110TH CONGRESS
2d Session

SENATE

REPORT
110–527

RECOGNITION OF EXCELLENCE IN AGING RESEARCH COMMITTEE REPORT

R E P O R T

OF THE

SPECIAL COMMITTEE ON AGING UNITED STATES SENATE

PURSUANT TO

S. RES. 89, SEC. 17(d), FEBRUARY 28, 2007

Resolution Authorizing a Study of the Problems of the Aged and Aging

DECEMBER 10, 2008.—Ordered to be printed

RECOGNITION OF EXCELLENCE IN AGING RESEARCH COMMITTEE REPORT

110TH CONGRESS
2d Session

SENATE

REPORT
110–527

RECOGNITION OF EXCELLENCE IN AGING RESEARCH COMMITTEE REPORT

R E P O R T

OF THE

SPECIAL COMMITTEE ON AGING UNITED STATES SENATE

PURSUANT TO

S. RES. 89, SEC. 17(d), FEBRUARY 28, 2007

Resolution Authorizing a Study of the Problems of the Aged and Aging

DECEMBER 10, 2008.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE

45–845 WASHINGTON : 2008

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

SPECIAL COMMITTEE ON AGING

HERB KOHL, Wisconsin, *Chairman*

RON WYDEN, Oregon
BLANCHE L. LINCOLN, Arkansas
EVAN BAYH, Indiana
THOMAS R. CARPER, Delaware
BILL NELSON, Florida
HILLARY RODHAM CLINTON, New York
KEN SALAZAR, Colorado
ROBERT P. CASEY, JR., Pennsylvania
CLAIRE MCCASKILL, Missouri
SHELDON WHITEHOUSE, Rhode Island

GORDON H. SMITH, Oregon
RICHARD SHELBY, Alabama
SUSAN COLLINS, Maine
MEL MARTINEZ, Florida
LARRY CRAIG, Idaho
ELIZABETH DOLE, North Carolina
DAVID VITTER, Louisiana
BOB CORKER, Tennessee
ARLEN SPECTER, Pennsylvania

DEBRA WHITMAN, *Majority Staff Director*
CATHERINE FINLEY, *Ranking Member Staff Director*

U.S. Senate
Special Committee on Aging
Washington, DC

Hon. Dick Cheney,
President, U.S. Senate,
Washington, D.C.

Dear Mr. President:

Under authority of Senate Resolution 89, agreed to February 28, 2007, we are submitting to you the annual report of the U.S. Senate Special Committee on Aging, titled *Recognition of Excellence in Aging Research.*

Senate Resolution 4, the Committee Systems Reorganization Amendments of 1977, authorizes the Special Committee on Aging "to conduct a continuing study of any and all matters pertaining to problems and opportunities of older people, including but not limited to, problems and opportunities of maintaining health, of assuring adequate income, of finding employment, of engaging in productive and rewarding activity, of securing proper housing and, when necessary, of obtaining care and assistance." Senate Resolution 4 also requires that the results of these studies and recommendations be reported to the Senate annually.

This report provides examples of exemplary, publicly-funded research related to older Americans. The report demonstrates that federal investments in aging research are broad and diverse and have significantly contributed to our knowledge and understanding of social, economic and medical issues related to old age.

Public funding of aging research has many benefits. For example, federal research in aging has led to the development of new technologies, such as NASA's wireless biometric monitoring system. Investments in biomedical research have led to the development of new treatments for disease, and the creation and evaluation of new models of care and service delivery are helping to target federal spending and reduce expenditures on programs that are inefficient or ineffective. Federally-funded research can create jobs and lead to economic growth. For instance, each grant at the National Institutes of Health creates seven jobs, on average, and one British study found that public investments in cardiovascular research received a nearly 40 percent annual return to the broader economy. In addition, federal funding often creates public resources, such as survey data, that can be used for research both in the public and private sectors. Lastly, federally-funded research can lead to improvements in public policy. For example, innovative research on savings behavior led to recent changes in pension law that is likely entice millions of American workers to increase their retirement savings by contributing to 401(k) accounts. Given these and many other important benefits, we strongly support continued federal funding for aging-related research.

On behalf of the members of the committee and its staff, we are pleased to transmit this report to you.

Sincerely,

Herb Kohl
Chairman

Gordon H. Smith
Ranking Member

110TH CONGRESS
2d Session

SENATE

REPORT
110–527

RECOGNITION OF EXCELLENCE IN AGING RESEARCH COMMITTEE REPORT

DECEMBER 10, 2008.—Ordered to be printed

Mr. KOHL, from the Committee on Aging,
submitted the following

R E P O R T

I. EXECUTIVE SUMMARY

The aging of the U.S. population is becoming an increasingly urgent issue for Congress to address. During the 110th Congress, the oldest members of the baby boom reached the age of 62 and became eligible for Social Security benefits. By 2029, the youngest baby boomers will have reached age 65 and will be eligible for Medicare. America's older population will double in the coming three decades, and even after the demographic impact of the baby boom has passed, the share of the population age 65 and over will grow due to longer life expectancies and declines in fertility. After remaining fairly constant for most of human history, average life expectancy has nearly doubled in the past century. Older Americans are able to spend these additional years working or by providing society with the benefit of their knowledge and experience through volunteerism or caregiving. As the nation's population ages, Congress will have the opportunity to help the growing number of older Americans contribute to and enrich the lives of their communities, and it will face the challenge of meeting the needs of the elderly who are poor, frail, or socially isolated.

In fields as diverse as biomedical sciences, housing, and environmental protection, federal agencies are making important contributions to the body of aging-related knowledge and science. Collecting data about older people and conducting research on their health, economic status, and social support systems substantially improves the ability of community leaders, program administrators, and the Congress to develop, implement, and monitor public policies that are effective, efficient, and equitable. Aging-related research conducted by federal agencies has led to significant breakthroughs in science and medicine and to the development of public policies that help older Americans lead healthier and more productive lives. By

45–845

continuing to support aging-related research, the Congress is committing the federal government to supporting public policies that enrich the lives of all Americans by improving the quality of life of older Americans.

RECOGNITION OF EXCELLENCE IN AGING RESEARCH

The U.S. Senate Special Committee on Aging (Committee) was established in 1961 to serve as a focal point in the Senate for discussion pertaining to the opportunities and challenges facing older Americans. The Committee has historically sought to recognize and promote the importance of aging research. Accordingly, this report describes federally-funded research that addresses the well-being of older adults in a wide range of areas, such as maintaining health, assuring adequate income, finding employment, engaging in productive and rewarding activity, securing proper housing, and obtaining long-term care services. The report demonstrates that the public sector is dedicated to improving the quality of life for older adults and their families and serves as a catalyst for continued progress in addressing the most pressing concerns of the nation's older population.

In May 2008, the Committee asked all federal departments and agencies to identify federally-funded research projects that address the well-being of older adults. Agencies were asked to submit to the Committee examples of research projects that contributed significantly to policymakers' knowledge and understanding of social, economic, and medical issues related to aging. Agencies were asked to describe how each research project was deemed to be exceptional, relevant, effective, and innovative. Agencies responded by identifying a wide range of research projects, including efforts to promote interagency collaboration in aging-related research, strengthen research infrastructure, initiate or advance data collection efforts, and carry out demonstration projects that are testing new methods of resolving aging-related policy issues. All research projects submitted for inclusion in the report were conducted, administered, or sponsored by a federal department or agency within the past four years. Research submissions included both intramural and extramural research and research co-funded by multiple federal agencies and by federal agencies and nongovernmental organizations. The following is a summary of aging-related research findings submitted by federal agencies.

II. SCOPE OF FEDERAL AGING-RELATED RESEARCH

A LARGE NUMBER OF AGENCIES CONDUCT AGING-RELATED RESEARCH

Twenty-seven agencies, ranging from the National Institutes of Health and the Department of Veterans Affairs to the Environmental Protection Agency and NASA, submitted over two hundred research projects to be included in this report.[1] The research these agencies sponsor and conduct draws on the knowledge and expertise of individuals representing a broad range of disciplines and professions who are advancing our understanding of the aging proc-

[1] See Appendix I for a full list of agencies.

ess and developing improved strategies for providing services to older Americans.

While many federal departments and agencies provide services to older Americans, four agencies focus on the needs of this population to a greater extent than most: the National Institute on Aging, the Administration on Aging, the Centers for Medicare and Medicaid Services, and the Social Security Administration. While the size, budget, and mission of each of these agencies differs substantially from that of the others, each conducts, administers, or sponsors aging-related research as part of its responsibilities to the public. For example:

• The National Institute on Aging (NIA) sponsors and conducts more aging-related research than any other agency of the federal government. NIA-sponsored research has contributed significantly to advancing scientific and medical understanding of the aging process and diseases of old age, including the identification of genes associated with a high risk of late-onset Alzheimer's disease.

• The Administration on Aging (AoA) provides supportive services to older Americans, including nutrition services, preventive health services, and home and community-based long-term care services. Recently, the AoA conducted an evaluation of supportive services provided under the Older Americans Act, including their role in planning, coordinating, and providing community services for older people.

• The Centers for Medicare and Medicaid Services (CMS) administers Medicare, Medicaid, and the State Children's Health Insurance Program. CMS research highlights the need for older Americans with multiple chronic diseases to receive recommended screening and preventive care services. Researchers have found that these services not only reduce mortality by one half, they may also reduce significant Medicare expenditures.

• The Social Security Administration (SSA) administers both Social Security and the Supplemental Security Income (SSI) program. Research conducted and sponsored by SSA has contributed greatly to our knowledge of the economic security of older Americans. Research findings from one recent SSA research project, for example, demonstrate how automatic enrollment in employer-sponsored 401(k) plans can boost participation in these plans increase workers' future retirement savings.

In addition to these examples, many federal agencies that do not focus exclusively on the needs of older adults conduct research on issues of importance to older Americans and their families. Some federal agencies have undertaken research specifically targeted at issues related to aging and the needs of older persons, while others have incorporated aging-related issues into other research projects. For example:

• The Department of Transportation (DOT) examines the driving safety of older adults who take multiple medications by comparing the driving assessments of occupational therapists with in-vehicle video recordings of daily driving by older individuals.

• The Environmental Protection Agency (EPA) estimates the exposure of older persons to air pollution through tools that can be used to evaluate whether air pollution is associated with greater risk of heart attack, stroke, chronic obstructive pulmonary disease, and asthma.

• The National Aeronautics and Space Administration's (NASA) Human Research Program is undertaking biomedical research on human health, safety and performance during space exploration missions. Because some of the effects of space flight on astronauts have similarities to the effects of human aging, such as loss of bone mass, impaired nutrition, and reduced immunological response, NASA's research offers insights into improving medical treatment of older persons.

• The Substance Abuse and Mental Health Services Administration (SAMHSA) is comparing the effectiveness for older adults of an integrated primary health care approach to specialty mental health and substance abuse services.

Several federal agencies that do not typically conduct research are undertaking projects that have added to our knowledge of the process of aging and the particular needs of older citizens. For example, the National Endowment for the Arts is evaluating the effects of active involvement in the arts on the physical and mental health and social functioning of older adults through a Creativity and Aging in America study. The Smithsonian Institution's Department of Anthropology is measuring bone density in 17th and 18th century human skeletons to determine whether low bone mass occurred in that era. The Appalachian Regional Commission, a federal-state partnership that works to create self-sustaining economic development and improved quality of life for people in Appalachia, is studying potential economic development opportunities for older persons in that area of the country.

A WIDE RANGE OF AGING ISSUES ARE ADDRESSED THROUGH RESEARCH

A majority of aging-related research currently being conducted by the federal government is focused on health care. The National Institutes of Health (NIH) conducts or sponsors most of the clinical research undertaken by the federal government, such as research on diseases and health conditions associated with the aging process. (Some of this research is described in following sections of this report). In addition to NIH; however, other federal agencies are involved in health care research on issues of importance for older adults. For example, the Agency for Healthcare Research and Quality (AHRQ) funds the Falls Prevention in Long Term Care Program that focuses on the prevention of injurious falls and related injuries and disabilities in nursing home and residential care settings and the Health Resources and Services Administration (HRSA) is examining access to home health care services among older people in rural areas. The Department of Veterans Affairs (VA) is working to improve end-of-life care through the Safe Harbor Palliative Care clinical demonstration project which strives to transfer the best practices of traditionally home-based hospice and palliative care into VA inpatient settings.

In addition to health care, federal aging-related research is also addressing social and economic concerns. For many older Americans their economic well-being depends greatly on their ability to continue working as they age. In addition to providing additional income, work at older ages can be a source of important social relationships. Older persons who continue to interact with others through work and volunteer activities tend to be healthier, both physically and mentally, than those who become socially isolated.

Federal agencies are evaluating the benefits of volunteerism for older adults, the investment and management of technology to better assist older people living independently in their homes, and the availability and accessibility of transportation options for older adults and people with disabilities. Examples of these types of research projects include:

• The Department of Labor (DoL) uses data from the Health and Retirement Study, to examine the economic consequences for retirees of exiting the workforce gradually in stages. The analysis focuses on the types of "bridge" jobs that people choose, the reasons behind their choices, and their socioeconomic outcomes.

• The Corporation for National and Community Service (CNCS) uses data from the Census Bureau's Current Population Survey to trace the volunteer habits of the "baby boom" generation to help volunteer program administrators develop strategies that will attract and retain greater numbers of volunteers.

• Researchers at the National Science Foundation (NSF) are developing an integrated monitoring system called "smart home" that will capture data in a noninvasive manner about elderly residents and their home environments in order to assess their changing needs and capabilities as they age.

• The National Council on Disability (NCD) utilizes a "livable communities" framework to enable older citizens to continue living in their homes, regardless of age or disability. The project assessed the needs of older community residents for safe and affordable housing, access to transportation, access to the political process, and access to services, programs, and activities offered by public and private entities.

III. Models of Federal Aging Research

INVESTMENTS IN BASIC SCIENCE ARE LEADING TO SIGNIFICANT BREAKTHROUGHS ON DISEASES THAT AFFECT OLDER AMERICANS

With more than half of its funding allocated to basic research, the National Institutes of Health (NIH) conducts and sponsors more research on aging-related diseases and disorders than any other federal agency.[2] While it is the mission of the National Institutes of Aging to provide leadership in aging-related research, the NIH Office of the Director and the other 26 NIH Institutes and Centers also invest heavily in research that contributes to greater understanding of the physical, mental, and sociological aspects of the aging process. For example, through NIH-sponsored research:

• Investigators have demonstrated that restricting caloric intake may improve the body's metabolic efficiency, an effect that could contribute to the slowing of adverse changes that often accompany aging.

• Researchers have studied the ability of cells to repair damage to DNA caused by exposure to environmental toxins, which are a major cause of diseases associated with aging, such as cancer.

[2] In fiscal year 2007, aging research accounted for almost nine percent of all spending on health research by agencies in the Department of Health and Human Services, including NIH. Data derived from HHS Budget Office cross-cutting table on aging-related programs, March 2008, and table on "Federal Obligations for Health Research and Development by Federal Agency, FY 1997–2007, "NIH Office of Extramural Research, available at: *http://report.nih.gov/award/Research/Fed_Obligations_By_Allocation_Agency_2007.xls.*

• A digital brain atlas of Alzheimer's disease was developed that correlates observations from many images to a single brain model. The research has led to novel methods to characterize and track Alzheimer's disease that are used at imaging centers worldwide.

• Investigators found that a daily, high-dose combination of antioxidant vitamins C, E, and beta-carotene and the trace element zinc reduced the risk of developing advanced age-related macular degeneration by 25 percent over a five-year period.

Other federal agencies also conduct scientific research that contributes to improving the lives of older persons. The Department of Agriculture, for example, has studied the effects of improved nutrition on reducing the risk of heart disease, bone fractures, eye disease, and dementia in old age. The Food and Drug Administration's (FDA) has used a combination of experimental approaches to understand the growth and repair of tissues in the joints, which are particularly susceptible to injury among older persons. In addition, the Department of Commerce is collaborating with other government scientists at the National Institute of Standards and Technology, the FDA, and the National Cancer Institute to develop standards for benchmarking medical imaging algorithms used in the detection and measurement of disease.

DATA COLLECTION EFFORTS PROVIDE VALUABLE INFORMATION ABOUT OLDER AMERICANS

Many federal agencies conduct surveys and maintain data registries that are used to inform policymakers and planners about aging-related trends, including population projections, labor force participation, and the incidence and prevalence of specific health conditions among older people. Several federal agencies collect data through surveys of households, employers, hospitals, and nursing homes. Surveys of nationally representative samples of the population, conducted on a regular basis, are essential to enable researchers to monitor trends in the health, functional capacity, family status, and income of older Americans. National surveys of households and institutions conducted and sponsored by federal agencies are often the only surveys large enough to allow analysts to study the most vulnerable populations, such as racial and ethnic minority populations, residents of institutions, low-income households, and people aged 85 and older. Examples of important federal data collection efforts include:

• The Social Security Administration and the National Institute on Aging collaboratively conduct the Health and Retirement Study, which is the most comprehensive source of longitudinal data for research on health, income, wealth and well-being for older Americans.

• The Census Bureau's Current Population Survey (CPS) and Survey of Income and Program Participation (SIPP) collect data on employment, income, health insurance coverage, household wealth, and other economic and demographic characteristics of individuals, allowing researchers to measure these variables in the elderly population relative to the non-elderly population.

• The National Science Foundation's (NSF) Panel Study of Income Dynamics (PSID) has collected data on a representative group of American families since 1968, allowing researchers to study the economic and social well-being of older Americans over time.

• The Agency for Healthcare Research and Quality (AHRQ) developed the Consumer Assessment of Health Providers and Services Hospital Survey to allow consumers to compare the experiences of adult inpatients' hospital care and services.

• The Office of the Assistant Secretary for Planning and Evaluation (ASPE) of the Department of Health and Human Services is conducting the first National Survey of Residential Care Facilities which will provide nationally representative data on residential care facilities and their residents.

RESEARCH PROVIDES AN IMPORTANT LINK TO POLICY

Data collected through surveys conducted or sponsored by federal agencies helps to inform Congress during the process of developing legislation, and guides executive branch agencies in implementing programs and policies. Federally-sponsored research also plays a crucial role in evaluating the effectiveness of federal programs and policies in achieving their stated goals. Objective analysis, guided by scientific methods and principles, is essential to ensuring that the public's needs are measured accurately, that the policies adopted by Congress to address those needs are executed effectively, and that the funds appropriated to implement these policies are expended efficiently.

Examples of how research conducted by federal agencies can inform public policy include:

• The Assistant Secretary for Planning and Evaluation (ASPE) of the Department of Health and Human Services is studying the potential for reverse mortgages to play a greater role in financing long-term care. In addition, ASPE is studying factors that influence the purchase of private long-term care insurance, including the effect of tax incentives.

• The Congressional Budget Office (CBO) examined the potential effectiveness of identifying high-cost Medicare beneficiaries and focusing on early intervention strategies for these individuals as a way to reduce the program's costs.

• The Congressional Research Service (CRS) analyzed the effect of possible benefit reductions under Social Security reform proposals on poverty among the elderly and assessed the effectiveness of options to mitigate these effects.

• The Social Security Administration (SSA) estimated how much longer a typical worker aged 65 in 2030 would have to work for the same financial resources under a scenario of high taxes and high health costs compared to one of lower taxes and health costs.

IV. NEW DIRECTIONS

BUILDING NEW INFRASTRUCTURE FOR AGING RESEARCH IN FEDERAL AGENCIES

In response to the growth of our nation's aging population, some federal agencies have recognized a need to change or restructure the programs that they lead to address the special circumstances facing an aging society. The examples listed below are indicative of how agencies have adapted their research agendas to address the needs of an aging population:

• The Department of Transportation is developing a system that will correlate driver performance to age-related functional deficits

and use of medications, providing new insights into risk factors for older drivers. DOT will also conduct evaluations of changes to behavior that reduce the risk of accidents among older drivers.

• The Environmental Protection Agency developed the Aging Initiative to give the agency and the public the ability to anticipate, accommodate, and manage the environmental risks associated with an aging society. The program is generating data, models, and guidance to incorporate the older population into health promotion and intervention strategies and to reduce risks from environmental exposures.

• The National Institute on Aging's Edward R. Roybal Centers for Translational Research in the Social and Behavioral Sciences are designed to improve the health, quality of life, and productivity of middle-aged and older people by facilitating the translation of knowledge learned in the social and behavioral sciences into practical outcomes to benefit the health and well being of older Americans.

INTERAGENCY COLLABORATION IS STRENGTHENING RESEARCH POTENTIAL

Federal agencies work together and with state and local governments, community-based organizations, and private-sector businesses to integrate their research projects with each other. Federal agencies and other organizations collaborate on research projects and share the knowledge and expertise of their staffs and affiliated researchers. Collaboration allows agencies to share resources and prevent duplication of effort across agencies. Although agencies have diverse responsibilities and goals, working collaboratively allows them to use scarce resources efficiently and contributes to high-quality research. The examples of interagency collaboration listed below show some of the ways federal agencies are working together to improve the lives of older Americans.

• The Agency for Healthcare Research and Quality (AHRQ) sponsors the Healthcare Cost and Utilization Project, a unique federal-state-industry partnership that brings together the data collection efforts of state data organizations, hospital associations, private data organizations, and the federal government to create a national information resource of patient-level health care data.

• The Administration on Aging (AoA), in collaboration with AHRQ, CDC, CMS, NIA and several national foundations, is promoting behavioral interventions that have been proven to reduce the risk of disease, disability and injury among the elderly.

• As part of a larger consortium, the Center for Disease Control's (CDC) National Center for Health Statistics operates the Federal Interagency Forum on Aging-Related Statistics (Forum) which brings together federal agencies that share a common interest in improving aging-related data. The Forum provides agencies with a venue to discuss data issues that cut across agency boundaries.

• The Centers for Medicare and Medicaid Services (CMS) collaborates with the National Cancer Institute to sponsor the Surveillance, Epidemiology, and End Results database to provide detailed information about older cancer patients.

• The National Institutes of Health's (NIH) Interdisciplinary Research Consortium in Geroscience fosters collaboration among biologists, biochemists, geneticists, physicians, physiologists, statisti-

cians, and chemists that will help scientists to better understand age-related diseases and disorders. Examples include studies of the effects of diet on aging and why the aging brain recovers less easily from traumatic brain injury.

FUTURE FEDERAL AGING RESEARCH

Never has it been more important to have knowledge about the aging process, including the characteristics and needs of the current and future older populations. In the decades to come, Congress and the executive branch will be responsible for developing policies to improve the nation's methods of financing and delivering health care and long-term care systems. This may include not just reforms to the Medicare and Medicaid programs, but possibly a comprehensive redesign and reform of the private health insurance market and the means by which long-term care services are provided and how they are funded. Additionally, as the first baby boomers reach retirement age and begin to rely on Social Security and pension benefits, policymakers must ensure that the systems created to support the economic well-being of older adults are secure. Now is the time for Congress to direct federal agencies to review their agendas for research on aging-related policy issues and to set priorities for their research that will most effectively aid the Congress as it develops legislation to address the needs of older Americans today and in the future.

V. APPENDIX I: AGENCY SUBMISSIONS

Administration on Aging
Agency for Healthcare Research and Quality
Appalachian Regional Commission
Assistant Secretary for Planning and Evaluation
Census Bureau
Centers for Disease Control and Prevention
Centers for Medicare and Medicaid Services
Corporation for National and Community Service
Department of Agriculture
Department of Commerce
Department of Labor
Department of Transportation
Department of Veterans Affairs
Environmental Protection Agency
Food and Drug Administration
Health Resources and Services Administration
Library of Congress/Congressional Research Service
National Aeronautics and Space Administration
National Council on Disability
National Endowment for the Arts
National Institute of Justice
National Institutes of Health/National Institute on Aging
National Science Foundation
Smithsonian Institution
Social Security Administration
Substance Abuse and Mental Health Services Administration

THE ADMINISTRATION ON AGING: TRANSLATING DISEASE AND DISABILITY PREVENTION RESEARCH INTO STATE AND COMMUNITY EVIDENCE-BASED SERVICE SYSTEMS

AoA's Evidence-based Prevention Demonstration Initiative documented that community aging service organizations can successfully translate evidence-based interventions into practical, attractive, low cost programs that improve the health of older adults and are likely to reduce health care costs. The best of these programs are being replicated across the nation.

Lead Agency: Administration on Aging.

Agency Mission: The mission of the Administration on Aging (AoA) is to help elderly individuals maintain their dignity and independence in their homes and communities for as long as possible. AoA does this by serving as the Federal agency responsible for advancing the concerns and interests of older people, and by working with and through a nationwide network of 29,000 community-based organizations, known as the Aging Services Network, to promote the development of comprehensive and coordinated systems of care at the community-level that respond to the needs and preferences of older people and their family caregivers.

Principal Investigator: Donald Grantt, Director, Evidence-Based Disease and Disability Prevention Program, U.S. Administration on Aging, Office of Planning and Policy Development, One Massachusetts Avenue, NW., Washington, D.C. 20001.

Partner Agencies: Agency for Healthcare Research and Quality (AHRQ), Centers for Disease Control and Prevention (CDC), National Institute of Health (NIH), Atlantic Philanthropies, Health Foundation of South Florida, Robert Wood Johnson Foundation, and John H. Hartford Foundation.

General Description: In 2003, the Administration on Aging (AoA) launched a $6 million demonstration program, in collaboration with CDC, AHRQ, CMS, NIA and several national foundations, to promote the translation of science-based interventions into practice at the community-level that have proven effective in helping older individuals to make behavioral changes that reduce the risk of disease, disability and injury among the elderly.

Chronic conditions currently limit activities for 12 million older persons living in communities. These conditions collectively account for seven out of every 10 deaths, and more than three-quarters of all health expenditures in the United States. To address this growing chronic disease epidemic, federal and philanthropic investments have generated a body of scientific evidence on the efficacy of specific interventions that can help older people to improve their health and well-bring by better managing their chronic diseases, being more physically active, avoiding falls, managing medications and improving nutrition and diet. In many cases, these tested interventions reached older adults in community, not clinical, settings. This is a critical point—if we can reach older adults with effective healthy aging programs without relying solely upon clinicians, we will save billions of dollars and reach many more people—especially those who are most vulnerable and lack access to medical care.

The AoA demonstration was designed to test the effectiveness of delivering these "evidence-based prevention programs" though

AoA's nationwide network of community-based aging service provider organizations. The evidence-based programs used for this demonstration include low-cost interventions, such as chronic-disease self-management training, fall prevention and exercise programs, that can be delivered by staff and volunteers who are not clinicians but are trained in specific tools and techniques that help people to modify unhealthy behaviors. Examples of organizations in AoA's network that provide sites for the delivery of such programs include senior centers, adult day care programs, congregate meal sites, senior housing projects and faith-based organizations. These organizations make up an existing nation-wide infrastructure that the federal government can use to rapidly deploy new programs and services that have proven effective in helping seniors to remain healthy and independent in their homes and community. These organizations reach into every community in the county and each year provide a wide range of social and supportive services to nearly 10,000,000 elderly individuals.

In 2003, AoA awarded twelve demonstration grants to communities across the nation supporting local partnerships involving aging service providers, area agencies on aging, local health entities and research organizations, such as university research centers. A strong emphasis was placed on coordination with the CDC and NIA funded Academic Research Centers around the country. Over a four-year period, the community grant programs reached more than 4,000 older adults. Over half were members of minority groups and one in eight was non-English speaking. The community programs' success has since led to a strengthened collaboration between AoA and its partners to create statewide programs in 27 states across the country.

Beyond the participation numbers, analysis of surveys conducted at baseline and then again 4–6 months after the program ended demonstrated that participants in these community-based demonstration projects achieved the same benefits as subjects in the randomized trials in much more controlled settings. Findings were especially powerful for the Matter of Balance fear of falling program, the Healthy IDEAS depression program, the Medication Management Program and the Stanford Chronic Disease Self-management Program. The programs reached diverse older adults and produced measurable and meaningful improvements in health and function. The attached list of references includes citations for relevant articles that detail the findings on these programs. (See Healy et al., Quijano et al., Casado et al., Alkema et al., and Gitlin et al.)

All of the grantees worked to ensure that their programs faithfully replicated the intervention from the original research. Four of them worked with an academic expert to analyze various dimensions of "fidelity" (the label for faithful replication) in their projects and the results were also published. (See Frank et al.)

Based on the success of these community-level grants, in 2006 AoA launched a $14 million grants program designed to encourage state governments to play a leadership role in promoting the deployment of evidence-based programs for older adults within their states as part of their overall prevention agenda. This program that involves partnerships between the state aging and health departments is currently supporting 350 community-level projects

and has already provided evidence-based prevention programs to an additional 8,600 older adults. States and local agencies have matched the 2003 and 2006 federal investment with at least $6.5 million in non-federal funds. Additionally, federal agencies such as AHRQ, CDC, CMS, HRSA, NIA and others have contributed expertise and funds to this demonstration initiative. Nine prestigious universities in the CDC's Healthy Aging Research Network are contributing expertise in research, evaluation and training to support success at both the local and national levels.

This collective effort has been bolstered by $8.4 million in grants from The Atlantic Philanthropies to the National Council on Aging (NCOA), AoA's National Technical Assistance Center and a leader in healthy aging. These funds are being used to further advance replication of the Stanford Chronic Disease Self-management Program in at least 27 states (24 funded by AoA and 3 by NCOA) and to build sustainable systems for statewide access in at least eight states. Together, the Robert Wood Johnson Foundation and The John A. Hartford Foundation have provided over $3.5 million to NCOA to promote healthy aging programming in the aging services network.

Additionally, The John A. Hartford Foundation awarded $1.7 million to the Partners in Care Foundation to fund national expansion of the Medication Management Program developed under the 2003 AoA demonstration grant. And in May 2008, the Health Foundation of South Florida committed $7.5 million over five years to embed evidence-based programming for older adults into community care systems in three counties.

Excellence: What makes this project exceptional?

This demonstration initiative is exceptional because it creates a practical, low-cost way to translate the best science from NIH and other federal agencies into attractive, effective programs that improve the health and function of older adults and reduce costs. It promotes collaboration and partnerships at the federal and local levels that leverage expertise, resources and funding from multiple public and private organizations. And it provides an important, value-added role for community-based social services agencies in deploying interventions that can keep older people healthy and also reduce health care costs.

Significance: How is this evidence-based demonstration relevant to older persons, populations and/or an aging society?

Four out of five older adults have a chronic condition and many experience limitations in activities due to such conditions. Minority and disadvantaged elders are at greater risk for chronic illnesses and accompanying disability. Nearly 40% of older adults living in the community reported limitations in function due to chronic conditions. Two-thirds of Medicare dollars are spent on people with 5 or more chronic conditions. The aging of the population alone is projected to increase health care costs by 25 percent between 2000 and 2030. Falls are the leading cause of both fatal and nonfatal injuries for those 65 and over. In 2005, over 1.8 million older adults were treated in emergency departments for injuries from falls, more than 433,000 were hospitalized, and nearly 16,000 died.

Poor health is not an inevitable consequence of aging. Given the medical nature of these chronic illnesses, the search for interventions has been heavily medical, but an often overlooked set of pro-

grams is best delivered outside of the medical care system. These programs relate primarily to supporting healthy lifestyle choices including self-management of chronic conditions, increasing physical activity, reducing falls, improving eating habits, and managing depressive symptoms.

Older adults—like everyone else—need support in making healthier choices. They often face unique challenges to engaging in preventive activities, such as having to endure arthritic pain that makes exercising difficult, or being discouraged about having so many chronic conditions, or not having good peer support. Proven chronic disease self-management workshops help older adults to address the barriers to making healthier choices and build skills to effectively manage their conditions. Community aging service providers, working collaboratively with health care providers and other local prevention experts, are highly suited to address the prevention needs of the elderly.

Effectiveness: What is the impact and/or application of this evidence-based demonstration to older persons?

Every program that was replicated under this demonstration initiative was based upon an intervention that had proven efficacy in a rigorous scientific study. For example, the Stanford Chronic Disease Self-management Program, a six week workshop led by trained lay facilitators, has repeatedly produced powerful outcomes for people with chronic conditions. In the original trial, six months after the end of the intervention, participants reported significant:

- Improvement in self-rated health, disability, social and role activities;
- More energy and less fatigue;
- Decreased disability;
- Increased exercise;
- Greater skill in coping strategies and symptom management;
- Better communication with their physicians; and,
- Fewer physician visits and hospitalizations.

In the AoA demonstration projects offering the Chronic Disease Self-management Program in Western Michigan and Philadelphia, most of these findings were replicated when the program was offered to diverse populations, including Hispanics and African-Americans, by Area Agencies on Aging working with senior centers and other local sites.

This program and many others in the AoA demonstration produced significant improvements in health that have been published in peer-reviewed journals. If taken to scale, these programs hold the promise of making dramatic improvements in the health and well-being of our older citizens.

Innovativeness: Why is this evidence-based demonstration exciting or newsworthy?

This AoA demonstration initiative is exciting and newsworthy because it did what is rarely done: It drew upon the billions of federal investment in high quality research to test practical, low-cost attractive programs that can reach millions of diverse elders and produce meaningful improvements in health and health care costs. It organized multiple public and private organizations into an effective results-focused collaborative.

STREAMLINING ACCESS TO LONG TERM CARE: THE AGING AND DISABILITY RESOURCE CENTER INITIATIVE

The vision of the ADRC program is to have Resource Centers in every community serving as highly visible and trusted places where people can turn for information on the full range of long-term support options. The goal is to empower individuals to make informed choices and to streamline access to long-term support. Long-term support refers to a wide range of in-home, community-based, and institutional services and programs that are designed to help individuals with disabilities.

Lead Agency: Administration on Aging (AoA).

Agency Mission: The mission of the Administration on Aging (AoA) is to help elderly individuals maintain their dignity and independence in their homes and communities for as long as possible. AoA does this by serving as the Federal agency responsible for advancing the concerns and interests of older people, and by working with and through a nationwide network of 29,000 community-based organizations, known as the Aging Services Network, to promote the development of comprehensive and coordinated systems of care at the community-level that respond to the needs and preferences of older people and their family caregivers.

Principal Investigator: Greg Case, U.S. Administration on Aging, Office of Planning and Policy Development, on Massachusetts Avenue, NW., Washington, D.C. 2001.

Partner Agency: Centers for Medicare and Medicaid Services (CMS).

General Description: The Aging and Disability Resource Center Program (ADRC), a collaborative effort of the Administration on Aging (AoA) and the Centers for Medicare & Medicaid Services (CMS), is designed to streamline access to long-term care.

The ADRC initiative supports state efforts to develop "one-stop shop" programs at the community level that will help people make informed decisions about their service and support options and serve as the entry point to the long-term support system. States are using ADRC funds to better coordinate and/or redesign their existing systems of information, assistance and access and are doing so by forming strong state and local partnerships.

Resource Center programs provide information and assistance to individuals needing either public or private resources, professionals seeking assistance on behalf of their clients, and individuals planning for their future long-term care needs. Resource Center programs also serve as the entry point to publicly administered long term supports including those funded under Medicaid, the Older Americans Act and state revenue programs.

Key Functions of an ADRC:

- Awareness & Information
  - Information on Options
- Assistance
  - Options Counseling
  - Benefits Counseling
  - Employment Options Counseling
  - Referral
  - Crisis Intervention
  - Planning for Future Needs

Access
- Eligibility Screening
- Private Pay Services
- Comprehensive Assessment
- Programmatic Eligibility Determination
- Medicaid Financial Eligibility Determination
- One-Stop Assessment to all public programs

ADRC demonstration grantee states target Resource Center services to the elderly and at least one additional population of people with disabilities (i.e., individuals with physical disabilities, serious mental illness, and/or mental retardation/developmental disabilities). Many ADRCs serve people with all disabilities regardless of their age and others are working towards this goal.

In many communities, long-term services are administered by multiple agencies and have complex, fragmented, and often duplicative intake, assessment, and eligibility functions. Figuring out how to obtain services is difficult. A single, coordinated system of information and access for all persons seeking long-term support minimizes confusion, enhances individual choice and supports informed decision-making. It also improves the ability of state and local governments to manage resources and to monitor program quality through centralized data collection and evaluation.

AoA and CMS launched the ADRC initiative in the fall of 2003 through the funding of 12 grants to states to develop pilot programs. Additional grants were awarded in 2004 and 2005 bringing the total number of states funded through the federal ADRC initiative to 43. Additional states have implemented. ADRC projects without federal funding.

To support ADRC grant projects, AoA and CMS fund technical assistance providers. The AoA funded ADRC Technical Assistance Exchange (TAE) coordinates technical assistance efforts and collaborates closely with the CMS funded Community Living Exchange Collaborative. Technical assistance is provided through individual assistance to grantees, national meetings, monthly teleconferences, a weekly newsletter, the ADRC–TAE website and in other ways. Many of the technical assistance products developed for grantees are available to the public on the website *www.adrc-tae.org*.

Excellence: What makes this project exceptional?

Since its inception in 2003, states have embraced the ADRC initiative as they have come to understand the significant role single point of entry programs can play in helping consumers with disabilities remain in their homes and communities. Today, just four years since the first AoA and CMS funded ADRC opened its doors, there are 173 ADRC program sites serving nearly 30% of the U.S. population. Over half of the 43 states with federally funded ADRC programs have passed legislation, developed executive guidance, and/or contributed state funds to enhance and expand ADRCs. State investments in ADRCs/single entry point systems, independent of the federal initiative, now total over $45,000,000. A number of states including Alaska, Indiana, Kentucky, Louisiana, New Hampshire, and West Virginia have achieved statewide coverage with their ADRCs.

On the Federal level, the ADRC initiative has also received significant support. With the 2006 reauthorization of the Older Ameri-

cans Act, Congress directed the Assistant Secretary for Aging to implement ADRC programs in all states to serve as visible and trusted sources of information on the full range of long-term care options.

Significance: How is this demonstration relevant to older persons, populations and/or on aging society?

The American public has an overwhelming preference for care at home, but all too often must deal with a long term care system that is fragmented, confusing and often biased in favor of more expensive institutional care. A fragmented system with no easy point hinders informed decision-making on the part of people with disabilities and their families and may result in the unnecessary use of expensive forms of care and spend-down to Medicaid. About half of the elderly people who enter a nursing home as private pay end up exhausting their assets and spending down to Medicaid. The ADRC initiative is designed to reduce the confusion experienced by consumers and instead empower them with the information and assistance they need to make informed choices and, for those that need publicly funded services, to streamline the eligibility determination process to make it easier to access needed supports.

One of the most significant outcomes of the ADRC initiative relates to the new partnerships that have formed as states and communities have developed single point of entry systems. One key example are the new partnerships that are forming across aging and disability networks as they work together to develop and implement ADRCs. While the aging network has always been a service network serving older adults, the disability network has developed primarily as an advocacy network assisting people with disabilities of all ages gain basic civil rights. In joining together to streamline access to long-term care, each of these networks bring unique skill sets to the table and the end result is that older adults and non-elderly adults with disabilities now gain benefit from the skill sets of both networks.

Effectivness: What is the impact and/or application of this demonstration to older persons?

The ADRC program impact on people with disabilities, including older people, is immeasurable as the program strives to simplify state systems for long-term care to make them more accessible. As ADRC projects become more visible in the community, sites are seeing an increase in the number of contacts they receive. From March 2004 to March 2008, the average number of contacts per month per site have increased 20% from 929 to 1,118. By investing in IT and management information systems that support ADRC functions and building strong partnerships across aging and disability networks, ADRC program sites have been able to respond to this increase in service volume without significant increases in number of staff. ADRCs will be well positioned to respond efficiently and effectively to the needs of older adults even as demand for services increases over the next two decades.

One important goal of the ADRC initiative is to get to consumers as they go through the most critical pathways to long term care: hospitals, physician's offices, and community health clinics. By getting to a consumer at that critical point when they are making decisions about long term care, the ADRC can help to ensure they have access to comprehensive information about the full range of

supports available. Based on the most recent ADRC reports from March 2008, 36.7% of referrals to ADRCs were from these "critical pathways."

Several characteristics differentiate ADRCs from other long-term care organizations and establish them as leaders in rebalancing systems of care historically oriented toward institutional care. These include:

- Delivery of efficient, simplified access to a wide range of information and supports about community-based options for an array of consumer groups seeking information or access into the long-term care system through diverse entry points;
- Commitment to providing resources based on the values of consumer direction, person-centered planning, and individual choice and autonomy, particularly through options counseling;
- Capacity to facilitate effective linkages at multiple junctures involving diverse stakeholders along the long-term care continuum; and
- Ability to prevent institutional placement by maximizing access to comprehensive, updated and credible information about alternate resources in the community including access to HCBS waiver services.

Innovativeness: Why is this demonstration exciting or newsworthy?

The ADRC program is exciting and newsworthy because it is being embraced by professional, consumers, and advocates alike as an initiative that helps to ensure that people with disabilities, regardless of income, in need of long-term supports and services have access to the full range of information to assist them in making informed decisions regarding the care they need. Any public hearing that has been held over the last decade to get consumer input on long-term care issues has been inundated by pleas from consumers to streamline the existing fragmented bureaucracy people are forced to deal with when they try to learn about and access existing care options. GAO's Means-Tested Programs: Information on Program Access Can be an Important Management Tool (March 2005) documents the information and decision-making barriers that fragmentation in existing public programs creates for consumers. The AoA and CMS ADRC initiative is in direct response to this documented need to streamline access to long term care.

AGING INTEGRATED DATABASE (AGID)

AGID is an on-line query system using AoA's performance measurement data and surveys, supplemented by information from the Census Bureau. AGID users can produce customized tables by selecting data elements and further results based on geographic locations or demographic stratifiers.

Lead Agency: Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Agency Mission: The mission of the Administration on Aging (AoA) is to help elderly individuals maintain their dignity and independence in their homes and communities for as long as possible. AoA does this by serving as the Federal agency responsible for advancing the concerns and interests of older people, and by working with and through a nationwide network of 29,000 community-based organizations, known as the Aging Services Network, to promote

the development of comprehensive and coordinated systems of care at the community level that respond to the needs and preferences of older people and their family caregivers.

Principal investigator: Saadia Greenberg, Director, Office of Evaluation, U.S. Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Partner agency: Social & Scientific Systems, Inc.

General Description: AGID is an on-line query system that provides dynamic access to AoA-related program performance results, AoA-supported surveys and Census population data. The purpose of the system is to allow users to produce customized tables in a step-by-step process and output the results in print or spreadsheet form. AGID users have the ability to select only those data elements applicable to their needs, and to further refine their results based on geographic locations (such as individual states or AoA regions) or demographic stratifiers that are meaningful to their application. In addition, the results from user queries can be downloaded in spreadsheet form and, in turn, post-processed for graphical displays or more in-depth analyses.

The system is based on aggregate statistics reports to speed up data access and protect individual records. Since there are many thousands of data elements available in the original databases, only the analytically relevant variables were carried over to AGID. If there is a query that the user would like to see but AGID does not support, the user can submit a request using the "Submit Feedback" link on the AGID homepage and the user will receive a prompt response. Although there are constructed variables and some restructuring of the database files, most of the data elements appearing in the system are in the form as reported by the states or survey participants.

The databases that are currently available in the system are listed below:

AoA Databases: State Program Reports (SPR) 2000–2006; National Ombudsman Reporting System (NORS) 2006–2006; National Surveys of Older Americans Act (OAA) Participants 2003–2005; National Survey of Area Agencies on Aging (AAA) 2005/2006.

Census Databases: American Community Survey (ACS) Data which includes State-Level ACS Data 2004–2006; Population Estimates Data which includes State-Level Population Data 2000–2006 and County-Level Population Data 2006.

A unique feature of the AGID system is the ability to build your own customized database. The user has the option of selecting a single database in generating database-specific tables or combining data elements from multiple databases to build a customized table. The user is able to build state-level tables with data from multiple databases. AGID can be accessed at *www.data.aoa.gov*.

Excellence: What makes this project exceptional?

AGID provides dynamic access to aging population statistics, program performance reports, and surveys of OAA program participants. The system allows users to produce customized reports and statistics from multiple databases. It is user-friendly in that it provides a step-by-step process and outputs the results in print or spreadsheet form.

Significance: How is this research relevant to older persons, populations and/or an aging society?

AGID is significant because it improves the handling of data and provides multiple data sources related to aging. This enables the State and local decision makers to examine trends, compare themselves to others, and develop the best senior programs available to them. It can be used for the following analyses: compare to Census, compare to national averages, compare to other States, develop benchmarks, develop per capita ratio, compare over time, examine cost per unit, and examine usage per client.

Effectiveness: What is the impact and/or application of this research to older persons?

AGID improves data reporting, comparison, analysis, and timeliness.

Innovativeness: Why is this research exciting or newsworthy?

AGID is available to everyone. This database provides detailed information not previously available to the public and data can be queried from various sources. The system constantly adds new data and features.

NATIONAL AGING PROGRAM INFORMATION SYSTEM COMPREHENSIVE AGING REPORTING AND DATA SYSTEM (CARDS)

The CARDS program is a web-based decision support system for NAPIS and houses all NAPIS data. It includes a web-based tool for SUAs to submit data and enable reporting for AoA.

Lead Agency: Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Agency Mission: The mission of the Administration on Aging (AoA) is to help elderly individuals maintain their dignity and independence in their homes and communities for as long as possible. AoA does this by serving as the Federal agency responsible for advancing the concerns and interests of older people, and by working with and through a nationwide network of 29,000 community-based organizations, known as the Aging Services Network, to promote the development of comprehensive and coordinated systems of care at the community-level that respond to the needs and preferences of older people and their family caregivers.

Principal Investigator: Saadia Greenberg, Director, Office of Evaluation, U.S. Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Partner agency: Harmony Information Systems, Inc., State Agencies on Aging.

General Description: The CARDS system houses the data warehouse and reporting tools for program information and services provided under the Older Americans Act (OAA). The OAA, administered by AoA, provides grant programs for an array of supportive services, as well as state and local efforts to develop comprehensive systems of car for older people and their family caregivers. Data and information on these programs is gathered through the National Aging Program Information System (NAPIS) in collaboration with an Aging Network that includes 56 State Units on Aging (SUAs), 655 Area Agencies on Aging (AAAs), 244 Tribal organizations, and over 29,000 local community service organizations.

The NAPIS database system has multiple components. Review, analysis and infrastructure upgrades of each part of the system are crucial for continued stability, security and validity of the data and the elements contained within the database and web elements. The

NAPIS data allows AoA to develop and dissect information about aging services to Congress, states and other stakeholders. NAPIS components include State Program Report (SPR), National Ombudsman Reporting system (NORS), title IV of the OAA, Senior Medicare Patrols Project (SMP), and the Census data.

The CARDS system houses AoA's NAPIS data and provides the following benefits:

- One-stop shopping because the system is a web-based portal using single "Hub" application.
- Easy-to-use single-click electronic report submission, which does not require any email or file transfer protocol.
- Simple method to capture, validate and report data.
- Decision support system and projections.
- Improve data timeliness, reliability, efficiency and effectiveness.
- 24/365 availability.
- Automatic backup.
- Year-by-year, multi-year, state-by-state and multi-state reporting, allowing local and nationwide reports.
- Ad hoc analysis.
- Standardized reports and procedures.
- Cross-program reporting.
- Historical analysis including variance reporting.
- Single data repository.
- Automated tracking, notification and logs.
- Role-based use.
- Third-party data import allowing flexibility.
- Scalable.
- Streamlined support.
- Streamlined training.

Excellence: What makes this project exceptional?

The CARDS program is exceptional because it enables state and other grantees to electronically submit data and information to the NAPIS database. It captures, validates and reports on data, and serves as a decision-support system for AoA. It enhances the timeliness, reliability, efficiency and effectiveness with which AoA manages data; and it establishes a web-based, hosted database and decision-support system to be operational, initially for SPR, NORS and information from the U.S. Census Bureau.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The CARDS data is designed to assist States and grantees to do reporting in a quick and efficient manner. The software is user-friendly and the system is designed to detect anomalies in data. As a result, the system can help reduce redundancy, lower costs, and maximize the level of care provided to consumers.

Effectiveness: What is the impact and/or application of this research to older persons?

The data makes it possible for AoA to develop and disseminate information about services for the aging to Congress, states and other stakeholders.

Innovativeness: Why is this research exciting or newsworthy?

The CARDS program provides an integrated environment to house AoA program and performance data. The data and information is gathered through NAPIS in collaboration with an Aging

Network that includes 56 SUAs, 655 AAAs, 244 Tribal organizations, and over 29,000 local community service organizations.

RECOGNITION OF EXCELLENCE IN AGING RESEARCH SUBMISSION FORM: AOA PERFORMANCE MEASUREMENT

AoA, in concert with State and local partners, uses performance measurement tools of GPRA to improve services. The results.aoa.gov *website is designed to provide program results and evaluation information.*

Lead government department/agency conducting, sponsoring or administering the research: Administration on Aging.

Mission of department/agency: The mission of the Administration on Aging (AoA) is to help elderly individuals maintain their dignity and independence in their homes and communities for as long as possible. AoA does this by serving as the Federal agency responsible for advancing the concerns and interests of older people, and by working with and through a nationwide network of 29,000 community-based organizations, known as the Aging Services Network, to promote the development of comprehensive and coordinated systems of care at the community-level that respond to the needs and preferences of older people and their family caregivers.

Name, title, mailing address, email address, and phone number of principal investigator(s)/lead researcher(s) for the research project: Saadia Greenberg, Director, Office of Evaluation, U.S. Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Partner agencies or organizations that participated in the research project: Office of Management and Budget, U.S. Department of Health and Human Services.

General Description: For over ten years, AoA has developed, tested and implemented performance measurement indicators that measure the effectiveness of the Older Americans Act (OAA) program. AoA performance measurement indicators are required under the Government Performance and Results Act (GPRA), which requires federal agencies to establish standards measuring their performance and effectiveness. The AoA indicators are described in an Online Performance Appendix which can be found on the website *results.aoa.gov*.

Since enacted in 1993, AoA has accepted GPRA as an opportunity to document each year the results that are produced through the programs we administer under the authority of the OAA. It is the intent and commitment of AoA, in concert with State and local program partners, to use the performance measurement tools of GPRA to continuously improve OAA programs and services for the elderly. The results are included in AoA's annual budget request to Congress.

The Online Performance Appendix is part of AoA's annual budget request which provides detailed performance information. Fiscal year 2009 represents the fourth year that AoA aggregated all budget line items into a single GPRA program, AoA's Aging Services Program, for purposes of performance measurement. AoA program activities have a fundamental common purpose reflecting the primary legislative intent of the OAA: to make community-based services available to elders who are at risk of losing their independence, to prevent disease and disability through community-based

activities, and to support the efforts of family caregivers. It is intended that States, Tribal organizations and communities actively participate in funding community-based services and develop the capacity to support the home and community-based service needs of elderly individuals with particular attention to low-income, frail and isolated older individuals.

These fundamental objectives led AoA to focus on three measurement areas to assess program activities through performance measurement:

1. Improving efficiency;
2. Improving client outcomes; and
3. Effectively targeting to vulnerable elderly populations.

Each of these measures represents several activities across the Aging Services Program budget and progress toward achievement of the outcome is tracked using number indicators.

The website *results.aoa.gov* was developed by AoA to measure program performance results. It includes:

- Annual reports on indicators of performance measures of the OAA program;
- Performance Outcome Measurement Projects which develop and test new and established performance outcome measures at the state and sub-state levels;
- Reports of National Surveys of OAA Participants;
- OAA program performance information reported by the states under the State Program Report and the National Ombudsman Reporting System;
- AoA compiled statistics on the older population; and
- A series of past, current, and planned program evaluations and related studies.

These program evaluations and related reports ensure that the most relevant data are available to policy makers, demonstrate the value of programs to taxpayers, and track results. AoA strives to evaluate programs in an integrated manner combining process, outcome, impact and cost-benefit analysis of evaluation activities. This site provides links to reports and results from these evaluation efforts.

Excellence: What makes this project exceptional?

AoA's Aging Services Program received an "Effective" rating—the highest rating—from the Office of Management and Budget in the 2007 Program Assessment Rating Tool (PART) rating process for its clear purpose, good management, strong performance measures, and positive evaluations. The review found that AoA efficiently provides home and community-based services while maintaining high service quality. AoA continues to enhance program evaluation activities to improve program management.

Significance: How is this research relevant to older persons, populations and/or an aging society?

In concert with State and local program partners, AoA uses the performance measurement tools of GPRA to demonstrate the effectiveness of OAA programs and services for the elderly. AoA's three performance measurement categories of program efficiency, client outcomes, and effectively targeting to vulnerable elderly populations contribute to measuring of the success of the national aging services network. The States have mirrored these measures to gauge their impact and improve performance.

Effectiveness: What is the impact and/or application of this research to older persons?

The impact of AoA's Performance Measurement for older persons is that it has achieved the primary legislative intent of the OAA: to make community-based services available to elders who are at risk of losing their independence, to prevent disease and disability through community-based activities, and to support the efforts of family caregivers.

Innovativeness: Why is this research exciting or newsworthy?

The Performance Measurement enables the Executive branch, Congress, and decision makers to appreciate the value of the Aging Services programs. AoA's performance data shows that the national aging services network is providing high quality services to the most vulnerable older adults and doing so in a very efficient and cost-effective manner. Consumers believe these services contribute in an essential way to maintaining their independence, and they report a high level of quality for those services.

THE EVALUATION OF SELECT CONSUMER, PROGRAM, AND SYSTEM CHARACTERISTICS UNDER THE SUPPORTIVE SERVICES PROGRAM (TITLE III–B) OF THE OLDER AMERICANS ACT (THE EVALUATION OF THE TITLE III–B PROGRAM)

The Evaluation of the Title III–B Program found that the Title III–B program effectively served the targeted population—vulnerable older adults at risk for institutionalization. Program clients confirmed the benefits of the program.

Lead Agency: Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Agency Mission: The mission of the Administration on Aging (AoA) is to help elderly individuals maintain their dignity and independence in their homes and communities for as long as possible. AoA does this by serving as the Federal agency responsible for advancing the concerns and interests of older people, and by working with and through a nationwide network of 29,000 community-based organizations, known as the Aging Services Network, to promote the development of comprehensive and coordinated systems of care at the community-level that respond to the needs and preferences of older people and their family caregivers.

Principal Investigator: Saadia Greenberg, Director, Office of Evaluation, U.S. Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Partner agency: Research Triangle Institute International.

General Description: This study evaluated the Older Americans Act (OAA) Title III–B program including its role in planning, coordinating, and providing community services for older people. The OAA was established in 1965 to help provide older Americans with the supportive services they need to live independently in the community for as long as possible.

The Title III–B program is one of the largest components of the OAA. Title III–B funds helped to develop the infrastructure that constitutes the Aging Network, the system of state agencies, called State Units on Aging (SUAs), Area Agencies of Aging (AAAs), and local community service providers that plan, coordinate and deliver services. The Title III–B program helped the Aging Network to serve as the entry point into the long-term care system, providing

critical information, case management services, and direct funding of long-term care services for individuals who otherwise might go without needed assistance.

The overarching research question for this study was, "how, to what extent, and with what results has the Aging Network implemented Title III–B of the Older Americans Act?" This study question was addressed through the following three sub-questions:

1. What is the role/importance of providing information and assistance and care planning (case management) services for older persons through the Aging Network and what is the role/importance of providing assessment and care planning for community-based long-term care services to the Aging Network?

2. What is the role/importance of providing transportation and home care (personal care, chore, and homemaker) services for older persons through the Aging Network and what is the role/importance of providing transportation and home care services to the Aging Network?

3. What is the role/importance of financing long-term care services for older persons (via home care, transportation, and other Title III–B in-home services) through the Aging Network and what is the role of financing and delivering long-term care services to the Aging Network?

The project used a combination of quantitative and qualitative methods to evaluate the Aging Network's involvement with key services supported by the Title III–B program: case management, information and assistance, personal care, chore services, homemaker services, transportation, and assisted transportation services.

Research Triangle Institute International (RTI) used several data sources to examine the characteristics of participants and Title III–B services and to evaluate the role/importance and administration of Title III–B services for older persons and their families. The quantitative data sources used for this study included the 2003 and 2004 National Surveys of OAA Program Participants, the 2001 through 2004 National Aging Program Information System State Program Performance Report data, and the 2006 National Survey of AAAs. Information from the AARP and the Urban Institute also was used to help understand the financial role of Title III–B services within the universe of home and community-based services. In addition, RTI conducted six focus group sessions with AAA directors, SUA directors, and community-based providers in order to more fully examine the issues that could not be addressed by the quantitative data.

The study found that the Title III–B program had successfully extended services to the targeted population—vulnerable older adults at risk for nursing home placement. The percent of program participants that were at high risk of institutionalization increased. The population that received home care services was older (aged 75+), lived alone, and had three or more Activities of Daily Living (ADL) impairments. Users of transportation services relied heavily on these services, with over half reporting that the service was used for at least 75% of their trips. Most of these participants lived alone and were at least 75 years old. In addition to reaching the program's target population, participants were highly satisfied. For example, over 80% of survey respondents rated home care services

as positive. Finally, Title III–B program funds were highly leveraged. Depending on the service, the study found that for every $1 of Title III–B funding, local programs leverage $2 to $6 from other sources. Overall, the Title III–B program was a key component of the OAA and it was performing as intended; assisting vulnerable older adults to remain independent and active in their communities.

Excellence: What makes this project exceptional?

This evaluation is the first time that the Title III–B program has been analyzed to examine the programs results, financing and characteristics of program implementation. Multiple years of data from a new annual performance survey at the participant level were now available and combined with annual program data and Aging Network data to provide a robust assessment of a program that is highly valued by participants and has helped the Aging Network serve as the entry point into the long-term care system. The Title III–B program helped the Aging Network to serve as the entry point into the long-term care system and provided critical information, case management services, and direct funding of long-term care services for individuals who otherwise might go without needed assistance.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Understanding the impact of the program and how it operates affects a significant number of older persons and their families. The Title III–B program services a substantial number of older adults and indirectly their families. Specifically, over 400,000 participants annually relied on Title III–B case management services during the years 2001 to 2004. Similarly, over 9 million hours of Title III–B personal care services were delivered annually, over 10 million hours of Title III–B homemaker services were provided, and over 1 million hours of chore services were supplied to older persons and their families during this 4-year period. In addition, over 34 million one-way trips were provided to general transportation users, and approximately 2 million assisted transportation trips were supplied annually to individuals with physical or cognitive impairments needing help to get to their appointments.

Title III–B transportation services facilitated access to health, wellness, and social activities, which were key factors to living a meaningful life in the community. Title III–B participants relied on these transportation services a great deal.

Effectiveness: What is the impact and/or application of this research to older persons?

This research evaluated how and with what results the Title III–B program achieves its purpose of promoting the economic independence and social well-being of individuals and families across the lifespan.

The research found that Title III–B service participants valued these services highly. Over 80% of survey respondents rated aspects of homemaker service as good or better, while the vast majority of respondents rated Title III–B transportation services as good, very good, or excellent. Overall, Title III–B provided older Americans with a range of needed services and helped them navigate a complex and confusing long-term care system.

Innovativeness: Why is this research exciting or newsworthy?

The Evaluation of the Title III–B program is exciting and newsworthy because the grants by the AoA and the Centers for Medicare & Medicaid Services for Aging and Disability Resource Centers consciously built on the expertise and infrastructure developed by Title III–B on information and assistance and case management. The Aging and Disability Resource Center Program initiative supported state efforts to develop "one-stop shop" programs at the community level that would help people make informed decisions about their service use and support options and serve as the entry point to the long-term care system.

PERFORMANCE OUTCOME MEASUREMENT PROJECT (POMP)

AoA, in concert with State and local partners, uses performance measurement tools of GPRA to improve services. The results.aoa.gov *website is designed to provide program results and evaluation information.*

Lead agency: Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Agency Mission: The mission of the Administration on Aging (AoA) is to help elderly individuals maintain their dignity and independence in their homes and communities for as long as possible. AoA does this by serving as the Federal agency responsible for advancing the concerns and interests of older people, and by working with and through a nationwide network of 29,000 community-based organizations, known as the Aging Services Network, to promote the development of comprehensive and coordinated systems of care at the community-level that respond to the needs and preferences of older people and their family caregivers.

Principal Investigator: Cynthia Bauer, Project Officer, U.S. Administration on Aging, One Massachusetts Avenue, NW., Washington, DC 20001.

Partner agency: Current participants in the both Standard and Advanced POMP include Arizona, Florida, Georgia, Iowa, Massachusetts, New York, North Carolina, Ohio and Rhode Island.

Past participants include Alabama, California, Delaware, Hawaii, Indiana, Illinois, Maryland, Oklahoma, South Carolina and Virginia.

General Description: The Government Performance and Results Act (GPRA) requires Federal agencies to use performance measurement, particularly outcome measurement, to improve the performance of Federal programs. Further, the Office of Management and Budget (OMB) has introduced the Program Assessment Rating Tool (PART), which they use to evaluate the performance of Federal programs. The PART places additional emphasis on assessing program performance through outcome measurement. Results from POMP projects have been instrumental in improving AoA's PART scores.

POMP is a multi-agency collaboration involving AoA, state and local Agencies on Aging, a technical assistance contractor and consultants. POMP helps State and Area Agencies on Aging (AAAs) assess their own program performance, while assisting AoA to meet the accountability provisions of GPRA and OMB program assessment requirements. Over the past nine years, AoA has sponsored the Standard POMP project for the Older Americans Act (OAA), Title III programs. This project with State Units on Aging (SUAs) and AAAs has produced a core set of performance measurement in-

struments. The instruments have been developed to obtain consumer-reported outcomes and quality assessment for critical OAA services. The instruments also measure special needs characteristics of the people who receive services such as physical and social functioning. Other measurement tools address the adequacy and benefit of services that support family caregivers. Performance measurement tools developed under POMP can be located at *www.grpa.net*. Work on Standard POMP is nearing completion. Final validity/reliability testing of the POMP surveys will be completed by December 2008.

In fiscal year 2004, AoA determined that while consumer assessment will continue to be an important component of program performance measurement, it was time for the POMP project to begin the process of evolving into a more sophisticated performance measurement system to assess program impacts in relation to costs. AoA collaborated with the grantees and technical assistance contractors to develop performance impact measures called "Advanced POMP." The first Advanced POMP competition occurred in 2004. The first year of Advanced POMP was a planning year. Grantees developed a statement of the project's overarching goals as follows:

Goal 1: Demonstrate Cost Savings or Cost Avoidance Attributed to OAA programs;

Goal 2: Demonstrate Efficiency of OAA programs; and

Goal 3: Demonstrate Effectiveness of OAA programs.

The grantees are working on statistical models predicting nursing home delay or diversion, the analysis of emergency room and hospital utilization data compared for OAA and non-OAA clients, and the effectiveness of senior centers or congregate meals programs in terms of improved nutrition, health, and social and emotional well-being. These projects are scheduled to be completed in September 2009. However, *preliminary findings are very promising*. Nursing home predictor modeling for four States has consistently shown that receipt of additional types of service yields increased time living in the community and a comparison of Medicaid home-delivered meal clients and non-clients shows fewer hospital admissions and emergency room visits for those older people receiving home-delivered meals.

AoA is currently launching a new project, the Next Generation: POMP, which will commence as a two-year planning and development grant. This project will establish the framework for Next Generation: POMP and will include as follows:

- The development and preparation of the toolkit "POMP TO GO," along with the redesigned POMP website, will provide user friendly performance measurement survey tools for the network and "POMP TO GO" will provide a protocol to be used for the future dissemination of more sophisticated POMP methodologies.
- The development of longitudinal survey instruments. The Standard POMP surveys will serve as a starting point but extensive developmental work is needed to identify performance data likely to show meaningful change over time.
- The review of the synthesis of nursing home predictors identified in Advanced POMP and the development of a specific strategy for cross-validating the "generic" model.

• The identification of key variables across earlier POMP surveys for consistency and development of an analytical protocol for testing the predictive value of survey items.

Excellence: What makes this project exceptional?

The POMP projects are exceptional because they represent a true collaborative effort between AoA, State Agencies on Aging and AAAs. The projects have successfully evolved over the years and the performance measurement capability throughout the Aging Network has also evolved. The results of the project are useful at all levels of the Aging Network. At the national level, the projects have enabled AoA to demonstrate program performance excellence.

Standard POMP: The following areas have been studied under POMP:

1. Case Management
2. Congregate Nutrition Program
3. Homemaker Service
4. Home Delivered Nutrition Program
5. Information and Assistance Assessment
6. Senior Centers
7. Transportation Service
8. Family Caregiver Support
9. Providers

In addition, survey instruments were designed to document client characteristics. These include physical functioning, social functioning, emotional well-being, and demographic information.

A website, *www.gpra.net*, was established to show the POMP activities and surveys, which include consumer reported outcomes and consumer-assessment of service quality.

Consumer assessment surveys developed under POMP have enabled AoA and our State and AAA partners to demonstrate that services provided by the National Aging Services Network:

• Are highly rated by recipients.

• Are effectively targeted to vulnerable individuals and those who need services.

• Provide assistance to individuals and caregivers that is instrumental in allowing older persons to maintain their independence and avoid premature nursing home placement.

Advanced POMP: The grantees are working on statistical models predicting nursing home diversions, the analysis of emergency room and hospital utilization data compared for the OAA and non-OAA clients, and the effectiveness of senior centers or congregate meals programs in terms of improved nutrition, health, and social and emotional well-being. Preliminary results are all positive. Nursing home predictor modeling for four States has consistently shown that receipt of additional types of service yields increased time living in the community and a comparison of Medicaid home-delivered meal clients and non-clients shows fewer hospital admissions and emergency room visits for those older people receiving home-delivered meals.

Next Generation: POMP: Building on the earlier results of the POMP demonstrations, AoA is launching a new project entitled "Next Generation: POMP." The first phase of this project is developmental and will encompass the development and preparation of the "POMP TO GO" generic toolkit, the development of longitudinal performance measurement survey instruments, the develop-

ment of a specific strategy to cross-validate the "generic" nursing home predictor model under development in Advanced POMP, and the identification of key variables from Standard POMP surveys that are predictors of nursing home placement.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Demonstrating the effectiveness of OAA services at the Federal, State and AAA levels is of paramount importance during this time of fiscal constraints. The POMP is relevant to older persons, populations and/or an aging society because AoA works with the States and AAAs to document the benefits of OAA services. The results of POMP are then used to improve program management and leverage additional funding thereby improving services provided to older persons.

Effectiveness: What is the impact and/or application of this research to older persons?

AoA's annual performance measurement surveys demonstrate that services provided by the Aging Network are highly rated by recipients, effectively targeted to vulnerable populations and individuals, and provide assistance to individuals and caregivers that help older persons maintain their independence and remain in the community. Over the years, the Grantees have used the POMP project to leverage funding and improve program performance and management which benefits older persons.

POMP documents the high quality of services provided under the OAA. For example, consumer ratings obtained from the AoA's annual performance measurement surveys consistently show high (over 90%) customer quality ratings of key OAA services, such as home delivered meals, transportation, and family caregiver support services.

In addition, the results of POMP are used to directly benefit older persons as demonstrated by the following examples:

• Improve program performance and management. North Carolina expanded information collected, enhanced advocacy, and improved program management. New York used the transportation survey to improve service and provide in-service training for dispatchers, and used the nutrition survey to demonstrate that home delivered meals represent a substantial portion of elderly persons' daily food intake, resulting in a meal site, scheduled to be shut down, remaining open.

• Leverage funding. During the 2006 legislative session, South Carolina used results of Advanced POMP with partners to obtain a $2.9 million supplemental appropriation. This is the first new money that the SUA has been able to obtain in ten years. New York used POMP nutrition survey results to illustrate the impact of the Home Delivered Meal program on clients. As a result, additional funding from the county legislature was added in order to provide another Home Delivered Meal route in one AAA. Another New York AAA used POMP nutrition survey results to justify the need for an increase in county funds. With the increase in funding, the AAA did not have to create a waiting list for meals.

Innovativeness: Why is this research exciting or newsworthy?

The POMP is exciting and newsworthy because *POMP is a true Federal/State/AAA partnership where the results are used effectively at all levels of the Aging Network*. At the national level, AoA

uses POMP to conduct national surveys using the POMP instruments. AoA uses the results of our national surveys to establish and report on performance measures that are included in the annual GPRA plan, the strategic plan and the PART assessment. The improvement in AoA's performance measurement capacity has resulted in improved PART assessments. In the 2007 PART assessment, AoA received a rating of "Effective," the highest possible rating, and AoA was cited in the OMB Director's memo for exemplary performance.

At the State level, POMP results are used in various ways (e.g. developing performance measures in State plans and budgets, improving information systems, developing high risk assessment tools, developing provider "scorecards," and justifying budget requests). At the AAA level, the results are used to improve program management, justify budgets, leverage funding from other sources, and justify the maintenance or expansion of OAA programs/services.

U.S. Department of Health and Human Services: Assisted Living for Americans

To develop tools and materials that help assisted living consumers, and consumer intermediaries (e.g., local Aging agencies) obtain uniform information on the characteristics, services and costs of individual AL/RC facilities—to aid consumers in determining which AL/RC community best meets their priorities and needs. Now known collectively as the AL Disclosure Collaborative (ALDC), the ALDC members—representing ~25 national organizations—have agreed to develop the tools (and eventually disseminate ALDC endorsed tools/materials) using a voluntary consensus process in partnership with AHRQ, the latter providing the research support to insure the resulting tools are based on sound scientific methods.

Lead Agency: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality (AHRQ)

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of health care for all Americans.

Principal Investigators: D.E.B. Potter, M.S. (2005–present), Senior Survey Statistician, Agency for Healthcare Research and Quality, 540 Gaither Road, Suite 500, Rockville, MD 20850; William Spector, PhD (2003–2005), Senior Social Science Researcher, Agency for Healthcare Research and Quality, 540 Gaither Road, Suite 500, Rockville, MD 20850.

Partner Agencies: AARP; Benjamin Rose Institute; University of Minnesota, Minneapolis (Division of Health Policy and Management, School of Public Health); University of Massachusetts (Gerontology Institute); Jessie F. Richardson Foundation (Clackamas, OR), National Academy of State Health Policy; Texas A&M Health Science Center at College Station (School of Rural Public Health)*; University of North Carolina at Chapel Hill; VA Puget Sound Health Care System (Health Services Research and Development); Westat, Inc.; University of Pittsburg (Center for Research on Health Care); National Academy of State Health Policy; Harvard Medical School, Massachusetts; RAND, California; American Institutes for Research; and Texas A&M Health Science Center at College Station (School of Rural Public Health).

General Description: Assisted living/residential care (AL/RC) is an important care option for people with health needs and functional impairments, especially for frail elders needing protective oversight, but not continuous nursing care. The typical assisted living resident is an 86-year-old woman who needs help managing medications and is in need of assistance with approximately two activities of daily living (i.e., help with bathing, dressing, toiling, transferring, or eating; NCAL, 2008). With the capacity to serve over a million residents (Mollica et al., 2007), AL/RC is gradually approaching the size of the nursing home resident population (1.4 million residents; AHCA 2008).

Currently, differences in State requirements and a wide variety of services and amenities offered by AL/RC providers make it difficult for consumers to obtain uniform information to determine which AL/RC setting best meets their priorities and needs. This is in contrast to information that is provided to nursing home and home health consumers on the national Medicare.gov web site (and maintained by U.S. Centers for Medicare and Medicaid Services), in part, as a result of federal regulations.

The goal of the Agency for Healthcare Research and Quality's Assisted Living Initiative is to help AL/RC consumers, and consumer intermediates (e.g., local Aging agencies, hospital discharge planners), differentiate between individual AL/RC facilities to determine what best meets the consumer's priorities and needs.

Phase I of the Initiative began by funding a working conference of AL researchers, consumers, providers and Government officials. The 2004 meeting developed a national AL research agenda (see references in Question II.5 for agenda); a key conclusion from the conference was "Consumers lack information for making informed decisions concerning AL" (Kane, Wilson and Spector, 2007).

Subsequently (Phase II of the Initiative), AHRQ funded a research scan of available AL/RC consumer measures and state consumer tools, and conducted consumer and provider focus group research. Findings from these efforts were assessed and presented at a second AL/RC stakeholder meeting. The 2006 group recommended the development of uniform information that would describe the services and characteristics of individual AL/RC communities.

Phase III of the project began late in 2006 with the establishment of a partnership between AHRQ and the Center for Excellence in Assisted Living. Jointly they invited key AL/RC stakeholders to work collaboratively through a voluntary, consensus process to develop a uniform instrument (based on evidence when available) that would be used to describe individual AL/RC communities. Efforts are focusing on: services available; pricing information for services; move-in and move-out criteria; staffing information (RN staffing, 24/7 staffing, staff training and turnover); dementia services; and resident rights, house rules and life safety. Known as the Assisted Living Disclosure Collaborative, this national voluntary consensus body is now composed of 22 member organizations (with expectations of more) and several ad hoc federal and national organizations. Once the uniform instrument is developed (planned for fall 2009), a formal testing period (small and large scale) will ensue with consumers and providers, followed by

dissemination of the ALDC endorsed instrument, associated materials and information.

Excellence: What makes this project exceptional?

The AL initiative from its outset has been a public/private partnership that involved key assisted living stakeholders in the AL research process. The research community, the AL provider community, organizations that advocate for older Americans and the disabled as well as consumers, have all voiced their need for consumer information on AL/RC.

What is exceptional is that for very little federal investment and no federal regulation—in contrast to the spending and regulation required to obtain uniform public information about individual nursing homes and home health agencies—the resulting AL/RC tools (based upon science when available) could (after development and dissemination) aid consumers in their informed choice of an AL/RC communities by providing information on the characteristics, services and costs of individual AL/RC residences.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The average age of an assisted living consumer is 85 years old (NCAL, 2008). The population age 85 and older is the fastest growing segment of the U.S. population, expected to grow from 8.5 million in 2006 to almost 21 million by 2050 (Federal Interagency Forum on Aging Related Statistics, 2008). AL/RC is an important care option for people with health needs and functional impairments, especially for frail elders and those with dementia related problems not requiring continuous nursing care. Informed consumer choice, especially a choice that diverts older Americans from more costly care alternatives (while simultaneously meeting their needs and priorities), has the potential to reduce the pace of public long-term care spending (62 percent of nursing home care in 2005 was financed by either Medicare or Medicaid; Komisar and Thompson, 2007).

Effectiveness: What is the impact and/or application of this research to older persons?

The goal of this project is to aid consumers and consumer intermediaries (e.g., local Aging agencies, hospital discharge planners) in their effective identification and choice of AL/RC residence(s) that meets their priorities and needs. Uniform information about the characteristics and costs of health care providers is an essential element of informed consumer choice. The tool in development is to be designed to obtain uniform information on the characteristics, services and costs of individual AL/RC facilities, using evidence-based information when available.

Innovativeness: Why is this research exciting and newsworthy?

Information (based on a national standard) about individual nursing homes and home health agencies was made available to the public, in part, due to federal regulation. The efforts of AHRQ's Assisted Living Initiative have the potential of providing consumers with uniform information as the result of a voluntary consensus process of key AL/RC industry stakeholders (see Question I.5 for a list of project partners) that work in partnership with the Federal government, i.e. AHRQ—supporting the development of AL/RC tools that are based on sound research principals that inform consumer decisionmaking.

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ): EFFICIENCY OF HEALTH CARE

To understand how therapeutics' safety and effectiveness may vary with aging and its associated healthcare needs. Improve knowledge of ways to influence the effectiveness and optimal use of therapeutics in older adults. Improve healthcare's organization and delivery of therapeutics in healthcare for older adults.

Lead Agency: Agency for Healthcare Research and Quality (AHRQ).

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of health care for all Americans.

Principal Investigator: Anne Trontell, MD, MPH, Program Director, Centers for Education and Research in Therapeutics (CERTs), Senior Advisor on Pharmaceutical Outcomes and Risk Management Center for Outcomes and Evidence, Agency for Healthcare Research and Quality, 540 Gaither Road, Suite 6222, Rockville, MD 20850.

Partner Agencies: Brigham and Women's Hospital; Duke University Medical Center; HMO Research Network; Rutgers, The State University of New Jersey; University of Alabama at Birmingham; University of Arizona CERT at The Critical Path Institute (C–Path); University of Iowa; Cincinnati Hospital Children's Medical Center; University of Pennsylvania School of Medicine; University of Texas M.D. Anderson Cancer Center and Baylor College of Medicine; Vanderbilt University Medical Center; Weill Medical College of Cornell University; and University of Chicago.

General Description: The Centers for Education and Research on Therapeutics (CERTs) research program is an on-going national research demonstration initiative to conduct research and provide education that advances the optimal use of therapeutics (i.e., drugs, medical devices, and biological products). Begun in 1999, the program currently consists of 14 research centers and a Coordinating Center and is funded and run as a cooperative agreement by the Agency for Healthcare Research and Quality (AHRQ), in consultation with the U.S. Food and Drug Administration (FDA). A National Steering Committee includes at-large members from other Federal agencies such as CMS, CDC, and NIH and membership from consumers, the health care sector, and the therapeutics industry.

The CERTs leverage their core public funding from AHRQ and FDA with other Federal and private resources. The research conducted by the CERTs program has three major aims which have significant impact, high relevance, and direct benefit to the elderly, who disproportionately use multiple and complicated therapeutic regimens:

1. To increase awareness of both the uses and risks of new drugs and drug combinations, biological products, and devices, as well as of mechanisms to improve their safe and effective use.

2. To provide clinical information to patients and consumers; health care providers; pharmacists, pharmacy benefit managers, and purchasers; health maintenance organizations (HMOs) and health care delivery systems; insurers; and government agencies.

3. To improve quality while reducing cost of care by increasing the appropriate use of drugs, biological products, and devices and by preventing their adverse effects and consequences of these effects (such as unnecessary hospitalizations).

As an AHRQ priority population, the elderly and their healthcare needs are a prominent research focus of the CERTs. The publications cited at the end of this form showcase the CERTs' examination of the special healthcare needs of older adults and their families, encompassing physiological, mental and social issues related to aging, elders' needs for therapeutics and for psychological and mental care, family and social supports, end of life care, financial challenges, and overall quality of life.

Emblematic of the importance of therapeutics among the elderly, AHRQ solicited a new CERT Center with a thematic emphasis in aging, resulting in a 2006 award to the University of Iowa CERT, since designated as the "elderly care CERT" and focusing on research and education in therapeutics and optimal healthcare for the elderly. A significant portion of older adults consume many medications and also have symptoms due to aging that may be confused with medication side effects, placing them at high risk for harmful drug interations. Among its many projects, the Iowa CERT is developing a medication review tool that will assist pharmacists in identifying and remedying clinically significant medication problems and dangerous drug interactions among the elderly they serve.

Excellence: What makes this project exceptional?

The CERTs research program is exceptional in the breadth, depth, quality, and impact of its research products in improving the health and quality of life of the aging. Topics that have been addressed include the aging process itself, the special healthcare needs of the elderly surrounding therapeutics, the effectiveness, safety, and comparative effectiveness of different therapeutic choices, and the quality and efficiency of elderly health care involving therapeutics.

Significance: How is this research relevant to older persons, populations and/or aging society?

In addressing the optimal use of therapeutics, a significant component of elderly care, the CERTs Program is particularly relevant to an aging society and to older persons where the most extensive and complicated use of therapeutics occurs. Research by the CERTs has direct relevance to the elderly covered by Medicare and Medicaid, including the dually eligible who are especially vulnerable to adverse events from therapeutics.

Effectiveness: What is the impact and/or application of this research to older persons?

Information developed by the CERTs program informs the elderly, their physicians, and policy and decisionmakers throughout the healthcare system in making informed choices among therapeutic options in order to promote the effectiveness, safety, efficiency, and quality of care received by the elderly. By developing research and translating it into educational products that will be used throughout the health care system, the CERTs enable the optimal use of therapeutics health care for all, but especially the elderly who use more drugs than any other age group of the population.

Innovativeness: Why is this research exciting or newsworthy?

In terms of innovativeness, CERTs research is exciting and newsworthy in addressing conditions among the elderly that are preventable through the optimal use of therapeutics. These include such important and timely topics as the prevention of medication errors in the elderly, the avoidance of hospitalization or death for treatable conditions among older adults, and the risk of inappropriate prescribing to the elderly outside of hospital settings.

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY: EFFECTIVE HEALTH CARE PROGRAMS

The Effective Health Care Program conducts and supports research with a focus on outcomes, comparative clinical effectiveness, and appropriateness of pharmaceuticals, devices, and health care services. The program focuses on issues of special importance to Medicare, Medicaid and the State Children's Health Insurance Program (SCHIP).

Lead Agency: Agency for Healthcare Research and Quality (AHRQ).

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of health care for all Americans.

Principal Investigator: Jean R. Slutsky, Director, Center for Outcomes and Evidence, Agency for Healthcare Research and Quality, John M. Eisenberg Building, 540 Gaither Road, Rockville, MD 20850.

Partner Agencies: Centers for Medicare & Medicaid Services (CMS), Food and Drug Administration (FDA), National Institutes of Health (NIH).

General Description: AHRQ's Effective Health Care Program provides current, unbiased evidence about the comparative effectiveness of different health care interventions. The object is to help consumers, health care providers, and others make informed choices among treatment alternatives, including drugs. The program was created under Section 1013 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 to conduct research regarding "the outcomes, comparative clinical effectiveness, and appropriateness of health care items and services." The program was launched in 2005 and focused initially on issues of special importance to Medicare but has been expanded to include Medicaid and the State Children's Health Insurance Program (SCHIP).

The Effective Health Care Program employs three approaches to its comparative effectiveness research:

Synthesize knowledge—AHRQ's 14 Evidence-based Practice Centers perform systematic reviews of published and unpublished scientific evidence. They produce reviews of comparative effectiveness, synthesizing what is known and where further research is needed.

Generate knowledge—A 13-member research network (the Developing Evidence to Inform Decisions about Effectiveness [DEcIDE] network) carries out accelerated practical studies as well as research to improve analytic tools.

Translate knowledge—The John M. Eisenberg Clinical Decisions and Communications Science Center distills research and presents results in a variety of useful and understandable formats. The Center also develops decision aid tools for consumers.

In the Effective Health Care Program, AHRQ seeks an emphasis on timely and usable findings, building on the thoroughness and unbiased reliability that have been hallmarks of efforts so far. Equally important is broad ongoing consultation with stakeholders which helps ensure that the program responds to issues most pressing for health care decision makers. Collaboration is also a key principle of the program and AHRQ works closely with many agencies of DHHS to identify topics for research under the program and to communicate findings, including identified research gaps.

All reports produced by the program are available on the Effective Health Care Web site, http://www.EffectiveHealthCare.ahrq.gov. The Web site also includes features for the public to participate in the Effective Health Care Program. Users can sign up to receive notification when new reports are available. They can also be notified when draft reports and other features are posted for comment, and comments can be submitted through the Web site. The public is also invited to use the Web site to nominate topics for research by the Effective Health Care Program.

Innovativeness: Why is this research exciting and newsworthy?

Which medical treatments are most effective? Which carry the most risks? AHRQ's Effective Health Care Program is the Federal Government's leading effort to make evidence-based comparisons of health care interventions. The Effective Health Care Program, with funding that doubled to $30 million in 2008, is unique among comparative effectiveness initiatives. Research topics reflect Federal priorities to improve the health of all Americans and include critical issues facing today's elderly population.

Pursuant to the legislate mandate and the impending implementation of the Medicare prescription drugs benefit, the Secretary in 2005 chose an initial set of 10 priority conditions focusing primarily on the needs of Medicare program. Through discussion with and extensive input from stakeholders, the Secretary in 2008 expanded the list of priority conditions to include conditions relevant not only to the Medicare program, but also Medicaid and SCHIP programs. This updated list of clinical conditions guides research, synthesis and translation and dissemination priorities for the Effective Health Care Program:

—Arthritis and nontraumatic joint disorders (Muscle, bone, and joint conditions)

—Cancer (Cancer)

—Cardiovascular disease, including stroke and hypertension (Heart and blood vessel conditions)

—Dementia, including Alzheimer's Disease (Brain and nerve conditions)

—Depression and other mental health disorders (Mental health)

—Developmental delays, attention-deficit hyperactivity disorder and autism (Developmental delays, ADHD, autism)

—Diabetes Mellitus (Diabetes)

—Functional limitations and disability (Functional limitations and physical disabilities)

—Infectious diseases including HIV/AIDS (Infectious diseases and HIV/AIDS)

—Obesity (Obesity)

—Peptic ulcer disease and dyspepsia (Digestive system conditions)

—Pregnancy including pre-term birth (Pregnancy and childbirth)

—Pulmonary disease/Asthma (Breathing conditions)

—Substance abuse (Alcohol and drug abuse)

One part of the Effective Health Care Program, The John M. Eisenberg Clinical Decisions and Communications Science Center, is devoted to developing tools to help people make decisions about health care. The Eisenberg Center translates knowledge about effective health care into summaries that use understandable, actionable language. An important function of the Eisenberg Center is to transform complex scientific information into short, plain language materials that can be used to assess treatments, medications, and technologies. The Eisenberg Center develops information summaries for three audience groups—consumers, clinicians, and policymakers. The guides are designed to help people including older persons, populations and an aging society use scientific information to maximize the benefits of health care, minimize harm, and optimize the use of health care resources.

The Effective Health Care Program has published a variety of research reviews, new research reports, and summary guides on a variety of topics relevant to the needs of people age 65 or older. Selected research is listed below and all products are available online, some with audio links for the visually impaired (www.effectivehealthcare.arhq.gov).

Comparative effectiveness research is changing practice. Our mission will be fulfilled when health care decision makers—including patients, clinicians, purchasers, and policymakers—use up-to-date, evidence-based information about their treatment options to make informed health care decisions.

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ)

Three falls prevention projects are funded to study the feasibility of long term care facilities incorporating these evidence based programs into their day to day practice. The goal is to foster improved quality of care and quality of life and safety in residential settings by demonstrating feasibility of evidence-based models to ultimately foster the dissemination of these model programs on a broader scale.

Lead Agency: Agency for Healthcare Research and Quality (AHRQ).

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of healthcare for all Americans.

Principal Investigators: William Spector, PhD (Agency Lead), Senior Social Scientist, Agency for Healthcare Research and Quality 540 Gaither Road, Rockville, MD 20850.

Falls Management Project for Nursing Homes (Contract PI), Joseph Ouslander, MD, Professor, Department of Medicine, Division of Geriatric Medicine and Gerontology, Wesley Woods Health Center, Emory University School of Medicine, Atlanta, GA 30329.

Falls Prevention Program in Assisted Living (Contract PI), Sheryl Zimmerman, PhD, Professor, School of Social Work, University of North Carolina at Chapel Hill, 301 Pittsboro Street, Campus Box 3550, Chapel Hill, NC 27599.

Preventing Disability Among Residents of Continuing Care Residential Communities (Contract PI), Helaine E. Resnick, PhD, Director of Research, Institute for the Future of Aging Services, American Association of Homes and Services for the Aging, 2519 Connecticut Avenue, NW., Washington, DC 20008–1520.

Development of Injurious Falls Measures for Nursing Homes (Contract PI), Terry Moore, MPH, Principal Associate, Abt Associates Inc., 55 Wheeler St., Cambridge, MA 02138.

Partner Agencies: National Institute for Aging (Preventing disability among residents of CCRC).

General Description: The Falls Prevention in Long Term Care Program at AHRQ focuses on the prevention of injurious falls and related injuries and disabilities in nursing home and residential care settings. Three contracts have been funded (1) implementation of an evidence-based falls prevention program in nursing homes; (2) implementation of a falls prevention program in assisted living facilities; and (3) preventing disability among residents of Continuing Care Residential Community (CCRC). In addition, one contract develops a method for comparing case-mix adjusted rates of injurious falls across nursing homes. AHRQ staff research on fractures in nursing homes has contributed to the evidence base.

The first project involved the implementation of the Falls Management Program (FMP) in 19 nursing homes owned and operated by a single nonprofit nursing home chain in Georgia. The FMP is based on work at the Vanderbilt University School of Medicine that has been developed, tested and refined over several years involving >250 facilities. FMP is an interdisciplinary, multifaceted approach to reducing fall risk that includes systematic screening, assessment, individualized care planning, resident monitoring, and the elimination of environmental safety hazards. The FMP is initiated by a self-assessment process that assists nursing homes in identifying areas that need improvement so that staff can tailor implementation to their own facility's needs. The FMP incorporates education on best practices and uses several quality improvement (QI) tools designed to assist nursing homes with program implementation. Core components of the program include administrative and clinical leadership, interdisciplinary teamwork using QI methodology, support by advance practice nurses, and an 8-step fall response system to facilitate the comprehensive investigation and documentation of falls, primary care provider involvement, and development of individualized fall risk reduction strategies.

The second project is a multi-component falls intervention program that assesses the feasibility of carrying out this program in assisted living facilities. The falls intervention includes medication review, assessment, environmental modification, and exercise, to reduce risk factors for falls and fall and fracture rates among residents of assisted living facilities. The project involves the following activities: adapting a multi-faceted, evidence-based falls prevention program to a protocol tailored to the assisted living environment; implementing the pilot protocol and collecting clinical and process data pre-post intervention; and evaluating the results of interventions. This project is currently on-going and being implemented in two assisted living facilities in North Carolina (with 2 control facilities).

The third project focuses on preventing disability among residents of CCRCs. This project will test the feasibility of screening, providing an evidence-based exercise program, and counseling to encourage exercise program adherence. The screening tool is the Short Physical Performance Battery (SPPB), a tool developed by the National Institute of Aging, to detect sub-clinical disability in older adults who the study involves 300 residents in 6 CCRCs. The goals are to show that CCRCs can feasibly incorporate this program into their daily practice and reduce the disability risk of their residents. Falls rates, mortality and hospitalizations will also be monitored. Implementation challenges and lessons learned will be summarized. This project is scheduled to commence July 2008.

The aim of developing an injurious falls measure in nursing homes is to help nursing homes and older consumers to compare nursing home on a measure of safety. With this measure, consumers can make better choices and facilities can monitor and improve the safety of the environment they provide to their residents. This project is being accomplished in collaboration with CMS and uses CMS data.

Innovativeness: Why is this research exciting and newsworthy?

This research program is ultimately designed to make long-term care facilities safer for an aging population and to provide programs that reduce the risk of older persons falling. Falls are significant problems for elderly persons who reside in long-term care facilities because they are the primary cause of fractures and other physical injuries which in turn, result in reduced physical function and quality of life, increased morbidity and mortality, and related health care utilization and costs. In addition by preventing disability and serious falls this research will contribute to the reduction of avoidable health care costs. An injurious fall increases nursing home cost by $5,325 per year. In the year 2000, the direct medical costs for fatal and non-fatal fall injuries of elderly in the U.S. totaled $19.2 billion.

The three implementation projects are exceptional in that they test evidence-based models of care in long term care settings to demonstrate that long term care facilities can incorporate best practices into their daily work flow. By testing models in the three main residential care settings that elderly live, this program provides evidence to help improve the safety of a wide range of housing options for older persons who need long term care services.

These studies will facilitate the dissemination of these models to other comparable long term care facilities, providing them with information to help them decide if they want to adopt a model that has been tried by their peers.

In nursing homes, where multiple interventions are often occurring at the same time, we have shown that when a restraint reduction program is being implemented, if the FMP was also implemented, the falls rate remained stable. Without the FMP the rate of falls increased.

Spector et al. (2007) demonstrates the importance of monitoring prescription drug ordering practices in nursing home when trying to prevent avoidable falls and fractures, although the FMP implementation study indicated that it is difficult for nursing homes to influence physician prescription drug orders. FMP tools have been made available at the MedQIC web site that supports Medicare

Quality Improvement Organizations (QIOs) and providers in finding, using, and sharing quality improvement resources.

Successful translation of research into clinical practice that improves care is complex. These projects are identifying how to make evidence based practices available to aging consumers who need long term care services in residential settings. As the population ages there will be increased demand for these types of services and it is important to assure that these environments can be made as safe as possible and can encourage persons to age as disability-free as possible.

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY

The CAHPS Hospital Survey, sometimes known as H–CAHPS or Hospital CAHPS, is a standardized survey of the experiences of adult inpatients with hospital care and services. Hospitals across the country are using this survey and voluntarily reporting data to the Centers for Medicare & Medicaid Services (CMS). CMS began public reporting of the results in March 2008.

Lead Agency: Agency for Healthcare Research and Quality (AHRQ).

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of health care for all Americans.

Principal Investigators: Paul Cleary, PhD, Dean, Yale School of Public Health, 60 College Street, P.O. Box 208034, New Haven, CT 06520; Ronald Hays, Professor of Medicine, UCLA School of Medicine, Division of General Internal Medicine and Health Services Research, 911 Broxton Plaza, Box 951736, Los Angeles, CA 90095–1736, Steven Garfinkel, Managing Research Scientist, American Institutes for Research, 101 Connor Drive, Suite 301, Chapel Hill, NC 27514.

Partner Agencies: Centers for Medicare and Medicaid Services, Hospital Quality Alliance (Member organizations include American Hospital Association, Federation of American Hospitals, American Nurses Association, AARP, AFL–CIO, The Disclosure Group, and others).

General Description: In June 2002, the Centers for Medicare and Medicaid Services asked AHRQ to develop a questionnaire through which hospital patients could rate the care that they receive. They asked AHRQ to perform this work through the Consumer Assessment of Health Providers and Services project (CAHPS®), which at that time was a consortium of three research organizations (RAND, Harvard and the American Institutes of Research) and a contractor (Westat). Though many hospital surveys exist, consumers can't compare hospital performance unless (1) all hospitals use the same survey and (2) survey results are routinely reported to a single organization and (3) these results are easily available to consumers. Development of the CAHPS Hospital Survey and aggregation/publication of the results by CMS has made these three things possible.

Excellence: What makes this project exceptional?

The HCAHPS project developed a rigorously tested, standardized questionnaire through which hospital patients can assess the care they receive in hospitals. To make sure that the survey included questions that people really want the answers to before they select a hospital, we conducted 16 focus groups with a variety of individ-

uals across the country. This led us to develop questions that focused on provider communication skills, communication about medications, pain control, information for care after discharge, and many other areas. The great majority of American hospitals report HCAHPS data to CMS, who then publish the results on their Hospital Compare website. In the first week after publication of HCAHPS data, page views of this website increased from 161,000 to 1.4 million, and people are continuing to consult this resource in large numbers. HCAHPS data are especially relevant to older persons since, as we age, the likelihood that we will need hospital care increases. Development of HCAHPS was an exceptional achievement since we faced extreme push-back from the hospital data vendor industry. Because AHRQ and CMS joined forces with the Hospital Quality Alliance, we were able to respond successfully to extreme public scrutiny of the instrument and our data collection methods.

DEPARTMENT OF HEALTH AND HUMAN SERVICES: AGENCY FOR HEALTHCARE RESEARCH AND QUALITY

The Healthcare Cost and Utilization Project (HCUP) is an important part of the research infrastructure for studies on the health care of older adults in the U.S. HCUP provides data and research software and tools that support a wide range of studies related to the health care of the elderly including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local levels. HCUP is the only source of data on hospital care for the all elderly U.S. residents that can provide statistics at both the national and local levels.

Lead Agency: Department of Health and Human Services, Agency for Healthcare Research and Quality.

Agency Mission: The Agency for Healthcare Research and Quality (AHRQ) is the lead Federal agency charged with improving the quality, safety, efficiency, and effectiveness of health care for all Americans. As one of 12 agencies within the Department of Health and Human Services, AHRQ supports health services research that will improve the quality of health care and promote evidence-based decisionmaking.

Principal Investigator: Jenny A. Schnaier, HCUP Project Officer, Center for Delivery, Organization and Markets (CDOM), Agency for Healthcare Research and Quality (AHRQ), 540 Gaither Road, Rockville, MD 20850.

Partner Agencies: Arizona—Department of Health Services; Arkansas—Department of Health & Human Services; California—Office of Statewide Health Planning & Development; Colorado—Hospital Association; Connecticut—Integrated Health Information (Chime, Inc.); Florida—Agency for Health Care Administration; Georgia—Hospital Association; Hawaii—Health Information Corporation; Illinois—Health Care Cost Containment Council and Department of Public Health; Indiana—Hospital & Health Association; Iowa—Hospital Association; Kansas—Hospital Association; Kentucky—Cabinet for Health and Family Services; Maine—Health Data Organization; Maryland—Health Services Cost Review Commission; Massachusetts—Division of Health Care Finance and Policy; Michigan—Health & Hospital Association; Minnesota—

Hospital Association; Missouri—Hospital Industry Data Institute; Nebraska—Hospital Association; Nevada—Division of Health Care Financing and Policy, Department of Health and Human Services; New Hampshire—Department of Health & Human Services; New Jersey—Department of Health & Senior Services; New York—State Department of Health; North Carolina—Department of Health and Human Services; Ohio—Hospital Association; Oklahoma—Health Care Information Center for Health Statistics; Oregon—Association of Hospitals and Health Systems; Rhode Island—Department of Health; South Carolina—State Budget & Control Board; South Dakota—Association of Healthcare Organizations; Tennessee—Hospital Association; Texas—Department of State Health Services; Utah—Department of Health; Vermont—Association of Hospitals and Health Systems; Virginia—Health Information; Washington—State Department of Health; West Virginia—Health Care Authority; and Wisconsin—Department of Health & Family Services.

General Description: The Healthcare Cost and Utilization Project (HCUP) (*http://www.hcup-us.ahrq.gov*) is an important part of the research infrastructure for studies on the health care of older adults in the U.S. HCUP provides data and research software and tools that support a wide range of studies related to the health care of the elderly including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local levels.

The Healthcare Cost and Utilization Project (HCUP) is a unique Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ) that brings together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of patient-level health care data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988.

In support of AHRQ's mission, the goals of HCUP are to:

- Create and enhance a powerful source of national and state all-payer health care data.
- Produce a broad set of software tools and products to facilitate the use of HCUP and other administrative data.
- Enrich a collaborative partnership with statewide data organizations aimed at increasing the quality and use of health care data.
- Conduct and translate research to inform decision making and improve health care delivery.

The HCUP Databases contain encounter-level information for all payers compiled in a uniform format with privacy protections in place. HCUP databases contain a core set of clinical and nonclinical information found in a typical discharge abstract (or billing record) including all-listed diagnoses and surgeries, patient status at discharge, patient demographics, and billed charges. HCUP data also include information about the hospital to support aggregate research. HCUP include the following hospital inpatient and outpatient databases that are used for analyses of health care for older persons:

- The Nationwide Inpatient Sample (NIS) with inpatient data from a national sample of over 1,000 hospitals designed for making national estimates.

• The State Inpatient Databases (SID) contain the universe of inpatient discharge abstracts from participating states.

• The State Ambulatory Surgery Databases (SASD) contain data from ambulatory care encounters from hospital-affiliated and sometimes freestanding ambulatory surgery sites.

• The State Emergency Department Databases (SEDD) contain data from hospital-affiliated emergency departments for visits that do not result in hospitalizations.

The HCUP databases have been a powerful resource for the development of software and tools that can be applied to other similar databases by health services researchers and decision makers. These tools include an online query system (HCUPnet) for generating statistics in a table format using HCUP data (*http://hcupnet.ahrq.gov/*), software to measure quality of hospital care (AHRQ Quality Indicators) and software for classifying diagnoses or surgeries into clinically meaningful categories for ease of statistical reporting (Clinical Classification Software).

HCUP also produces reports that summarize important findings from the databases. The HCUP Statistical Briefs present simple, descriptive statistics on a variety of specific, focused topics. Most of these topics have relevance to the elderly. And one focused specifically on the elderly—(HCUP Statistical Brief #14 "Trends in Elderly Hospitalizations, 1997–2004").

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. Unlike the hospital files maintained by the Centers for Medicare and Medicaid, HCUP files include records for Medicare patients who are enrolled in managed care and it includes records for elderly who are not covered by Medicare (primarily foreign-born who were not part of the Social Security system). Because of the unique Federal, State, industry partnership in data, HCUP can support both national and local analyses of health care among the elderly. As a result, HCUP is the only source of data on hospital care for elderly residents that can provide statistics at both the national and local levels.

HCUP databases capture the hospital inpatient experience of the 32.7 million people who are 65 years and older and who reside in the 39 HCUP Partner states (88% of all persons age 65 and older in the U.S.). In 2006, this represents approximately 11.3 million hospital inpatient records.

HCUP not only provides access to data files for researchers, but it also has an online query system (HCUPnet) that is designed for both researchers and non-researchers. Using this online query system, the average person has easy access to statistics on the care of elderly almost instantaneously. Options are available for statistics on older patients for individual diagnoses or surgeries broken down by hospital characteristics. Available statistics include the average cost and length of hospital stays, the percentage admitted

through the emergency room, discharged to nursing homes or those who died. The following is an example of information that can be generated from HCUPnet within seconds:

• Congestive heart failure was the single most common condition primarily responsible for the hospitalization of persons age 65 and older in 2006 (about 810,000 hospitalizations); pneumonia was the second most common reason for hospitalization (about 700,000 hospitalizations).

HCUP data are used to support many of the measures used for the Congressionally-mandated National Healthcare Quality Report and National Healthcare Disparity Report. HCUP supplies all quality and disparity statistics for these annual reports separately for the elderly population. Thus, HCUP statistics are being used to monitor quality of care for the older population. Below is an example table for the National Healthcare Quality Report that shows the decline in hospital deaths for acute myocardial infarction (heart attack) since 2000.

DEATHS PER 1,000 ADMISSIONS WITH ACUTE MYOCARDIAL INFARCTION (AMI) AS PRINCIPAL DIAGNOSIS

		2005	2004	2000
Total		77.5	83.0	105.8
Age	18–44	16.8	20.9	21.1
	45–64	35.1	35.3	45.5
	65 and over	107.9	115.5	144.9
Age	65–69	58.1	68.5	88.6
	70–74	81.1	83.6	113.2
	75–79	102.2	106.6	140.6
	80–84	124.5	132.7	161.2
	85 and over	150.7	165.9	207.5

Source: HCUP Nationwide Inpatient Sample.

HCUP can support a wide-range of research and health policy topics that can improve the health of the elderly. In the last decade, over 600 peer-reviewed articles have been written based on HCUP data and related software tools, with 160 professional journal articles published in 2007 alone. In addition, there are many health care journalists who rely on HCUPnet for quick statistics to support their news stories. In 2007 there were nearly 400 non-journal publications (e-journals, magazines and newspapers) that featured HCUP. Most of these articles were on topics that focused on the elderly or on health care topics of relevance to the elderly.

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY: THE RURAL OREGON ADULT MEMORY STUDY

Researchers and clinicians in the Rural Oregon Adult Memory Study (ROAM), a pilot study with seven rural primary care practices, designed, implemented, and evaluated the feasibility of a universal screening program for dementia in adults over 75 years.

Lead Agency: Agency for Healthcare Research and Quality (AHRQ).

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of health care for all Americans.

Principal Investigator: Linda Boise, PhD, Principal Investigator, Oregon Health & Science University, 3181 SW Sam Jackson Park Rd. (CR131), Portland, OR 97239.

Partner Agencies: Agency for Healthcare Research and Quality; Oregon Health Sciences University; Oregon Rural Practice-based Research Network.

General Description: The purpose of this small feasibility study, the Rural Oregon Adult Memory Study (ROAM) was to improve the recognition, diagnosis and care for persons with dementia in rural communities through innovative support for rural primary care offices. The study team, in close collaboration with rural physicians, adapted a set of tools that had not been studied in rural communities in order to allow systematic dementia screening, evaluation, and patient and family education for patients age 75 and over. The goals of the study were to implement and test this newly developed clinical practice model in a small set of rural practices and to gather pilot data on whether the practices could successfully implement the model and the outcomes of universal screening and follow-up evaluation. The team studied the satisfaction of patients and families as well as clinicians and office staff to the program. The study is the first piece in a long range program, the goal of which is to utilize effective education and practice change strategies to improve healthcare for older persons with dementia in rural Oregon communities. The study was conducted in four phases over 12 months, including intervention adaptation to rural practice, training, conduction of screening, and analysis. The model for ROAM was the Assessing Care of the Vulnerable Elders model (ACOVE), developed by geriatric experts at University of California, Los Angeles and Rand. This model, which utilizes efficient collection of condition-specific clinical data, physician education and decision supports, and patient and caregiver education materials to encourage activation of the patient's role in follow-up, was designed to be effectively and efficiently implemented in primary care practice. Until now, the model had only been evaluated in urban and suburban practices, often in communities with access to specialized evaluation and treatment centers and other community supports. The ROAM study was intended to build on the ACOVE model, introducing into practice a system to efficiently screen for possible dementia, encouraging the performance of clinical follow-up for patients who screen positive through guided memory evaluation forms, and provision of patient education and resource materials.

Seven clinics recruited from among Oregon Rural Practice-based Research Network participated in ROAM involving 19 clinicians and over 20 staff members. 436 or 94% of eligible patients over 75 years of age where screened during the intervention with 49% having a positive screen. Of 66 patients who received a full evaluation during the intervention period, 21 were diagnosed with mild cognitive impairment or dementia. The intervention was very favorably reviewed by clinicians and staff members and the ROAM tools were revised based on feedback. Patients were very pleased to have been asked about their memory, with over 90% reporting that they believed it was good idea for primary care clinicians to assess older patients' memory and thinking.

With the success of this feasibility study, the team is moving forward with other step in their plan to improve healthcare for older persons with dementia in rural communities.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting and newsworthy?

The ROAM study brought together academic researchers and rural primary care practices to jointly refine an existing evidence-based model for universal screening for dementia for use in rural communities.

Dementia is one of the most challenging conditions to diagnose and manage and is also one of the most common conditions affecting older Americans. The prevalence of dementia in persons 75 or older is estimated to be 15% and up to 50% for those aged 85 or older. The most common form of dementia in the elderly is Alzheimer's disease. For most older adults, the primary healthcare provider is the first clinician to be contacted by patients suffering from Alzheimer's disease or related dementias and in many cases is the only clinician involved in the person's care. The challenges of effectively diagnosing and caring for Alzheimer's patients are even greater in rural practices. Specialty clinical diagnostic and management services are often remote or not available and community resources are generally limited.

Numerous studies, however, have found that a considerable number, as many as 50% of cognitively impaired patients, have not been evaluated or diagnosed especially, though not exclusively, at earlier stages of the disease.

Improved patient-centered outcomes for people with dementia will require engagement of primary care practices for the screening, evaluation, management, and patient and family education and support. This is especially true in rural communities where specialized resources are often not available.

This project included the adaptation and implementation of an evidence-based clinical model for screening and evaluation for dementia in rural primary care practices. It is the first known testing of the ACOVE model in a rural setting.

The results of this pilot study, which found that the model can be successfully implemented in rural primary care practices and that rural elders are eager to talk with their primary care teams about their memory function, support the team's plans to move forward with their larger effort to utilize effective education and practice change strategies to improve healthcare for older persons with dementia in rural Oregon communities. Their accomplishments will have value to rural clinicians and communities across the country and already have produced an adapted and revised set of tools that rural primary care practices may use to screen and evaluate adults over 75 years old for dementia.

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY: THE PRESSURE ULCER PROGRAM

The Pressure Ulcer program is an innovative program designed to improve day-to-day practice in nursing homes, improve and rede-

sign workflow, improve productivity of direct-care workers, and reduce pressure ulcers.

Lead Agency: Agency for Healthcare Research and Quality (AHRQ).

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of health care for all Americans.

Principal Investigators: William Spector, PhD, Senior Social Scientist, Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850; Susan Horn, PhD (Contract PI), Vice President, Research, Institute for Clinical Outcomes Research, International Severity Information Systems, Inc., 699 E. South Temple, Suite 100, Salt Lake City, UT 84102–1282.

Partner Agencies: New York State Department of Health; California and District of Columbia QIO (Centers for Medicare and Medicaid Services); California Health Care Foundation.

General Description: The Pressure Ulcer Prevention and Healing Research Program is carried out under the leadership of AHRQ staff working with contractors and partner organizations. The major activity, "On-Time Quality Improvement (QI) for Long-Term Care" has been the development of a pressure ulcer and healing quality improvement program to help nursing home staff identify high risk residents and to integrate evidence-based tools and documentation tools into daily workflow and care planning structures. This project applies and extends knowledge that had been learn in "Real Time Optimal Care Plans for Nursing Home QI", grant funded by AHRQ, to new nursing homes using Health Information Technology (HIT).

The "On-Time" model integrates clinical guidelines and clinical information into each nursing home's daily routine and processes for assessment, care planning, care delivery, communication and reassessment using HIT. The "On-Time" model streamlines Certified Nursing Aide (CNA) documentation and focuses their documentation on critical data. Using HIT, CNAs spend less time documenting (redundancies are eliminated), but they document more information in a standardized way and it is more accurate, meaningful, and useful to them in their daily assignments. New work is integrated into daily routines rather than added on to them. The model facilitates timely information flow that informs weekly monitoring of resident status and on-going care planning. The communication mechanisms used in the "On-Time" model are effective and efficient and provide staff with current and accurate information on the resident on a weekly or more frequent basis. Ultimately, the project aimed to redesign clinical workflow—instead of concentrating on improving existing processes only—to reduce the incidence of pressure ulcers among nursing homes residents.

"On-Time" has been implemented, tested and refined in 30+ nursing homes across the nation. Twenty-One nursing facilities across the country have completed the prevention program. Fifteen of the participating facilities are in California. Sixteen facilities have begun implementing in 2008 in New York State. All facilities in the District of Columbia plan are planning to participate beginning in 2008 and 2009. The "On-Time" has also expanded it scope by including pressure ulcer healing. Ten of the facilities in Cali-

fornia are currently implementing pressure ulcer healing tools that supplements on-going work on pressure ulcer prevention.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting and newsworthy?

The elderly are at greatest risk of developing pressure ulcers because of age-related changes in soft tissues and decreases in skin perfusion and subcutaneous fat. Pressure ulcers in elderly can be extremely painful and can lead to other complications if left untreated. It has been estimated that over $355 million are spent annually on pressure ulcer treatment in long-term care settings.

This project has developed a quality improvement model that can be applied to all aspects of care, not just care for pressure ulcers, through better documentation of all aspects of resident care and through on-time feedback reports to inform care planning. Of all nursing home staff, CNAs spend the most time with residents. It integrates and uses CNA clinical reports to enhance communication across disciplines, and promote teamwork. The "On-Time" reports, designed with input from multiple disciplines, identify residents at highest risk for pressure ulcer development, show trends in multiple outcomes for these residents over time, and help staff monitor the effectiveness of care in a timely fashion. By documenting key observations on every shift, and using these data summarized in weekly reports focusing on high risk residents, critical information is made available for decision making by the entire care team.

The initial grant pilot facilities achieved an average 33% annual reduction in pressure ulcer prevalence among 11 participating nursing homes. Some facilities reduced prevalence by up to 73% and incidence by up to 65%. In this project (21 facilities completing the program), for facilities with a high level of implementation there was a 30.7% decline (from 13.1% to 9.1%) in the CMS pressure ulcer quality measure and a 42% decline in in-house pressure ulcer rates (from 4% to 2.3%). Seven HIT vendors have now programmed the "On-Time" specifications into their products making these tools available to their customers.

U.S. Preventive Services Task Force: Clinical Preventive Strategies

This research project aims to develop innovative approaches to reviewing the evidence on clinical preventive strategies in older adults and making recommendations to physicians for prevention in older adults. Evidence on clinical strategies to prevent falls will be reviewed. Additional outcomes of interest to older adults will be reviewed including the prevention of fall-related injuries, quality of life, maintenance of independence, and prevention of disability.

Lead Agency: U.S. Preventive Services Task Force Program at the Agency for Healthcare Research and Quality (AHRQ).

Agency Mission: The mission of the Agency for Healthcare Research and Quality is to improve the safety, quality, effectiveness, and efficiency of health care for all Americans. The mission of the U.S. Preventive Services Task Force (USPSTF) is to evaluate the benefits of individual services based on age, gender, and risk fac-

tors for disease; make recommendations about which preventive services should be incorporated routinely into primary medical care and for which populations; and identify a research agenda for clinical preventive care.

Principal Investigators: Evelyn Whitlock, MD, MPH, Principal Investigator, Oregon Evidence-Based Practice Center, 3800 North Interstate Avenue, Portland, OR 97227 and Yvonne Michael, ScD, MS, Project Lead Investigator, Oregon Health and Sciences University, Evidence-Based Practice Center, 3181 SW Sam Jackson Park Rd, CB 669, Portland, OR 97239–3098.

Partner Agency: Oregon Evidence-Based Practice Center.

General Description: This research project aims to develop innovative approaches to reviewing the evidence on clinical preventive strategies in older adults and making recommendations to physicians for prevention in older adults. The U.S. Preventive Services Task Force (USPSTF), first convened by the U.S. Public Health Service in 1984, and since 1998 sponsored by the Agency for Healthcare Research and Quality (AHRQ), is the leading independent panel of private-sector experts in prevention and primary care. The USPSTF conducts rigorous, impartial assessments of the scientific evidence for the effectiveness of a broad range of clinical preventive services, including screening, counseling, and preventive medications. Its recommendations are considered the "gold standard" for clinical preventive services. The USPSTF recently began work to update its recommendation on fall prevention in older adults. Preliminary work revealed that the usual methods of reviewing evidence may not be the most appropriate for addressing prevention in older adults. This is because: (a) some interventions (for example, vision screening) cut across several topics; (b) prevention may not be the only purpose of screening (care management may be another reason); and (c) falls are not the result of one "disease" but may result from myriad causes. Another very important reason that traditional review methods may not work for preventive strategies in older adults is the different outcomes in older adults compared to younger adults. While preventing or forestalling death may be the goal, other important outcomes are quality of life, maintenance of independence, and prevention of disability. Future plans for this work include the application of the newly-developed methods to the review of other prevention strategies in older adults.

Excellence: What makes this project exceptional?

Falls are an important cause of morbidity and mortality in older adults. This project has developed methods that have forced researches and policy makers to "think outside the box."

Significance: How is this research relevant to older persons, populations and/or an aging society?

The U.S. Census Bureau projects that the number of persons 65 years and older will more than double by 2030. Falls and fall-related injuries increase with age. Between 30 and 40 percent of community-dwelling persons aged 65 years and older fall at least once per year. Falls are the leading cause of injury in people 65 years of age or older. In 2004, more than 1.8 million older adults were treated for fall-related injuries in U.S. hospital emergency departments, and more than 433,000 were hospitalized. In 2003, the Centers for Disease Control and Prevention (CDC) reported that falls

were the leading cause of injury deaths and the ninth leading cause of death from all causes among those 65 years of age and older. Twenty to thirty percent of those who fall incur moderate to severe injuries that result in decreased mobility that subsequently impacts the individual's independence. These limitations will likely decrease the injured person's quality of life. In addition to these limitations, this degree of injury increases an older adult's risk of premature death, and mortality from falls is significantly higher in older adults.

Effectiveness: What is the impact and/or application of this research to older persons?

The results of this project will be used by the USPSTF to make recommendations to primary care doctors about what is effective to prevent falls and fall-related outcomes in older adults. Many professional organizations and other guideline-making organizations consider the USPSTF the gold-standard for prevention recommendation and these organizations often use the USPSTF reviews as a basis for their own recommendations.

Innovativeness: Why is this research exciting and newsworthy?

Falls are an important cause of morbidity in older adults—between 30 and 40 percent of community-dwelling older adults fall at least once per year. Traditional methods of synthesizing evidence may not be appropriate for older adults. In contrast to the traditional USPSTF methods of reviewing evidence for improvements in morbidity and mortality this project will also review evidence on outcomes that may be of most importance to older adults: quality of life, maintenance of independence, and prevention of disability.

THE APPALACHIAN COMMISSION: THE AGING OF APPALACHIA

This report uses data from Census 2000 to show how and why the age structure of the Appalachian population differs from the national average and varies within the Region. The report examines implications for the region and argues that they are not all negative. The changing age structure will be an important fact of life for decision-makers in both the public and private sectors in Appalachia in coming years.

Lead Agency: Appalachian Regional Commission.

Agency Mission: The Appalachian Regional Commission's mission is to be an advocate for and partner with the people of Appalachia to create opportunities for self-sustaining economic development and improved quality of life.

Principal Investigator: John Haaga, Deputy Director of the Behavioral and Social Research Program, National Institute on Aging, Building 31, Room 5C27, 31 Center Drive, MSC 2292 Bethesda, MD 20892.

Partner Agency: Population Reference Bureau.

General Description: The Aging of Appalachia, by John Haaga, Population Reference Bureau, July 2004. This report uses data from Census 2000 to show how and why the age structure of the Appalachian population differs from the national average and varies within the Region. The report examines implications for the region and argues that they are not all negative. The changing age structure will be an important fact of life for decisionmakers in both the public and private sectors in Appalachia in coming years. In 2000, 14.3 percent of Appalachian residents were ages 65 and

over, compared with 12.4 percent of all U.S. residents. Northern Appalachia had the oldest population among the subregions, with 16.0 percent ages 65 and over. Pennsylvania and West Virginia ranked second and third among states in 2000 in the percentage of their population ages 65 and over; only Florida ranked higher. The major reason for the difference in age structure between the Appalachian population and that of the United States as a whole is the net out-migration of young adults from Appalachia to other parts of the country, and Appalachia's relatively low share of immigrants from other countries. Three of the four Appalachian subregions analyzed here had disability rates—overall, mobility, and self-care—generally somewhat higher than those for elderly people in the nation as a whole. The sub-regions of Appalachia vary widely in poverty rates among older people. High poverty rates among elderly people living alone are a particular problem for the Appalachian region, where higher proportions of older people live alone than the national average. Poverty rates for the over-65 population were fairly close to the national average in southwestern Pennsylvania, southern West Virginia, and western North Carolina, but poverty rates were higher for the over-65 population as a whole and for all subgroups in eastern Kentucky. The oldest-old, those ages 85 and over, were more likely to be poor than the entire over-65 population. Demographic projections prepared by Regional Economic Models, Inc., show that, with current trends, the Appalachian region will be home to over 5 million people ages 65 and over in 2025, just under 20 percent of the total population. One of every 40 Appalachian residents will be among the oldest old, those ages 85 and over, in 2025. As is currently the case, Northern Appalachia is expected in 2025 to have a significantly older population than the rest of the region and the nation as a whole, with 23.5 percent of its population ages 65 and over. The report assesses both the service and fiscal demands of the higher regional proportion of older people on state and local governments, but also looks at the economic development potential of the "young old" (those ages 60 to 75) who may actually bring more retirement assets than demands to localities, and who may bring skills and experience into regional labor markets through "bridge jobs" in their retirement.

Excellence: What makes this project exceptional?

The report examines the regional dynamics of population change and aging in place and the economic development implications for a high poverty region.

Significance: How is this research relevant to older persons, populations and/or an aging society?

It examines both the regional actuarial demands of an aging population and the potential economic development opportunities of the younger cohort of the senior population.

Effectiveness: What is the impact and/or application of this research to older persons?

It has been used by the Local Development Districts for policy and planning purposes in both retirement destination communities, as well as fiscally strapped communities in the northern sub-region of Appalachia.

Innovativeness: Why is this research exciting or newsworthy?

It examines both the regional actuarial demands of an aging population and the potential economic development opportunities of

the younger cohort of the senior population. This finding is, by and large, lacking in most journalistic and policy discussions of the implications of aging.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: ADULT DAY SERVICES

This study of adult day services (ADS) examined the role of ADS in state long-term care systems and identified operational and regulatory issues facing providers.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Janet O'Keeffe, Dr. P.H., R.N., Program on Aging, Disability, and Long-Term Care, Research Triangle Institute, 3040 Cornwallis Road, Research Triangle Park, NC 27709–2194.

General Description:

ADULT DAY SERVICES: A KEY COMMUNITY SERVICE FOR OLDER ADULTS AND A REGULATORY REVIEW OF ADULT DAY SERVICES

Adult Day Services (ADS) are community long-term services provided outside an individual's home that consist of therapeutic activities and assistance with activities of daily living. These services often also meet family caregivers' needs for respite care or to enable them to work. States are interested in the potential of adult day services to reduce health care costs, and prevent or delay nursing home placement. Although promoted as community-based service for older persons, little was known about the provision, use, or outcomes of adult day services prior to this study. This research identified operational and regulatory issues facing adult day service providers, and provided information to guide future research and policy analysis.

The purpose of this study was threefold: to inform policymakers about the current and potential role of ADS in the health care and long-term care systems as determined by state regulation; to identify operational and regulatory issues facing ADS providers under different ADS models and in different regulatory and financing environments; and to provide information that can guide future research and policy analysis on ADS for elderly persons.

The study used several qualitative research methods, including: an in-depth review of state approaches to regulating ADS; consultation with a Technical Advisory Group, subject experts, state regu-

latory and Medicaid staff, and state provider associations; and site visits to ADS providers in five states: Georgia, Illinois, Maryland, North Carolina, and Washington.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

While State and Federal long-term care spending on home and community services has increased significantly in recent years, most of the research and policy literature on home- and community-based services for elderly persons has focused on home care and residential care. Less attention has been paid to adult day services (ADS)—a nonresidential community service provided outside the home.

Little is known about the provision, use, or outcomes of ADS, particularly the medical model, and the ADS industry's capacity to provide health services. Research has been hampered by the considerable variation in the characteristics of ADS programs both within and across States, and by a lack of data.

ADS programs are of interest to States because of their potential to delay or prevent nursing home placement, in large part by supporting informal caregiving. Informal caregivers are the backbone of the nation's long-term care system. Over seven million Americans provide 120 million hours of care to about 4.2 million elderly persons with functional limitations each week. The estimated economic value of this care ranges from $45–$96 billion a year. Research has found that caregivers who experience stress and burden are more likely to institutionalize relatives suffering from dementia. Once the physical resources of caregivers decline and other home and community resources (paid or unpaid) are unavailable, nursing home placement is more likely. Many caregivers who use ADS are providing care to family members with dementia who need constant supervision to assure their safety. The respite provided by ADS is thought to lessen the caregiving burden, making it possible to delay nursing home admission.

All States fund some form of ADS through a Medicaid State plan or a waiver programs States are interested in the potential of ADS to reduce health care costs by providing health monitoring, preventive health care, and timely provision of primary care, particularly for individuals at risk for incurring high medical costs. These include elderly individuals who are dually eligible for Medicare and Medicaid—called dual eligibles—who comprised 18 percent of all Medicare beneficiaries in 2000, but accounted for 24 percent of total Medicare spending. Similarly, in 2002, they represented 16 percent of all Medicaid enrollees but 42 percent of program spending.

Adult day services are relatively inexpensive compared to home care or nursing home care. However, the study identified a number of barriers to the use of these services. High cost or the lack of transportation is a major impediment to the use of adult day services. The study also found that adult day service providers have difficulty covering their costs solely through private payments and public program reimbursements. Nearly all providers receive a sig-

nificant portion of their operating revenue through Medicaid or other public funding sources, but these reimbursements generally do not cover providers' costs. Many programs rely on volunteers, in-kind contributions and charitable donations to subsidize their operations.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: PILOT STUDY OF TECHNOLOGY AND AGING

This project developed an 8–10 minute modular survey to measure the existence, addition, and use of assistive devices and home modifications by older adults. The survey instrument was determined to have good statistical properties (i.e., good validity and reliability) and a version of the survey was included as part of the 2006 Health and Retirement Study.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Vicki A. Freedman, Ph.D., Professor, Department of Health Systems and Policy, School of Public Health, University of Medicine and Dentistry of New Jersey, 683 Hoes Lane West, P.O. Box 9, Room 312, Piscataway, NJ 08854.

Partner Agency: National Center for Health Statistics, Centers for Disease Control and Prevention, National Institute on Aging, University of Medicine and Dentistry of New Jersey, Johns Hopkins University, and The Urban Institute.

General Description:

PILOT STUDY OF TECHNOLOGY AND AGING

Assistive technologies and home modifications can help older Americans with disabilities and chronic illnesses live independently in the community. Having good information on the home environment and the prevalence and use of assistive devices is therefore critical to policymakers seeking to promote the independence of the elderly; however, national surveys have rarely collected this type of information and we have little knowledge about the extent to which technology mitigates disability and enhances the lives of older persons.

In 2003, the Office of the Assistant Secretary for Planning and Evaluation, in conjunction with the National Center for Health Statistics and the National Institute on Aging, began a project to develop, pilot, and disseminate a new survey on assistive technology use and the home environment. The goal was to develop a

set of questions that could be easily added to existing or new surveys that would better capture the population at-risk for a disability because of an environmental barrier or lack of modification to the home, and track the adoption and use of assistive devices and technology. The new instrument could better address key questions such as: what role do assistive technologies and home modifications play in the lives of older Americans?; how extensively are they used?; and ultimately, how effective is assistive technology in increasing older American's well-being, social engagement, and participation in valued activities?

After extensive design, pilot testing, and evaluation, a final 8–10 minute survey instrument was developed that included five modules: home environment, mobility and other devices, effectiveness, information and communication technology, and residual activity of daily living/ instrumental activity of daily living difficulty. A shorter version of the survey instrument that could be administered in 2–3 minutes was also developed. The full instrument was included as part of a module on the 2006 Health and Retirement Study (HRS), a nationally representative survey of the noninstitutionalized population age 50 and older living in the U.S. Preliminary findings indicate that a substantial portion of the HRS sample has access to or uses assistive devices/home modifications. For example, approximately two-thirds of the sample report having at least one assistive home feature (e.g., a ramp at their home's entrance, emergency call system, grab bars in shower/tub, raised toilet seat, etc.); one-third reported adding at least one of these features to their home; and assistive home features were shown to enable independent performance of activities. A final report more fully describing the findings form the HRS will be available in late 2008.

Office of the Assistant Secretary for Planning and Evaluation: Report to Congress on Advance Directives

The Report to Congress on Advance Directives will provide a set of recommendations based on findings from the literature review, in-depth commissioned papers and the roundtable discussions on how best to improve advance directive use and advance care planning as a means of expressing wishes for end-of-life care.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Lisa R. Shugarman, Ph.D., Health Policy Researcher, RAND Corporation, 1776 Main Street, PO Box 2138, Santa Monica, CA 90094.

Partner Agency: ABA Commission on Law and Aging, Center for Practical Bioethics, Yeshiva University.

General Description:

REPORT TO CONGRESS ON ADVANCE DIRECTIVES

Over the past century, the experience of dying has changed tremendously. At the beginning of the 1900s, the majority of people died at home, usually from a sudden illness or injury. Now, the majority of Americans die of chronic, progressive illnesses often with prolonged periods of physical dependency (Peres & Kaplan, 2002). Over a decade of research has documented that dying in America is painful, isolating and costly (SUPPORT, 1995; IOM, 1997; Hogan et al., 2001). A key predictor of good end-of-life care is whether people have articulated about their preferences ahead of a crisis. This is known as advance care planning. Advance directives are the cornerstone of advance planning and these directives consist of a person's oral and written instructions about his or her future medical care in the event that he or she becomes unable to communicate or becomes incompetent to make health care decisions. There are two types of advance directives: a living will and a health care power of attorney/health care proxy. Living wills (sometimes called medical directives) are written instructions for care in the event that a person is not able to make medical decisions for him or herself (Fagerlin, 2004). The health care proxy or surrogate is a document by which the patient appoints a trusted person to make decisions about his or her medical care if he or she cannot make those decisions.

Congress enacted the Patient Self-Determination Act (PSDA) in 1990 to encourage competent adults to complete advance directives. The PSDA requires all health care facilities receiving Medicare or Medicaid reimbursements to ask if patients have advance directives, to provide information about advance directives, and to incorporate advance directives into the medical record (PSDA, 1990). Unfortunately, waiting until the crisis of admission to a facility is not the ideal setting for developing an advance care plan.

In recognition of the need for greater understanding of advance care planning, the Health Education and Labor Committee 2006 Appropriations provided for the Secretary of Health and Human Services (HHS) to develop a Report to Congress on advance directives. As provided, Public Law 109–149 "* * * directs the Secretary to conduct a study to determine the best way to promote the use of advance directives among competent adults as a means of specifying their wishes about end-of-life care and provide recommendations to Congress on changes to federal law needed to ensure appropriate use of advance directives." The Secretary is instructed to involve persons with disabilities and identify options for people with cognitive disabilities as well.

The Office of the Assistant Secretary for Planning and Evaluation contracted with RAND to commission a literature review, topic-specific papers on: (1) the historical and current legal issues with advance directives; (2) advance care planning among persons with intellectual and physical disabilities; and (3) public engagement with advance directives. In addition, we held Roundtable Discussion meetings with advance care planning experts, and included an emphasis on people with disabilities. This background work will

form the basis for the report from the Secretary of HHS to Congress outlining the recommendations on how best to promote advance directives.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The literature review examines the empirical evidence about the degree to which advance directives and advance care planning have met their intended goals. The report is one of the most comprehensive reviews of what the medical literature reports concerning the use of advance directives and advance care planning, disparities among groups in their use, and interventions to enhance the use and value of advance directives and advance care planning.

Of the 2.5 million people who die in the U.S. each year, about 85 percent are Medicare beneficiaries (Hogan et al., 2001). A recent Centers for Medicare and Medicaid Services (CMS) report on Medicare spending in the last year of life indicated that expenditures have steadily increased from 26% of total expenditures in 1994 to 29% in 1999 (CMS, 2005). Although considerable sums are spent on prolonging life, relatively little is spent for pain relief, quality of remaining life and emotional support for older persons and their families.

In addition, the concerns, perspectives, and values of people with disabilities have often been overlooked in the research, programs, and policies regarding advance directives, advance care planning, and end-of-life care more generally. While the process for advance care planning for people with physical and intellectual disabilities is the same as for non-disabled people, there are unique community perspectives and issues to be addressed in policies seeking to promote such plans.

The Patient Self-Determination Act (PSDA) requires that all health care facilities receiving Medicare or Medicaid reimbursements must inform patients of their rights to make choices about the treatment they receive and to prepare advance directives. Advance directives are not only focused on what treatments one does not want, they are equally applicable and viable to indicate all of the treatments that one wants. Our Report to Congress will recommend strategies to help strengthen the advance care planning process for elders, people with disabilities and their families.

Generally, the research suggests that even when advance directives are executed, physicians are frequently unaware of them, advance directives are not easily available to surrogates when needed, advance directives are too general and/or are inapplicable to clinical circumstances, and/or they are invoked late in the dying process or are at times over-ridden by providers and families. Only in the context of a comprehensive community effort do advance directives and advance care planning appear to substantially change care at the end of life. Despite the weakness of advance directives as an individual intervention, research points to promising interventions.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION, ENSURING A QUALIFIED LONG-TERM CARE WORKFORCE: FROM PRE-EMPLOYMENT SCREENS TO ON-THE-JOB MONITORING

This study examined different state approaches to screening and monitoring long-term care workers for criminal background and history of elder abuse and the efficacy of these approaches.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Karen W. Linkins, Ph.D., Vice President, The Lewin Group, 3130 Fairview Park Drive, Suite 800, Falls Church, VA 22042.

Partner Agencies: HHS Office of the Inspector General, Centers for Medicare and Medicaid Services (CMS), Federal Bureau of Investigations (FBI), U.S. Department of Justice, Nursing Home Initiative, U.S. Health Resources and Services Administration (HRSA), Kansas Department of Health and Environment, San Diego Prosecutors Office.

General Description:

ENSURING A QUALIFIED LONG-TERM CARE WORKFORCE: FROM PRE-EMPLOYMENT SCREENS TO ON-THE-JOB MONITORING

There has been renewed focus on reducing the incidence of elder abuse, especially in long-term care facilities. One commonly suggested solution is more rigorous background screenings and monitoring of long-term care workers. However, the efficacy and cost effectiveness of such interventions is not known.

This project examined the efficacy of various approaches to pre-employment screening and on-the-job monitoring of nurse assistants to prevent resident abuse in nursing homes. The goal was to inform policymakers, providers, consumers and other interested parties about the relative contributions and perceived effectiveness of existing federal mandates and state and provider-based strategies for preventing or reducing the abuse of vulnerable adults.

Federal and state governments, education and training centers, and employers have created a variety of formal mechanisms aimed at preventing incidences of abuse, neglect and exploitation in nursing homes and other long-term care settings. These mechanisms can include certification and licensure of paraprofessional long-term care workers, various pre-employment screenings, (e.g., nurse aide registries, criminal background checks and drug tests), and on-the-job training and monitoring.

The two primary methods used for pre-employment screening include checking nurse aide registries and conducting criminal background checks. Federal guidelines require each state to establish and maintain a registry of nurse aides that includes certification information and substantiated findings of abuse, neglect, or financial exploitation in nursing homes. Federal guidelines require nursing facilities to check their State nurse aide registry to ensure that hired nurse aides are certified to work and meet all state requirements, and that they do not have any substantiated findings of abuse, neglect or misappropriation associated with their license. In addition, long-term care facilities may check other relevant databases they believe will include any information on the potential employee (e.g., criminal background database).

Some states, either through law or by choice, collect data beyond the scope mandated by federal requirements for maintaining nurse aide registries. For example, states registries may include data on certified and non-certified health care workers in addition to nurse aides, along with additional demographic information such as race/ethnicity, education level, or current employer.

Previous studies have examined rates of abuse in nursing facilities, direct service worker capacity issues, and compliance of states to maintain nurse aide registries. This study looked across all of these issues, by examining the process states go through to collect and maintain information in their registries, state and employer mandated background check procedures, reporting and investigating policies/practices when abuse allegations are made, and the impact of such processes on the direct service workforce, employers and state agencies.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

Examining the efficacy of long-term care worker employment screening mechanisms (such as state nurse aide registries and criminal background checks) comes at a particularly relevant time. Recent federal studies highlight the urgency for the study from both a long-term care staffing perspective and from a quality care perspective. The Medicare Prescription Drug, Improvement, and Modernization Act (MMA) authorized a background check pilot program in seven states. Additionally, there have been numerous legislative proposals in recent years to address long-term care worker screenings to prevent elder abuse in long-term care. However, the efficacy and cost effectiveness of such interventions is not clear. Nor is there information on the impact that more rigorous background screenings might have on the supply of long-term care workers.

The goal of this study was to examine current practices at the state and facility levels regarding pre-employment screening and on-the-job monitoring, and how these influence the quality of the long-term care workforce.

Extensive variation across states affected the ability of the researchers to make a definitive statement about the efficacy of these strategies to ensure a qualified workforce. The study's in-depth ex-

amination of four states revealed that some aspects of these systems work well, but limitations exist in each state that affects the overall utility of these practices. The technology, coordination capabilities and infrastructure exist through on-line registries, fingerprint databases and abuse registries to help employers make the best hiring decisions possible to protect the elderly in their care. States are building on their knowledge, experience, and capabilities to streamline these processes, but there is still room for improvement while balancing the resource intensiveness of making these changes.

Key findings from the study:

Criminal background checks are a valuable tool for employers during the hiring process and their use does not limit the pool of potential job applicants. None of the nursing facilities experienced any negative impact on their applicant pool as a result of this requirement.

A correlation exists between criminal history and incidences of abuse. Based on data from Arizona and Kansas, it does appear that nurse aides who had a previous criminal conviction (non-disqualifying offense) had higher rates of substantiated abuse than nurse aides without a criminal history.

Criminal background checks are only one component of preventing abuse. Other effective strategies for preventing abuse include: adequate supervision/monitoring, presence of managers on the floor, decreasing staff burnout, adequate staffing levels, rotating nurse aides on the floor to alleviate pressure of difficult residents, increased education and training, obtaining meaningful employment references (beyond verification of employment dates), instituting a drug-free workplace policy, minimizing temporary hires, and pointing out negative behaviors in the moment and using them as a staff development opportunity.

There are fewer policies in place that support or reinforce post-employment strategies to ensure a qualified workforce. Most states have no process in place to notify employers if an active employee commits a crime that would have prohibited them from working during their background check prior to employment. One innovative state program monitors criminal behavior of individuals working in positions of direct care and service of potentially vulnerable populations (nursing facilities, home health, child care agencies, etc.) While the program is an exemplar, it also illustrates that such on-going monitoring requires significant commitment of resources and participation across agencies.

Previous studies on this issue have examined rates of abuse in nursing facilities, direct service worker capacity issues, and compliance of states to maintain nurse aide registries. This study is unique because it looked across all of these issues and provides valuable information to states considering changes to their long-term care worker requirements to prevent elder abuse.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: SPECIFICATION OF THE LONG TERM CARE NURSING HOME (LTC–NH) ELECTRONIC HEALTH RECORD SYSTEM (EHR–S) FUNCTIONAL PROFILE

This project, sponsored by the Office of the Assistant Secretary for Planning and Evaluation (ASPE), in conjunction with significant

private support, identified the LTC–NH EHR–S Functional Profile. The Functional Profile has been shared with HL7 and CCHIT.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Jennie Harvell, M. Ed., Senior Policy Analyst, Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, 200 Independence Ave., SW., Room 424E, Washington, DC 20201; Michelle Dougherty, MA, RHIA, CHP, Director, Practice Leadership, American Health Information Management Association; Nathan Lake, RN, BSN, MSHA, Director, Clinical Design, American HEALTHTECH; Sue Mitchell, RHIA, Director of Clinical Systems, Omnicare Information Solutions, 5148 Blacklick Eastern Rd. NW, Baltimore, OH 43105; and Hugh McDonough, Senior Associate, Abt Associates, 55 Wheeler Street, Cambridge, MA 02138.

Partner Agencies: American Association of Homes and Services for the Aging/Center for Aging Services Technology (AAHSA/CAST), American Health Care Association/National Centers for Assisted Living (AHCA/NCAL), American Health Information Management Association (AHIMA), and National Association for the Support of Long Term Care (NASL).

General Description: Specification of the Long Term Care Nursing Home (LTC–NH) Electronic Health Record System (EHR–S) Functional Profile.

Consensus has emerged that interoperable health information technology (HIT) and electronic health records (EHRs) are needed to improve quality, safety, and effectiveness of health care while simultaneously enhancing efficiency and reducing costs.

The HHS 2004 report entitled, "The Decade of Health Information Technology—Framework for Strategic Action" recommended establishing private sector certification of HIT products to reduce the risk of product failure and increase the uptake of EHR implementation. HHS subsequently authorized and funded the Certification Commission for Healthcare Information Technology (CCHIT) to specify certification criteria for electronic health records (EHRs) and to implement a process through which EHR products would be certified as meeting the certification criteria. In late 2006, HHS authorized and funded the CCHIT to expand its certification scope to begin addressing EHR products for nursing homes. In March 2007, CCHIT announced that nursing homes would be included in their "Roadmap" for expansion of product certifications. In specifying certification criteria for nursing home EHR products, CCHIT will

draw heavily on the requirements published in the 2007 HL7 EHR-System Functional Model (EHR–S FM) standard (also developed with ASPE funding), and industry specific requirements that are specified in a nursing home-specific Functional Profile.

With the funding provided by ASPE and significant staff resources provided by the long-term care community, the public and private sector sectors specified the Long Term Care Nursing Home (LTC–NH) Electronic Health Record System (EHR–S) Functional Profile. The LTC–NH EHR–S Functional Profile identifies the subset of functions from the HL7 EHR–S FM that reflects the unique aspects and needs for EHR systems in the long term care-nursing home setting. The LTC–NH EHR–S Functional Profile identifies needed EHR functions and criteria in the domains of direct care, supportive services, and information infrastructure.

The LTC–NH EHR–S Functional Profile has been registered by HL7 and will be balloted as an industry standard.

The LTC–NH EHR–S Functional Profile has also been sent to CCHIT to help inform their efforts related to certification of nursing home EHR products. CCHIT will use the LTC EHR–S Functional Profile as a reference as they develop the functionality, interoperability, and security requirements for certified nursing home EHR system products.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The LTC–NH EHR–S Functional Profile represents the best efforts of a broad array of long term care professionals and stakeholders from the public and private sectors to derive functional requirements and timelines for these requirements for EHR systems in nursing homes using the HL7 EHR–S Functional Model. The LTC–NH EHR–S Functional Profile will be undergoing balloting by HL7 Electronic Health Record Technical Committee to become an industry standard. The LTC–NH EHR–S Functional Profile has been sent to the Certification Commission for Health Information Technology (CCHIT) to help inform their efforts as they specify certification criteria for nursing home EHR products and begin to certify nursing home EHRs as meeting these criteria. CCHIT is expected to begin certifying NH EHRs in 2009.

The development of the Functional Profile, the anticipated recognition by HL7 of the LTC–NH EHR–S Functional Profile as an industry standard, and the use of the LTC–NH EHR–S Functional Profile by CCHIT in specifying the certification criteria for NH EHRs is expected to inform nursing home providers of the EHR functionality they could acquire, and will provide a roadmap for nursing home HIT vendors as to the type of functionality that certified products will be required to meet and when. Such information is expected to encourage and accelerate implementation of interoperable EHRs by nursing home providers. Use of interoperable EHRs is expected to support needed quality and continuity of care improvements, efficiency gains, and cost reductions.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: NATIONAL DATA ON ELDER ABUSE

This research will inform a report to Congress from the Secretary of Health and Human Services, which will address the feasibility of collecting uniform national data on elder abuse.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Karen Linkins, Project Director, Sharon Zeruld, Project Manager, Bernadette Wright, Associate, Sarah Lash, Associate, The Lewin Group, 3130 Fairview Park Dr., Suite 800, Falls Church, VA 22042.

Partner Agencies: Department of Justice, Administration on Aging, and Centers for Disease Control.

General Description: Congress directed the Secretary of the Department of Health and Human Services (HHS) to conduct a study, in consultation with the Attorney General, assessing current elder abuse data collection systems and examining the feasibility of establishing a uniform national elder abuse database to improve the quality and accessibility of data (P.L. 109–432). To develop the basis for its report to Congress, the HHS Office of the Assistant Secretary for Planning and Evaluation (ASPE) contracted with The Lewin Group, and subcontractor Dr. Catherine Hawes, to conduct research to address these issues.

A focused literature review and inventory of existing elder abuse data collection and reporting efforts represents one component of that research. Findings are based on a review of the published literature on elder abuse data collection and reporting as well as information gleaned from telephone discussions with over 30 experts in related fields. This review addresses the following questions:

a. How is elder abuse currently defined in Federal and state laws and by researchers and other organizations?

b. How have studies measured the prevalence and incidence of elder abuse, and what are the strengths, challenges and limitations of these studies?

c. What are the current practices in investigating, substantiating, and reporting elder abuse at the Federal, state, and local levels?

d. How do confidentiality laws and policies affect the sharing of information about elder abuse among agencies?

e. What are the shortcomings and strengths of existing data collection and reporting efforts?

f. How are data collected on child abuse and intimate partner violence? How have these fields addressed challenges such as underreporting, differing definitions, and difficulties in detecting abuse?

g. What state practices have been developed to enhance elder abuse reporting, investigation, and data collection?

Based on the findings, the report identifies areas that will need to be addressed in determining the feasibility of a national elder abuse database. The project's other major activities include: developing a memorandum that outlines key issues and approaches for establishing a uniform national dataset on elder abuse; obtaining input from government, research, advocacy, and industry experts; and preparing a report that synthesizes all findings and discusses implications for implementing a uniform national database on elder abuse.

This project will inform a report to Congress to be issued by the Secretary of HHS.

Older adults can be vulnerable to abuse, neglect, and financial exploitation perpetrated by caregivers, others in positions of trust, and relative strangers, as well as self-neglect. The true incidence of elder abuse in the United States is unknown, although several studies have attempted to measure the scope of the problem. Chronic underreporting and a lack of a standard definition are commonly reported problems that make it difficult to report precise figures. However, most experts agree that elder mistreatment is a large and growing problem that has only recently begun to attract the public attention it deserves.

The scope and purpose of definitions of elder abuse vary across states and local agencies, and data collection methods are similarly diverse, complicated by the involvement of many autonomous agencies operating under different mandates.

A national database or consistent national data collection strategy on elder abuse data have been recommended as possible solutions to the problems associated with varying and uncoordinated state and local data collection and reporting systems. As early as 1992, the Department of Health and Human Services (HHS) Secretary's Task Force on Elder Abuse recommended the development and funding of a national elder abuse research and data collection strategy. More recently, a number of studies have recommended increased standardization of elder abuse definitions and data collection systems.

This study will inform a report to Congress from the Secretary of Health and Human Services on the feasibility of collecting uniform national data on elder abuse. It will inform an important debate among policymakers and lawmakers currently considering strategies for tackling the growing societal problem of elder abuse and mistreatment in the United States.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: PREVENTING COSTLY FALLS AMONG OLDER AMERICANS

This demonstration, sponsored by the Office of the Assistant Secretary for Planning in conjunction with Bankers Life and Casualty Company and the John Hancock Life Insurance Company, will test whether a comprehensive falls prevention program will reduce the incidence of falls among older Americans and use of subsequent acute health and long-term care services.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Jessica Miller, Director of Analytic Services, LifePlans, Inc., 51 Sawyer Road, Suite 340, Waltham, MA 02453.

Partner Agencies: Abt Associates, LifePlans, Inc., Bankers Life and Casualty Company, and John Hancock Life Insurance Company.

General Description:

PREVENTING COSTLY FALLS AMONG OLDER AMERICANS

Falls constitute one of the most significant and common causes of injury and disability for the elderly. One in every three people age 65 and older living in the community falls during a year and fall-related injuries cost an estimated $17 billion annually. Falls are also associated with subsequent admission to a nursing home and use of long-term care services. While there are numerous studies identifying the major risk factors associated with falling (e.g., poor muscle strength/gait and balance, cognitive impairment, polypharmacy, and unsafe physical environment), there is virtually no research demonstrating the cost-effectiveness of comprehensive programs designed to reduce the incidence and impact of falls. This project will fill a significant research gap and answer a critical question posed by policymakers: can an affordable falls prevention program reduce the incidence of falls in the elderly and lower spending for acute health and long-term care services?

The Office of the Assistant Secretary for Planning and Evaluation (OASPE) contracted with Abt Associates and LifePlans, Inc. in 2003 to design a demonstration to determine the cost-effectiveness of a fall prevention program for older Americans. After further refinement of the intervention, methodological approach and assessment instruments, OASPE began the next phase of the demonstration with LifePlans in 2006—the actual implementation and evaluation of the program. The demonstration uses a classic experimental design where a random sample of older persons receives a full falls-risk assessment and intervention (treatment) and others do not (control). Unlike other falls prevention programs, the demonstration will provide a comprehensive falls risk assessment (both via the telephone and in-person), clinical review of assessment findings, individualized action plan with specific recommendations, and periodic follow-up and case management. One of the unique aspects of the project is the partnership between the federal government

and two well-known and established providers of long-term care insurance: Bankers Life and Casualty Company, and the John Hancock Life Insurance Company. Persons age 75 and older who have a long-term care insurance policy with one of the two companies will have the opportunity to participate in the demonstration, with approximately 5,600 persons divided into a treatment group and various control groups. Medicare claims data will be used as part of the demonstration, thereby allowing researchers to determine whether or not the falls prevention program reduces acute health care cost as well as long-term care expenses.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: STANDARDIZING ASSESSMENTS AND SUPPORTING HEALTH INFORMATION EXCHANGE

This project, sponsored by the Office of the Assistant Secretary for Planning and Evaluation (ASPE), in conjunction with FORE/AHIMA and several collaborating experts will link required and recognized HIT standards to the MDSv3 and OASIS–C.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Michelle Dougherty, MA, RHIA, CHP, Director, Practice Leadership, American Health Information Management Association.

Partner Agencies: Alschuler Associates, LLC, College of American Pathologists—SNOMED Terminology Solutions, Indiana University of Regenstrief Institute, Inc., Apelon, Inc., TerraStar Consulting, and Center for Aging Services Technology (CAST).

General Description: Standardizing Assessments and Supporting Health Information Exchange.

Consensus has emerged that interoperable health information technology (HIT) and electronic health records (EHRs) are needed to improve quality, safety, and effectiveness of health care while simultaneously enhancing efficiency and reducing costs. The use of HIT standards is needed to make interoperability a reality.

Much of the national HIT policy focus has not considered the standards and HIT applications needed in long-term care, including nursing facilities (NFs) and home health agencies (HHAs).

Each year in the U.S., thousands of NFs and HHAs provide services to millions of patients—many of whom are medically complex and frail requiring either short-term (post-acute) or long-term care. Caring for these individuals involves inter-disciplinary teams of health care professionals and paraprofessionals in NFs and HHAs,

millions of physician encounters each year, and frequent transitions in care in and out of NFs and HHAs and to other health care settings.

Timely access to complete and useable health information is important in providing and improving quality and continuity of care provided to persons receiving NF and HHA services, and for increasing efficiencies in and the cost effectiveness of health care delivery to these individuals.

CMS requires NFs and HHAs complete and electronically transmit federally-developed patient assessments: the Minimum Data Set (MDS) assessment and the Outcome and Assessment Information Set (OASIS), respectively. CMS will be updating these instruments to the MDSv3 and OASIS–C.

Federally-required assessments are the backbone of HIT products available to NF/HHA providers. Presently, these assessments are not linked with HIT standards and HIT products used by most of these providers are not standardized. Linking accepted HIT standards to federally-required assessments is expected to enable NF/HHA providers to engage in interoperable health information exchange with hospitals and doctors to improve critical information sharing between the sectors, support quality and continuity of care improvements, increase efficiencies, and reduce costs.

The Office of the Assistant Secretary for Planning and Evaluation has contracted with the Foundation of Research and Education (FORE) of the American Health Information Management Association (AHIMA) to apply recognized and required HIT standards to the MDSv3 and OASIS–C. FORE/AHIMA has convened several persons with expertise in HIT content and messaging standards, and expertise in the MDS and OASIS instruments to link required/recognized HIT standards to these patient assessment instruments.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The project to link accepted HIT standards to the emerging NF MDSv3 and HHA OASIS–C patient assessment instruments is exceptional in its focus on applying HIT standards to a key business function in NFs and HHAs. Much of the national HIT policy focus has not taken into account long-term care.

This project will leverage standards that have been (i) recognized by the public and private sectors for use in exchanging health information, and (ii) required for use by the Secretary of HHS for Federal health care programs. Certain Federal health care programs (including Medicare) are required to use HIT systems and products that meet "recognized interoperability standards" as designated by the Secretary of HHS. This project will re-use and link applicable "recognized interoperability standards" to the MDSv3 and OASIS content and for the exchange of these assessments.

In addition, the Secretary of HHS has required the use of accepted CHI (Consolidated Health Informatics) Standards by "all federal agencies in implementing new, and as feasible, updating existing health information technology systems." The accepted CHI standards include HIT standards for assessment content and for the ex-

change of assessment instruments. The CHI standards are consistent and compatible with the standards that have emerged from HITSP and recognized by the Secretary of HHS. This project will also link CHI-required standards to the MDSv3 and OASIS–C.

The LTC Community (NF and HHA providers, physicians, and vendors) have requested that LTC be included in the emerging Nationwide Health Information Network (NHIN) and have specifically requested the linkage to and use of these HIT standards of the MDSv3 and OASIS–C.

Linking and using accepted and recognized HIT standards to federally-required assessments is a critical step that will enable NF/HHA providers to engage in interoperable health information exchange in the emerging NHIN, support quality and continuity of care improvements, increase efficiencies, and decrease costs.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: MODELING THE DECISION TO PURCHASE PRIVATE LONG-TERM CARE INSURANCE

This project estimated how the purchase of private long-term care insurance is influenced by various economic and demographic factors, including the effect of tax incentives. If all taxpayers could fully deduct premium expenses from income subject to federal income taxes, the number of older adults with coverage would increase by about 36 percent.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Richard W. Johnson, The Urban Institute, 2100 M Street, NW., Washington, DC 20037.

General Description:

MODELING THE DECISION TO PURCHASE PRIVATE LONG-TERM CARE INSURANCE

Long-term care spending is expected to soar in coming decades as the population ages. Enhanced private insurance coverage of long-term care needs might ease the looming crisis. Raising private insurance coverage rates would increase the pool of funds set aside to finance future services and would reduce reliance on public resources. Enhanced private coverage could also protect families from catastrophic long-term care costs. Some policymakers have proposed expanding tax incentives for private long-term care coverage to stimulate demand.

Like traditional medical insurance, private long-term care insurance is a financial contract whereby the insurer agrees to provide covered benefits in exchange for regular premium payments by the policyholder. Policies are guaranteed renewable, and premiums remain fixed over the life of the contract. However, rates can rise for an entire class of policyholders if insurers can demonstrate that their costs exceed premium revenue, and rate increases have been common in recent years.

The analysis estimated hazard models of time to purchase private long-term care insurance as a function of the net benefit that individuals expect to derive from the policy. The net expected benefit is the difference between what policyholders expect to receive in benefit payouts from the plan over their lifetimes, in present value terms, and what they expect to pay into the plan in the form of premiums. The measure, which accounted for state-level fluctuations in premiums and Medicaid eligibility rules, varied widely across individuals.

Data came primarily from the Health and Retirement Study (HRS), a nationally representative longitudinal survey of older Americans. The sample consisted of person-year observations between 1992 and 2004 on adults ages 51 to 61 in 1992 who did not have coverage in the previous year. The sample was restricted to respondents likely to satisfy long-term care insurers' underwriting restrictions and thus able to purchase private coverage.

The net expected benefit of coverage significantly increased the likelihood of taking-up private long-term care insurance coverage, although the impact was modest. Every $1,000 increase in the net expected benefit of coverage would raise purchase probabilities by about 2.3 percent. Take-up rates also increased with age, education, health status, and the self-assessed probability of using nursing home care in the next year. They declined with the number of children, perhaps because children help with their parents' home care or help finance nursing home costs.

Creating additional federal tax incentives for the purchase of private long-term care insurance would modestly boost take-up rates. Take-up rates would rise to 19 percent if all taxpayers could fully deduct premium expenses from income subject to federal income taxes, representing about a 36 percent boost in the number of older adults with coverage. The impact of tax incentives on private long-term care insurance would be concentrated among high-income taxpayers. Tax breaks would have very little impact on coverage rates for adults in the bottom half of the income distribution.

Office of the Assistant Secretary for Planning and Evaluation: A Profile of Medicaid Institutional and Community-Based Long-Term Care Service

This project estimated how Medicaid long-term care is balanced between institutional and community-based care. Significant variation across states and age groups was found. The proportion of Medicaid long-term care expenditures that are for community-based services declines with age.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and

Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Audra T. Wenzlow, Ph.D., Mathematica Policy Research, Inc., 555 S. Forest Ave., Suite 3, Ann Arbor, MI 48104.

General Description:

A PROFILE OF MEDICAID INSTITUTIONAL AND COMMUNITY-BASED LONG-TERM CARE SERVICE USE AND EXPENDITURES AMONG THE AGED AND DISABLED USING MAX 2002

Since 1982, states have increasingly utilized Medicaid Section 1915(c) waivers and optional state community-based programs to shift long-term care for the aged and disabled from institutions to the community. New rules introduced under the Deficit Reduction Act (DRA) of 2005 provide states with even more flexibility to provide home and community-based long-term care services to their low-income populations. Two overarching goals underlie these policies: (1) to provide long-term care services more cost-effectively; and (2) to give aged and disabled people more options in how they receive their care.

As baby boomers enter their senior years and increase the need for long-term care services nationally, information about how Medicaid community long-term care programs have functioned in the past will be critical for assisting states in choosing how to utilize the new options provided under the DRA. Until recently, only limited aggregate data and some national surveys have been available to examine Medicaid community-based long-term care service use and compare it with use of institutional care. The Medicaid Analytic eXtract (MAX) data system produced by Centers for Medicare & Medicaid Services now enables much more detailed analyses of long-term care utilization and expenditures at the person level.

This study evaluates the potential of using MAX Person Summary files to examine how successfully states have rebalanced their long-term care systems and how Medicaid enrollees who utilize community-based long-term care services differ from people in institutions. Data for 2002 were analyzed for 37 states that have reliable MAX long-term care data.

In 2002, only 34 percent of Medicaid long-term care expenditures paid for persons served were for community-based services in 2002, while almost 59 percent of long-term care users used community-based services. National estimates mask significant variation across states. Community-based services accounted for over 60 percent of long-term care expenditures in Alaska and New Mexico but less than 12 percent in the District of Columbia and Mississippi. Use of community-based services among long-term care users ranged from 87 percent in Alaska to 23 percent in Indiana.

Institutional and community long-term care expenditures were much more balanced among young disabled Medicaid enrollees than their aged counterparts in 2002. Over half of long-term care expenditures were for community-based services among disabled enrollees but less than 20 percent were for community-based care among those over 65. Community-based service expenditures as a share of total long-term care expenditures ranged from 50 percent for people under age 65, 31 percent for people between ages 65 and 74, 21 percent for people between ages 75 and 84, and 13 percent for those age 85 and older. Rates of community-based service utilization were higher but followed a similar pattern by age.

People using both institutional and community-based services (6 percent of long-term care users) had higher average total Medicaid expenditures ($46,055) than users of institutional care only ($38,844) or community care only ($24,966). Aged and disabled enrollees using Medicaid long-term care services accounted for 7.7 percent of all full-benefit Medicaid enrollees in our 37 sample states but represented over 50 percent of their total Medicaid expenditures.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: A PROFILE OF MEDICAID INSTITUTIONAL AND COMMUNITY-BASED LONG-TERM CARE SERVICE USE AND EXPENDITURES AMONG THE AGED AND DISABLED USING MAX 2002

This project estimated how Medicaid long-term care is balanced between institutional and community-based care. Significant variation across states and age groups was found. The proportion of Medicaid long-term care expenditures that are for community-based services declines with age.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Audra T. Wenzlow, Ph.D., Mathematica Policy Research, Inc., 555 S. Forest Ave., Suite 3, Ann Arbor, MI 48104.

General Description:

A PROFILE OF MEDICAID INSTITUTIONAL AND COMMUNITY-BASED LONG-TERM CARE SERVICE USE AND EXPENDITURES AMONG THE AGED AND DISABLED USING MAX 2002

Since 1982, states have increasingly utilized Medicaid Section 1915(c) waivers and optional state community-based programs to

shift long-term care for the aged and disabled from institutions to the community. New rules introduced under the Deficit Reduction Act (DRA) of 2005 provide states with even more flexibility to provide home and community-based long-term care services to their low-income populations. Two overarching goals underlie these policies: (1) to provide long-term care services more cost-effectively; and (2) to give aged and disabled people more options in how they receive their care.

As baby boomers enter their senior years and increase the need for long-term care services nationally, information about how Medicaid community long-term care programs have functioned in the past will be critical for assisting states in choosing how to utilize the new options provided under the DRA. Until recently, only limited aggregate data and some national surveys have been available to examine Medicaid community-based long-term care service use and compare it with use of institutional care. The Medicaid Analytic eXtract (MAX) data system produced by Centers for Medicare & Medicaid Services now enables much more detailed analyses of long-term care utilization and expenditures at the person level.

This study evaluates the potential of using MAX Person Summary files to examine how successfully states have rebalanced their long-term care systems and how Medicaid enrollees who utilize community-based long-term care services differ from people in institutions. Data for 2002 were analyzed for 37 states that have reliable MAX long-term care data.

In 2002, only 34 percent of Medicaid long-term care expenditures paid for persons served were for community-based services in 2002, while almost 59 percent of long-term care users used community-based services. National estimates mask significant variation across states. Community-based services accounted for over 60 percent of long-term care expenditures in Alaska and New Mexico but less than 12 percent in the District of Columbia and Mississippi. Use of community-based services among long-term care users ranged from 87 percent in Alaska to 23 percent in Indiana.

Institutional and community long-term care expenditures were much more balanced among young disabled Medicaid enrollees than their aged counterparts in 2002. Over half of long-term care expenditures were for community-based services among disabled enrollees but less than 20 percent were for community-based care among those over 65. Community-based service expenditures as a share of total long-term care expenditures ranged from 50 percent for people under age 65, 31 percent for people between ages 65 and 74, 21 percent for people between ages 75 and 84, and 13 percent for those age 85 and older. Rates of community-based service utilization were higher but followed a similar pattern by age.

People using both institutional and community-based services (6 percent of long-term care users) had higher average total Medicaid expenditures ($46,055) than users of institutional care only ($38,844) or community care only ($24,966). Aged and disabled enrollees using Medicaid long-term care services accounted for 7.7 percent of all full-benefit Medicaid enrollees in our 37 sample states but represented over 50 percent of their total Medicaid expenditures.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: NATIONAL NURSING ASSISTANT SURVEY

Our nation is facing a major shortage of health care workers who provide for the long term care needs of residents in nursing homes and other places. The National Nursing Assistant Survey is the first nationally representative study of nursing assistants working in U.S. nursing homes. This new survey provides information that can inform state and federal initiatives to recruit, retain, and expand the workforce, and could be used to examine the important role of workers in providing care to a growing elderly and chronically ill population.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Marie R. Squillace, Ph.D., Social Science Analyst, Office of the Assistant Secretary for Planning and Evaluation, Hubert H. Humphrey Building, Room 424E.20, 200 Independence Avenue, SW., Washington, DC 20201.

Partner Agency: National Center for Health Statistics, Centers for Disease Control and Prevention, Mathematica Policy Research, Inc., and Westat, Inc.

General Description:

NATIONAL NURSING ASSISTANT SURVEY

Our nation is facing a major shortage of health care workers who provide for the long-term care needs of residents in nursing homes and other places. Many direct care workers are leaving the field and too few are entering. Projections of a substantial health care workforce imbalance have motivated policymakers, providers, private foundations, and others to seek immediate and sustainable solutions to stabilize the health care workforce. Current demographic, economic and policy trends suggest that without serious intervention, the supply of health care workers could significantly worsen in the coming decades.

The National Nursing Assistant Survey is the first nationally representative survey of nursing assistants working in U.S. nursing homes. This new survey provides information that will inform state and federal initiatives to recruit, retain, and expand the long-term care workforce. It also provides important information about the role of workers in caring for a growing elderly and chronically ill population. The survey collected information on whether workers plan to continue working in their present positions and what fac-

tors affect their decisions, including job satisfaction, nature of the work environment, training, advancement opportunities, benefits, working conditions, and personal or family demands. By identifying the priorities of nursing assistants, the survey can help identify ways to meet those priorities and how to prevent staffing shortages in the future.

The survey design and implementation were made possible through collaborations with two independent research organizations, a national advisory group, and a sustained partnership with the National Center for Health Statistics, Centers for Disease Control and Prevention.

Excellence: What makes this project exceptional?

The National Nursing Assistant Survey represents a major advance in the data available about health care workers in U.S. nursing homes and provides a rich resource for evidence-based policy, practice and applied research initiatives. This survey can be linked to other existing data sets thereby expanding the usefulness of the data by enabling researchers to examine more comprehensive and complex relationships between worker, facility, resident, and community characteristics.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The care of 1.5 million elderly and chronically ill persons in the United States is largely in the hands of nursing assistants—the individuals who provide eight out of every ten hours of care residents receive in nursing homes. Turnover of these direct care workers is high which profoundly decreases the quality of life and care of the residents. This research provides industry and policy leaders with information that is useful for improving the attractiveness of caregiving jobs and for reducing worker turnover.

Effectiveness: What is the impact and/or application of this research to older persons?

As at least 36 states currently consider workforce vacancies to be a serious issue, results from this research will provide an invaluable resource in federal and state labor, welfare and health policy discussions on expanding the pool of workers, and on reimbursement, regulation and program design. Ultimately, this will result in improvements in the quality of life and care of older Americans in U.S. nursing homes.

Innovativeness: Why is this research exciting or newsworthy?

The major advance of this survey over other studies is its use of a nationally representative sample of certified nursing assistants within a nationally representative sample of nursing homes. Previous studies have been of local or regional samples that were not representative of the country as a whole.

Office of the Assistant Secretary for Planning and Evaluation: Nursing Home Divestiture and Corporate Restructuring

Analyses of large national nursing home chains indicated a trend towards consolidation, with smaller chains operating in fewer states and, in some states, emergent regional chains replacing the national chains, particularly in Florida and Texas where malpractice litigation has been particularly acute.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: David Stevenson, Ph.D., Department of Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston, MA 02115.

General Description:

NURSING HOME DIVESTITURE AND CORPORATE RESTRUCTURING

Over the past two decades, the nursing home industry has experienced changes in the financial, regulatory, and competitive environments. Nursing homes have been greatly impacted by federal and state policies, such as the regulatory reforms of the Omnibus Budget Reconciliation Act of 1987 and the payment reforms of the Balanced Budget Act of 1997. Occupancy rates have fallen in the context of shortened lengths of stay for residents and increased competition from assisted living facilities and other home and community-based care. Medicaid payment rates vary substantially across states and have gone through periods of relative generosity and parsimony. Nursing home malpractice litigation has increased, leading to an increase in overall operating costs, especially in a handful of states.

Responding to these and other policy and market factors, the nation's largest nursing home chains have undergone periods of considerable expansion, contraction, and retrenchment. The role of chain providers, which represent more than half of all facilities, is significant in the nursing home industry. To investigate these issues further, the Assistant Secretary of Planning and Evaluation (ASPE) contracted with Harvard Medical School to study recent trends in nursing home divestiture and corporate restructuring of the nation's largest nursing home chains.

After a review of the literature and analyses of On-line Survey, Certification, and Reporting (OSCAR) data, the final report describes the trends in nursing home ownership by national chains over the past decade and discusses policy implications. The literature review identified the policy and market incentives that led the nursing home industry and especially national chains to expand substantially. The generous cost-based reimbursement policies attracted investment in the industry and encouraged substantial merger and acquisition activities. The review highlighted several challenges that followed when market conditions were less favorable, leading highly leveraged chains to bankruptcy, divestiture, and corporate restructuring.

The outcome of these challenges is a national chain sector that is smaller and has a different focus than 10 years ago. Government financing remains vital, with corporate structure also heavily influenced by factors such as litigation, state reimbursement climates, and geographic considerations. The industry today maintains a moderately healthy capital structure. The industry's reemergence and relatively better financial condition are attributed to more rational portfolios of nursing home ownership, improved access to capital, and improved Medicare reimbursement.

Guided by the literature review, analysis of OSCAR data from 1993–2004, and review of information on public companies, the report describes the nursing home industry and documents ownership trends over the last decade. The focus was on the characteristics and activities of the nation's largest nursing home chain providers. Analyses of these data nationally, within states, and across specific chains, revealed several broad themes. Nationally, nursing home chains have consistently owned or operated half of all facilities. Chains sold nursing homes in high litigation states to regional chains, sold assets to real estates investment trusts (REITs), and restructured corporation with private equity firms. Importantly, these aggregate findings mask important state- and chain-specific trends.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

This study is the only analysis of the corporate divestiture and restructuring of the large national nursing home chains that represent the majority of over 16,000 nursing homes in the country. The analyses show that there is substantial variation across national chain providers in the strategies with which they navigate policy and market conditions, and highlights the need to investigate more about the specific characteristics and practices of the parent company. As the population over 85 years of age continue to grow, continuity of care from stable nursing home industry is essential.

Some of the restructuring and financing trends that were identified have unclear implications for the quality of care received by nursing home residents. Although further research into some topics is made difficult by the lack of comprehensive data on facility ownership, further analytic work is ultimately needed to investigate these trends more thoroughly and to analyze whether they have had any impact on nursing home residents' quality of care. Several congressional hearings have been conducted in the past year on this subject.

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION: THE NATIONAL SURVEY OF RESIDENTIAL CARE FACILITIES (NSCRF)

The National Survey of Residential Care Facilities (NSCRF) will fill a gap in federal long-term care data collection and provide nationally representative data on residential care facilities and their residents.

Lead Agency: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: John D. Loft, Ph.D., Principal Scientist, Survey Research Division, RTI International, 230 W. Monroe Street, Suite 2100, Chicago, IL 60606.

Partner Agencies: National Center for Health Statistics (NCHS), Agency for Health Research and Quality (AHRQ), CDC National Center for Chronic Care and Disease Prevention and Health Promotion—Division of Heart Disease and Stroke Prevention, and Veterans' Administration (VA).

General Description: Unlike nursing homes and home and hospice care, the federal government does not currently collect data on residential care. Without this data it is impossible to understand the entire spectrum of long-term care options. States are responsible for regulating residential care and state policies, licensure requirements, and terminology vary widely across states. This makes accurate national estimates of facility services and the total number of residents challenging.

To address this issue the Office of the Assistant Secretary for Planning and Evaluation (ASPE) with the National Center for Health Statistics (NCHS) is conducting a National Survey of Residential Care Facilities (NSRCF). This will be the first nationally representative sample survey of residential care in the United States. The survey will determine the characteristics of residential care facilities, such as their structure and environment, types of services offered, the staff they employ, and the requirements for admission, retention, and discharge. Additionally the survey will determine the characteristics of residents living in residential care settings, such as demographics, levels of functional disability and cognitive impairment, service needs, and the types of services used.

A general shift in state Medicaid long-term care policy toward community-based care over the past 25 years, and independent growth in private-pay residential care (e.g., assisted living) since the late 1980s have led to a burgeoning, yet still not clearly delineated, set of residential care alternatives to home care and traditional skilled nursing facilities. Residential care facilities, such as assisted living facilities or board and care homes, are a critical component of long-term care systems, serving individuals who cannot live at home without assistance, but who do not require the level of skilled nursing care found in nursing homes.

Collecting information on residential care is critical because it is impossible to understand the changing dynamics of publicly fi-

nanced long-term care (i.e., Medicare home health, Medicaid Home and Community Based Services (HCBS), and nursing home care) without a complete picture of the entire spectrum of residential care options available to persons with disabilities. Without an accurate source of information on the characteristics of all residential care facilities, the services they provide, and their residents, policymakers and providers will be unable to fully understand the current long-term care system and the likely impact of policy changes.

This essential national study will help policymakers have a more complete picture of the long term care spectrum and of the residential care industry and residents. The pretest will be administered in Fall 2008, and the national survey will be fielded in early 2010.

OFFICE OF THE ASSISTANT SECRETARY OF PLANNING AND EVALUATION: LONG-TERM CARE REVERSE MORTGAGE

This project features the development of special reverse mortgages for persons likely to need long-term care within a year. The mortgages will be cheaper than those on the market today and targeted at home values of $175,000 and less.

Lead Agency: Office of the Assistant Secretary of Planning and Evaluation, U.S. Department of Health and Human Services.

Agency Mission: The Assistant Secretary for Planning and Evaluation advises the Secretary of the Department of Health and Human Services on policy development in health, disability and aging, human services, and science and data policy, and provides advice and analysis on economic policy. The Office of the Assistant Secretary for Planning and Evaluation (OASPE) leads special initiatives, coordinates the Department's evaluation, research and demonstration activities, and manages cross-Department planning activities such as strategic planning, legislative planning and review of regulations. Integral to this role, OASPE conducts research and evaluation studies, develops policy analyses, and estimates the cost and benefits of policy alternatives under consideration by the Department or Congress.

Principal Investigator: Barb Stucki, National Council on Aging, 1901 L Street, NW., 4th Floor, Washington, DC 20036.

Partner Agency: U.S. Administration on Aging and U.S. Department of Housing and Urban Development.

General Description:

LONG-TERM CARE REVERSE MORTGAGE

As the population ages and more and more people need long-term care, it is critical to understand the potential of different financing options. Reverse equity mortgages have been around for some time, but they have yet to play a significant role in financing long-term care. Home equity is considered an asset for Medicaid eligibility, and states have begun to explore helping older adults tap into this equity in order finance long-term care while remaining at home.

This project will investigate the potential for reverse equity mortgages to assume a greater role in financing long-term care in three states: Minnesota, New Jersey, and Georgia. The Office of the Assistant Secretary for Planning and Evaluation, in conjunction with the U.S. Department of Housing and Urban Development, the U.S. Administration on Aging, and state leaders is developing special re-

verse mortgages structured specifically for use by persons likely to need long-term care with in a year's time. These reverse mortgages will be less expensive than current products and be targeted at home values of $175,000.

Before expanding such reverse mortgages to a larger number of states, it is critical to understand whether consumers are interested in such arrangements, and how effective this financial tool is at keeping elders in the community. Staff from the aging networks will serve as reverse mortgages counselors, and assist consumers in determining whether their situation is appropriate for a reverse mortgage. The reverse mortgages resources will then be used in combination with public case management and public services to serve older persons in their homes for as long as possible. The reverse mortgage funds have the flexibility to provide those services which are not otherwise available, and are expected to extend the time an individual can receive less-costly care in a setting they prefer—home.

Excellence: What makes this project exceptional?

This project is exception in its use of an existing asset to finance long-term care. Many long-term care financing proposals require a new funding source while this one taps an existing source in a way that maximizes consumer direction. It also expands this potential funding source to people with lower home equity who are more likely to utilize costly Medicaid services.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This project is significant because it features the conversion of previously unavailable (for most homeowners) assets for the purpose of financing long-term care. Many older persons want to remain in their homes but have no way to pay for the care they require. This project has the potential to release billions of dollars for long-term care financing while facilitating continued residence at home. Without this project these resources are unlikely to be converted for this purpose, particularly given the high cost of existing reverse mortgages and a mortgage structure that does not favor frail older persons.

Effectiveness: What is the impact and/or application of this research to older persons?

This project has the potential for immediate effectiveness upon completion because it includes a financing approach that has been demonstrated in three states. Other states can readily replicate the approach and thereby expand this option to a large number of vulnerable elders in need of long-term care.

Innovativeness: Why is this research exciting or newsworthy?

This project is innovative in its use of an existing asset to financing consumer directed care in a new way. Budget constraints will limit the ability of Medicaid to fund all of the long-term care that the baby boomers will need. This research supports another financing option that facilitates the ability of older adults to purchase their own care, remain in their own homes while making use of public services when appropriate.

U.S. Census Bureau

LEHD's Older Worker Profile series is an innovative use of a unique new data source, which covers the employment history and

characteristics of workers (including older workers) and the firms that employ them in the United States while their confidentiality is protected.

Lead Agency: The U.S. Census Bureau.

Agency Mission: The Census Bureau serves as the leading source of quality data about the nation's people and economy. We honor privacy, protect confidentiality, share our expertise globally, and conduct our work openly. We are guided on this mission by our strong and capable workforce, our readiness to innovate, and our abiding commitment to our customers.

Principal Investigator: Matthew Graham, Longitudinal Employer-Household Dynamics Program, Center for Economic Studies, U.S. Census Bureau, Room 6H141, 4600 Silver Hill Road, Suitland, Maryland 20746.

Partner Agencies: Employment and Training Administration, U.S. Department of Labor and National Institute on Aging (NIA), National Institutes of Health.

General Description: The Longitudinal Employer-Household Dynamics (LEHD) Program is in the process of producing a series of reports on Older Worker Profiles and associated tables by state.

To date, reports for 15 states have been issued, covering Arkansas, Colorado, Delaware, Hawaii, Indiana, Iowa, Kentucky, Maine, Maryland, Montana, New Jersey, Oklahoma, South Carolina, Vermont, and Wisconsin. Reports for about 15 more states under the Local Employment Dynamics (LED) partnership will be released in the coming months.

Drawing on the unique collection of databases developed by LEHD, the Older Worker Profiles highlight the age composition of the state's workforce, job gains and losses for older workers by industry, industries in which older workers are concentrated, and their job stability and earnings.

In addition, forty-two (42) different supplementary and appendix tables are provided for additional details. These reports and tables are made available from the LEHD website located at http://lehd.did.census.gov.

The unique collection of databases developed by LEHD is also known as a job frame, designed to cover the employment history and characteristics of every worker in the United States and the employment history and characteristics of every job-linked employer in the nation.

The job frame is created by integrating historical and current data from state agencies, the Census Bureau, and sister federal agencies. It currently contains over 6 billion records and is growing with new records of recent data every 90 days.

Additional products have been derived from this job frame for older workers, including:

- OnTheMap. An interactive mapping and reporting application that shows where people live and work with companion reports on age, earnings, industry, and cross-state patterns of residence and workplace. OnTheMap also allows for mapping and reporting for older workers only.
- Quarterly Workforce Indicators. A set of 30 indicators that describe the dynamics of local employment, earnings, turnover, and job changes by geography, gender, industry and time in year and quarter for all workers and older workers only.

Excellence: What makes this project exceptional?

The Older Worker Profiles produced by LEHD are exceptional because they provide unique and valuable information on the labor market outcomes for the aging population that are useful for both research and policy evaluation. Each Older Worker Profile, which consists of a report and a series of supplementary and appendix tables for a single state, identifies key features of the local (to the Metropolitan and County areas) employment dynamics for older workers. Because the underlying microdata is tagged with a number of socioeconomic variables (including age and industry), detailed answers about local labor market conditions can be reported.

Specifically, the Older Worker Profile exposes lay audiences to a new set of statistics called Quarterly Workforce Indicators (QWIs). These data describe—at quarterly intervals with a historical sequence back to 1990 for some states—various statistical aspects of local labor markets, including but not limited to: Employment, New Hires, Job Separations, Turnover, and Average Earnings. QWIs for older workers in the report portion of the Profile are available at the 2-digit NAICS industry sector level and in the downloadable tables at the 3-digit NAICS industry subsector level. Using the QWI, the Older Worker Profiles generate information on the types of jobs that older workers are leaving and being hired.

Additionally, the Older Worker Profiles are exceptional because they are only the tip of the iceberg with respect to the data source from which they were extracted. The LEHD data infrastructure provides opportunities for a comprehensive and longitudinal analysis of older workers across the nation and down to the county level. Extensions of this research are expected to bring further detail to the database through the addition of external data sources and the application of more advanced confidentiality protection systems, which should allow greater geographic/characteristic detail while maintaining strict confidentiality protection and increasing analytical validity.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The research on older workers goes right to the heart of questions of the economic health of the United States in the coming decades. As older workers—specifically of the aging Baby Boom generation—move through the traditional retirement age, outcomes of their employment opportunities and choices will have significant impacts on policy choices and options at every level of government and private industry. Whether or not older workers choose to move directly to retirement, continue to work full time, or move into semi-retirement; which jobs older works choose or are forced into holding because of their economic resources; and whether or not older workers continue to be compensated for their experience are all questions whose answers will have important consequences for the national and local economies. These are all questions that can be illuminated by the data and research that underlie LEHD's Older Worker Profile series.

Effectiveness: What is the impact and/or application of this research to older persons?

The primary impact of this research is to lead the way in making use of a unique dataset for the purposes of evaluating the consequences of an important change coming in the workforce as the

Baby Boom generation moves through the traditional retirement age. This research and these data can guide programs and policy to address the needs of and support older workers who continue to participate in the workforce. In addition, the dataset provides the ability to answer questions about potential gaps in knowledge as a large cohort of experienced workers faces retirement. What are the industries in which there will most likely be knowledge/experience gaps? In which industries will older workers continue on through retirement, reaping the rewards of their long experience? In which industries will we expect to find those older Americans who did not plan adequately for retirement and how will their compensation compare with their younger colleagues? The research being done and the research to come on older workers will have a significant impact on how these questions are interpreted and how they are answered by economic and labor force policy at all levels.

Innovativeness: Why is this research exciting or newsworthy?

The Older Worker Profiles are exciting and newsworthy because they report on a much-needed dataset at exactly the right time. As communities see their labor forces age and retire, local, regional, state, and national leaders are looking for information to help them understand how to respond. At the same time, business and industry want to know how many jobs they will need to fill in the coming years. These reports begin the process of uncovering the answers to these questions.

This research is also exciting and newsworthy because it makes use of a relatively new dataset that has the opportunity to open up whole new lines of research into the labor force dynamics of older workers. The Older Worker Profiles (reports and supplementary tables) report on public-use data that has been cleared by the Census Bureau's Disclosure Review Board. These data are available in a number of extended forms (the Older Worker Profiles are merely one slice of it) that extend the information on the QWIs as well as show more detailed geographical distributions of the data. Additionally, a rich series of confidential microdata is available through approved research projects, and the possibilities for this research and almost limitless.

NATIONAL CENTER FOR HEALTH STATISTICS

The goal of the Federal Interagency Forum on Aging-Related Statistics (Forum) is to bring together Federal agencies that share a common interest in improving aging-related data. The Forum provides agencies with a venue to discuss data issues that cut across agency boundaries

Lead Agency: National Center for Health Statistics.

Agency Mission: The mission of the National Center for Health Statistics (NCHS) is to provide statistical information that will guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigator: Jennifer Madans, Co-Acting Deputy Director/Associate Director for Science, National Center for Health Statistics, 3311 Toledo Road, Room 7207, Hyattsville, MD 20782.

Partner Agencies: Administration on Aging, Agency for Healthcare Research and Quality, Bureau of Labor Statistics, Centers for Medicare and Medicaid Services, Department of Housing

and Urban Development, Department of Veterans Affairs, Employee Benefits Security Administration, Environmental Protection Agency, National Institute on Aging, Office of Management and Budget, Office of the Assistant Secretary for Planning and Evaluation, HHS, Social Security Administration, Substance Abuse and Mental Health Services Administration, and U.S. Census Bureau.

General Description: The Federal Interagency Forum on Aging-Related Statistics, established in 1986 by the National Center for Health Statistics, National Institute on Aging, and the U.S. Census Bureau, fosters collaboration among Federal agencies that produce or use statistical data on the older population.

The Forum plays a key role in improving aging-related data by critically evaluating existing data resources and limitations, stimulating new database development, encouraging cooperation and data sharing among Federal agencies, and preparing collaborative statistical reports. In 1998, the Forum was reorganized and expanded to include several new members. In addition to the original three core agencies, the members of the Forum now include the Administration on Aging, Agency for Healthcare Research and Quality, Bureau of Labor Statistics, Centers for Medicare and Medicaid Services, Department of Housing and Urban Development, Department of Veterans Affairs, Employee Benefits Security Administration, Environmental Protection Agency, Office of Management and Budget, Office of the Assistant Secretary for Planning and Evaluation in the Department of Health and Human Services, Social Security Administration, and Substance Abuse and Mental Health Services Administration.

Excellence: What makes this project exceptional?

The Federal Interagency Forum on Aging-Related Statistics (Forum) is an interagency committee dedicated to improving the quality of Federal statistics on older Americans. It is a collection of 15 Federal government agencies that collect, analyze, and report data on issues related to people age 65 and over. The Forum is exceptional because it brings together such a wide variety of Federal agencies with the primary purpose of improving both the quality and utility of data on the aging population. The specific goals of the Forum are to:

- widen access to information on the aging population through periodic publications and other means;
- promote communication among data producers, researchers, and public policymakers;
- coordinate the development and use of statistical databases among Federal agencies;
- identify information gaps and data inconsistencies;
- investigate questions of data quality;
- encourage cross-national research and data collection on the aging population; and
- address concerns regarding collection, access, and dissemination of data.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Americans age 65 and over are an important and growing segment of our population. Many Federal agencies provide data on aspects of older Americans' lives, but it can be difficult to fit the pieces together. Thus, it has become increasingly important for pol-

icymakers and the general public to have an accessible, easy to understand portrait that shows how older Americans are faring. The Forum's periodic report Older Americans: Key Indicators of Well-Being monitors the health and well-being of older Americans through a broad range of indicators in five important areas: population, economics, health status, health risks and behaviors, and health care. It provides data on 37 key indicators carefully selected by the Forum to portray important aspects of the lives of older Americans and their families.

Effectiveness: What is the impact and/or application of this research to older persons?

The Forum's periodic report, Older Americans: Key Indicators of Well-Being, provides the Nation with a summary of national indicators of well-being and monitors changes in these indicators over time. By following these data trends, more accessible information becomes available to target efforts that can improve the lives of older Americans and their families. Older Americans reflects the Forum's commitment to advancing our understanding of where older Americans stand today and what they may face tomorrow.

Innovativeness: Why is this research exciting or newsworthy?

The Forum's mission is to encourage cooperation and collaboration among Federal agencies to improve the quality and utility of data on the aging population. To accomplish this mission, the Forum provides agencies with a venue to discuss data issues and concerns that cut across agency boundaries, facilitates the development of new databases, improves mechanisms currently used to disseminate information on aging-related data, invites researchers to report on cutting-edge analyses of data, and encourages international collaboration. The work of the Forum is newsworthy because in an era of agencies competing for research funds, the Forum members work together on projects that cross agency boundaries to share resources and enhance the work of the Federal statistical system.

THE PREVENTION RESEARCH CENTER: 10 KEYS TO HEALTHY AGING

The University of Pittsburgh's Center for Healthy Aging created the 10 Keys to Healthy Aging program to encourage healthy living among older adults. Research combines learning about the "10 keys" with education and physical activity to find the best combination for reducing participants' risk for stroke, heart failure, cancer, disability, institutionalization, and suicide. Preliminary results showed the 10 keys led to health improvements, and the information has been shared across Pennsylvania and in Europe.

Lead Agencies: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, Prevention Research Centers Program.

Agency Mission: The Prevention Research Centers work as an interdependent network of community, academic, and public health partners to conduct prevention research and promote the wide use of practices proven to promote good health.

Principal Investigator: Anne P. Newman, M.D., M.P.H., University of Pittsburgh Center for Healthy Aging, 130 N. Bellefield Avenue, Room 550, Pittsburgh, PA 15213.

Partner Agency: PRC Healthy Aging Research Network.

General Description: The 10 Keys to Healthy Aging, based on epidemiological, clinical, and laboratory studies, address 10 conditions essential for maintaining health in older adults: (1) prevent bone loss and muscle weakness, (2) control blood pressure, (3) increase physical activity, (4) regulate blood sugar, (5) stop smoking, (6) maintain social contact, (7) participate in cancer screening, (8) get regular immunizations, (9) lower cholesterol, and (10) combat depression. Researchers are collaborating with community partners to refine interventions around several of these conditions.

Project staff are implementing and evaluating two interventions for about 1,000 older adults: a healthy lifestyle intervention and a brief education intervention. After completing an initial 4-hour assessment related to the ten keys, participants are randomly assigned to an intervention group. Participants in both groups meet with a health counselor who explains the results of their assessments and offers recommendations. Participants identify one or two goals for improving their results and are referred to their doctors as needed. People in the brief education group are referred to community resources and receive follow-up calls from a health counselor every 3 months.

Adults in the healthy lifestyle intervention join in walking groups and attend group sessions about healthy food choices for controlling blood pressure and diabetes, and exercises to improve strength, flexibility, and endurance. In social activities, participants can get support from peers; practice techniques to maintain and enhance memory and other mental abilities; and learn about the risk factors conditions associated with aging. All participants will complete the assessments after the intervention and every year thereafter for 3–4 years. Post-intervention results of the 2 groups will be compared with each other and with individuals' initial assessments. Evaluators will analyze the extent to which the interventions decreased participants' risk for stroke, heart failure, cancer, disability, institutionalization, and suicide.

Excellence: What makes this project exceptional?

The 10 Keys to Healthy Aging intervention is a portable and simple method to address the leading causes of illness in older adults. The research involves older adults in every step of its development. Laypersons are recruited from the community, learn about how to prevent disease and promote health, and become Community Health Ambassadors. They work with researchers to design and test interventions and spread health messages among their peers.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Older adults are at risk for heart disease and stroke, diabetes, influenza, pneumonia, disability, suicide, and other preventable conditions. However, those who engage in physical activity, healthy diets, socially and mentally stimulating activities, cancer screening, and other positive health behaviors can often maintain active and healthy lives.

Effectiveness: What is the impact and/or application of this research to older persons?

Community Health Ambassadors have shared the research across the state of Pennsylvania and through a partnership with a multinational corporation, with corporation employees working in

Europe. One thousand older adults are participating in the second-round trials of the research project.

Innovativeness: Why is this research exciting or newsworthy?

Older adults are bombarded by health messages about every aspect of life. The 10 keys intervention simplifies health messages to a consistent, evidence-based set of priorities that helps without overwhelming the audience. Older adults work alongside researchers to develop and test the 10 keys, and can attest to its effectiveness and ease of use.

THE PREVENTION RESEARCH CENTER: PEARLS (PROGRAM TO ENCOURAGE ACTIVE, REWARDING LIVES FOR SENIORS)

PEARLS reduces minor depression among older adults by teaching participants behavioral techniques during in-home counseling sessions. The program has been proven to reduce depression and hospital visits, and has been recognized in the National Registry of Evidence-Based Programs and Practices.

Lead Agency: Prevention Research Centers Program.

Agency Mission: The Prevention Research Centers work as an interdependent network of community, academic, and public health partners to conduct prevention research and promote the wide use of practices proven to promote good health.

Principal Investigator: Sheryl Schwartz, Principal Investigator, University of Washington, Health Promotion Research Center, 1107 NE 45th St., Suite 200, Seattle, WA 98105.

Partner Agencies: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, City of Seattle Aging and Disability Services, Senior Services of Seattle/King County, Washington State Unit on Aging, Washington State Aging and Disability Services Administration, and Substance Abuse and Mental Health Services Administration.

General Description: PEARLS aims to reduce minor depression and resulting disability among older adults by teaching them depression management techniques. It consists of eight in-home counseling sessions followed by monthly telephone calls for 6 months. The counseling covers three behavioral approaches to managing depression: (1) Participants are taught a set of steps they can use to solve their problems—from clearly defining the problem to implementing their chosen solution. These steps help participants recognize symptoms of depression and understand the link between unsolved problems and depression. (2) Participants are encouraged to meet recommended levels of social and physical activity by using community settings, such as senior centers. (3) Participants are taught to identify and participate in activities pleasurable to them. The intervention was shown to significantly reduce depression and has been listed in the National Registry of Evidence-Based Programs and Practices, a service of the Substance Abuse and Mental Health Services Administration. King County now offers the program to seniors who receive social services and have minor depression, and the program is available via an online toolkit for wide dissemination.

Excellence: What makes this project exceptional?

Local participants report having benefited from the program. It has the potential to substantially improve health and quality of life

for older adults who suffer from minor depression or dysthymia, and are receiving social case management services. Because dissemination can occur within existing community social services programs, eligible older adults could be readily identified and enrolled in the program. Moreover, because most social services agencies have access to mental health experts who could supervise training of staff and the implementation of PEARLS, the program does not require large increases in local funding. Thus PEARLS has the potential to benefit many ill, disabled, and frail older adults.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Minor depression affects 15%–20% of older adults and is known to profoundly compromise health and quality of life. People who are socially isolated and in frail health are especially at risk for depression. Doctors and their older patients often incorrectly assume that depression is an unavoidable consequence of aging, and many depressed elders do not receive treatment.

Effectiveness: What is the impact and/or application of this research to older persons?

After one year, 43% of seniors in the intervention group reported at least a 50% decline in depressive symptoms. Only 15% of seniors in the control group reported the same decline. Depression resolved completely for 36% of PEARLS participants, compared with 12% of nonparticipants. PEARLS participants experienced significant improvements in functional and emotional well-being. Current efforts are focused on replicating the PEARLS program, making it available to a broad range of older adults and to all adults with chronic medical conditions.

Innovativeness: Why is this research exciting or newsworthy?

Researchers have made a PEARLS Toolkit available online, so the program can be implemented in any community in the United States.

THE PREVENTION RESEARCH CENTERS: ENHANCE FITNESS

EnhanceFitness is a physical activity program for adults, aged 60 years or older, that emphasizes activities to increase endurance, strength, balance, and flexibility. Participants improve in physical and social functioning as well as levels of pain and depression. Their health care costs are also significantly reduced.

Lead Agency: The Prevention Research Center.

Agency Mission: The Prevention Research Centers work as an interdependent network of community, academic, and public health partners to conduct prevention research and promote the wide use of practices proven to promote good health.

Principal Investigator: Sheryl Schwartz, Principal Investigator, University of Washington, Health Promotion Research Center, 1107 NE 45th St., Suite 200, Seattle, WA 98105.

Partner Agencies: Group Health Cooperative of Puget Sound and Senior Services of Seattle/King County Administration on Aging, National Council on Aging.

General Description: Researchers collaborated to develop a physical activity program for adults aged 60 years or older. The program emphasizes activities to increase endurance, strength, balance, and flexibility. The pilot study showed that participants im-

proved significantly in almost every area tested—from physical and social functioning to levels of pain and depression. The health care costs for participants attending at least once a week were significantly reduced. Now the program is offered at 158 community sites in 17 states, and the researchers continue to dissemination research. In 2003, the National Council on Aging recognized the physical activity program as one of the top ten physical activity programs for U.S. seniors.

Excellence: What makes this project exceptional?

EnhanceFitness is feasible and well-attended when offered in senior centers and other community-based settings. It is sustainable and portable. The number of participants continues to increase—by 76% in a recent calendar year.

Significance: How is this research relevant to older persons, populations and/or an aging society?

An analysis of Group Health Cooperative Medicare enrollees showed that people who participated in EnhanceFitness at least once per week had significantly fewer hospitalizations (by 7.9%), and lower health care costs (by $1,057) than nonparticipants. The availability of such a successful program becomes more and more pertinent as the U.S. population ages, disability prevention among the elderly becomes a higher national priority, and health care costs continue to climb.

Effectiveness: What is the impact and/or application of this research to older persons?

The program was adapted for dissemination and portability by developing standards; manuals for instructors, administrators, and participants; and procedures for monitoring outcomes. Now in development as a "train-the-trainer" program and pilot programs in Hispanic and American Indian communities. It also receives funding from local foundations to help defray the cost of the program for low-income older adults of color.

Innovativeness: Why is this research exciting or newsworthy?

The decline in strength, endurance, flexibility, and balance that occurs with aging contributes to diminished independence, diminished vitality, and increased likelihood of disabling injury. EnhanceFitness has been proven to enhance physical and psychosocial function. Such gains can help ensure that older adults retain independence and a high quality of life.

CENTER FOR DISEASE CONTROL AND PREVENTION: SPECIAL PROJECTS BRANCH: LINKED MEDICARE

The Special Projects Branch, Data Linkage Team completed a comprehensive data enhancement and research infrastructure project by linking several important NCHS surveys with Medicare enrollment and claims records collected from the Centers for Medicare and Medicaid Services (CMS). Linkage of the NCHS survey participants with the CMS Medicare data provides the opportunity to study changes in health status, health care utilization, and expenditures in the elderly and disabled U.S. population.

Lead Agency: Center for Disease Control and Prevention/National Center for Health Statistics/Office of Analysis and Epidemiology.

Agency Mission: The mission of the National Center for Health Statistics (NCHS) is to provide statistical information that will

guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigator: Christine S. Cox, M.S., Chief, Special Projects Branch, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 6317, Hyattsville, MD 20782.

Partner Agencies: Centers for Medicare and Medicaid Services (CMS).

General Description: NCHS has linked its population based survey data with Medicare enrollment and claims data collected from the Centers for Medicare and Medicaid Services (CMS). These linked survey files provide the data needed to formulate and answer vital research questions by profiling Medicare service use and assessing health care costs.

Medicare enrollment and claims data are available for those NCHS survey participants who agreed to provide personal identification data to NCHS and for whom NCHS was able to validate and match with Medicare administrative records. CMS provided NCHS with Medicare benefit claims data for 1991 through 2000 for all successfully matched NCHS survey participants.

The following NCHS surveys were linked to Medicare enrollment and claims files:

—1994–1998 National Health Interview Survey (NHIS)
—NHANES I Epidemiologic Follow-up Study (NHEFS)
—Second National Health and Nutrition Examination Survey (NHANES II)
—Third National Health and Nutrition Examination Survey (NHANES III)
—The Second Longitudinal Study of Aging (LSOA II)

For successfully matched NCHS survey participants, Medicare enrollment and claims information are available from the following CMS files:

—Denominator
—MedPAR Hospital Stay
—MedPAR Skilled Nursing Facility
—Carrier file (formerly the Physician/Supplier Part B file)
—Outpatient
—Home Health Agency
—Hospice
—Durable Medical Equipment

Excellence: What makes this project exceptional?

The Special Projects Branch within OAE is responsible for conducting record linkage projects, developing linked data files for analytic use, evaluating the linked data and promoting the data for public health and health policy research. Demand for more comprehensive data from the research and public health policy communities coupled with the need for cost-effective data collection efforts, indicates the importance of the development of linked data sets. This project demonstrates the successful collaboration and cooperation between federal agencies to enhance the research infrastructure for aging research.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Medicare administrative records provide one of the most valuable sources of information on health events, health care utilization and costs for the U.S. population aged 65 years or older. However, Medicare data alone does not provide a complete picture of beneficiary's health status. NCHS population based surveys linked to Medicare data can provide a more comprehensive view of health status, not only for specific chronic conditions or functioning, but also can provide a longitudinal component to the beneficiary's health status.

Effectiveness: What is the impact and/or application of this research to older persons?

By linking Medicare administrative data with NCHS survey data, researchers and policy makers can improve understanding of the health status, utilization, and expenditure patterns of the Medicare population.

Innovativeness: Why is this research exciting or newsworthy?

The linkage of NCHS survey participants to their individual administrative records on Medicare enrollment and claims provide a cost-effective means to enrich and expand the available information on health status, functional limitations, medical care utilization and costs. The linked NCHS-Medicare files provide a single source of data on various domains of interest to researchers that, in general, are difficult to find. For each of the NCHS surveys linked to Medicare administrative records, there are approximately 80 different files available for researchers.

NATIONAL CENTER FOR HEALTH STATISTICS: NURSING HOME CARE

The 2004 National Nursing Home Survey (NNHS) is the latest in a continuing series of surveys of United States nursing homes, their services, their staff, and their residents. The NNHS is the only periodic nationally representative survey of nursing home facilities. As the U.S. population ages and people are living longer with chronic diseases, the 2004 NNHS permits researchers, policy makers, and the nursing home industry to assess the adequacy of current nursing home care and future long-term care needs.

Lead Agency: National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC).

Agency Mission: The mission of the National Center for Health Statistics (NCHS) is to provide statistical information that will guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigator: Robin E. Remsburg, PhD, RN, GCNS–BC, FNGNA, FAAN, Deputy Director, Division of Health Care Statistics, National Center for Health Statistics, 3311 Toledo Road, Hyattsville, MD 20782.

Partner Agencies: United States Department of Veterans Affairs, Office of the Assistant Secretary for Planning and Evaluation (ASPE), United States Department of Health and Human Services.

General Description: The 2004 National Nursing Home Survey (NNHS) is the latest in a continuing series of nationally representative sample surveys of United States nursing homes, their services, their staff, and their residents. The 2004 NNHS was redesigned and expanded to collect many new data items. The 2004 NNHS will permit researchers, policy makers, and the nursing

home industry to assess the adequacy of current nursing home care and future long-term care needs.

Data collected about the facilities include characteristics such as bed size, number of residents, ownership, top management training and tenure, staffing levels, turnover, Medicare/Medicaid certification, geographic region, services provided and specialty programs offered, and charges. Data collected about the residents include information such as demographic characteristics, functional and cognitive status, continence, diagnoses, length of time since admission, services received, pain management, pressure ulcers, vaccinations, physical restraints, advance directives, falls, fractures, weight management, emergency department visits, hospitalizations, medications taken, and sources of payment. Data for the 2004 NNHS were obtained through in-person interviews with facility administrators and designated staff that used administrative records to answer questions about the facilities, staff, services and programs, along with interviews with staff familiar with the medical records to answer questions about the sampled residents.

All nursing homes that participated in the 2004 NNHS had at least three beds and were either certified by Medicare or Medicaid or had a State license to operate as a nursing home. A representative sample of nursing homes was selected from nursing home facilities in the United States. The 2004 survey sample consisted of about 1,500 facilities throughout the United States and up to 12 current residents from each facility.

The 2004 NNHS was administered using a computer-assisted personal interviewing (CAPI) system and included a supplemental survey of nursing assistants employed by nursing homes, the National Nursing Assistant Survey (NNAS). The NNAS, sponsored by the Office of the Assistant Secretary for Planning and Evaluation (APSE), is the first-ever nationwide survey of nursing assistants, the group of health care workers who provide the majority of direct care (such as assistance with bathing or showering, dressing, getting in or out of bed or a chair, using the toilet, and eating) to the country's almost 1.5 million nursing home residents. A sample of up to eight nursing assistants was selected from about half of the nursing home sample at the time of the facility interview. The NNAS was administered after the nursing home visit, using a computer-assisted telephone interview (CATI) system.

For the 2004 NNHS: 1,174 nursing facilities participated, representing 16,100 nursing homes and 1,492,200 residents nationally. For the NNAS, 3,017 nursing assistants participated, representing 702,500 nursing assistants working in U.S. nursing homes in 2004. The next NNHS is currently scheduled to be fielded in 2011.

Excellence: What makes this project exceptional?

The 2004 NNHS was significantly re-designed from previous years, including a four-fold increase in survey content, sample design modifications, and migrating from paper-and-pencil to CAPI data collection to facilitate data collection and improve data quality. The content enhancements include measures of quality of care, safety, staffing characteristics, outcomes of care, and palliative and end-of-life care. The sample design enhancements include increasing the sample size, enabling new subgroup analyses by selected diagnosis and race groups. The re-designed survey also enables link-

age to other Federal data sets to enable access to and analysis of more clinical information.

The data from the 2004 NNHS are available on the Internet as public-use files. For the first time in 2004, the public-use files include the sample design variables that improve the accuracy of the results produced through the public-use files.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The NNHS is the only periodic nationally representative survey of nursing home facilities. The public health impact of this project is to improve the public's health by monitoring care and outcomes of care provided to elderly residents in nursing home settings and to provide data for research that can assist health services researchers, federal stakeholders, policy analysts, and the long-term care industry. As the U.S. population ages, these data are especially important to explore the relationship between the services provided in these settings with patient safety, quality of care, and desired clinical outcomes.

Effectiveness: What is the impact and/or application of this research to older persons?

Today, nursing facilities continue to provide much needed long-term care services to a large segment of the country's disabled and elderly population. As the nation's total population of older adults grows and the average lifespan continues to increase, we need to continue to assess the availability and adequacy of these services. Data from the NNHS will have a direct impact on the health and well being of individuals residing in long-term care settings. The NNAS will provide extremely valuable information, which will guide future policy initiatives to increase the supply of nursing assistants in long-term care.

Innovativeness: Why is this research exciting or newsworthy?

Conducting the NNAS as part of the 2004 NNHS reduced duplication of data collected on nursing homes, reduced respondent burden, reduced costs, increased efficiency of data collection and dissemination, and increased the analytical potential for both the NNHS and the NNAS. The successful fielding of a health care worker survey, as a component of a health care provider survey, will serve as a model for future surveys of these types of workers including home health aides and aides working in other non-nursing home residential care. The NNAS will provide extremely valuable information, which will guide future policy initiatives to increase the supply of nursing assistants in long-term care. Data from the NNHS will have a direct impact on the health and well being of individuals residing in long-term care settings.

CENTER FOR DISEASE CONTROL'S NATIONAL CENTER FOR HEALTH STATISTICS HEALTHY PEOPLE 2010

Assess the progress of The Healthy People 2010 goal to increase the quality and years of healthy life in the U.S. by measuring expected years in good or better health, expected years free of activity limitation, and expected years free of selected chronic diseases.

Lead Agency: Center for Disease Control's National Center for Health Statistics—Office of Analysis and Epidemiology.

Agency Mission: The mission of the National Center for Health Statistics (NCHS) is to provide statistical information that will

guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigator: Richard J. Klein, MPH, Chief, Health Promotion Statistics Branch, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 6317, Hyattsville, MD 20782.

General Description: The concept of healthy life expectancy reflects the fact that not all years of a person's life are lived in perfect health. As the prevalence of chronic disease and disability tend to increase with age, a population with a higher life expectancy may not actually be the healthiest.

One of the goals of Healthy People 2010 is to increase the quality and years of healthy life in the U.S. Progress towards this goal is assessed by 3 healthy life expectancy measures: expected years in good or better health; expected years free of activity limitation; and expected years free of selected chronic diseases. These measures can provide an indication of expected years of healthy life remaining at birth or other ages such as 55 years, 65 years, or 85 years.

Analysis completed for the Healthy People 2010 Midcourse Review revealed a slight overall increase in both expected years remaining in good or better health and years free of activity limitation at birth and at age 65, and an overall decrease in expected years remaining free of selected chronic conditions at birth and at age 65; gender and racial differences were present in all three of these measures. Future plans include the development of additional measures, focus on additional domains including mental health and health behaviors, and improving the understanding and interpretation of healthy life expectancy.

The use of healthy life expectancy in Healthy People 2010 was recently presented to the European Commission's Task Force on Health Expectancies. Plans for continued discussions on international comparability between the U.S. and European measures are in progress.

Excellence: What makes this project exceptional?

There is currently no consensus on how to measure the quality and years of healthy life.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The concept of healthy life expectancy reflects the fact that not all years of a person's life are lived in perfect health. As the prevalence of chronic disease and disability tend to increase with age, a population with a higher life expectancy may not actually be the healthiest.

Effectiveness: What is the impact and/or application of this research to older persons?

If healthy life expectancy is increasing more quickly than general life expectancy within the population, then the aging population is living a greater portion of life free of chronic diseases and disabilities. If not, then education of policy makers could result in re-allocation of resources to promote a healthier life at later stages.

Innovativeness: Why is this research exciting or newsworthy?

This research provides the opportunity for international comparability between the healthy life expectancy measures being used in the U.S. and by the European Commission.

THE NATIONAL CENTER FOR HEALTH STATISTICS

This project investigates the trends in functional limitations for Americans age 65 and over from 1992 to 2003 and found decreases in years spent with functional limitations.

Lead Agencies: Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS).

Agency Mission: The mission of NCHS is to provide statistical information that will guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigator: Liming Cai, Ph.D., Senior Service Fellow, National Center for Health Statistics, 3311 Toledo Road, Rm. 6330, Hyattsville, MD 20782.

General Description: Background. Life expectancy for older Americans has risen substantially over the past five decades due to reductions in mortality from chronic diseases, especially cardiovascular disease. Whether these added years are mostly free of disability has been the focus of debate. Different hypotheses of trends in population aging have been proposed: compression of morbidity, expansion of morbidity and dynamic equilibrium (an increase in moderate disability and a decrease in severe disability, as medical advances increase survival from chronic diseases and lessen their effects).

This study uses functional status (activities of daily living and instrumental activities of daily living (ADLs and IADLs), e.g., ability to perform tasks of everyday life like bathing, dressing, housework) to measure morbidity among Americans age 65 and over. We investigate whether the years spent with functional limitations have decreased (compression of morbidity), increased (expansion of morbidity) or if the picture is mixed (dynamic equilibrium) in the period 1992 to 2003.

Data. We used data from the Medicare Current Beneficiary Survey (MCBS), a nationally representative, multistage, longitudinal survey of the Medicare population, sponsored by the Centers for Medicare and Medicaid Services. Based on a person's difficulty or inability to perform ADLs and IADLs due to health problems, we constructed four mutually exclusive states:

1. Active health (no difficulty with IADLs or ADLs)
2. Moderate disability (difficulty with at least one or more IADLs and/or two or less ADLs)
3. Severe disability (difficulty with at least three ADLs)
4. Death (the fourth and absorbing state)

The analysis sample consists of 40,320 beneficiaries of age 65 and over, including 23,958 women, with 131,141 person-year observations and 90,821 pairs of observations.

Method. This project applied a multi-state life table model to longitudinal person-level data to develop probability estimates for incidence of and recovery from disability, as well as death. After age-specific transition probabilities are estimated, the authors simulate a large cohort of 65-year-olds, by year and sex, and record their complete trajectories of changes in disability status until death. Simulation is a powerful computation technique that facilitates estimation of those statistics that are difficult to obtain otherwise.

Results. This project found that all of the increase in life expectancy during 1992–2003 period was accounted for by an increase in life spent without functional limitations. The time spent with severe limitations decreased due to a combination of factors, including delayed onset, reduced incidence, shorter episodes and increased probability of recovery.

During the study period, elderly men spent more years without limitations than elderly women; this may reflect the greater gains in total life expectancy for men in the last decade. In addition, all persons 85 years of age experienced gains in time spent without limitations and reductions in time spent with severe limitations.

Conclusion. These trends are consistent with elements of both the theory of compression of morbidity and the theory of dynamic equilibrium. We will continue monitoring these trends using the latest MCBS data to see if time spent with functional limitations continues to decrease.

Excellence: What makes this project exceptional?

This project is the first U.S. study to comprehensively evaluate the latest trends in functional health to test whether they support the two most popular theories predicting the future health of the elderly population—expansion versus compression of morbidity. It used innovative statistical methods, including multi-state life table approaches and micro-simulation to gain insights that are otherwise hidden. For example, it finds that the recent decrease in life spent with severe functional limitations is due to a combination of factors, including delayed onset of limitations, reduced incidence, shorter episodes and increased probability of recovery. It has advanced our knowledge of the nature of trends in the health of older persons and has developed methods that will be used to track future trends.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This project focuses exclusively on the American elderly of age 65 and over. Its analysis revealed the complex pattern of trends in functional health among the elderly, and identified a number of factors associated with the recent improvement. This provides critical background information for policy makers to assess the direction of future trends in elderly health as the first wave of baby boomers enter Medicare. It may also assist the development of a range of health and public policies to reduce health disparities among the elderly and improve the overall well-being of the nation's older population.

Effectiveness: What is the impact and/or application of this research to older persons?

The finding may lead to policies affecting the lives of older persons. The findings demonstrate that a combination of improved risk factor profiles and medical advances has likely increased health life expectancy for older persons. The findings support increased emphasis on health promotion activities among the middle aged and older populations. The findings also support policies to encourage work force participation by the 65 and over population as a way to ease pressure on Social Security and Medicare, since the proportion of the older population with limitations that might hinder employment is decreasing.

Innovativeness: Why is this research exciting or newsworthy?

It demonstrates that the older Americans have experienced an increase in years without functional limitations and highlights the importance and the feasibility of following future trends to see if the good news continues.

CENTERS FOR DISEASE CONTROL AND PREVENTION: TRENDS IN HEALTH AND AGING

This project provides reliable up-to-date information on trends in the health and health care utilization of the elderly population, using data primarily from the National Center for Health Statistics and the Centers for Medicare and Medicaid Services.

Lead Agency: Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS).

Agency Mission: The mission of NCHS is to provide statistical information that will guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigators: Yelena Gorina, M.S., Aging and Chronic Disease Statistics Branch, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 6331, Hyattsville, MD 20782 and Ellen Kramarow, Ph.D., Aging and Chronic Disease Statistics Branch, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 6332, Hyattsville, MD 20782.

General Description: The Trends in Health and Aging (THA) project uses the statistical resources of NCHS and other federal agencies to provide current, policy-relevant information on the health and well-being of the older population in the United States. The core of the project has been the THA web-site (*www.cdc.gov/nchs/agingact.htm*), which allows access to a wealth of data presented in a consistent manner. The compilation, analysis and dissemination of these data are coordinated by staff of the Aging and Chronic Disease Statistics Branch of the Office of Analysis and Epidemiology (OAE) of NCHS. This branch brings together researchers with expertise in epidemiology, demography, and economics, assuring that the data are of high quality and presented in a manner useful to policy-makers and researchers. These researchers have used the data to produce a series of simple, policy relevant, topical reports on a range of topics relating to health and aging. (See: *www.cdc.gov/nchs/about/otheract/aging/research-publications.htm*)

In the near future, NCHS plans to merge the THA website with another web-based interactive data system—Health Data for All Ages—to produce a system that has consistent data across the lifespan. This new system will allow for the tracking of trends in the health and health care utilization of the future elderly.

Excellence: What makes this project exceptional?

Trends in Health and Aging is a powerful web-based resource that employs user-friendly software to provide access to up-to-date trend data on the health of the elderly population. By distilling data from complex surveys and data systems into user-friendly tools and reports, it provides a model of data and research dissemination for other federal agencies.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The entire focus of the project is to provide information on trends in the health of the elderly population.

Effectiveness: What is the impact and/or application of this research to older persons?

THA provides reliable, readily accessible information on the health of the elderly to policymakers, educators, researchers, and the public resulting in more informed decision making and better training tools.

Innovativeness: Why is this research exciting or newsworthy?

The project represents a powerful use of web-based tools to disseminate complex data in a user-friendly way.

NATIONAL CENTER FOR HEALTH STATISTICS: DISABILITY STATISTICS AND CARE

With a focus on the equalization of opportunities and social participation, this project provides a universal approach to the measurement of disability and functioning that is of particular relevance to an aging population that is often restricted by chronic and disabling conditions.

Lead Agency: Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS).

Agency Mission: The mission of NCHS is to provide statistical information that will guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigators:

Jennifer H. Madans, Ph.D., Co-Acting Deputy Director, Associate Director for Science, Office of the Center Director, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 7207, Hyattsville, MD 20782.

Julie Dawson Weeks, Ph.D., Health Statistician, Office of Analysis and Epidemiology, Aging and Chronic Disease Statistics Branch, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 6327, Hyattsville, MD 20782.

Mitchell Loeb, M.Sc., Research Fellow, Office of Analysis and Epidemiology, Aging and Chronic Disease Statistics Branch, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 6325, Hyattsville, MD 20782.

Cordell Golden, Health Statistician, Office of Analysis and Epidemiology, Special Projects Branch, Centers for Disease Control and Prevention, National Center for Health Statistics, 3311 Toledo Road, Room 6426, Hyattsville, MD 20782.

Partner Agencies: The United Nations Statistical Commission and representatives from National Statistical Offices from over 50 countries have been involved in this project.

General Description: Internationally comparable disability measures are being developed by the Washington Group on Disability Statistics (WG), a "city group" established by and operating under the aegis of the United Nations Statistical Commission. The WG was established in response to the United Nations International Seminar on the Measurement of Disability held in June 2001 to de-

velop questions and instruments that could be used in national surveys and censuses to measure disability among a variety of populations. It is a cooperative effort among national statistical offices of developed and developing countries, international statistical organizations, and international organizations representing persons with disabilities.

The primary objective of the WG is to promote and coordinate international cooperation in the area of disability statistics, focusing on measures that will provide basic, more comparable information on disability throughout the world. Activities include the development of a small set of general disability measures suitable for use in censuses, sample surveys, or other statistical formats; the design of one or more extended sets of survey items intended to be used as components of population surveys or as supplements to specialty surveys; and the conduct of methodological studies.

In keeping with its purpose, the WG has developed a small set of questions on disability that address the issue of assessing equalization of opportunity. In developing these questions, special attention was directed to international comparability of the resulting data. Cognitive and field tests have been conducted in 17 countries to determine how well the questions perform across different cultures. The results of the tests demonstrated that the questions were being interpreted as intended in countries in Africa, South America, North America, and Asia. The approach to data collection developed by the WG has also been incorporated into the UN Principles and Recommendations for the 2010 Census. At its eighth annual meeting, scheduled for October 2008, the WG will produce batteries of extended sets of questions on disability for use on surveys. These question sets will undergo cognitive and field testing over the next 12 months. All papers and products of the WG are available at *www.cdc.gov/nchs/citygroup.htm*.

In January, 2008, a disability module that is consistent with the approach and conceptualization outlined in the United Nations' recommendations was incorporated into the American Community Survey (ACS). The ACS questions will also be added to the Current Population and the National Crime Victimization Survey in 2008. In addition, a joint research project is under way that will add the ACS disability questions to the National Health Interview Survey (NHIS). This project is part of a broader interagency effort to improve the collection and interpretation of information on disability. The NCHS will also be undertaking a review of the disability and functioning measures currently on the NHIS to identify design changes that would enhance its comparability with other national and international data collections and provide the more detailed information necessary to fully understand the complexities of disability.

Excellence: What makes this project exceptional?

The approach of the Washington Group on Disability Statistics to the operationalization and measurement of disability is unique and represents a milestone in recognizing the shift in attitudes and approaches to persons with disabilities that have been evolving over the past few decades. The WG recognizes the changing nature of disability and that it is manifested as a result of the interaction between persons with impairments and the barriers (both attitu-

dinal and environmental) that hinder their full and effective participation in society on an equal basis with others.

Significance: How is this research relevant to older persons, populations and/or an aging society?

While the focus of the research is on producing global, comparable measures of disability and functioning, an aging society bears the burden of many chronic and disabling conditions. By focusing on the needs of this particular sub-population and their level of participation in society we can improve both their quality of life and their continued contribution to society.

Effectiveness: What is the impact and/or application of this research to older persons?

It has been demonstrated that life expectancy among the elderly has been improving for many decades, and there is also evidence to indicate that health among the elderly is also improving; however, while life expectancy at older ages has increased, so has the prevalence of chronic diseases and the associated effects of deceased functioning.

By providing a universal measure of disability and functioning that focuses on the equalization of opportunities it would be possible to focus efforts on improving the quality of life of the older population that is overburdened by the effects of chronic, disabling conditions.

Innovativeness: Why is this research exciting or newsworthy?

The project represents a novel approach to the conceptualization and measurement of disability—that builds the model of disability proposed by the World Health Organization's International Classification of Functioning, Disability and Health.

THE PREVENTION RESEARCH CENTERS: HEALTHY AGING RESEARCH NETWORK

The Healthy Aging Network is made up of 9 universities with expertise in the health of older adults. Member universities collaborate on research to identify best practices for physical activity programs for older adults and to set a research for studying healthy aging.

Lead Agency: The Prevention Research Centers.

Agency Mission: The Prevention Research Centers work as an interdependent network of community, academic, and public health partners to conduct prevention research and promote the wide use of practices proven to promote good health.

Principal Investigator: Basia Belza, Ph.D., R.N., Professor, Aljoya Endowed Professor in Aging, School of Nursing, Box 357266, Health Science Building, T618D, University of Washington, Seattle, WA 98195–7266.

Partner Agencies: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, Robert Wood Johnson Foundation, National Council on Aging, National Association of Chronic Disease Directors, Alzheimer's Association, American Society on Aging, Administration on Aging, CDC's Division of Nutrition and Physical Activity, and CDC's Prevention Research Centers.

General Description: The Healthy Aging Research Network is developing a research agenda around the public health aspects of

healthy aging. The nine universities participating in the network are a subset of 33 Prevention Research Centers the CDC funds.

The prevention research agenda is intended to increase understanding of the determinants of healthy aging, identify interventions that promote healthy aging, and translate research into sustainable community-based programs that can be used throughout the nation. The researchers are identifying the key health-promoting skills and behaviors as well as the organ systems and syndromes that can affect healthy aging. The network members are also consulting with federal and state organizations on establishing local programs for healthy aging and working with national organizations to identify the most effective physical activity programs. The network members and other stakeholders are also conducting a literature review about the effectiveness and cost-effectiveness of cross-cutting interventions for older adults that can affect multiple health outcomes. The results are intended as recommendations to be used by researchers in the network and the U.S. Task Force on Community Preventive Services to create a chapter for the Community Guide to Preventive Services on evidence-based interventions for promoting health in older adults.

Excellence: What makes this project exceptional?

The project is a collaboration of leading researchers in aging from across the country, spanning academia, government, and private foundations, who have come together to review and set a research agenda for healthy aging.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The U.S. aging population is growing, and this research is vital to maintaining health and quality of life for this large subset of the U.S. population.

Effectiveness: What is the impact and/or application of this research to older persons?

Three national demonstration projects have been completed.

(1) An in-depth, evidence-based review and statement of public health's role in addressing physical activity for older adults.

(2) A network-wide survey and report of community-based physical activity opportunities for older adults at seven national sites.

(3) An environmental audit to assess the built environment as it relates to physical activity for older adults.

Innovativeness: Why is this research exciting or newsworthy?

The network is unique in fostering collaboration among researchers on the issue of aging.

NATIONAL CENTER FOR HEALTH STATISTICS: LONG TERM RESIDENTIAL CARE

The goal of this project was to develop a national typology, or classification system, of long-term residential care places. Making state-to-state comparisons regarding long-term care availability, use, and related research and policy questions is extremely difficult because states differ in their licensing and labeling practices for these residences. A national typology that classifies similar places in different states by a common set of characteristics, such as size, services provided, or population served will allow researchers and policymakers to compare the supply, distribution, and characteris-

tics of the full continuum of long-term care residential places and facilities.

Lead Agency: National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC).

Agency Mission: The mission of the National Center for Health Statistics (NCHS) is to provide statistical information that will guide actions and policies to improve the health of the American people. As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data.

Principal Investigators: Robin E. Remsburg, PhD, RN, GCNS–BC, FNGNA, FAAN, Deputy Director, Division of Health Care Statistics, National Center for Health Statistics, 3311 Toledo Road, Hyattsville, MD 20782, and Amy Bernstein, Sc.D., National Center for Health Statistics, 3311 Toledo Road, Hyattsville, MD 20782.

Partner Agency: National Institute on Aging.

General Description: The well-documented aging of the population, particularly those aged 85 and older, will lead to an increase in the number of people who need long-term care services. While most people who need long-term care services receive them in their own home, personal care received outside both the home and traditional nursing facilities is an important and growing service option. This is especially the case for people who can no longer live alone but do not require the skilled level of care provided by a nursing home. This type of care—broadly referred to here as residential care—includes congregate settings that provide both housing and supportive services.

In 2002, states reported a total of 36,399 licensed long-term care residential facilities with 910,486 units or beds, a 14.5% increase over 2000. However, there is no existing agreed-upon classification system that allows one to distinguish the different types of long-term care residential places across the country. In 2003, the Assisted Living Workgroup (ALW), formed by the U.S. Senate Special Committee on Aging in 2001, recommended that places designated as assisted living facilities provide 24-hour supervision, provision and oversight of personal and supportive services (assistance with activities of daily living (ADLs)) and instrumental activities of daily living (IADLs), health-related services (e.g., medication management services), social services, recreational activities, meals, housekeeping and laundry, and transportation services.

The precursor to the Typology project—the 2001 Inventory of Long-Term Care Residential Places (ILTCRP) project—was sponsored by the National Center for Health Statistics (NCHS), the Agency for Healthcare Research and Quality (AHRQ), and the Office of the Assistant Secretary for Planning and Evaluation (ASPE) of the U.S. Department of Health and Human Services (HHS). Based on state licensing criteria and state regulations obtained in the ILTCRP, relevant literature review, and expert opinions, a typology of long-term care residential places in the U.S. was developed.

The typology proposed includes any place licensed, registered, or officially listed by a state that houses older adults and provides residential care, such as 24-hour supervision/responsibility, provision and oversight of personal and supportive services (ADLs and IADLs), medication management, meals, housekeeping, and laundry. The typology excludes: (1) nursing homes, (2) hospitals, (3) fa-

cilities for only mentally ill, mentally retarded, or developmentally disabled; (4) places that house military population; (5) HUD section 202 subsidized housing; (6) senior citizen cooperatives; (7) naturally-occurring retirement communities (NORC); (8) commercial retirement communities (that do not include licensed or certified places described above); and (9) other places for independent living.

On January 12–13, 2004, the National Center for Health Statistics (NCHS) conducted an expert meeting of about 50 long-term care researchers, residential care providers, industry representatives, and colleagues from various federal agencies. The objectives of the meeting were to: review, critique, and refine a proposed typology of long-term care residential places; discuss issues related to surveying these places; confirm the need for a survey of long-term care residential places; discuss the challenges of developing a sampling frame and classifying long-term care residential places; identify the places that should be included in a survey of long-term care residential places; and offer recommendations for refining the proposed typology of residential care places. Subsequent initiatives associated with this project have included the design of a national survey of residential care facilities, the development of an unduplicated sampling frame from which the sample for the national survey will be drawn, and preparations for conducting a nationally representative survey of residential care facilities and their residents.

Excellence: What makes this project exceptional?

Creating a uniform classification system or typology for long-term care residential places would enable the federal government to monitor long-term care policy and payment initiatives more effectively. A sampling frame that covers the full continuum of existing long-term care residences in the U.S. could be established. A typology would enable researchers to tailor their sampling methodologies and data collection strategies for the different types of long-term care residential places, direct care workers, and residents. The typology development has served as one of the precursor activities to the design of a national survey of residential care facilities and preparations for conducting a nationally representative survey of residential care facilities and their residents. This project has been part of a larger effort characterized by collaboration among multiple Federal agencies within the U.S. Department of Health and Human Services (HHS) to enable a better understanding of long-term care residential places.

Significance: How is this research relevant to older persons, populations and/or an aging society?

There are various types of "long-term care" residential places in the U.S. States differ in their licensing and labeling practices for long-term care residential places and services, making cross state comparisons extremely difficult. The term "assisted living" is used in the regulations or statutes in 32 states and the District of Columbia in 2002, however the characteristics of facilities labeled as assisted living vary dramatically across states. Even within states, the labeling among various hybrid facilities or residential communities that provide long-term care services but are not certified nursing homes is inconsistent. Facility licensing, regulation, and payment policy also vary considerably across states. Places licensed

as board and care facilities in one state may be licensed as assisted living facilities in another state.

Effectiveness: What is the impact and/or application of this research to older persons?

Creating a uniform classification system or typology for long-term care residential places would enable the federal government to monitor long-term care policy and payment initiatives more effectively. A sampling frame that covers the full continuum of existing long-term care residences in the U.S. could be established. A typology would enable researchers to tailor their sampling methodologies and data collection strategies for the different types of long-term care residential places, direct care workers, and residents.

Innovativeness: Why is this research exciting or newsworthy?

The experts convened for this two-day meeting concluded that a nationally representative survey of long-term care residential places is needed. Many consumers are confused about the different types of residential care places and the services they provide. Researchers and policy makers need to understand how services and populations change among residential care settings and be able to track the evolution of residential care over time. Given survey costs and budgetary constraints, most participants recognized that the scope of a survey may need to be limited to residential care places licensed/registered and listed by the state.

Most participants recommended conducting a provider-based survey, which will provide more information on characteristics of the selected types of residential care places than a population-based survey. This project was a precursor to the National Survey of Residential Care Facilities being conducted by the National Center for Health Statistics in partnership with the Office of the Assistant Secretary for Planning and Evaluation (ASPE), United States Department of Health and Human Services, the Agency for Healthcare Quality and Research (AHRQ), United States Department of Health and Human Services, and the United States Department of Veterans Affairs.

CENTERS FOR MEDICARE & MEDICAID SERVICES (CMS) & THE NATIONAL CANCER INSTITUTE (NCI): CANCER EPIDEMIOLOGY RESEARCH

The NCI sponsors the SEER program, which contracts with 15 tumor registries to provide selected information on all newly diagnosed cancers in their reporting areas; CMS provides Medicare claims and enrollment records for the elderly and disabled populations. The linked database has been used to study a wide variety of issues related to cancer epidemiology and health services research.

Lead Agency: The research data project is a joint effort between the Centers for Medicare & Medicaid Services (CMS) and the National Cancer Institute (NCI).

Agency Mission: The mission of CMS is to administer the Medicare, Medicaid, and State Children's Health Insurance Programs and to promote quality care for beneficiaries.

Principal Investigators: Gerald F. Riley, M.S.P.H., Senior Researcher, Centers for Medicare & Medicaid Services, 7500 Security Blvd., Mail stop C3–21–27, Baltimore, MD 21244 and Joan L. War-

ren, Ph.D., National Cancer Institute, EPN Room 4005, 6130 Executive Blvd., MSC 7344, Bethesda, MD 20892–7344.

General Description: The Surveillance, Epidemiology, and End Results (SEER)-Medicare database is the linkage of two large population-based data sources that provide detailed information about elderly persons with cancer. The CMS collaborates with the NCI to link SEER data to Medicare claims and enrollment records for elderly and disabled populations. NCI sponsors the SEER program, which contracts with 15 tumor registries to provide selected information on all newly diagnosed cancers in their reporting areas. These areas currently include about 25 percent of the U.S. population. The SEER data collected about each new cancer case includes site of cancer, month and year of diagnosis, data about the cancer (e.g., histology, stage, and grade), type of surgical treatment, radiation therapy, patient demographics, follow-up of vital status, and cause of death. National statistics on cancer incidence, survival, and mortality are generated from the SEER database.

The CMS provides Medicare claims and enrollment data for the SEER-Medicare linked database, including information on specific procedures like cancer screening services, chemotherapy, and post-treatment surveillance. Diagnoses reported on the claims can be used to identify comorbid conditions, and costs of care can be estimated from payment data. Enrollment records indicate enrollment and disenrollment from managed care. Medicare records for a 5 percent sample of cancer-free beneficiaries residing in SEER reporting areas are also included in the database for comparison purposes.

The SEER-Medicare linked database includes cancer cases diagnosed from 1973 to 2002, and cases diagnosed from 2003–2005 are currently being added. Medicare data are available from 1991 to 2006. The database has been used to study a wide variety of issues related to cancer epidemiology and health services research. Several studies have addressed patterns of care by cancer site, as well as outcomes of care. Costs of cancer care have been estimated by phase of care, as well as on a lifetime basis from diagnosis to death. Effects of comorbidities on treatment and outcomes have been studied, and comparisons made of treatment under managed care and fee-for-service. Additional topics include volume-outcome studies and disparities in cancer treatment and outcomes.

The linked database has been used by CMS and NCI researchers to study numerous policy issues related to cancer epidemiology and health services. The data have also been made available on a de-identified basis to epidemiologists and health services researchers outside these two agencies for research purposes, subject to strict confidentiality rules, and appropriate reviews and approvals. To date, over 250 articles have appeared in the peer-reviewed literature based on SEER-Medicare data. The agencies intend to continue updating the linkage on a biannual basis for the foreseeable future.

Excellence: What makes this project exceptional?

The SEER and Medicare data have complemented each other to produce a unique powerful tool for examining issues related to cancer care for the elderly. The linked database has made possible a broad range of studies that have resulted in more than 250 published articles in peer-reviewed journals. The project has required

close collaboration between CMS and NCI, as well as with the participating SEER registries.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Cancer greatly affects the elderly, as 60 percent of new cancers and 70 percent of cancer deaths now occur in the population of those over the age of 65. The SEER-Medicare linked data provide a powerful tool for studying patterns of care, outcomes, and costs of cancer care among the elderly population.

Effectiveness: What is the impact and/or application of this research to older persons?

Research based on SEER-Medicare data has provided important information to policymakers, providers, and beneficiary organizations concerned with cancer care for the elderly.

Innovativeness: Why is this research exciting or newsworthy?

The linked database provides a unique wealth of information, not available in other databases, on a very large number of cancer cases among the elderly population. SEER data on cancer incidence, survival, and mortality are linked to Medicare data on cancer screening services, chemotherapy, and post-treatment surveillance.

MEDICARE PSYCHIATRIC ADMISSIONS

In 2005, Medicare implemented a new prospective payment system for inpatient psychiatric facilities (IPF PPS). This project analyzed Medicare psychiatric admissions between 1987 and 2004. Special attention was given to differences in use of inpatient psychiatric care by aged and non-aged disabled Medicare beneficiaries. Analysis of Medicare psychiatric inpatient claims for 1987–2004 provides insights into future experience post-IPF PPS.

Lead Agency: Centers for Medicare & Medicaid Services (CMS).

Agency Mission: The mission of CMS is to administer the Medicare, Medicaid, and State Children's Health Insurance Programs and to promote quality care for beneficiaries.

Principal Investigator: Philip G. Cotterill, Ph.D.. Economist, Centers for Medicare & Medicaid Services, 7500 Security Blvd., Mail stop C3–21–28, Baltimore, MD 21244.

General Description: In 2005, Medicare implemented a new prospective payment system for inpatient psychiatric facilities (IPF PPS). This analysis of Medicare psychiatric hospital stays begins in 1987, soon after the 1983 implementation of the DRG-based inpatient hospital prospective payment system (IPPS). It continues through 2004—the last year in which freestanding psychiatric hospitals and psychiatric units within short-stay general hospitals were paid under the cost-based TEFRA system. The factors that influenced utilization of psychiatric inpatient care in the pre-IPF PPS past provide the basis for hypotheses about the impact of the IPF PPS and future trends in this Medicare benefit.

Medicare pays for psychiatric inpatient care in three provider settings—freestanding psychiatric hospitals, short stay general hospital certified psychiatric units, and short stay general hospital beds (either as "scatterbeds" or uncertified psychiatric units). As noted earlier, the first two types of providers were exempted from the IPPS and paid under the cost-based TEFRA system until 2005. Uncertified units and scatterbeds have been paid under the DRG-

based IPPS from its inception. Hospitals and units specializing in alcohol and drug treatment were exempt from the IPPS until 1988 when, following some refinement of the alcohol and drug DRGs, they were brought under the IPPS.

Medicare payment policy has the potential to affect the utilization of psychiatric inpatient care in several ways. The use of different Medicare inpatient payment systems for different provider settings is very likely to affect how providers organize care. Differences in payment units, such as per case payments under the IPPS and per diem payments under the IPF PPS, provide different incentives. Differences in relative payment levels for these settings may also influence their relative utilization. Broader impacts are also possible. Relative Medicare payments for inpatient versus outpatient care may influence care choices between inpatient and community-based services. Finally, Medicare coverage and payment for psychiatric inpatient care may encourage its utilization versus comparable utilization in long-term care residential settings not covered by Medicare.

Medicare payment policy was only one of many factors that influenced psychiatric admissions between 1987 and 2004. In order to identify other factors, the study first decomposes admission trends into components representing changes in the number of beneficiaries, the rate of service use by beneficiaries, and the number of admissions per user. This part of the analysis also determines how various groups of Medicare beneficiaries were differentially affected by these factors. Second, the study examines the changes in care delivery patterns that resulted from the interaction of Medicare payment incentives and the factors identified in the first part of the study. The paper concludes with a discussion of the potential implications of these results for the delivery of Medicare psychiatric inpatient care in the future.

Excellence: What makes this project exceptional?

The study uses analysis of trends over 17-year period to pose questions about future developments in inpatient psychiatric care for Medicare beneficiaries.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Psychiatric care for the elderly has received less attention than psychiatric care for the chronically mentally ill population. This study highlights differences between the elderly and the chronically mentally ill in terms of their mental health conditions and care delivery patterns.

Effectiveness: What is the impact and/or application of this research to older persons?

The study shows that the growth of psychiatric units within general hospitals was a significant source of inpatient care for elderly dementia patients. The study asks whether Medicare's inpatient psychiatric facility payment system implemented in 2005 will alter the care delivery pattern that developed under the earlier payment system.

Innovativeness: Why is this research exciting or newsworthy?

This study is the first publication to summarize trends in inpatient psychiatric care during recent decades in a way that provides a context for future research.

MEDICARE CURRENT BENEFICIARY SURVEY

The MCBS is a longitudinal study, continually collected since 1991, that takes a comprehensive look at the Medicare population. Linked to Medicare claims data, this database is used to manage the Medicare program and help formulate future changes.

Lead Agency: Centers for Medicare & Medicaid Services (CMS).

Agency Mission: The mission of CMS is to administer the Medicare, Medicaid, and State Children's Health Insurance Programs and to promote quality care for beneficiaries.

Principal Investigator: Franklin Eppig, J.D., Director, Medicare Current Beneficiary Survey, Centers for Medicare & Medicaid Services, 7500 Security Blvd., Mail stop C3–16–27, Baltimore, MD 21244.

General Description: The MCBS is a continuous, multipurpose survey of a representative sample of the Medicare population designed to aid the Centers for Medicare & Medicaid Service's (CMS) administration, monitoring and evaluation of the Medicare program. The survey is focused on health care use, cost and sources of payment. Data from the MCBS enables CMS to determine sources of payment for all medical services used by Medicare beneficiaries, including co-payments, deductibles, and non-covered services; develop reliable and current information on the use and cost of services not covered by Medicare (such as prescription drugs and long-term care); ascertain all types of health insurance coverage and relate coverage to sources of payment; and monitor the financial effects of changes in the Medicare program. Additionally, the MCBS is the only source of multi-dimensional person based information about the characteristics of the Medicare population and their access to and satisfaction with Medicare services and information about the Medicare program.

Sample Characteristics:

Universe: Medicare enrollees, both aged and disabled, whether in the community or in an institution.

Periodicity: Three rounds per year, each 4 months in length.

Unit of Analysis: Persons / Medicare beneficiaries.

Sample Design: Multi-stage stratified random list sample.

Survey Design: Rotating Panel / Each panel followed for 12 interviews.

Survey Methodology: In-person interviews using computer assisted personal interviewing (CAPI).

Sample Strata: The MCBS sample is stratified by age group within the Medicare aged and disabled sub-populations. Both the disabled and the very old are over sampled to achieve a desired number of sample persons in each age strata. The over sample insures sufficient cases for analysis by age strata and increases the number of institutionalized persons in the sample. Approximately 16,000 sample persons are interviewed in each round. However, because of the rotating panel design, only 12,000 sample persons receive all three interviews in a given calendar year.

Age group per	Sample size	
	Round	Annual
0–44	1,334	1,000
45–64	1,334	1,000
65–69	2,667	2,000

Age group per	Sample size	
	Round	Annual
70–74	2,667	2,000
75–79	2,667	2,000
80–84	2,667	2,000
85+	2,667	2,000

Questionnaire Content: The MCBS collects information on: health care use, cost and sources of payment; health insurance coverage; household composition; socio-demographic characteristics; health status and physical functioning; income and assets; access to care; satisfaction with care; usual source of care; and how beneficiaries get information about Medicare.

Availability of Data: Information collected in the survey is combined with information from CMS' administrative data files and made available through data files. The Access to Care data file combines survey responses from the fall round of the MCBS with complete calendar year Medicare claims data. "Access to Care" data files are available within a year of the close of the subject calendar year. The complete medical use, cost and source of payment data file takes twice as long to produce because it requires complex editing and imputation activities which are built upon an event level match of survey collected information with Medicare claims and administrative data.

For More Information Visit The MCBS Web Site: *www.cms.hhs.gov/mcbs*.

Excellence: What makes this project exceptional?

The MCBS is in a unique position to monitor effects of the Medicare program on its beneficiaries and provide the basic information needed to estimate the benefits and costs of program changes and expansions. The MCBS is used as a program management tool to assess legislative proposals (e.g., proposed expansion of home health care). Once decisions on health care reforms are made, the MCBS is in position to monitor their effects upon the Medicare population (e.g., enacted prescription drug benefit).

Significance: How is this research relevant to older persons, populations and/or an aging society?

The MCBS is identified to assist policy makers and researchers in monitoring and evaluating the Medicare program and produce statistics and linked data files. This function is generalized, but not limited to the following tasks:

1. responses to MCBS questions on access to care are used to measure our beneficiaries' ability to get the health care services in a timely manner in both fee-for-service and managed care settings;
2. responses to questions on satisfaction from the MCBS are used to measure the degree to which a beneficiary's perception of care received meets or exceeds his or her expectation for care, in both fee-for-service and managed care settings;
3. responses to questions on utilization from the MCBS and the associated Medicare claims are used to track the percent of Medicare beneficiaries who receive preventative health services to include but not be limited to:
   —an annual vaccination for influenza and a lifetime vaccination for pneumococcal;

—a screening or diagnostic mammogram within a 2-year period; and

—diabetic eye exam for beneficiaries diagnosed with diabetes.

4. responses to questions on beneficiary needs measure the effectiveness of CMS' dissemination of Medicare information to it's beneficiary population; and

5. responses to questions on beneficiary knowledge measures the effectiveness of CMS' initiative to increase beneficiary understanding of basic features of the Medicare program.

Effectiveness: What is the impact and/or application of this research to older persons?

Research based on MCBS data has provided important information to program managers and policymakers concerned with the Medicare program. Most recently data from the MCBS helped shape and inform the crafting of the 2003 Medicare Prescription Drug, Improvement and Modernization Act—MCBS was the only source of self-reported prescription drug utilization by the Medicare population. The MCBS continues to serves as a collection tool for non-covered prescription drugs as well as to measure the impact of the legislation on the Medicare program.

Innovativeness: Why is this research exciting or newsworthy?

In 2006, nearly 37 million people age 65 and over lived in the United States, accounting for just over 12% of the total population. To give historical perspective, over the 20th century the 65 and over population grew from 3 million to 35 million. The Baby Boom Generation will start turning 65 in 2011 causing a dramatic increase in this population over the following two decades. In 2030, this 65 and over population is projected to be twice as large as their counterparts in 2000, growing from 35 million to 72 million and representing 20% of the total U.S. population. From 2030 onward the proportion of aged 65 and over will remain relatively stable, at around 20%. While this demographic shift is interesting what truly makes this change exciting and newsworthy is that the 2008 Annual Trustees Report states that costs will exceed income, excluding interest, for the Medicare Hospital Insurance Trust Fund beginning in 2008. Beginning in 2010, costs are projected to exceed income including interest. It is projected that by 2019 the trust fund will be exhausted.

Over the next few years the Medicare program will most likely undergo increasing scrutiny. The MCBS will continue to play an active role in shaping and informing public debate. If and when changes to the program are enacted, the MCBS will again serve to measure the affects of those changes on the program and on the Medicare population.

END-STAGE RENAL DISEASE CLINICAL PERFORMANCE MEASURES PROJECT

This submission pertains to studies of quality of care for End-Stage Renal Disease (ESRD) patients, the majority of which are over the age of 65 years. Several of these studies use the Centers for Medicare & Medicaid Services' (CMS's) ESRD Clinical Performance Measures (CPM) Project data, either stand alone or linked with other CMS administrative data. These data have been used to study

a wide variety of issues related to the quality of care for ESRD patients.

Lead Agency: Centers for Medicare & Medicaid Services (CMS).

Agency Mission: The mission of CMS is to administer Medicare, Medicaid, and the State Children's Health Insurance Program and to promote quality of care for beneficiaries.

Principal Investigator: Diane L. Frankenfield, DrPH, MPH, BSPharm., Senior Researcher, Centers for Medicare and Medicaid Services, 7500 Security Blvd., Mail stop C3–21–28, Baltimore, Md. 21244.

Partner Agencies: National Institutes of Health, National Institute of Diabetes & Digestive & Kidney Diseases, The United States Renal Data System, Kidney Epidemiology and Cost Center, Wake Forest University, Section on Nephrology, University of Wisconsin, Department of Pharmacy, Henry Ford Hospital, Department of Nephrology, Emory University, School of Public Health, and Duke Clinical Research Institute, Duke University Medical Center.

General Description: End-Stage Renal Disease (ESRD) represents a significant disease and economic burden on the elderly. The CMS research program has emphasized studies of patterns of quality of care for ESRD patients.

Several studies have explored patterns of care by sex, race, Hispanic ethnicity, and geographic location to determine if disparity in care exists for different patient groups. In addition, studies have been conducted to examine patterns of care by facility characteristics, such as profit-status, chain affiliation, and size. Different clinical outcomes examined have included intermediate outcomes such as dialysis adequacy, anemia management, type of vascular access in use, and nutritional factors, as well as outcomes such as hospitalization and mortality.

On-going studies include (1) examining the association of erythropoietin stimulating agents (ESAs) dose and route of administration (intravenous vs. subcutaneous) with subsequent hospitalization and death; and (2) trending of anemia management among dialysis patients over time in response to changing FDA recommendations and clinical practice guidelines.

Excellence: What makes this project exceptional?

CMS, NIH, and other research organizations have collaborated to produce a series of policy-relevant studies of ESRD care in the elderly Medicare population. The studies have used several data sources, most notably CMS's ESRD CPM Project database and CMS administrative data. Analyses have addressed many facets of ESRD care, including treatment, outcomes, and costs.

Significance: How is this research relevant to older persons, populations and/or an aging society?

ESRD is largely a disease of the elderly. Research on patterns and costs of care inform Medicare policies in these areas. Analyses of patterns of care may result in improvements to beneficiary health as well as reducing/eliminating disparities in care for different patient groups.

Effectiveness: What is the impact and/or application of this research to older persons?

Research on patterns of ESRD care has provided important information to policymakers, providers, and beneficiary organizations.

Innovativeness: Why is this research exciting or newsworthy?

The use of special databases has enabled researchers to conduct unusually detailed analyses of ESRD care that elderly Medicare beneficiaries are receiving.

MEDICARE BENEFICIARIES WITH MULTIPLE CHRONIC CONDITIONS

This project found that although diabetes care services decreased and the odds of dying increased among those with multiple chronic conditions as compared to diabetes only, the receipt of these diabetes care services was associated with half the odds of dying and lower costs to Medicare.

Lead Agency: Centers for Medicare & Medicaid Services (CMS).

Agency Mission: The mission of CMS is to administer Medicare, Medicaid, and the State Children's Health Insurance Program and to promote quality of care for beneficiaries.

Principal Investigators: A. Marshall McBean, M.D., M.Sc., Professor, University of Minnesota School of Public Health, 420 Delaware St., SE Mayo A369, Minneapolis, MN 55455.

General Description: The purpose of Activity #1 of this study was to examine the extent to which elderly Medicare beneficiaries with multiple chronic conditions received recommended care and preventative services and to determine whether each additional condition had an impact on whether the beneficiaries received those services. The following chronic diseases and disease combinations were considered: diabetes; diabetes and depression; diabetes and chronic obstructive pulmonary disease (COPD); and diabetes and depression and COPD. The study outcomes included three diabetes care measures (serum hemoglobin A1c (HbA1c) and lipid (LDL–C) testing, and eye examination) as well as three preventive care measures that are recommended for all elderly beneficiaries (or one gender): influenza immunization, mammography and screening prostate specific antigen (PSA) testing. Rates of screenings and preventative care services were determined and multivariate logistic regression analyses were carried out to examine the effect of additional disease burden on the rate of receipt diabetes care and preventive care services. Baseline age-adjusted rates among Medicare beneficiaries with diabetes were as follows: HbA1c test (72.9%), lipid testing (66.5%), eye examination (50.7%), influenza vaccination (54.7%), mammogram among women (45.4%), and prostate specific antigen (PSA) test among men (42%). Across all measures, rates generally became lower among beneficiaries with diabetes and COPD, and even lower among those with diabetes, COPD and depression, a set of findings that was also supported by the regression analyses. Results were more variable among those with diabetes and depression, but not COPD.

The purpose of Activity #2 of this study was to examine costs of care and likelihood of mortality among elderly Medicare beneficiaries with multiple chronic conditions. The following chronic diseases and disease combinations were considered: diabetes; diabetes and depression; diabetes and chronic obstructive pulmonary disease (COPD); and diabetes and depression and COPD. Multivariate regression analyses were carried out for each disease cohort, as well as all cohorts combined, in order to examine the effect of adding additional disease burden on mortality and costs. The mean per beneficiary cost to Medicare in 2003 varied almost three fold between the cohort with diabetes only ($9,052) and diabetes, COPD

and depression ($26,707) with intermediate cost burdens of $14,647 for those with diabetes and depression and $18,756 for those with diabetes and COPD. A key cost-related finding is that the receipt of diabetes care services was strongly and linearly related to lower costs to Medicare for all four cohorts of beneficiaries. Compared with those diagnosed with diabetes only, there was a 75% greater likelihood of dying within two years among those with diabetes and COPD, and the risk was more than double for those with diabetes, COPD and depression. As the number of diabetes care services increased, a beneficiary's odds of dying decreased. Those who had received all three diabetes care measures (serum hemoglobin A1c (HbA1c) and lipid (LDL–C) testing, and eye examination) slashed their odds of dying in half, compared with those who had received none of these services.

Excellence: What makes this project exceptional?

This project is the first to look at the additional burden of multiple chronic diseases in conjunction with likelihood of receipt and health and cost impact of preventive healthcare services that are recommended for persons with diabetes and other chronic diseases.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This project is relevant to aging populations because it not only focuses on Medicare beneficiaries who are sixty five years of age and older, but also it hones in on issues of particular importance to this group of older Americans. Specifically, it addresses the experience of those suffering multiple chronic conditions as opposed to those with zero to one chronic disease. Sixty five percent of Medicare beneficiaries in this age group suffer two or more chronic conditions, 43 percent have three or more chronic conditions, and 24 percent have four or more chronic conditions.

Effectiveness: What is the impact and/or application of this research to older persons?

This highlights the need for older Americans with one or more chronic disease to receive all the recommended screening and preventive care services. Not only do these reduce the odds of dying by one half, but also they are significantly associated with reduced cost to Medicare.

Innovativeness: Why is this research exciting or newsworthy?

This research is exciting because the screenings have been associated with both reduced mortality and decreased cost to Medicare. This is a win-win for patient care and Medicare cost containment.

EFFECTS OF DISEASE MANAGEMENT DEMONSTRATIONS ON ELDERLY MEDICARE POPULATIONS

CMS has conducted seven disease management (DM) demonstrations, social experiments on whether and how DM approaches by various health care providers affects the cost, access to, and the quality of care provided to groups of frail elderly with Medicare coverage. Evaluations have been conducted, results together constituting a significant body of knowledge on effects on DM programs on frail elderly Medicare populations.

Lead Agency: Centers for Medicare & Medicaid Services (CMS).

Agency Mission: The mission of CMS is to administer Medicare, Medicaid, and the State Children's Health Insurance Program and to promote quality of care for beneficiaries.

Principal Investigators: David Bott, Mary Kapp, Lorraine Johnson, Carol Magee, CMS, Baltimore, 7500 Security Boulevard, Baltimore, MD 21244,

Partner Agencies: Contractors included Mathematica Policy Research, RTI International.

General Description: During the last decade, CMS has conducted seven disease management (DM) demonstrations, involving approximately 300,000 fee-for-service Medicare beneficiaries served by 35 programs. Programs include provider-based, third party, and hybrid models, located in different geographic regions across the country. CMS staff, assisted by funded contractors, have conducted evaluations of these demonstrations. These analyses constitute a significant contribution to knowledge on effects on DM programs on frail elderly Medicare populations.

Excellence: What makes this project exceptional?

The volume of high-quality work underlying the evaluations of DM on the Medicare fee-for-service population.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Results improve understanding of effects of DM for frail Medicare populations and point to future research opportunities that will have direct relevance to the Medicare program.

Effectiveness: What is the impact and/or application of this research to older persons?

Research contributes to understanding of policy makers in shaping the Medicare program, which impacts cost, quality, and access to care of the elderly.

Innovativeness: Why is this research exciting or newsworthy?

Research focuses on the application of DM activities to sicker Medicare populations, whereas these DM activities were previously applied to under-age-65-populations. Thus, findings potentially improve the understanding of policy makers in shaping the Medicare program.

MEDICARE FEE-FOR-SERVICE BENEFICIARIES' TRANSITIONS THROUGH HOME HEALTH CARE

The authors selected a 5% random sample of Medicare fee-for-service (FFS) beneficiaries and analyzed their administrative data (enrollment, claims, and OASIS assessments) from 2004 to document the substantial health needs and medical complexity of home health patients.

Lead Agency: Centers for Medicare & Medicaid Services (CMS).

Agency Mission: The mission of CMS is to administer the Medicare, Medicaid, and State Children's Health Insurance Programs and to promote quality care for beneficiaries.

Principal Investigators: Jennifer L. Wolff, Ph.D., Department of Health Policy and Management, Johns Hopkins University, 624 N. Broadway, Room 692, Baltimore, MD 21205.

Partner Agencies: Johns Hopkins University, Johns Hopkins School of Medicine, Johns Hopkins Bayview Center for Innovative Medicine.

General Description: The purpose of this research was to describe Medicare fee-for-service (FFS) beneficiaries' transitions through home health care within the context of other acute and post-acute services, to examine health indicators among home health services

patients, and to examine agreement within administrative claims and Outcome and Assessment Information Set (OASIS) measures of health services use. To conduct this study, the authors exploited a new CMS data resource, the Chronic Condition Data Warehouse (CCW). The CCW was created pursuant to Section 723 of the Medicare Modernization Act of 2003, whose intent was to improve the quality of care and reduce the cost of care for chronically ill Medicare beneficiaries.

Excellence: What makes this project exceptional?

This project contributes knowledge to an important but less well understood area of the health care continuum. Existing home health quality initiatives are setting-specific and limited to information generated by providers that submit OASIS assessments to the government. The authors found that approximately two-thirds of home health patients incurred acute or post-acute services in the 2 weeks preceding entry into home health, and that one-third incurred further acute and/or post-acute services during the month after discharge. This result suggests there would be merit in articulating patient-specific rather than setting-specific measures of home health care quality.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Approximately 7.4% of beneficiaries in 2004 used home health care. According to this study, home health users' average age is five years higher than the age of beneficiaries generally (77.0 vs. 71.9 years), and more than one-quarter are at least 85 years old. More than one-quarter used Medicaid as well as Medicare. Upon initial assessment, nearly 1 in 3 participants were dependent on others for help with activities of daily living; virtually all were disabled in instrumental activities of daily living. Claims-based indicators of chronic illness from the CCW suggested that one-quarter of home health users in 2004 had Alzheimer's disease or senile dementia, and one quarter had an indication of major depression within the last year. High rates of neurological and emotional disorder in this population of Medicare beneficiaries suggest substantial challenges are inherent in caring for ill elders at home, often shortly following a stay at an acute hospital.

Effectiveness: What is the impact and/or application of this research to older persons?

The study documents the substantial health needs and medical complexity of Medicare home health patients, as well as the high frequency of their transitions through the health care system. Findings substantiate the practical importance of CMS current efforts to develop a new, psychometrically sound, uniform post-acute assessment tool to improve information transfer between care settings, coordination of care, and patients' transitions across health care delivery settings.

Innovativeness: Why is this research exciting or newsworthy?

This study documents an important but less well understood area of the home health care continuum as it affects elderly Americans. The research also demonstrates the utility of enhancing traditional administrative data with a relatively new routine data resource, provider-submitted assessments, and with longitudinal summary data that facilitate efficient analysis.

CHARACTERISTICS OF ENROLLEES AND ENROLLMENT IN MEDICARE PART D PLANS

Projects provide insights related to Part D and drugs including beneficiary enrollment, enhanced benefits offered among Part D plans, medication therapy management, and transitioning dual eligibles and other low-income subsidy beneficiaries into Part D.

Lead Agency: Centers for Medicare & Medicaid Services (CMS).

Agency Mission: The mission of CMS is to administer Medicare, Medicaid, and the State Children's Health Insurance Program and to promote quality care for beneficiaries.

Principal Investigators:

Aman Bhandari, Economist, Centers for Medicare & Medicaid Services, Office of Research, Development and Information, 7500 Security Blvd, MS C3–19–26, Baltimore, MD 21244

Steve Blackwell, Social Science Research Analyst, Centers for Medicare & Medicaid Services, Office of Research, Development and Information 7500 Security Blvd, MS C3–19–26, Baltimore, MD 21244.

Gerald Riley, Senior Social Science Research Analyst, Centers for Medicare & Medicaid Services, Office of Research, Development and Information 7500 Security Blvd, MS C3–19–26, Baltimore, MD 21244.

Iris Wei, Social Science Research Analyst, Centers for Medicare & Medicaid Services, Office of Research, Development and Information 7500 Security Blvd, MS C3–19–26, Baltimore, MD 21244.

Partner Agencies: Research Triangle Institute, Mathematica Policy Research, and Abt Associates.

General Description: The Medicare Part D benefit, established in the Medicare Prescription Drug, Improvement and Modernization Act (MMA) of 2003 represents the largest expansion of Medicare benefits since the program's inception in 1965. CMS has undertaken several Part D and drug related research in the areas of enrollment, payment, and medication therapy management. All of these research projects together provide a picture of some aspects of the early implementation years of Part D that is valuable for any future decisions relating to the program.

CMS has several research projects relating to characteristics of enrollees and enrollment in Part D plans. One study provides information on characteristics of beneficiaries who obtained coverage in 2006 through Part D, the retiree drug subsidy, other creditable coverage arrangements, or who had no known source of coverage. Preliminary analyses suggest that Part D enrollees do not have unusually high prescription drug costs, but had high out-of pocket drug costs prior to Part D enrollment. Prescription drug plans, especially those offering gap coverage appeared to have enrolled beneficiaries with higher baseline drug costs. Another study examined enrollment in plans with enhanced benefits. CMS launched the Part D payment demonstration allowing plans to choose alternative payment methods for re-insurance and to increase beneficiaries' choices of and access to supplemental drug coverage. CMS evaluated enrollment in the demonstration versus, selection bias for the demonstration plans, and impact of the demonstration on overall Part D enrollment. In general, the study found that the majority of enrollees in enhanced Part D plans were in non-demonstration

plans and there was little evidence of selection bias among the plan types. Both of these studies have possible implication on the long-term financial impact of Part D on Medicare financing.

CMS also evaluated the demonstration to transition unassigned full dual eligibles and other low-income subsidy (LIS) beneficiaries to a Medicare Part D plan at the point-of-sale (POS). CMS put in place a contract with a prescription drug plan to provide temporary drug coverage at the pharmacy counter for beneficiaries who were eligible but who were not yet enrolled in a Part D plan. States also took temporary action to provide emergency coverage for dual eligibles and other low-income beneficiaries during the transition of having drug coverage from Medicaid to Medicare. This study documented gains in administrative efficiency within the point-of sale facilitated enrollment process and highlighted pitfalls to avoid and options to pursue for future efforts that States and CMS may undertake to facilitate access to Part D benefits for dual eligibles.

The MMA also required prescription drug plans (PDPs) and Medicare Advantage plans that offer prescription drug coverage (MA–PDs) to have a Medication Therapy Management Program (MTMP), to improve medication use and reduce adverse events for high-risk beneficiaries. CMS conducted a study to explore the evolving field of MTM in order to identify and understand the attributes of MTM that may be most effective for the Medicare prescription drug program.

Excellence: What makes this project exceptional?

The collection of research studies provides a wide range of topics related to Part D and drugs. The findings from these studies provide some of the earliest information about enrollment, benefits, payment and some aspects of service delivery relating to Part D.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As of January 2008, over 25.4 million Medicare beneficiaries are receiving drug coverage through private plans, either through stand-alone prescription drug plans or Medicare Advantage plans with prescription drug coverage. The research findings and possible implications from these findings affect these 25.4 million beneficiaries enrolled in Part D and millions more who may enroll in the program.

Effectiveness: What is the impact and/or application of this research to older persons?

Since the Medicare program serves the population of those who are 65 and older, the research has implications for the enrollment and plan experience, and service delivery to older persons who are in the Medicare program.

Innovativeness: Why is this research exciting or newsworthy?

These studies present the earliest findings and insights to several aspects of the Part D program. The studies relating to enrollment in Part D provide information on the plans and benefits offered and utilized by beneficiaries. Information about improving the transition of dual eligibles and other low-income beneficiaries to Part D is valuable for decision makers and for those serving this vulnerable segment of the population. Finally, while the information on medication therapy management still has many gaps, the CMS research on MTM provides the information for how it is being

utilized for the Medicare population and provides some relevant information for future research.

CORPORATION FOR NATIONAL AND COMMUNITY SERVICE: KEEPING BABY BOOMERS VOLUNTEERING

Lead Agency: Corporation for National and Community Service.

Agency Mission: The mission of the Corporation for National and Community Service is to improve lives, strengthen communities, and foster civic engagement through service and volunteering.

Principal Investigator: John Foster-Bey, Senior Advisor, Office of Research and Policy Development, Corporation for National and Community Service, 1201 New York Avenue NW, Room 10909, Washington, DC 20525.

General Description: The Baby Boomer generation is more educated, experienced, and larger than any previous U.S. generation. As they begin to retire, they will leave the workforce with unprecedented knowledge and skills. Engaging Boomers through volunteerism represents a tremendous opportunity for nonprofits. To ensure their participation, it is imperative to understand how best to capture their experience and energy in initial recruiting efforts. Secondly, organizations must understand what factors will impact their decision to continue volunteering from year-to-year.

"Keeping Baby Boomers Volunteering" used data obtained from the Current Population Survey (CPS) from 1974, 1989, and each year from 2002–2006. The CPS is a monthly national household survey administered by the U.S. Census Bureau and is the primary source of employment information on our nation's labor force. The CPS volunteer supplement provides reliable data on volunteering behavior among American households. The data trace the volunteer habits of the same sample of Baby Boomers over two consecutive years, as well as a similar sample of pre-Boomers (the 1974 and 1989 surveys).

"Keeping Baby Boomers Volunteering" highlights several trends that ultimately will help nonprofits design volunteer management programs to generate more volunteer opportunities for Boomers and improve retention. These findings include:

- The number of volunteers age 65 and older in the U.S. will increase 50% by 2020, from just under 9 million in 2007 to over 13 million. The number of senior volunteers will double by 2036.
- Boomers volunteer today at higher rates than past generations did at a similar age. Boomers between the ages 46 to 57 volunteer at a rate of 30.9%, compared to 25.3% recorded by that age cohort in 1974 (the Greatest Generation, born 1910–1930) and 23.2% recorded in 1989 (the Silent Generation, born 1931–1945).
- Education and having children are two key predictors of volunteer levels. Boomers' high education rate and propensity to have children later in life explain their high volunteer rate. This accounts in part for the fact that the volunteer rate for Baby Boomers is peaking later in life than past generations.
- Baby Boomers have different volunteer interests than past generations. Volunteers ages 41 to 59 were most likely to volunteer with religious organizations in both 1989 and 2005. However, in 1989, the second most popular type of volunteer organizations were civic, political, business, and international. By 2005, the second

most popular type of volunteer organization for Baby Boomers were educational and youth services.

• The type of volunteer activities done by Boomers affects retention. Baby Boomers who engage in professional or management activities are the most likely to keep volunteering (74.8% retention). Baby Boomers who engage in general labor or supply transportation are the least likely to volunteer the following year (55.6% retention).

Excellence: What makes this project exceptional?

As more and more Baby Boomers reach retirement age over the next several decades, they will have a dramatic and costly impact on Social Security, Medicare, and other social services. "Keeping Baby Boomers Volunteering" emphasizes their importance to society, viewing Baby Boomers as valuable assets to public service in America. The report describes the volunteering characteristics of this highly educated and skilled generation and uses this information to develop a plan for nonprofits to efficiently utilize their abilities for the next three to four decades.

Significance: How is this research relevant to older persons, populations and/or an aging society?

"Keeping Baby Boomers Volunteering" describes the volunteering characteristics of Baby Boomers, who are poised to become the most highly educated and skilled generation of older Americans in history, and the reasons why so many of them volunteer one year but drop out in the next. The report uses this information to help nonprofit organizations develop a plan to harness the abilities and skills of Baby Boomer volunteers for the next three to four decades.

For organizations to effectively utilize Baby Boomers as volunteers, they must be aware of certain trends. Baby Boomers are more active in volunteering activities then their predecessors, but like other age groups, a large proportion (over 30%) of volunteers drop out the following year. The report outlines possible volunteer management practices that will reduce this attrition. Organizations must recognize that Baby Boomers have different volunteering preferences than previous generations. Additionally, they serve for different motivations and prefer specific activities for service (professional management work as opposed to physical labor). To harness Baby Boomers' experience and energy, the study proposes several recommendations to develop a meaningful volunteering experience for volunteers and organizations.

1. Rethink how to attract and utilize Baby Boomers as volunteers.

2. To improve retention, put Boomers' skills to use through challenging projects.

3. Treat volunteers in the same fashion as employees and donors. The more positive experience a volunteer has, the more likely (s)he will return, just like an employee or donor.

4. Adopt progressive management practices, such as matching volunteers with appropriate assignments and providing professional development opportunities for volunteers. This can build organizational capacity and sustain volunteer participation.

5. Because volunteering and giving are related, find ways to encourage substantial volunteering. This could produce considerable monetary contributions.

Effectiveness: What is the impact and/or application of this research to older persons?

The bulk of the Baby Boomer population is rapidly approaching retirement age. Boomers have accumulated exceptional wealth, education, and experience, and many of them will look to continue to have a positive impact on society. Other studies, including one by CNCS, have demonstrated the health benefits of volunteering. By engaging more Boomers in volunteering, they are improving their health, maintaining connections with the community, and contributing their knowledge to the rest of society.

Innovativeness: Why is this research exciting or newsworthy?

The research suggests the relationship between Baby Boomers and nonprofit organizations is symbiotic: by engaging Baby Boomers in volunteering, both the organization and the volunteers can benefit. Boomers are leaving the workforce with unprecedented skills and knowledge, and millions of them are able and willing to make positive contributions to their communities. By understanding how Boomers like to volunteer, nonprofits can both improve the experience of Boomer volunteers, while at the same time maximizing the benefits of the service provided by the volunteers. This in turn provides society with more help in addressing critical areas of need—for example, health care for the aging population. The ability to live independently is one of the primary concerns of retiring Boomers; older volunteers can help their neighbors live at home longer, while preserving their own health by staying active within their communities.

CORPORATION FOR NATIONAL AND COMMUNITY SERVICE: THE HEALTH BENEFITS OF VOLUNTEERING

Numerous studies have found that when older adults volunteer, they not only help their community but also experience better physical and mental health in later years. These findings suggest Baby Boomers and older Americans who volunteer may be more likely to maintain their health and independence as they age.

Lead Agency: Corporation for National and Community Service.

Agency Mission: The mission of the Corporation for National and Community Service is to improve lives, strengthen communities, and foster civic engagement through service and volunteering.

Principal Investigator: Robert Grimm, Jr., Director of Research and Policy Development, Corporation for National and Community Service, 1201 New York Avenue, NW., Room 10909, Washington, DC 20525.

General Description: A growing body of research finds that volunteering provides individual health benefits to those donating their time. This research has found that those who volunteer have lower mortality rates, greater functional ability, and lower rates of depression later in life than those who do not volunteer. "The Health Benefits of Volunteering: A Review of Recent Research," describes some key findings from this research, along with a state-level analysis of the relationship between volunteering and incidence of mortality and heart disease.

To produce the report the CNCS Office of Research and Policy Development conducted a literature review of peer-reviewed studies that have researched the relationship between volunteering and health. These studies were analyzed and summarized for the re-

port. Additionally, the office obtained state-by-state data from the U.S. Census Bureau's Current Population Survey (CPS) and the Center for Disease Control to conduct an analysis of volunteer rate in comparison to mortality rates and incidences of heart disease for each state. The CPS is a monthly national household survey that is the primary source of employment information on our nation's labor force. The CPS volunteer supplement provided up-to-date data on volunteering behavior among American households for each state.

Some of the key findings of "The Health Benefits of Volunteering," include:

• States with a high volunteer rate have lower rates of mortality and incidences of heart disease. Health problems are generally more prevalent in states where volunteer rates are lowest.

• Individuals who volunteer have greater functional ability and better health outcomes and lower mortality rates, even after controlling for physical health, age, socioeconomic status, and gender. Additionally, when chronically or seriously ill patients volunteer, they appear to receive some benefits beyond what can be achieved through medical care.

• The health benefits of volunteering, including improved physical and mental health and greater life satisfaction, are more pronounced among older volunteers than among younger volunteers.

• Volunteering often enhances the social networks of citizens of all ages, reducing stress and the risk of disease.

• Volunteering and health are positively reinforcing. One study found that those who volunteered in 1986 reported higher levels of happiness and physical health in 1989, while those in 1986 who reported higher levels of happiness and physical health were more likely to volunteer in 1989.

These findings are particularly relevant today as Baby Boomers reach retirement age. Baby Boomers are volunteering at a higher rate than earlier generations did at the same age. With their demonstrated commitment to volunteerism combining with medical advances that keep them serving later into life, Baby Boomers may develop exceptional life expectancy over the next three or four decades. Efforts should be made to keep Baby Boomers serving in the future to enhance the health of the growing number of older adults.

Excellence: What makes this project exceptional?

A number of studies have evaluated the correlation between health and volunteering, but this report is a comprehensive review of research that illustrates the robustness of the findings. This report determines that many previous studies have found a positively reinforcing relationship between health and volunteering. Clearly, those in better health are more likely to volunteer, but these studies demonstrate that volunteering also leads to improved physical and mental health: volunteering keeps healthy people healthy. Several studies show that volunteering also can improve health of those battling chronic or serious illness.

This study also is the first to compare mortality rates and incidences of heart disease to volunteer data for every state. Using the volunteer supplement to the monthly Current Population Survey data produces reliable volunteering information that can display the relationship between volunteering and health. Breaking the data down by state allows the researchers to graph these vari-

ables and use a line of best-fit to display this relationship. This study demonstrates yet another method to determine that volunteering has a positive correlation to better health for older Americans.

Significance: How is this research relevant to older persons, populations and/or an aging society?

These studies find that older volunteers are more likely to receive significant health benefits from volunteering than younger volunteers. As Baby Boomers become eligible to retire, the U.S. will have to find ways to care for the health of the aging. This report suggests that volunteering may constitute a low-cost solution to maintaining health among seniors. For older adults, volunteering each week may be just as effective as other recognized preventive measures to ensure a healthy retirement. Additionally, seniors can volunteer to aid other seniors, creating a double positive effect. This ethos provides numerous positive effects for society as a whole.

Effectiveness: What is the impact and/or application of this research to older persons?

This research demonstrates the importance of engaging Baby Boomers in volunteering activities as they reach retirement age. With the costs of healthcare rising, these studies show that volunteering is one of the most cost-effective ways to stay physically and mentally healthy while also participating in public service. Seniors looking for a healthy activity should consider volunteerism. Organizations in need of volunteers, particularly nonprofits, can utilize this information to target volunteer management programs towards senior citizens that will engage them in service while also meeting organizational needs. Independent living, identified by CNCS in other studies as a salient concern among seniors, can benefit from seniors serving with each other to ensure those dependent on others are not without aid.

Innovativeness: Why is this research exciting or newsworthy?

Evidence suggests the possibility that the best way for Baby Boomers and older Americans to remain physically and mentally healthy as they age is to volunteer. While there have been studies about the health benefits of volunteering, this document assembles recent significant studies in an easily comparable format and finds that they are constant in their conclusions: there is a strong relationship between volunteering and health benefits, particularly lower mortality rates, greater functional ability, and lower rates of depression later in life among those who volunteer as opposed to those who do not. For those interested in adopting volunteering as a method to stay healthy, this report summarizes the theorized "thresholds" that a person must cross to receive health benefits. There is also information that finds state volunteer rates are strongly connected with the physical health of the state's population, and this fact may spark interest from localities around the nation.

THE CORPORATION FOR NATIONAL AND COMMUNITY SERVICE: THE SENIOR COMPANION PROGRAM

"The Final Report of the Senior Companion Quality of Care Evaluation" finds that by pairing senior volunteers with homebound seniors in frail health, the Senior Companion Program improves the

quality of life and care for both the clients and primary caregivers being served. It also builds the capacity of the organization sponsoring the program."

Lead Agency: Corporation for National and Community Service.

Agency Mission: The mission of the Corporation for National and Community Service is to improve lives, strengthen communities, and foster civic engagement through service and volunteering.

Principal Investigator: Donna Rabiner, Ph.D., RTI International, 3040 Cornwallis Road, P.O. Box 12194, Research Triangle Park, NC 27709–2194.

Partner Agencies: Senior Corps and AmeriCorps.

General Description: The Senior Companion Program provides grants to organizations that partner low-income senior volunteers with homebound elderly people in frail physical and/or mental health, most of whom live alone.

The "Final Report of the Senior Companion Quality of Care Evaluation" examines the impact of the Senior Companion Program on quality of life and quality of care outcomes for clients and families/caregivers served. The study also examines the value of individual Senior Companions to organizations serving older Americans. To obtain a well-rounded understanding of the program's impacts, the study surveyed clients, clients' families/caregivers, and volunteer supervisors.

To examine the impact of the Senior Companion Program on quality of life and quality of care outcomes for clients and the clients' families/caregivers, interviews were conducted over three time periods (at program entry, after three months, and after nine months). Interviews were also conducted with two comparison groups, one composed of potential clients on the Senior Companion Program waiting list, the other of adults who received care with other agencies, but not from Senior Companions.

Overall, nine-month results reported by clients and/or family members over time included:

- The relative increase in Senior Companion Program client self-reported health improvements;
- The reduction in the number of depressive symptoms reported by clients;
- The reduction in client unmet needs for assistance with various activities of daily living;
- The increased ability of family members/caregivers to remain employed as a result of having Senior Companions care for their frail relatives at home;
- Fewer unmet needs for transportation services, according to families/caregivers;
- The relative increase in the likelihood of families/caregivers being very satisfied with the reliability of their Senior Companion.

Surveys of volunteer supervisors found that Senior Companions played an important function in enabling organizations to expand services to clients. Supervisors valued the assistance that the Senior Companions provided to their staff, and they were "very satisfied" with the roles that Senior Companions performed at their various locations. Supervisors also felt that other senior service providers, as well as the broader community-at-large, valued the Senior Companion Program.

Finally, the "Final Report of the Senior Companion Quality of Care Evaluation" submits recommendations to address qualitative feedback from those surveyed. Recommendations include improving the overall quality of service by refining existing training and screening programs. Additionally, clients and family members perceive there to be a shortage of Senior Companions who are available to serve. The report recommends recruiting additional Senior Companions to serve the increasing number of frail older adults who are eligible for program services.

Excellence: What makes this project exceptional?

The impending retirement of the Baby Boomer generation has created an impetus for policies that meet health, social, transportation, and other needs of the aging population. The "Final Report of the Senior Companion Quality of Care Evaluation" finds that Senior Companions improve the quality of life for the clients they serve, as well as the quality of care that their host organizations are able to provide.

The study, conducted by RTI (Research Triangle Institute), is one of the most rigorous studies ever conducted on the impacts volunteering has on the health and independent living ability of older Americans. To measure the benefits received by clients, it compares outcome data for a sample of Senior Companion clients with data collected from random samples from two comparison groups individuals on the SCP wait list and individuals who received care from other providers—and followed up with these groups over time. To measure client impacts, the study examined "adjusted" differences in several outcome measures, controlling for prior health status and many other factors. To measure program impacts on other beneficiaries, the study also surveyed Senior Companion participants, family caregivers, and SCP host agencies.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The Senior Companion Program enables low-income persons aged 60 and over to remain active through continued participation in needed community service. It also provides support primarily to homebound seniors with physical, emotional, or mental health limitations, most of whom live alone, in an effort to achieve and maintain their highest level of living. With the large Baby Boomer population reaching retirement age, the Senior Companion Program provides an opportunity for well intentioned, low-income seniors to provide necessary support for seniors who are homebound, typically live alone, and often have mental and physical health problems.

Effectiveness: What is the impact and/or application of this research to older persons?

Overall, the evidence suggests the Senior Companion Program is responsible for a number of positive benefits, controlling for other factors. The program has helped many senior citizens retain their dignity and independence in spite of failing health or disabilities. This program gives seniors the opportunity to continue to live in their home with only periodic assistance. Additionally, homebound seniors can build social connections with other seniors, a very important aspect of strong mental and physical health.

The "Final Report of the Senior Companion Quality of Care Evaluation" also demonstrates the need for more volunteers in the program, and recommends extending the Senior Companion Program

so more seniors can benefit from it. As the population ages, the number of available volunteers aged 45 to 64 is expected to increase by 34 percent over the next two decades. By offering individuals new and expanded opportunities to serve their communities, larger numbers of Baby Boomers would begin to participate in this service program.

Innovativeness: Why is this research exciting or newsworthy?

With the number of Americans over age 65 projected to increase from 4.2 million in 2000 to 8.9 million in 2030, there is a pressing need for policy makers to meet the needs of frail seniors in the community. The Senior Companion Program is part of the solution; it is composed of over 200 volunteer stations around the country that support 15,000 Senior Companions and 61,000 elderly clients. This rigorous study examines the impact of this program and finds that its relatively low-cost and "low-tech" approach has had a positive impact on the agencies, clients, and family members/caregivers served by the program.

USDA Agricultural Research Service: Improving Nutrition and Health for Seniors

The Center has made pioneering discoveries about the role of nutrition in improving the health and quality of life for elderly Americans, including ways to reduce risk of heart disease, bone fractures, eye disease, and dementia.

Lead Agency: USDA Agricultural Research Service (ARS).

Agency Mission: ARS conducts research to develop and transfer solutions to agricultural problems of high national priority and to provide information access and dissemination in order to:

- Ensure high-quality, safe food and other agricultural products,
- Assess the nutritional needs of Americans,
- Sustain a competitive agricultural economy,
- Enhance the natural resource base and the environment, and
- Provide economic opportunities for rural citizens, communities, and society as a whole.

Principal Investigator: Robert Russell, MD, Center Director, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, 711 Washington Street, Boston, MA 02111.

Partner Agencies: Tufts University, National Institutes of Health.

General Description: The Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University (the Center) was established by an Act of Congress 30 years ago. It quickly became the premier institution in the world conducting research on nutrition in the prevention of age-related chronic diseases. The Center's accomplishments have greatly contributed to the health of the American people. Select examples of recent pioneering research that has impacted public health and served to establish Federal nutrition policy include the discoveries that:

- High vitamin D levels in the elderly are associated with fewer falls.
- Dietary omega-3 fats are a means of preventing dementia.

• Lutein, a pigment found in corn, spinach, and egg yolks, protects the eye against age-related macular degeneration, the leading cause of blindness in the elderly.

• Saturated and trans fats increase serum cholesterol and the risk of heart disease.

• Higher protein intake and exercise can decrease the loss of muscle normally seen in aging.

• Adequate intake of zinc can reduce the incidence of pneumonia in elderly residents of nursing homes.

• Vitamin K—not just calcium and vitamin D—is critical for bone health.

• The requirement for vitamin A is partially met by plant sources of beta-carotene.

• Folic acid can reduce the level of homocysteine in the blood, which is a risk factor for heart and brain disease.

Excellence: What makes this project exceptional?

The Center is widely acknowledged as the premier research institution studying the relationship between nutrition and aging. What makes this project exceptional are the breadth and strength of the scientists who staff it along with their discoveries. The staff are routinely recognized with prestigious awards from national and international nutrition and health organizations.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Because nutrition is one of the few factors for health under our complete control, this field offers people the ability to manage their own health. Many of the discoveries from the Center have stimulated other nutrition scientists to investigate the same questions, and other scientists often replicate the work of the Center. This is an acknowledgement by peers that the studies carried out here are of high impact in the field.

Effectiveness: What is the impact and/or application of this research to older persons?

Nutrition research is relatively easily translated into practical applications for older persons. From work done at the Center, we know that vitamin D is more important than calcium for bone health in the elderly. In addition, we know that adequate intake of yellow and dark green vegetables can help prevent both cataracts and age-related macular degeneration. Small changes in the diet can improve health and reduce costs associated with avoidable causes of morbidity and mortality and have led the scientists to recently produce a food guide pyramid specifically for older Americans.

Innovativeness: Why is this research exciting and newsworthy?

This research is both exciting and newsworthy because a series of dietary recommendations can be made for older people to improve their health simply by substituting healthier choices for the foods they commonly consume. Specific recommendations can be made that have the potential for improving bone health, the immune system, the cardiovascular system, brain function (cognition), and the musculoskeletal system. In other words, virtually every system in the body can benefit from the work done at the Center.

UNITED STATES DEPARTMENT OF COMMERCE: COMPUTER ASSISTED ORTHOPAEDIC SURGERY

This research promotes the establishment of standard calibration and performance testing procedures for automated surgical systems within the operating room to ensure more predictable and successful hip replacement operations.

Lead Agency: National Institute of Standards and Technology (Department of Commerce).

Agency Mission: To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

Principal Investigator: Dr. Nicholas Dagalakis, Mechanical Engineer, 100 Bureau Drive MS 8230, Gaithersburg, MD 20899.

General Description: The nominee and his team are developing state-of-the-art measuring techniques, similar to those used in making aerospace components fit together precisely, that soon could improve success rates for hip replacement surgery. At the request of a group of prominent orthopaedic surgeons and the American Academy of Orthopaedic Surgeons (AAOS), the NIST researchers are working to improve calibrations and operating room testing of the Computer Assisted Orthopaedic Surgery (CAOS) tracking instruments surgeons use to plan the delicate, highly complex joint replacement surgery. As the U.S. population ages, the number of hip replacement surgeries is increasing rapidly. According to HCUPnet–2004, 225,900 hip replacements and 37,115 revision hip surgeries were performed in the U.S. in 2004.

To be completely successful, CAOS hip replacement surgery must take into account minute human skeletal differences. Imprecise measurements, which could result from conditions seemingly unrelated to the surgery, such as operation room noise or temperature, can lead to poor positioning of implants, leaving some patients with discomfort during walking and, in rarer cases, a need to redo the operation.

The researchers have built a lightweight device called a "phantom" that resembles the artificial socket, ball and femur substitutes that surgeons use to replace the joint and bone in hip operations. They drilled tiny holes at precisely measured intervals into the phantom and made cuts at precisely measured angles, favored by surgeons for CAOS operations. Because the precise coordinates of the mechanical (magnetic) ball and socket joint center of rotation have been measured, manufacturers of CAOS tracking sensors can use the phantom to test the accuracy of their measuring instruments. Surgeons also will be able to test the accuracy of their CAOS devices, just before making their first incision, to measure ball and socket joint center of rotation coordinates, angles for cuts into the bone and places for the insertion of screws, all critical to a successful outcome.

Currently, no standardized approach to the evaluation of CAOS technology exists, but an ASTM International committee is working on the establishment of such standards. In the coming months NIST has submitted its hip CAOS phantom to orthopaedic surgeons for review and has begun receiving very positive feedback. Clinical trials could follow. If the device wins Federal Drug Admin-

istration (FDA) approval, it can be expected to find its way into operating rooms across the country and world. The researchers look forward to extending the application of the technology to surgical procedures on the knee and shoulder, which are also becoming more prevalent for older patients.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

This work is an excellent example of innovative use of NIST precision engineering and dimensional metrology experience to address a difficult biomedical engineering problem, which affects the quality of life of hundreds of thousands of people worldwide. Approximately one million joint reconstruction operations are performed every year throughout the world. One of the fastest-growing procedures is hip replacement, which has grown 80% since 2000. With an aging population, the number of hip replacements is expected to continue increasing for the foreseeable future. According to HCUPnet–2004, 225,900 hip replacements and 37,115 revision hip surgeries were performed in the U.S. in 2004. A revision surgery is significantly more risky and painful than the original operation. A significant cause for revision hip surgery is malpositioning of the implant. The effectiveness and reliability of joint-replacement surgeries has been shown to improve through the use of Computer-Assisted Orthopedic Surgery (CAOS). However, CAOS requires precise measurements of position and angles in order to fully realize these advantages. NIST contributed an artifact that enables calibration and performance tests of CAOS tools prior to an operation to ensure the accuracy of their position measurements. Attaining greater measurement precision will remove a critical barrier to wider use of computer-aided surgery, which would increase the success rate of the initial operations.

Critical measurements of patient dimensions must be taken prior to and during the hip-replacement operation to ensure that the prosthesis is properly sized and aligned. Otherwise, the patient's leg length may not be correct or the prosthesis could fail due to dislocation and premature wear. The measurements are defined with respect to the patient pelvis frontal and transverse coordinate planes, which are difficult to locate while the patient is lying on the operating table. To address these measurement problems during operations, surgeons adopted robot calibration and performance measurement tracking sensors, giving birth to Computer-Aided Orthopedic Surgery. The tracking sensors use cameras to determine coordinates of active or passive targets, which are usually attached to surgical tools, helping surgeons precisely measure positions and distances. The tracking sensors have accuracy problems, however, that result in positioning errors. Sources of errors include camera optics, camera position and orientation determination, operating conditions (e.g., temperature, non-uniform radiation field, distance from camera sensors), and different sampling rate frequency for multiple targets. Recognizing these challenging metrology errors, the American Academy of Orthopaedic Surgeons asked NIST for help with the calibration and performance testing of CAOS sys-

tems. NIST responded by establishing a research project to mitigate the measurement errors through calibration of the sensor tracking system, which led to invention of the CAOS calibration artifact hereafter referred to as the "phantom." NIST researchers had to work closely with surgeons to determine requirements and constraints.

The NIST team defined requirements that: any metrology solution had to be "clinically relevant," meaning suitable within an operating room, lightweight, have low coefficient of thermal expansion, imitate the operation of human skeleton parts, and allow the simulation of critical phases of orthopaedic operations. NIST addressed these challenges by designing an artifact that resembles the artificial prosthesis, yet supports dimensional metrology calibration. The phantom is made of a femur-like bar, a magnetic ball and socket, and an L-shaped XY coordinate frame. Inherent in the design of the phantom are easily-measured target features. The materials used are suitable for both operating room environments and for precision engineering dimensional metrology operations. Surgeons use the phantom to calibrate their CAOS systems prior to every operation to ensure that their measurements and positioning of the implant are correct.

A prototype of the phantom was built and calibrated by NIST. This prototype was tested by leading CAOS surgery researchers in the operating room. They responded enthusiastically to the phantom in terms of its design, applicability, potential to improve their surgical procedures, and reduce the need for revision surgeries. Dr. James B. Stiehl, Columbia St. Mary's Hospital, a world-renowned CAOS researcher, was the first to test the NIST CAOS phantom. His reaction was "The hip phantom that we worked on is an important project for me. I have a new idea that I am trying to work on and the phantom will be a critical tool to evaluate that new approach." Industry is very interested in commercializing the phantom: CAOS tracking experts from Medtronic Navigation, the leading provider of integrated navigation and intra-operative imaging solutions, are testing a prototype.

UNITED STATES DEPARTMENT OF COMMERCE: HOME LIFT, POSITION AND REHABILITATION CHAIR

The HLPR chair is a testbed for developing assistive mobility technology concepts for wheelchair-dependent people. A prototype design has been developed that offers much greater independence in safely transferring from the chair to other locations.

Lead agency: National Institute of Standards and Technology (Department of Commerce).

Agency Mission: To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

Principal Investigators: Roger Bostelman, Electronics Engineer, Intelligent Systems Division, 100 Bureau Drive MS 8230, Gaithersburg, MD 20899; Dr. James Albus (retired), Intelligent Systems Division, 100 Bureau Drive MS 8230, Gaithersburg, MD 20899.

Partner agency: University of Delaware (through a National Science Foundation Grant).

General Description: Engineers at the National Institute of Standards and Technology (NIST) have developed a robotic system that may offer wheelchair-dependent people independent, powered mobility and the ability, depending on patient status, to move to and from beds, chairs and toilets without assistance.

The lifting ability of the system, which is called the "HLPR Chair" (for Home Lift, Position and Rehabilitation), also should significantly reduce caregiver and patient injuries.

The HLPR chair draws on mobile robotic technology developed at NIST for manufacturing and defense applications. It is built on an off-the-shelf forklift with a U-frame base on wheel-like casters and a rectangular vertical frame. The frame is small enough to pass through the typical residential bathroom. The user drives the chair using a joystick and other simple controls.

The HLPR chair's drive, steering motors, batteries and control electronics are positioned to keep its center of gravity—even when carrying a patient—within the wheelbase. This allows a person weighing up to 300 pounds, to rotate out, from the inner chair frame, over a toilet, chair or bed while supported by torso lifts. The torso lifts lower the patient safely into the new position. The chair frame can even remain in position to continue supporting the patient from potential side, back or front falls.

In addition, the proof-of-concept prototype HLPR Chair would allow stroke victims and others to keep their legs active without supporting their entire body weight. Retractable seat and foot rests, padded torso lifts for under arms (that, when raised, act like crutches) and an open frame at the bottom of the chair facilitate leg exercises. The patient, once lifted and supported by the torso lifts, can walk as the HLPR Chair moves forward at a slow pace. The current maximum speed is 27 inches per second (0.7m/s).

Future research possibilities include defining the sensing and control requirements that would enable the HLPR to autonomously dock with toilets, provide voice-activation capability so patients can call the HLPR from another location, and provide dial-in leg loading to limit leg forces during rehabilitation.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

There has been an increasing need for wheelchairs over time. Independent mobility is fundamental to health, social integration and individual well-being of humans. Hence, mobility must be viewed as being essential to the outcome of the rehabilitation process of wheelchair-dependent persons and to their successful (re-) integration into society and to a productive and active life. The quality of the wheelchair, the individual work capacity, the functionality of the wheelchair/user combination, and the effectiveness of the rehabilitation program do indeed determine the freedom of mobility.

Just as important as wheelchairs are the lift devices and people who lift patients into wheelchairs and other seats, beds, automobiles, etc. The need for patient lift devices will also increase as generations get older. Beyond providing the patient greater inde-

pendence, lift devices can prevent numerous injuries to both the patient and their care-givers. Example statistics are: one in three nurses becomes injured while moving non-ambulatory patients and one in two non-ambulatory patients are injured from falls while being transferred between a bed and a wheelchair.

Based on a survey of patient lift and mobility devices, NIST researchers discovered a need for technology that includes mobility devices that can lift and maneuver patients to other seats and technology that can provide for rehabilitation to help the patient become independent of the wheelchair. Their study also determined there are no standards nor performance metrics for such devices should they become available in the commercial sector. Nursing home caregivers will develop back injuries totaling 200,000 incidents this year alone from transferring patients and cost the U.S. $2 Billion. Based on these compelling needs, NIST designed a HLPR Chair testbed to investigate patient transfer including specific areas of mobility, lift and rehabilitation toward safety standards, performance measurements of such devices, and advanced autonomous controls.

The HLPR Chair testbeds are based on a manual, inexpensive, off-the-shelf, sturdy forklift. The forklift includes a U-frame base with casters in the front and rear and a rectangular vertical frame. The lift and chair frame's dimensions allow it to pass through even the smallest, typically 61 cm (24 in) wide x 203 cm (80 in) high, residential bathroom doors.

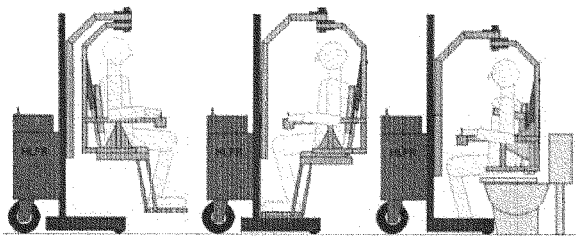

Figure 1: Graphic showing concept of placing patient onto a toilet or other chair with the HLPR chair.

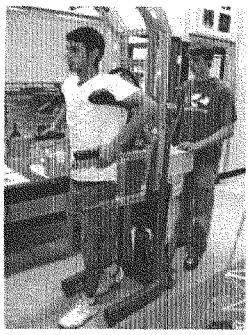

Figure 2: Rehabilitation configuration of the HLPR chair

The HLPR chair design is innovative in several ways. It is designed to explore key challenges in wheelchair-bound mobility, transfer to other surfaces, ability to reach high objects, rehabilitation, and autonomous assistive navigation for wheelchairs. The HLPR chair provides a seat/stand mechanism that provides lift and rotation to the patient allowing transfer to other chairs, beds, or toilets while maintaining safety by having the center of gravity remain within the wheelbase even if the patient is outside of it. See Figure 1 for a graphic illustrating a transfer. To place a HLPR Chair user on another seat, they can drive to for example, a toilet, seat, or bed. Once there, the HLPR Chair rotates the footrest up and beneath the seat and the patients feet are placed on the floor personally or by a caregiver. The HLPR Chair inner L-frame can

then be rotated manually with respect to the chair frame allowing the patient to be above the toilet. Padded torso lifts then lift the patient from beneath his/her arm joints similar to crutches. The seat, with the footrest beneath, then rotates from horizontal to vertical behind the patients back clearing the area beneath the patient to be placed on the toilet, seat, bed, etc. Patient lift is designed into the HLPR Chair to allow user access to high shelves or other tall objects while seated. The HLPR Chairs' patient lift is approximately 1 m (36 in), equivalent to the reach of a standing 2 m (6 ft) tall person. This is a distinct advantage over marketed chairs and other concepts. The additional height comes at no additional cost of frame and only minimally for actuator cost.

The HLPR Chair enhances patient rehabilitation through a load sensor and control on the lift actuator. The researchers designed rehabilitation into the HLPR Chair, as shown in Figure 2, to allow, for example, stroke patients to keep their legs active without supporting the entire load of the patients body weight. The patient, once lifted, could walk while supported by the HLPR Chair driving at a slow walking pace towards regaining leg control and eliminating the need for a wheelchair.

Autonomous mobility control using a sophisticated control architecture and advanced 3D imagers is nearly complete through a teaming arrangement with the University of Delaware. Commercialization is now being considered by the healthcare industry.

UNITED STATES DEPARTMENT OF COMMERCE: NIST BIOMEDICAL IMAGING

Today the information content of biomedical imaging, such as in the reading of lung computed tomography (CT), is not fully exploited. By using computer-assistive algorithms in measuring the extent of disease and the response to therapy, physicians could more rapidly identify effective treatments. The Biomedical Imaging Project is researching measures and standards for benchmarking medical imaging algorithms for use in the measurement of disease.

Lead agency: National Institute of Standards and Technology (NIST).

Agency Mission: To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

Principal Investigator: Charles Fenimore, Mathematician, Information Technology Laboratory, National Institute of Standards and Technology, 100 Bureau Drive, MS 8940, Gaithersburg, MD 20899–8940.

Partner Agency: NIST ITL is collaborating with other organizations, both inside and outside NIST.

- NIST: The following organizations have contributed assistance with measurements related to the Biomedical Imaging Project: Polymers Division (Contact: Marcus Cicerone); Precision Engineering Division (Contact: Steve Phillips)
- FDA : Center for Devices and Radiological Health (CDRH, Contact: Nicholas Petrick)
- National Cancer Institute including sponsorees: Cancer Imaging Program (CIP, Contact: Laurence Clarke); University

of Michigan (Contact: Charles Meyer); Cornell University (Contact: Anthony Reeves)

- Kitware Inc. (Contact: Rick Avila)

General Description:

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The Biomedical Imaging Project engages with the medical imaging community and with other government scientists at NIST, the FDA, and NCI in a broad-based investigation of the performance of algorithms and computer-assisted diagnostic (CAD) tools for reading biomedical imaging. Medical imaging systems are widely used in the detection and staging of disease, the assessment of response to therapy, and other health-critical applications. Today, expert radiologists provide subjective interpretation, often using computer-assisted diagnostic (CAD) tools. Such measurements depend on the expert, the software tools used, and the conditions of imagery acquisition. The variation, even with computer assistance, can be comparable in magnitude to clinically significant change criteria. The lack of reliable "ground truth" is a fundamental challenge in measuring CAD and algorithm performance. Determining performance metrics is an important area of investigation in the Project.

The Biomedical Imaging Project develops methods for assessing the performance of algorithms and computer-assisted diagnostic (CAD) tools. Currently, we are conducting a multifaceted investigation of the performance of change analysis algorithms applied to computed tomography (CT) imagery of lung lesions. The principal elements of the project are the design and the conduct of benchmarking trials of algorithm performance, with the direct aim of developing reliable algorithm assessment methods and the study, implementation, and application of various change analysis algorithms, in order to better understand and compare their performance. In addition, the availability of a large number of CT scans with known lesion characteristics is essential in conducting benchmarking trials. We are investigating the production of synthetic imagery, intended to eventually provide a robust set of imagery for use in benchmarking evaluations.

This research is significant for aging populations because it applies to the detection, staging, and measurement of clinical response to therapy in cancers. As recently observed, "Cancer in the older person is an increasingly common problem, due to the progressive prolongation of life expectancy * * *" (Carreca, I; Balducci, L; Extermann, M; Cancer in the older person, Cancer treatment reviews [2005]). At the same time, mortality from some cancers, particularly those of the lung, have proven to be stubbornly resistant to modern medical diagnostic and treatment methods.

The research focuses on the use of medical imaging algorithms as part of the development of reliable systems for measuring patient response to therapy. Today, there is rather high uncertainty associated with the assessment of response.

A high reliability measurement of a patient's response to therapy is expected to have impact on improving the determination of malignancy and improving treatment options. The result would improve the clinical practice of cancer therapy. In addition, it promises to shorten clinical trials used in the development of new pharmaceuticals, by giving the pharmaceutical researcher more rapid indication of effectiveness or lack of response.

Today, the standard method for measuring the extent of disease using imagery, known as RECIST, does not use the full potential of the CT data. We are in the early stages of building a consensus on how to improve the measurement of response to therapy. Measuring the performance of algorithms and CAD tools through benchmarking has proven to be an effective method for improving performance of algorithms in biometrics for detection and identification. Because of our long involvement in such measurements, the medical imaging community is very welcoming of NIST's leadership.

UNITED STATES DEPARTMENT OF COMMERCE: NIST HEALTH INFORMATICS INFRASTRUCTURE

NIST research is contributing to the President's goals of having electronic health records for most Americans, as well as a nationwide health information network, by 2014, which will improve quality and accessibility and reduce costs of healthcare for older Americans.

Lead Agency: National Institute of Standards and Technology (NIST).

Agency Mission: To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

Principal Investigator: Bettijoyce Lide, Scientific Advisor, Health IT, Information Technology Laboratory, National Institute of Standards and Technology, 100 Bureau Drive, Mail Stop 8900, Gaithersburg, MD 20899–8900.

Partner Agency: Department of Health and Human Services, American Telemedicine Association, Center for Aging Services Technologies, Healthcare Information Technology Standards Panel, Certification Commission for Healthcare Information Technology, Integrating the Healthcare Enterprise, Continua, among others.

General Description: The National Institute of Standards and Technology (NIST) has a long and effective history for contributing to the technical direction of health IT, which has potential to improve the quality and accessibility of healthcare for older Americans, while reducing costs. Activities include supporting the efforts of the Department of Health and Human Services Office of the National Coordinator for Health IT and collaborations with a host of other public and private organizations including the American Telemedicine Association (ATA) and the Center for Aging Services Technologies (CAST). NIST's laboratories are contributing to this research and to the healthcare industry by providing standards, measurement science, security technology, and testing expertise. NIST collaborates with major standards development organizations, professional societies, and the public sector in fostering secure, interoperable, standards-based solutions for the exchange of

health information. NIST focuses on advancing healthcare information standards that are complete and testable, and by providing the necessary conformance tests, interoperability tools, and techniques where appropriate. These activities, when integrated into standards, software, and certification processes, raise the quality of the clinical outcomes, lower cost of health IT implementation, and foster adoption of healthcare systems.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

This project is exceptional in that it brings together key government departments and agencies such as those listed in section I, response 5, to fulfill the President's Executive Order, Number 13335, which calls for most Americans having electronic health records and for our country to have a nationwide health information network by 2014. Each public and private entity brings its expertise to contribute to the goal.

This research is relevant to all Americans, but of particular importance to our aging society. People are living longer, and the demographic tidal wave will swell the ranks of the elderly in America from approximately 12.5 today to 18.8 percent in 2025, a 50 percent increase. By 2030, the proportion of the U.S. population 65 years old or greater will double to 71 million. By 2030, healthcare spending will increase 25 percent, largely due to an aging population. Unfortunately, also, chronic conditions disproportionally affect older adults, thus consuming a greater proportion of healthcare resources. About 80 percent of older adults have at least one chronic condition; at least 50 percent of older adults have at least two chronic conditions.

The impact and/or application of this research is that it will include applications of connected technologies that are possible, practical, and affordable. It has potential to improve the quality of healthcare that our aging populations needs and deserves, for example, having test results available when and where they are needed. It will also improve accessibility, for example, through telemedicine, allowing seniors to communicate with their healthcare providers remotely without costly and time-consuming (and potentially difficult) trips to the clinicians' offices. In addition, it can reduce costs through, for example, minimizing duplicative tests, or providing collaborative systems including personalized sensors and software converging through wireless Internet capability to permit seniors to stay in their own homes longer. Not only can results of this research improve healthcare, but it can improve the quality of life and preserve independence for our aging population.

The research is exciting and newsworthy, because NIST has already been able to use its core competencies as articulated in our mission. Some of NIST's recent achievements in this area include:

• Developed software to advance the national goal of providing doctors secure and appropriate access to all patients' electronic health records, thereby enabling accurate diagnosis and treatment of disease. This software is used by U.S. regional healthcare systems (MA, NY, NC, Philadelphia) with over 40 vendors (IBM, GE

Healthcare, Siemens, etc.) and is part of several national healthcare infrastructures (France, Demark, Italy, Austria, Spain, China, and Japan). It is the basis of the Healthcare Information Technology Standards Panel's Manage Sharing of Document specification that was recognized by the Secretary of HHS (Dec. 2007).

• Developed test tools to validate healthcare messages sent between healthcare systems. These tools have been incorporated into testing for DICOM (radiology images), used by the Certification Commission for Health Information Technology (CCHIT) in testing interoperability of Electronic Health Record systems, and used by the Veterans Administration, Kaiser Permanente, Siemens, and IBM Healthcare & Life Science, among others.

• Authored the conformance strategy and model to specify electronic health record (EHR) functions critical to care settings and for certification of EHR systems.

• Collaborated with the American Telemedicine Association on practice guidelines. For example, the Practice Guidelines for Ocular Telehealth have been adopted by several major ocular health centers, including the Joslin Diabetes Center, Inoveon, and the Walter Reed Medical Center.

• With the Center for Aging Services Technologies, hosted a major national summit that brought together a diverse group of stakeholders to address the challenges and enabling technologies needed to reach the vision of a connected home environment for the aging population in which healthcare devices are interoperable with home and consumer appliances, providing the infrastructure for patient-centric healthcare and wellness.

• Leading the development of an integrated virtual system to test interoperability of standards-based health systems. This is expected to be used by the Healthcare Information Technology Standards Panel (HITSP), the Certification Commission for Healthcare Information Technology, and implementers of the HITSP specifications. This test bed offers developers of health information technology (health IT) systems the interactions necessary to develop conformant standards-based implementations, leading to optimal health IT systems.

• Working with the private sector to harmonize healthcare standards and to develop specifications to enable transmission of health information securely using standard cryptographic technologies.

• Working on tools and tests to assure medical device interoperability.

Cross Document sharing (XDS) Reference Implementation and Test Suite: *http://ihewiki.wustl.edu/wiki/index.php/XDS* Main Page IEEE Medical Device Test Tools: *http://xw2k.nist.gov/medicaldevices/index.html.*

Information on the NIST/CAST National Summit on Moving Towards Interoperability: Affordable, Accessible Healthcare: *http://www.nist.gov/public_affairs/techbeat/tb2006_0831.htm; http://www.itl.nist.gov/Healthcare%20Summit/index.htm.*

NIST's role in this research area is recognized in reports such as the following: The ONC-Coordinated Federal Health IT Strategic Plan 2008–2012, released June 2008. Achieving Electronic Connectivity in Healthcare, Connecting for Health Collaborative, July 2004. Revolutionizing Health Care through Information Tech-

nology, President's Information Technology Advisory Committee, June 2004.

UNITED STATES DEPARTMENT OF COMMERCE: NIST COMPUTATIONAL BIOLOGY

The Computational Biology Project aims to analyze and characterize image-processing techniques used by cellular biology researchers; provide guidance to researchers in selecting the appropriate techniques for their research; and bring computational and measurement science expertise to the cellular biology community to help them to effectively deal with the large amounts of images generated by their research.

Lead agency: National Institute of Standards and Technology (NIST).

Agency Mission: To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

Principal Investigator: Alden Dima, Computer Scientist, Information Technology Laboratory, National Institute of Standards and Technology, 100 Bureau Drive, Stop 8970, Gaithersburg, MD 20899–8970.

Partner Agency: Karen Kafadar, University of Colorado.

General Description: Research on aging, like all biological research today, is being facilitated by automation that provides instrumentation control and data acquisition. At the same time, there have been advances in imaging and other sensor-based technologies. Researchers are now able to quickly collect large amounts of multimodal image-based data that serves as the primary output of their experiments and as the source of their measurements. These measurements ultimately provide the information required to decipher complex cellular processes including those related to aging.

Unfortunately, biological researchers are left with huge amounts of image data to process and analyze using techniques that are usually outside of their field of expertise. In addition, the large amounts of images require large amounts of secondary information (metadata) for their correct interpretation, handling and storage; gone are the days when a few sentence fragments in a lab notebook could jog memory and guarantee understandable and repeatable results.

Scientific literature has many references to and descriptions of image processing techniques, but experience shows that many techniques have limited applicability; a method that works well for optical character recognition may well fail miserably in cell biology. Indeed, even within a well-defined field, certain techniques work well only on certain types of images; two images from different data channels of a microscope may require fundamentally different techniques. As image-based measurement becomes increasingly vital to biological research, the measurement uncertainty associated with image processing is increasingly becoming an issue.

Today, the biological researcher is expected to be an expert in his/her field of research as well as a savvy user of image processing software and techniques. There is a deluge of available options, and typically the researcher chooses tools and techniques that they

have been exposed to and feel comfortable with. There is little guidance available, and much of the biological literature seems to give little information about the methods used for analyzing experimental data and their associated parameters. This situation essentially distracts biological researchers from fulfilling the central goals of their research, such as understanding the biology of aging and developing new treatments for aging-related diseases. Given that the U.S. population is aging and that scientific resources are not unlimited, research that aims to improve the ability of biological researchers to handle their critical image-based data will ultimately facilitate the development of new treatments for aging-related diseases.

A basic tenet of the Computational Biology project is that image processing and analysis techniques, despite their implementation in software, are fundamentally measurements and not simply calculations. As such, they can be characterized and understood in a manner similar to other measurement techniques. This suggests that the measurement uncertainty associated with the use of software-based image processing and analysis methods can and should be determined. It also suggests that clear guidance can be given to researchers to aid them in choosing the correct image processing techniques and will facilitate the interpretation of their research data.

The Computational Biology Project aims to analyze and characterize image-processing techniques used by cellular biology researchers; provide guidance to researchers in selecting the appropriate techniques for their research; and bring computational and measurement science expertise to the cellular biology community to help them to effectively deal with the large amounts of images generated by their research.

Excellence: What makes this project exceptional?

Though this project is very new, it is exceptional in its approach to addressing some of the key issues hindering cell biology research that depends on large quantities of multimodal image data, including research on the biology of aging. Typically, a cell biology research project will focus on an area of interest, perhaps one or more particular cell processes related to aging. The research staff will consist mostly of biological researchers who will run experiments and collect data including images from microscopes.

Given the complexity of cellular processes, at some point, the researchers will run into bottlenecks that slow down the pace of the research; perhaps they've collected huge amounts of complex images that need to be analyzed using techniques with which they are uncomfortable. They may bring in expertise from outside of the project's central area of interest to provide additional support. Over time, the project's success will become increasingly dependent on measurement and analysis techniques that are outside the scope of the biological researchers' specialized domain. The project will tend to start spending more time focusing on these ancillary issues instead of making progress on its primary research goal. Given the amount of biomedical research occurring, many projects will be in effect competing for the same outside support to solve a similar set of issues.

If outside expertise is not available, the biological researchers may find themselves in the difficult position of becoming competent

in technical fields outside of their primary area of expertise. They may make technical decisions that ultimately hinder their ability to progress with their primary research goals such as understanding the biology of aging and developing new treatments for aging-related diseases.

The Computational Biology Project strategy is to effectively invert the problem to directly tackle the standards, measurements, and informatics issues that can slow down biological research. For example, one key issue with biological image data is the selection of the technique used to extract key features from the rest of the image (segmentation algorithms). Using cellular microscopy images generated by NIST biological researchers, our computational scientists, mathematicians, and statisticians intend to analyze and characterize common segmentation algorithms so that we can publish guidance for the biological research community as a whole. This will effectively mitigate the need for each project to address this issue and brings NIST measurement expertise to bear on the problem.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As the population ages, an increasing emphasis will be placed on research related to the treatment of aging-related diseases—much of which will share infrastructure, resources, and expertise with other cell biology research.

Effectiveness: What is the impact and/or application of this research to older persons?

A key component in the treatment of aging-related diseases is the understanding of the complex cellular processes related to aging. This understanding, in turn, depends on sophisticated laboratory and data analysis techniques. By addressing some of the key issues related to the analysis of image data generated by cell biology research, the Computational Biology Project will improve the efficacy of cell biology research in general and as a result, research into the biology of aging will also benefit. This should, in turn, aid in the development of new treatments for aging-related diseases.

Innovativeness: Why is this research exciting or newsworthy?

From our perspective, this research is exciting because it brings NIST's traditional measurement expertise to bear in a new domain (cellular biology) and has the potential to make significant impact in terms of scientific and medical advancements. As our work progresses, we hope that it will become newsworthy in terms of the other advancements that were enabled by it.

65+ IN THE UNITED STATES: 2005

The report 65+ in the United States: 2005 provides a comprehensive description of the older population in the United States to foster a better understanding of their experiences and challenges.

Lead Agency: Staff of the Population Division within the U.S. Census Bureau, Department of Commerce, conducted the research for the 65+ in the United States: 2005.

Agency Mission: The mission of the Census Bureau is to serve as the leading source of quality data about the Nation's people and economy. We honor privacy, protect confidentiality, share our expertise globally, and conduct our work openly. We are guided on

this mission by our strong and capable workforce, our readiness to innovate, and our abiding commitment to our customers.

In addition, the specific mission of the Population Division is to provide regularly updated information on the population of the United States and countries around the world, and their demographic, geographic, and other characteristics. We share our expertise globally.

Principal Investigator: Victoria A. Velkoff, Assistant Division Chief, Population Estimates and Projections, U.S. Census Bureau, POP HQ–5H185, 4600 Silver Hill Road, Washington, DC 20233, *Victoria.A.Velkoff@census.gov*, 301–763–7070.

Partner Agency: The National Institute on Aging.

General description: The report 65+ in the United States: 2005 provides a comprehensive description of the older population in the United States to foster a better understanding of their experiences and challenges.

The dynamics of aging are affected by many interrelated factors, including demographic, social, economic, and medical influences. The growth of the older population has been dramatic. In the 20th century, this group increased from 3.1 million to over 35 million, and its size is projected to double between 2000 and 2030. This substantial growth will challenge society on a range of issues, many of which are highlighted in this report.

Diversity is a distinguishing feature of the older population in the United States and is highly likely to increase in the future on at least some dimensions. This report discusses diversity of age, sex, race, Hispanic origin, health, economic status, geographic distribution, marital status, living arrangements, and educational attainment among those aged 65 and older.

The older population of tomorrow will differ from the older population of today in many ways. They will most likely be better educated and more racially and ethnically diverse than today's older population. While the older population will grow over the first half of the 21st century, the size of this growth is not certain. For example, if mortality decreases faster than projected, the older population of the future could be much larger than currently projected.

How people experience aging depends on a variety of factors, including social and economic characteristics and health status, which are discussed in the chapters in this report. The second chapter of this report looks at the growth of the older population over the 20th century and into the 21st century, and includes data on race and Hispanic origin. The last section of this chapter provides a global context on population aging. The third chapter focuses on the health status of the older population. Trends in mortality are examined, and chronic diseases and disability are discussed. The fourth chapter covers economic characteristics of the older population, including trends in labor force participation and retirement. Data on wealth, income, and poverty are also presented. In the fifth chapter, geographic distribution and mobility of the older population are discussed. The sixth chapter examines social characteristics of the older population, such as marital status, living arrangements, and educational attainment.

This report used data from a variety of sources. Data used in this report are primarily from Census 2000 and previous censuses; nationally-representative surveys such as the Current Population

Survey , the Survey of Income and Program Participation, the National Health Interview Survey, the Longitudinal Study on Aging, and the American Housing Survey; recent population projections; and data compiled by other federal agencies, including the National Center for Health Statistics. This report also draws on information on the older population in numerous reports prepared by the Census Bureau, other federal agencies, and private researchers.

The report 65+ in the United States: 2005 is exceptional because it provides a comprehensive portrait of the older population in the United States using multiple data sources. It presents demographic, social, and economic data on the older population in a manner that is accessible to a wide range of audiences.

Population aging is one of the most important demographic dynamics affecting families and societies throughout the world. People are living longer and healthier lives. According to Census Bureau projections, a massive increase in the number of older people will occur when the Baby-Boom generation (people born between 1946 and 1964) begin to turn 65 in 2011. The older population is projected to double from 36 million in 2003 to 72 million in 2030, and to increase from 12 percent to 20 percent of the population.

The growth of the population aged 65 and over is challenging policymakers, families, businesses, and health care providers, among others, to meet the needs of aging individuals. Policymakers need to understand the characteristics of older populations, their strengths, and their requirements. Understanding the dynamics of aging requires accurate descriptions of older populations from interrelated perspectives, including demographic, social, and economic. This report is an effort to contribute to an accurate description of the older population in the United States.

How people experience aging depends on a variety of factors, including social and economic characteristics and health status, which are discussed in this report. The growth of the older population over the 20th century and into the 21st century is presented, and data on race and Hispanic origin are included. The report also provides a global context on population aging. The health status of the older population is examined in the report, and trends in mortality, chronic diseases and disability are discussed. Information on the economic characteristics of the older population, including trends in labor force participation and retirement are presented, as well as data on wealth, income, and poverty. The geographic distribution and mobility of the older population are discussed. Finally, social characteristics of the older population, such as marital status, living arrangements, and educational attainment that impact how people experience aging are presented and discussed.

DEPARTMENT OF LABOR: RETIREMENT ADEQUACY WITH AN EMPHASIS ON THE BABY BOOM GENERATION

RAND has taken an integrated approach to studying retirement adequacy with an emphasis on the Baby Boom generation. They have incorporated trends in health care costs, health, pension offerings and retirement behavior to provide a multi-dimensional look at retirement decisions.

Lead Agency: Employee Benefits Security Administration (Department of Labor).

Agency Mission: The Employee Benefits Security Administration (EBSA) of the Department of Labor (DOL) administers and enforces Title I and certain other provisions of the Employee Retirement Income and Security Act of 1974 (ERISA). ERISA section 513(a) authorizes the Secretary to "undertake research * * * and in connection therewith to collect, compile, analyze, and publish data, information, and statistics relating to employee benefit plans, including retirement, deferred compensation, and welfare plans, and [other] * * * plans not subject to this Act."

Principal Investigator: Dr. Jeff Dominitz (Senior Economist, RAND), 1200 South Hayes Street, Arlington, VA 22202.

Partner Agencies or Organizations: None.

General Description: The rise in health care costs, shift from traditional defined benefit pension plans and erosion of retiree health plans has made it increasingly important for individuals to incorporate expected medical costs into their retirement planning. However, detailed health information, including expected health outcomes given medical expenditures as well as disease and mortality prevalence, has been absent from household financial data, hindering the ability of researchers to forecast the economic well being of future retirees. Absent this information, measures of retirement adequacy are incomplete and may lead to a false sense of security.

RAND, with support from the Employee Benefits Security Administration (EBSA), has attempted to rectify this by taking a more integrated approach in their research, including projected health care costs into retirement planning, and by considering the many factors which go into the decision to retire. As a result, RAND has produced research for EBSA on such diverse topics as: alternative measures of replacement rates; offers of retiree health insurance; international comparisons of individual's responses to government policies; timing of retirement; and labor force transitions of older workers.

In addition to their current research, RAND is expanding the Future Elderly Model (FEM), a dynamic health model, to include economic measures such as financial wealth, pension claiming and labor force participation. RAND intends to use the expanded model to perform various policy experiments, including projecting the solvency of the Social Security Trust Fund and the economic well-being of future cohorts, while controlling for expected health costs.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The RAND research project sponsored by EBSA employs several researchers with diverse backgrounds to examine issues facing an aging society. Typically, researchers focus on a single research topic and hold all other factors constant. RAND, however, takes a more unified approach, acknowledging that there are many issues which influence the choices made by aging individuals. For example, in modeling retirement decisions, RAND incorporates how health care coverage of a younger spouse may affect timing of retirement. In developing both income and consumption based replacement rates for retirement income, RAND includes potential health care costs

in their calculations and presents the replacement rates in terms of the likelihood of having sufficient retirement income. To investigate institutional determinants of labor-force participation (with a focus on older workers), RAND looks at data from 12 other countries and develops standardized measures in order to compare how individuals respond to changes in retirement and health insurance policies. In its research, RAND take a complete look at the issues facing an aging workforce and it is this holistic approach that makes its research exceptional.

The EBSA-sponsored research by RAND has focused on the effects of health insurance and pensions on labor-force transitions for older workers. Health and financial security are two of the most important issues facing older persons and RAND's research sheds light on how older persons make decisions that impact these issues.

By looking at what influences how and when older workers retire as well as responses to various government policies, RAND's research provides policy-makers with insights into these difficult decisions. These new insights may in turn shape future legislation and regulations which target older persons.

RAND's research is exciting because it combines different data sources as well as researchers of different disciplines to achieve a fuller picture of the issues facing older workers. RAND's research considers the many components of retirement and sheds light on how they interact with each other.

DEPARTMENT OF LABOR: PENSION SIMULATIONS (PENSIM) FROM GOVERNMENT POLICIES

PENSIM is a dynamic micro-simulation model used to estimate the retirement income implications of government policies which affect employer-sponsored pensions, employer offerings of pensions, and employee behavior with respect to pensions.

PENSIM is a dynamic simulation model that produces life histories for a sample of individuals born in a particular year.

Lead Agency: Employee Benefits Security Administration (Department of Labor).

Agency Mission: The Employee Benefits Security Administration (EBSA) of the Department of Labor (DOL) administers and enforces Title I and certain other provisions of the Employee Retirement Income and Security Act of 1974 (ERISA). ERISA section 513(a) authorizes the Secretary to "undertake research * * * and in connection therewith to collect, compile, analyze, and publish data, information, and statistics relating to employee benefit plans, including retirement, deferred compensation, and welfare plans, and [other] * * * plans not subject to this Act."

Principal Investigator: Dr. Martin Holmer, President of the Policy Simulation Group, 1314 Kearney Street, NE., Rm N5718, Washington, DC 20210.

Partner Agencies or Organizations: The Office of Retirement and Disability Policy (Social Security Administration) has sponsored substantial development of SSASIM and GEMINI since 2001 in order to expand the range of Social Security reforms that can be simulated and enable simulated life histories from PENSIM to be used in producing aggregate Social Security solvency estimates.

General Description: The U.S. Department of Labor's Employee Benefits Security Administration (EBSA) began supporting the de-

velopment of PENSIM a dynamic micro-simulation model produced by the Policy Simulation Group (PSG), in September 1997. The model analyzes lifetime coverage and adequacy issues related to employer-sponsored pension plans in the United States using stimulated life histories of sample cohorts and detailed pension characteristics imputed based on National Compensation Survey establishment data.

The life history for a sample individual includes a variety of life events and their timing: birth, schooling, marriage, divorce, childbirth, immigration, emigration, disability onset and recovery and death. In addition, a simulated life history contains a complete record of jobs held by the individual, including each job's starting and ending date, job characteristics, pension coverage and plan characteristics. The richness of the life history allows the estimation of, for each year of an individual's life, their Social Security taxes and benefits as well as employer-sponsored pension benefits.

The design of PENSIM has been strongly influenced by the policy analysis needs of the EBSA. It has been used to study a number of employer-sponsored issues, particularly the sensitivity of future benefits to government policy, employer offerings, and employee behavior and plan design. Findings from PENSIM have been published in several GAO reports as well as regulations published by the Department of Labor.

PSG began distributing PENSIM free to the public via its website in spring 2007, enabling individual users to conduct analysis of the simulated pension environment and produce research papers. The model is currently being compared to another pension model (Poterba, Rauh, Venti and Wise) to test its validity. Beginning in fall 2008, PSG intends to add defined contribution participant loans and hardship-withdrawals, as well as federal income taxation of pension income to the model, to better reflect current pension issues.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

Employer-sponsored pensions make up the third leg of the "three-legged stool" used to describe the major sources of retirement income, along with Social Security and personal savings. However, because not all employees are covered by pensions throughout their working years, EBSA has become increasingly concerned as to the adequacy of retirement income provided by employer-sponsored pensions for some segments of the population. In order to study this issue and how it is impacted by government policy, EBSA commissioned work on the PENSIM beginning in September 1997.

PENSIM is a smaller-scale model which represents the interaction between employees and employers that determines lifetime pension coverage and adequacy. PENSIM simulates life histories which are rich enough to allow estimation for each year in an individual's life of pension benefits as well as Social Security taxes and benefits. It is uniquely able to model pension accumulations of American workers across populations and over time, and as a re-

sult, had been used by EBSA as well as the Social Security Administration (SSA) and the Government Accountability Office (GAO) on such policy questions as Social Security and pension reform. PENSIM is exceptional precisely because it was designed as a leading rather than a lagging policy research activity that has been able to contribute significantly to high priority, behavioral analysis projects.

PENSIM regularly revises its assumptions with regard to demographics and life events so that the simulated cohorts' life histories closely mimic the actual populations. As such PENSIM captures the "graying" of the workforce, the decline of defined benefit (DB) pensions in favor of defined contribution (DC) plans, changes in the Social Security rules, the delaying of childbearing, increases in divorce as well as other societal and generational shifts. This makes the model and the research it generates relevant not only to current retirees, but also to future retirees.

Because PENSIM is focused on retirement savings over a lifetime, it is able to project the endowment an individual will have at the time of death. Moreover, it is able to measure the impact various policy proposals will have on this endowment. This provides insights into the well-being of older Americans under different economic and political assumptions which can in turn influence which policies are ultimately adopted and enforced by the government.

PENSIM is exciting and newsworthy because it is currently being used to help shape pension legislation which will have far-reaching effects on the retirement adequacy of this and future generations. PENSIM is able to adjust to changes in the pension landscape quickly so that it can project impacts of proposals rather than analyze their effects after the fact. This is essential to insure that those policies ultimately adopted will best serve current and future retirees.

DEPARTMENT OF LABOR, U.S. CONSUMER EXPENDITURE SURVEY

Research using the U.S. Consumer Expenditure Survey data documents the rising share in out-of-pocket expenditures over the past two decades of households at the retirement age. The findings also show the higher costs for retired households.

Lead Agency: U.S. Bureau of Labor Statistics (BLS), Division of Consumer Expenditure Surveys.

Agency Mission: Providing impartial, timely, and accurate data relevant to the social and economic conditions of our Nation, its workers, and their families.

Principal Investigator: Meaghan Duetsch, Phase 2 Section Chief, Division of Consumer Expenditure Surveys, U.S. Bureau of Labor Statistics, 2 Massachusetts Ave., NE., Room 3985 Postal Square Building, Washington, DC 20212.

Partner Agencies: The U.S. Bureau of the Census collects the Consumer Expenditure Survey data under contract with BLS. All research was done within BLS.

General Description: This research project, Out-of-Pocket Care Spending Patterns of Older Americans, as Measured by the Consumer Expenditure Survey, used data from Consumer Expenditure Surveys, 1985, 1995, and 2005 and examined the out-of-pocket healthcare expenditures of older families in the age-ranges just be-

fore and just after the Medicare eligibility age of 65, and analyzed how health care expenditures for these two groups have changed.

Components included in the study were health insurance premiums paid for by the household members, as well as spending for medical services, drugs, and medical supplies.

The research showed that over this 20-year period, there was a greater percent increase in expenditures on health care than in total expenditures. As a share of average total annual expenditures, health care expenditures rose for both age groups over the two decades. The share of expenditures allocated to health care by the 65–74 year-old group is slightly more than 1.5 times the share allocated by 55–64 year-old group in all three time periods.

Future Plans: As this research covered up to 2005, the recent change to the new Medicare prescription drug benefit will warrant further analysis.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The United States has experienced many changes over the past two decades in the way health care is managed and the way households allocate their spending. Families approaching retirement need to understand these trends to prepare for the future, and retired persons need to be aware of how their spending patterns change. This research measures and documents these changes using the only Federal source of expenditure data linked to detailed household characteristics and demographics. Expenditures on health care have risen faster than overall spending, and retired households spend 50 percent more than do households approaching retirement age.

DEPARTMENT OF LABOR: GRADUAL RETIREMENT THROUGH "BRIDGE" JOBS

This research project examines why so many retirees are exiting the workforce gradually, in stages, and the economic consequences of these decisions. It focuses on the types of jobs that people take, the reasons behind their choices, and their socioeconomic outcomes.

Lead Agency: U.S. Bureau of Labor Statistics.

Agency Mission: Providing impartial, timely, and accurate data relevant to the social and economic conditions of our Nation, its workers, and their families.

Principal Investigators: Michael D. Giandrea, PhD., U.S. Bureau of Labor Statistics, Office of Productivity and Technology, Postal Square Building, Room 2180, 2 Massachusetts Ave., NE., Washington, DC 20212; Kevin E. Cahill, PhD., Analysis Group, Inc., 111 Huntington Avenue, 10th Floor, Boston, MA 02199; Joseph F. Quinn, PhD., Department of Economics, Boston College, Chestnut Hill, MA 02467.

Partner Agencies or Organizations: Dr. Cahill and Dr. Quinn received funding from the Sloan Center on Aging and Work/Workplace Flexibility at Boston College and also from the Centre for Retirement Research at Boston College.

General Description: More often than not, older Americans with full-time, long-tenure jobs move to a "bridge" job before finally leaving the labor force. These bridge jobs are voluntary for some, a way to try something new, remain socially active, or benefit in some other nonpecuniary way. For others, work later in life is a financial necessity to avoid hardship in retirement. Measuring the extent of these experiences and their consequences are of interest to policymakers. Policies that encourage work later in life have been proposed as a way to alleviate the expected economic strain on aging society. This research project examines bridge jobs and retirement transitions, including the extent to which bridge jobs are utilized by older and younger workers, the role of self employment in retirement transitions, and the relationship between bridge jobs and retiree well-being.

One study in this project asked if today's younger retirees are following in the footsteps of their older peers with respect to gradual retirement. An earlier study by these researchers, based on the Health and Retirement Study (HRS), an ongoing nationally-representative survey of older Americans that began in 1992, found that the majority of older Americans with full-time career jobs later in life moved to another job prior to complete labor force withdrawal. In this follow-up study, the authors compared a cohort of older workers born between 1942 and 1947 with those born between 1931 and 1941, and found that younger retirees followed patterns of gradual-retirement similar to those of their predecessors. This conforms the view that traditional one-time, permanent retirements remain the exception rather than the rule.

In another paper, the authors examined transitions into and out of self employment among older workers who had career jobs. They utilized the HRS to investigate the prevalence of self employment transitions later in life and explored the factors that determine the choice of wage-and-salary employment or self employment. They found that post-career transitions into and out of self employment were common, that self employment increases in importance as workers age, and the health status, career occupation, and financial variables were important determinants of these transitions. As older Americans and the country confront financial strains in retirement income in the years ahead, self employment may be a vital part of the pro-work solution.

Finally, another aspect of this research examined the outcomes of older Americans who transitioned to bridge jobs following career employment. The authors examined the extent to which transitions onto bridge jobs were involuntary and how workers' bridge jobs compared to the career jobs they had left behind. They found that about 20 percent of those with full-time career jobs later in life left these jobs involuntarily, and that these individuals were less likely than others to move to a bridge job. The large majority of older workers with full-time career jobs, however, left these jobs voluntarily and moved to bridge jobs before complete retirement, suggesting that for most of these individuals work beyond career employment may be an effective way to maintain an adequate level of financial security and/or quality of life.

Excellence: What makes this project exceptional?

This research is timely and based on a nationally-representative sample of older Americans born between 1931 and 1941. Today's

retirees are changing the way older workers exit the labor force. Traditional one-time, permanent retirements are now the exception rather than the rule, as older workers increasingly change jobs later in life or reenter the labor force after "retiring." The conclusions are based on analyses of data from the Health and Retirement Study, a nationally-representative sample of more than 12,000 older Americans surveyed every other year from 1992 to 2006.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This research on work later in life is relevant because today's retirees are experiencing more financial risk than prior cohorts, and therefore may have to work later in life in order to supplement income from Social Security, private pensions, and savings.

The pro-work mindset of many of today's older Americans is likely a reflection of many factors. People are healthier, are living longer and have higher levels of education compared to earlier generations. Jobs are also less physically demanding now than in the past. Over the past two decades, a generally strong labor market has provided older workers with job opportunities. These changes have enabled older workers to remain productive well beyond traditional retirement ages.

Many of the financial incentives surrounding retirement have changed as well. Defined-benefit pension plans that offer a guaranteed annuity payment upon retirement are less common in today's private sector and many existing defined-benefit plans are being converted to cash balance plans or replaced with defined-contribution plans managed by the worker. Social Security, the bedrock of financial security late in life, is facing financial strain and will likely provide lower replacement rates than in the past. Finally, private saving, the third pillar of retirement income, is currently near record low rates.

As a result, today's retirees are now in charge of their retirement finances and face more financial risk than at any time in the postwar era.

Effectiveness: What is the impact and/or application of this research to older persons?

The shift towards "do-it-yourself" retirement has both positive and negative consequences for older people. On the one hand, workers have more control of their retirement assets and they respond to many of the financial incentives associated with retirement by working longer and by taking on bridge jobs after career employment. The implication is that if retirement assets are less than expected upon retirement many older workers may remain active members of the labor force well into their late 60's and 70's. Conversely, if work later in life is not an option, because of factors such as health or inflexible work options, some retirees' well-being will be vulnerable to fluctuations in market conditions.

What is clear is that retirement incentives have changed and these changes will likely influence the retirement decisions of older workers for years to come.

Innovativeness: Why is this research exciting or newsworthy?

This research is exciting because the topic of work later in life is important to a large number of Americans who are on the cusp

of retirement. The leading edge of the Baby Boomers, in particular, reached traditional retirement age in 2008.

Today's older workers are searching for increased levels of financial security for the remainder of their increasingly long lives. This research on bridge jobs illustrates how current retirees have utilized transitional employment to smooth financial shocks that may have occurred following full-time career employment. These bridge jobs also help older workers maintain social networks that are often available only among fellow workers.

While other authors have investigated partial retirement and employment among older workers, they have developed a series of papers that relate and build upon each other. They first described the prevalence of bridge jobs in a 2006 Gerontologist paper and then compared bridge job activity between an older and a younger cohort of workers above the age of 50 (forthcoming in Research on Aging). Building on this framework, they investigated the economic outcomes of older workers comparing those who retired directly from career jobs to those who transitioned to bridge jobs. They found that most transitions, particularly bridge jobs, were voluntary and that most workers were happy with their jobs. They then examined one of the most interesting transitions, from wage-and-salary career employment to self-employment (Center on Aging & Work Issue Brief).

The work decisions of older Americans are diverse and rich. Policymakers should be interested in our findings, in light of the fact that Americans may be asked to work later in life in order to supplement traditional sources of retirement income.

DEPARTMENT OF LABOR: DETAILS OF PLAN GENEROSITY AMONG 401(k) PLANS HAVING EMPLOYER MATCHES 2002–2003

This project provides new measures of the generosity of the 401(k) plans provided by private employers in the United States in the calendar years 2002 and 2003, using the microdata collected as part of the Bureau of Labor Statistics' National Compensation Survey (NCS).

Lead Agency: United States Bureau of Labor Statistics.

Agency Mission: Providing impartial, timely, and accurate data relevant to the social and economic conditions of our Nation, its workers, and their families.

Principal Investigator: Keenan Dworak-Fisher, Office of Compensation and Working Conditions, U.S. Bureau of Labor Statistics, Room 4130, 2 Massachusetts Ave., NE., Washington, DC 20212.

General Description: This project provides new measures of the generosity of the 401(k) plans provided by private employers in the United States in the calendar years 2002 and 2003, using the microdata collected as part of the Bureau of Labor Statistics' National Compensation Survey (NCS). With the ongoing transformation of employer-provided retirement benefits from a predominance of traditional Defined Benefit pensions to a concentration on optional, Defined Contribution plans now almost three decades old, understanding the generosity of these types of employer benefits is more and more important. Yet, much of what is known about these plans originates from small, non-representative surveys and household surveys whose potential for inaccuracy is oft cited. Regular BLS publications use NCS to provide useful descriptive information

about Defined Contribution plans, but the complexity and variability of the plans prevents such publications from going into comprehensive detail on the generosity of 401(k) plans. This project provides many of these needed details.

The generosity of the predominant type of 401(k) plans is reflected in the form and extent of matching contributions that the employer pledges to make when the employee contributes. While the value of the benefits ultimately received by the workers from their employers depends on the employees' own actions (participation and contribution rates), the structures of the employer matches themselves demonstrate the potential for employer contributions to add to employees' retirement savings. The paper draws on the coded microdata underlying NCS publications, as well as additional data gleaned from employers' plan brochure to describe the distribution of plan generosity observed in the NCS sample, which is representative of the nation as a whole.

The project portrays many dimensions of the wide variation between the 401(k) plans offered by employers. Match rates are seen throughout the 0–100 percent range, and even higher. These matches are provided on 1 to 6 percent of employees' salaries, and even higher. Some matching schemes provide "flat" matches, while other employers vary the match rate over the distribution of employee contribution amounts, or between employees with different amounts of tenure. The project shows that some of these features of plan generosity are offsetting—e.g., a low match rate is often compensated for by a high amount of employee salary eligible to be matched. Nonetheless, plans with variable match rates tend to be somewhat more generous than those providing flat rates. The project also documents how the generosities of plans differ by job and employer characteristics—for example, workers in the Western region tend have access to significantly more generous plans than workers in the South.

This project has been published in the BLS's Monthly Labor Review and circulated to interested retirement researchers at other private and public organizations. It has also affected plans for future BLS publications using NCS data. And it forms a needed background and basis for the author's own continuing work using the underlying data to examine how the characteristics of 401(k) plans affect the participation rates of employees having access to them.

Excellence: What makes this project exceptional?

The project uses accurate data representative of all private employers in the United States to document 401(k) plan characteristics. This provides a more comprehensive view of the plans in existence than other studies, which have used samples of large employers or other subsets of the population.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The amount of retirement saving is a key component of the resources available to older populations. 401(k) plans provided by employers are an increasingly large fraction of these savings, reflecting the evolution of employers' retirement benefits over the last three decades.

Effectiveness: What is the impact and/or application of this research to older persons?

This research will help establish a backdrop to further studies of 401(k) benefits, including simulations of retirement savings accumulations as well as studies of how plan details affect savings behavior. It may also be used in policy simulations that ask how changes to tax, Social Security, and savings policy might be accommodated by the population.

Innovativeness: Why is this research exciting or newsworthy?

The research demonstrates a wide variability between the 401(k) plans provided by different employers and uncovers some of the correlates of plan generosity. Given the passive behavior of employees with regard to plan participation that has been documented in the literature, it seems likely that much of this variation (and subsequent sufficiency of retirement saving) is distributed arbitrarily across the population. If so, it poses some interesting questions about the operation of the labor market and may prompt interest in public policies aimed at leveling out the variation in generosity received.

DEPARTMENT OF LABOR: SURVEY OF OCCUPATIONAL INJURIES AND ILLNESSES AND THE CENSUS OF FATAL OCCUPATIONAL INJURIES

Americans are living longer than ever before, and many are staying in the workforce past age 55; although older workers experience similar events leading to injury, they sustain more severe injuries than their younger counterparts and require more days away from work to recover.

Lead Agency: Bureau of Labor Statistics.

Providing impartial, timely, and accurate data relevant to the social and economic conditions of our Nation, its workers, and their families.

Principal Investigators: William J. Wiatrowski, Associate Commissioner, Office of Compensation and Working Conditions, Occupational Safety and Health Statistics, Postal Square Building, Room 3180, 2 Massachusetts Ave., NE., Washington, DC 20212–0001; Elizabeth L. Rogers, Economist, Office of Compensation and Working Conditions, Occupational Safety and Health Statistics, Postal Square Building, Room 3180, 2 Massachusetts Ave., NE., Washington, DC 20212–0001.

General Description: Older workers face many of the same workplace hazards as do other workers; the most prevalent events leading to job-related injuries or fatalities are falls, assault, harmful exposures, or transportation incidents. But in many cases, the nature of the injury suffered by an older worker is more severe than that suffered by younger workers. Older workers who suffer a workplace injury may experience longer recovery periods than their younger counterparts. And older workers die from workplace injuries at a higher rate than do younger workers. This analysis focuses on occupational injuries, illnesses, and fatalities among older workers, and identifies differences in the severity of the events as a result of age.

Americans are living longer than ever before, and increasing numbers of older Americans are working. These facts have led to expanded interest in the activities of older Americans and their work life. Americans born at the beginning of the 21st century can expect to live an average of 77 years, an increase of 9 years, compared with persons born a half century ago. Those aged 65 in 2000

can expect to live 18 years. Considering age 65 to be a typical retirement age, individuals can expect to live nearly 2 additional decades. Both the need to feel productive and the need for income may lead these older Americans to work during what are typically considered retirement years.

But the need to work does not come without potential hazards. This article explores recent data on workplace injuries, illnesses, and fatalities among older workers. Data from the Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses and Census of Fatal Occupational Injuries provide a wide range of information about the events that led to an injury, illness, or fatality, the demographics of the workers involved, and the types of occupations and industries where these incidents occur.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The percentage of older Americans in the labor force has been increasing. As it has, the need to understand the particular experience of older workers has expanded with it. Presenting the demographic data available from the Survey of Occupational Injuries and Illnesses and the Census of Fatal Occupational Injuries, this article demonstrates that older workers need more time to recover from non-fatal work-related injuries and illnesses, experience more traumatic injuries like fractures and multiple injuries, and sustain a higher fatality rate than do younger workers. Two case studies are included that demonstrate that older workers are likely to have more severe injuries even when the event leading to the injury was not particularly serious.

These findings are important to policy makers, regulators, employers, and safety and health researchers. They are used in the development of safer workplaces for older workers, which is important as the American workforce ages.

This article is innovative in that it presents demographic data available from the Survey of Occupational Injuries and Illnesses and the Census of Fatal Occupational Injuries, the premier source of information on the safety and health of American workers. Using these data, consistent comparisons between older and younger workers across many different case characteristics can be drawn. The data presented in this article highlight the experiences of older workers, experiences both anticipated and surprising.

U.S. Department of Transportation: Dementia and Driving Ability

This project explores the driving behaviors of people with early-stage memory impairments by collecting objective driving data from these people through custom in-vehicle technology.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigators: David W. Eby, Ph.D., Research Associate Professor, Principal Investigator, Social and Behavioral Analysis Division, University of Michigan Transportation Research Institute, Director, Michigan Center for Advancing Safe Transportation throughout the Lifespan, 2901 Baxter Rd., Ann Arbor, MI 48109–2150.

David J. LeBlanc, Ph.D., Associate Research Scientist, Engineering Research Division, University of Michigan Transportation Research Institute, 2901 Baxter Rd., Ann Arbor, MI 48109–2150.

Lisa J. Molnar, M.H.S.A., Lead Research Associate, Social and Behavioral Analysis Division, University of Michigan Transportation Research Institute, Assistant Director, M–CASTL, 2901 Baxter Rd., Ann Arbor, MI 48109–2150.

Nina M. Silverstein, Ph.D. Professor and Program Director, Gerontology, College of Public and Community Service, University of Massachusetts Boston, 100 Morrissey Boulevard, Boston, MA 02125–3383.

Geri Adler, Ph.D., Assistant Professor, Graduate College of Social Work, University of Houston, 4800 Calhoun Rd., Houston, TX 77004.

Partner Agencies: University of Michigan Transportation Research Institute, University of Massachusetts, Boston, University of Houston.

General Description: It is not unusual for a person who has been diagnosed with early-stage Alzheimer's or other dementia to continue to drive. While some studies indicate that those in the earliest stages of dementia may retain their driving skills, others document older drivers with dementia who continue to drive even after being involved in crashes and near-crashes. Thus, while many persons with early stage dementia drive, their ability to drive safely, particularly as the disease progresses, remains unclear.

Those who want to know whether a family member who has been diagnosed with a form of dementia should continue to drive often turn to professionals including physicians, eye care specialists and retirement community personnel for guidance. These professionals may base their opinions on the driver's self assessment, the opinion of family members, or on the basis of a formal assessment. However, professionals, family members, and the drivers themselves may be unaware of the extent of declines in driving skills.

Recent advances in technology make it possible to automatically collect detailed information about driving performance. This technology can be used to monitor the driving behavior of individuals diagnosed with early stage dementia to provide practitioners with a better sense of how to monitor these drivers' changing skills. Moreover, the validity of drivers' self-assessments and those of family members could be investigated using in-vehicle data.

The primary objective of this project is to evaluate the feasibility of using existing in-vehicle technology to monitor a set of potentially hazardous driving behaviors common in persons with early stage dementia.

Excellence: What makes this project exceptional?

Research has plainly shown that individuals with dementia drive more poorly than drivers without dementia. Studies have identified several driving problems associated with dementia, including getting lost while driving, even in familiar areas, vehicle speed control

difficulties, particularly driving consistently below posted speed limits, failure to signal lane changes, failure to check blind spots before lane changes, failure to maintain lateral lane position, running stop signs, and failure to recognize and obey traffic signs and signals. None of this research, however, examined driving behaviors objectively under natural driving conditions. Some studies rely on the self-report of family members, while others rely on the observations of an evaluator who rides with the person in their vehicle. Family member reports can be unreliable, the family member is not always with the driver with dementia, and people with dementia can improve their driving somewhat, if they know they are being evaluated. This study will be the first to collect objective driving measures in this population during a everyday driving.

Significance: How is this research relevant to older persons, populations and/or an aging society?

According to the Alzheimer's Association, there is a new case of Alzheimer's Disease diagnosed every 72 seconds. Alzheimer's and related dementias are quite common in the older adult population. With the first baby boomer reaching age 65 in 2011 and all baby boomers being age 65 or older by 2029, there will be many older adults with dementia who will have mobility needs that need to be met. This project is a critical first step in studying the driving behaviors of this group of people, so that more effective driving evaluators, family members, health professionals, and others will have objective information on the driving skills that are declining for people with early-stage dementia.

Effectiveness: What is the impact and/or application of this research to older persons?

This project is designed to help all people who work with older adults become more aware of the how driving skills decline in people with dementia. By understanding how skills decline, more effective countermeasures can be developed to help maintain safe mobility for people with dementia. Ultimately, this research should help to identify those drivers who are no longer safe to drive while also allowing those who are safe drivers to continue driving even though they are experiencing memory impairments.

Innovativeness: Why is this research exciting or newsworthy?

This is the first project to use in-vehicle technology to objectively record the driving behaviors of people diagnosed with early-stage memory impairment (dementia). The project has other innovative features. First, the project developed a sensor-suite and computer system (collectively called a data-acquisition system, DAS) that can be installed in the person's own vehicle. This meant that the DAS needed to be versatile enough to handle the huge variation in vehicle designs. Second, the project needed to develop algorithms to convert the raw sensor data into measures of nearly 20 driving behaviors. While some of these algorithms had been developed in previous studies, this project required that new ones be developed. For example, one behavior that the researchers expected to find with the memory-impairment subjects was that subjects will get lost. Because this behavior is rare in non-memory-impaired people, the project had to develop a way to analyze global positioning system (GPS) data to yield trips where people got lost. Finally, the project had to develop a sophisticated subject recruitment system. The project needed to find people with a diagnosis of early-stage mem-

ory impairment, who have recently had their driving professionally evaluated and been cleared to drive; and who were willing to have the technology installed in their vehicle.

U.S. DEPARTMENT OF TRANSPORTATION: AGING LICENSING POLICIES

This study will examine how the various types of special screening and testing that State driver licensing agencies apply to older drivers affect older driver crash rate, licensing administration and older person quality of life.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: Richard D. Blomberg, President, Dunlap and Associates, Inc., 110 Lenox Avenue, Stamford, CT 06906–2300.

General Description: Some States attempt to screen out high risk older drivers (65+) using various administrative procedures and specific testing. This ongoing study focuses on assessing the effects of these licensing procedures on the crash rates of older drivers. The specific objectives of the study are to:

- Identify safety benefits and unintended consequences of licensing policies that are specific to older drivers.
- Conduct a process evaluation of driver license renewal policies and procedures that apply to the general public and those that apply specifically to older drivers across the United States.
- Collect information about licensing processes and procedures from each of the States as well as the District of Columbia.
- Select Special Emphasis States for a more comprehensive examination of general and older driver licensing procedures.
- Gather information from DMV officials, older drivers who have recently renewed their licenses and older adults who no longer drive in each of the Special Emphasis States.

Excellence: What makes this project exceptional?

This project is exceptional because it combines a scientific examination of the effect on crashes of various licensing policies for older drivers with a rigorous process examination of the way these policies are applied. A coordinated examination of outcome and process measures can facilitate identifying the mechanisms through which various State approaches work or whether ineffective implementation may be the reason for the absence of a safety benefit. The combination of a practical examination of the implementation of interventions with a fully coordinated crash-based assessment of safety benefit is unusual and should provide decision-makers with the best possible information.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The literature on prior research well establishes that the aging process can affect safe driving. Older drivers who are still safe, however, do not want to be denied the driving privilege simply because they reach a chronological milestone. The challenge is to develop and successfully apply performance-based criteria determining older driver fitness. This study will identify whether the current specialized licensing practices for the older driver as presently applied are effective as safety interventions, are accepted by

older drivers and licensing officials and can reasonably be implemented. As such, the results of this study will influence licensing policies with respect to older drivers for the foreseeable future.

Effectiveness: What is the impact and/or application of this research to older persons?

Older drivers want fair treatment. The literature indicates that they want to continue driving as long as they are safe and that they are willing to forego driving when their abilities are no longer capable of coping with the modern traffic environment. This research will quantify the effectiveness and consistency of application of some of the most widely used licensing interventions. The quantitative results this study will produce should allow all concerned to make data-driven and unemotional decisions with respect to licensing approaches for the older driver.

Innovativeness: Why is this research exciting or newsworthy?

The older population is growing and covets its mobility and independence. Crash studies show an increased rate of involvement as a function of age, but the effects are far from uniform. Licensing authorities and the older driver each need well-founded information upon which to base decisions concerning who should be prohibited from driving and how those prohibitions will be implemented.

Current licensing policies for older drivers have evolved based on general studies of the capabilities of older persons and the professional judgments of State officials. This study will not only examine multiple implementations of popular approaches, but will also assess the extent to which approaches are actually implemented and the reactions of older drivers and license administration personnel to them. This appears to be the first time that a crash-based assessment has been coupled with an in-depth process examination of older driver licensing policies. As such, the study will provide government decision-makers, advocates for the older person and older drivers themselves with better information to make informed decisions on older driver fitness.

U.S. Department of Transportation: Medical Conditions and Driving Abilities

This literature review summarizes forty years of research related to older driver safety. It focuses on how medical conditions affect driving skills and abilities. The report is a valuable compendium that can help driver licensing authorities, physicians, and policymakers make appropriate decisions related to older driver safety. This is the first report to thoroughly address these issues.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: Bonnie Dobbs, Associate Professor, University of Alberta.

Partner Agencies: Association for the Advancement of Automotive Medicine.

General Description: This report reviews the contribution of medical conditions and functional limitations (e.g., sensory, motor, or cognitive functioning) to motor vehicle crashes. It provides a comprehensive and up-to-date review of the international research lit-

erature on the effects of medical and functional conditions on driving performance. The report is divided into 15 sections (Introduction, Vision, Hearing, Cardiovascular Diseases, Cerebrovascular Diseases, Peripheral Vascular Diseases, Diseases of the Nervous System, Respiratory Diseases, Metabolic Diseases, Renal Diseases, Musculoskeletal Disabilities, Psychiatric Diseases, Drugs, The Aging Driver, and the Effects of Anesthesia and Surgery). Each section contains a brief overview of the condition/illness; prevalence information; a review of the medical, gerontological, and epidemiological literature relevant to the condition/illness, followed by current fitness to drive guidelines for the condition/illness from Canada and Australia. The Appendix presents preliminary guidelines for physicians to assess medical fitness-to-drive. The report is a scholarly but practical compendium that can serve as a valuable resource for physicians, rehabilitation practitioners, other allied health care professionals and educators, Department of Motor Vehicle personnel, road and traffic safety personnel, transportation planners, highway safety researchers, and public policymakers. Its value is particularly relevant as the driving population increases in size and age.

Excellence: What makes this project exceptional?

Because there will be an increase in the numbers of older drivers in the coming decades, it is important to understand the types of safety challenges facing this population and those with whom they share the road. A special concern is age-related illness and its potential to influence driving safety.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This report represents the first time that a compendium of medical conditions and driving has been compiled. The report presents findings that delineate the correlations between age-related illnesses and safe driving ability that can be useful for physicians dealing with older patients.

Effectiveness: What is the impact and/or application of this research to older persons?

This project promotes safety and older citizen mobility by providing crucial support for functional ability screening. It has been used as a starting point for an evidence-based review that was sponsored by the American Occupational Therapy Association, and for research in Canada and the U.S.

Innovativeness: Why is this research exciting or newsworthy?

The compendium fills significant knowledge gaps in our understanding of the relationships between medical conditions, functional abilities, and crash risks.

FEDERAL HIGHWAY ADMINISTRATION: SAFETY AND MOBILITY

The NHTS is a national survey of the American public that provides detailed travel volume and behavior information on older people that supports a wide range of safety, mobility, and travel demand applications.

Lead Agency: Federal Highway Administration, Office of Policy, Highway Policy Information.

Agency Mission: Enhancing mobility on our Nation's highways through national leadership, innovation, and program delivery.

Principal Investigator: Heather Contrino, Travel Surveys Team Leader, 1200 New Jersey Avenue, SE., Room E83–426, Washington, DC 20590.

Partner Agency: FHWA Office of Policy, FHWA Office of Safety, FHWA Research and Development, Federal Transit Agency, American Association of Retired Persons (AARP).

General Description: The National Household Travel Survey (NHTS) collects National, regional, and State level data on the characteristics of travel by the American public. The gathering and subsequent data analyses for older drivers are key components of the NHTS program. The NHTS provides detailed information aid in understanding and assessing mobility, accessibility, and safety for older Americans. The NHTS is used in research, policy, planning and engineering extensively throughout the transportation community including Federal, State and Local agencies, Non-profit organizations, and University researchers.

Specifically, the NHTS surveys the public on travel behavior, choices, and preferences, providing 40 years of trend data on the past, current, and forecasted travel demand and travel characteristics of older people. The study provides estimates of vehicle miles of travel (VMT) person miles of travel (PMT) on all modes of transportation, detailed trip characteristics including time of day, speed, distance, trip purpose, and vehicle occupancy, and vehicle information including mileage, make, model, year, and primary driver.

As the only source of data on travel behavior by people, NHTS data has been used extensively to support several older people safety and mobility programs and policies within and outside the Department of Transportation. In the 2001 NHTS our oldest driver was 102 years old. Most recently, the NHTS data was the core source of information for the 50-year forecast of travel demand by the aging population for the Policy and Revenue Commission.

Excellence: What makes this project exceptional?

The NHTS is an exceptional project because it provides a comprehensive measure of travel by older people on all modes of transportation and in all regions of the United States.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The NHTS Program is highly relevant to older persons now and in the context of an aging population due to the direct support of several planning and policy applications that are core to the Department's mission in providing safety and mobility for all Americans. These include:

- Exposure rates, both VMT and PMT, for safety measures,
- 40 Years of trend data on the travel volume and behavior of older people,
- Detailed vehicle/fleet data in the context of travel volumes and demographics for safety and mobility performance measurement and program development,
- Trip characteristics by age and gender which support short and long range forecasts of demand by older people as our society ages,
- Information on the non-traveling public provides measure of mobility for older people,

- Disability data and impacts on travel behavior provide information on barriers to travel, difficulties in driving, special transportation needs, and accessibility.

Effectiveness: What is the impact and/or application of this research to older person?

The NHTS program connects older people with travel behavior in the context of mode choice and vehicle characteristics so that effective programs and policies can be put into place to ensure mobility and safety of this large and important population group. In addition, the NHTS supports performance measurement of the system and for specific policies and programs. With the NHTS, DOT understands the travel needs of older people, can identify safety risk groups, and evaluate and institute effective programs that improve safety and enhance mobility.

Innovativeness: Why is this research exciting or newsworthy?

Baby boomer population is aging and the sheer size of the older person population over the next 10–20 years allows for a potentially great impact on travel demand and travel behavior, as they are a more mobile group that previous generations of older people. This research gives DOT the information and tools to be proactive in planning for the transportation needs and safety of older people as this population grows.

FEDERAL AVIATION ADMINISTRATION: AIR TRAFFIC CONTROL PERFORMANCE

Researchers analyzed operational error data among Air Traffic Control Specialists by age, found no difference in error rates, suggested that the current age limitations may not be necessary, and called for further research.

Lead Agency: Department of Transportation (DOT)—Federal Aviation Administration (FAA), Office of Aerospace Safety (AVS)—Office of Aerospace Medicine (AAM)—Civil Aerospace Medical Institute (CAMI)—Aerospace Human Factors Research Division (AAM–500).

Agency Mission: FAA: Federal Aviation Administrations mission is to provide the safest, most efficient aerospace system in the world.

Aviation Safety and the Office of Aerospace Medicine's mission is to enhance aerospace safety through surveillance, research, education, medical standards, and the prevention of illness and injury.

Principal Investigator: Dana Broach, Ph.D., Personnel Research Psychologist, FAA Civil Aerospace Medical Institute, P.O. Box 25082, Oklahoma City, OK 73125.

Partner Agency: FAA Human Factors Research and Engineering Group (AJP–61).

General Description: This study analyzed operational error data among Air Traffic Control Specialists above and below the age of 55. The results in indicated no difference in error rates, suggesting that the current age limitation may not be necessary. U.S. federal law requires that air traffic control specialists (ATCSs) hired after May 16, 1972 retire at age 56 on the premise that the risk of adverse events such as operational errors (OEs) increases with age (U.S. House of Representatives, 1971). OE count was modeled as a function of en route ATCS age and exposure to test that premise using Poisson regression. The odds of OE involvement for older

(age 56 and older) and younger (age 55 or less) ATCSs were equal. These results suggest that the rationale for mandatory retirement of controllers might need to be reexamined through continued research. While recognizing that the results called into question the safety benefits of the law, they acknowledge that policy change would require replication of their findings and extension of analyses to other sources of data. They also discussed the competition of changes in cognitive function with age to accrual of experience with change. As such, the research represents a good start towards balancing our desire to avoid unwarranted discrimination with our desire to prevent errors and safety concerns that may be associated with cognitive changes.

Excellence: What makes this project exceptional?

This project was exceptional in its authors' recognition of Operation Error data potential to address aging effects and the careful conceptual approach taken to interpreting the data. The opportunity to examine the impact of aging on error frequency was presented by the age limitation decision by Congress in 1971. The authors made use of operational error data collected by the Air Traffic Organization to examine possible age effects. Their interpretation of findings was appropriately limited to the dataset, but asked some fundamental questions about aging and suggested possible policy reassessment.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The work is relevant to an aging society because it questions the impact of known trends in cognitive performance with age upon job performance. It suggests that while tactically-oriented cognitive speed and flexibility decreases with age may be accompanied by some degree of strategic compensation—experience may lead controllers to prevent situations that would require novel or speedy tactical interventions. Were this finding further validated, it would cause us to reassess most policies providing for firm age limits for a job category in favor of more individual-assessments of cognitive function, leading to a potentially more fair set of decisions.

Effectiveness: What is the impact and/or application of this research to older persons?

The impact of the research has been limited, however, in that follow up activities were not sponsored or funded within the agency.

Innovativeness: Why is this research exciting or newsworthy?

The research is worthy of recognition because it challenges how we think about age limitations in air traffic control. The error data, at least, does not support our current policy. This calls for further reassessment. The authors' thoughtful interpretations call for more fundamental research about how controllers perform their jobs as they age.

U.S. Department of Transportation: Clearview Highway Improvement

The Clearview font allows agencies to meet the needs of older drivers, with regard to the legibility of guide signs, without an increase in the size and cost of the signs. In August 2004, the FHWA issued interim approval for the use of the Clearview font for positive contrast legends on guide signs.

Lead Agency: U.S. Department of Transportation/Federal Highway Administration (FHWA).

Agency Mission: Improve mobility on our Nation's highways through national leadership, innovation, and program delivery.

Principal Investigator: Carl K. Andersen, Roadway Team Leader, Office of Safety Research & Development, Federal Highway Administration, HRDS–05, 6300 Georgetown Pike, McLean, VA 22101.

Partner Agency: Texas Department of Transportation, Pennsylvania Department of Transportation.

General Description: The Clearview highway sign font was developed through a decade of research starting in the early 1990s. Clearview font letters were developed to address four issues with the legibility of standard highway sign alphabets:

(1) upgrade highway signing word messages to accommodate the needs of older drivers without increasing the overall size of the signs;

(2) improve word pattern recognition;

(3) improve the speed and accuracy of destination recognition and the distance at which a sign can be read; and

(4) control halation (glow that makes letters become unrecognizable blobs) that may occur on high brightness retroreflective materials for drivers with reduced contrast sensitivity.

The concept for an improved highway sign font was developed by Meeker & Associates, Inc., in response to the determination by the FHWA that guide signs using the standard highway sign alphabets would have to be increased in size to meet the needs of older drivers. The initial research on Clearview was conducted at the Pennsylvania Transportation Institute (PTI). In two PTI studies, the use of an early version of Clearview Bold improved nighttime sign reading distances by up to 16 percent when compared to the E-modified road sign typeface. An initial study at the Texas Transportation Institute (TTI) found that there were significant differences in the legibility of full-size signs as compared to the smaller signs tested at PTI. Meeker & Associates, Inc. made refinements to the Clearview font that were used in additional joint FHWA/TxDOT studies conducted by TTI.

A TTI study on nighttime sign legibility as a function of retroreflective material and sign font found that the refined Clearview font provided an 11 to 12 percent increase in legibility distances for guide signs using Clearview. Both the Pennsylvania and Texas Departments of Transportation reviewed the research on the use of Clearview font for guide signs and requested that Clearview font be allowed for use on positive contrast guide signs.

Excellence: What makes this project exceptional?

This project is exceptional because the results allow agencies to meet the nighttime guide sign legibility needs of older drivers without a need to increase the physical size of the signs. Increasing the sign size would potentially have resulted in a need to redesign and replace sign support structures. In many cases, larger signs are not feasible, as the existing signs are already 12 feet in width.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Development and evaluation of Clearview font demonstrated that the nighttime legibility requirements of older drivers could be met without the need to increase the size and cost of overhead guide

signs. Without these results, it would have been difficult, if not impossible, for agencies to meet this need. The results are a significant improvement in the ability of the national highway signage system to meet the needs of older drivers, thereby improving their mobility and potentially improving safety by permitting all drivers to acquire information in a timely manner.

Effectiveness: What is the impact and/or application of this research to older persons?

The FHWA has issued interim approval for the use of Clearview font on positive contrast guide signs, which permits agencies to install signs that meet the nighttime visual requirements of older drivers.

Innovativeness: Why is this research exciting or newsworthy?

The development and evaluation of the Clearview font was a cooperative venture by a private company, two transportation institutes, two State Departments of Transportation, and the FHWA. Meeker & Associates, Inc. saw a national need that the company felt uniquely capable of fulfilling, and initiated work with the Pennsylvania DOT and PTI. The results of the initial evaluations prompted the FHWA and Texas DOT to fund research at TTI to complete the evaluation of the first alternative highway sign font developed in the U.S. in the last 50 years.

U.S. DEPARTMENT OF TRANSPORTATION: PEDESTRIAN SAFETY

Lead Agency: U.S. Department of Transportation, Federal Highway Administration.

Agency Mission: FHWA is charged with the broad responsibility of ensuring that America's roads and highways continue to be the safest and most technologically up-to-date.

One of our Six Life Saving Strategies is to Reduce Roadway-Related Pedestrian Deaths, which account for 12% of all roadway fatalities and a disproportionate number of the deaths of youthful and elderly crash victims: We encourage a systematic approach to community safety, including comprehensive programs to increase awareness of pedestrian safety issues; to provide pedestrian safety training; to improve roadway designs to more safely accommodate pedestrian needs; and to emphasize the need for pedestrian safety planning by MPOs and other planning organizations.

Principal Investigators: David Harkey, Director, University of North Carolina, Highway Research Center, 730 Martin Luther King, Jr. Blvd., CB# 3430, Chapel Hill, NC 27599–3430.

Tom Granda, PhD., Research Psychologist, Turner-Fairbank Highway, Research Center, 6300 Georgetown Pike, McLean, VA 22101.

Beth Alicandri, Director, FHWA Office of Safety Programs, 1200 New Jersey Ave., SE., Washington, DC 20590.

Gabe Rousseau, PhD., FHWA Office of Environment, 1200 New Jersey Ave., SE., Washington, DC 20590.

F. E. (Gene) Amparano, P.E., Safety Engineer, FHWA Resource Center, Safety & Design Technical Services Team, 901 Locust Street, Suite 466, Kansas City, MO 64106.

Gail Holley, Safe Mobility for Life Program and Research Mgr., Florida Department of Transportation, State Traffic Engineering and Operations Office, 605 Suwannee Street, M.S. 36.

Tom Welch, PE, State Transportation Safety Engineer, Iowa Dept. of Transportation, 800 Lincoln Way.

Partner Agency: National Highway Traffic Safety Administration.

General Description: In 1998 the Federal Highway Administration published the first edition of the Older Driver Highway Design Handbook. The original guide provided practical information to transportation professionals about designing roadways and traffic signals to improve safety for older drivers. In 2001, FHWA released a revised edition and broadened the scope to include other road users, namely pedestrians. It is now called the Highway Design Handbook for Older Drivers and Pedestrians. The 2001 Handbook provided detailed design recommendations and provided literature reviews to show the research basis for these recommendations. For example, the Handbook provides recommendations for roadway signs to ensure that older drivers can see them from an appropriate distance. Although the Handbook itself is not a set of standards, many of the recommendations in it have subsequently been incorporated in roadway and traffic signal design standards. A third version of the Handbook is currently being developed. The Handbook has been and continues to be a popular and important resource for transportation professionals who are trying to ensure that our growing population of older adults will have safe transportation options. The Handbook helps us address important societal issues including roadway safety and independent living.

The FHWA also offers a 1-day training workshop to thoroughly review the recommendations and guidelines contained in the Highway Design Handbook for Older Drivers and Pedestrians. Interactive methods are used to help participants fully understand the changes that occur with aging. It provides information and demonstrations of the effects of aging on vision, range of motion and cognition; goes over the information in the handbook; and provides hands-on exercises with real world case studies to allow participants to apply what they have learned.

Modifications to the roadway system are identified that can make it easier for older drivers and all drivers. Case studies are used during the workshop. The workshop is designed primarily for practicing highway and traffic engineers responsible for highway design and operations, and over 3,000 transportation professionals have attended the workshop since it began.

Demographic trends indicate that Americans are living longer. This is certainly good news, but the trends require that we examine how to ensure that Americans can maintain independence and quality of life in their senior years. Perhaps the key aspect of independence in our country pertains to transportation. In many communities independence is synonymous with being able to drive. As we grow older we experience age-related changes in our vision, hearing, and cognition and these changes can make it harder to safely walk or drive on our roadways. In 2006, older adults comprised about 14 percent of all traffic fatalities even though they represent only 12 percent of the population. Transportation researchers and practitioners are trying to ensure that older Americans can travel safely by using their knowledge of age-related ability changes to revise standards for roadways and traffic signs and signals. In 1998, the Federal Highway Administration published

the first version of what is now called the Highway Design Handbook for Older Drivers and Pedestrians. The original Handbook and the more recent 2001 version have been a key resource for roadway designers and other transportation professionals. Because of the popularity of the previous Handbooks, it is currently being revised once again to incorporate new research findings. The Handbook has been the premier source of information for recommending design practices to accommodate older drivers and pedestrians. In addition, many of these recommendations have been incorporated into Federal transportation standards such as the Manual on Uniform Traffic Control Devices.

The Handbook is a synthesis of research pertaining to older road users. What is unique about it is how it takes a wide range of research findings and incorporates them into a single document in order to develop recommendations for roadway situations that pose increased risk for older adults. Some of these situations include intersections, work zones, and roadway curvature and passing zones. Based on the analysis of the research, the Handbook presents recommendations on roadway design features (e.g., the recommended font size on roadway signs). One of the unique aspects of the Handbook is that for each recommendation, the authors examined how these recommendations compare or contrast for different standards that transportation professionals rely on for designing roads and traffic control devices (such as roadway signs). The intent is to unify these sometimes disparate standards.

The aim of the guide is to improve safety for older adults but it is likely that road users of all ages and abilities will benefit from recommendations in the Handbook. Because the Handbook will continue to be revised in the future, it can be updated as new research emerges. New recommendations can be developed and we will be able to examine roadway safety statistics to determine what challenges older adults still experience.

U.S. Department of Transportation: Visual Field Loss

This project compared drivers with visual field loss to those with normal vision on driving scenarios at the National Advanced Driving Simulator. Participants with visual field loss showed more variance in maintaining the driving lane on curves, when leaving the simulated freeway, and when responding to peripheral information.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigators: Linda Boyle, Ph.D., Principal Investigator, Department of Mechanical and Industrial Engineering, University of Iowa, Iowa City, Iowa 52242–1320; Matthew Rizzo, Department of Neurology, College of Medicine, University of Iowa, Iowa City, Iowa 52242–1320; Mark Wilkinson, Department of Ophthalmology and Visual Sciences, College of Medicine, University of Iowa, Iowa City, Iowa 52242–1320.

General Description: Vision is clearly essential for safe driving. Deterioration in vision through normal aging, as well as from eye diseases such as cataracts and macular degeneration has been shown to be a major contributing factor in changes in driving strat-

egies and performance. Drivers, however, may not always compensate for their deterioration appropriately, resulting in higher crash risks.

The goal of this study was to use the National Advanced Driving Simulator (NADS) to compare driving performance in participants with peripheral visual field loss (VFL) and those with normal vision. NADS is a high fidelity simulator that simulates the visual, auditory and haptic feedback one would experience during real world driving. The driving task was designed to capture compensatory behaviors in drivers with VFL such as increased head movements, eye scanning patterns, and mirror use in addition to driving performance measures in the simulator.

The results from this study indicate that, while VFL and Control participants' performance was similar in most tasks, there were a few significant differences in driving performance measures between the groups. Participants with VFL exhibited some difficulties with lane maintenance on curves and when departing the freeway as well as a delay in responding to the vehicle incursion, an unanticipated hazard that originated in the periphery during the simulator driving task.

Excellence: What makes this project exceptional?

This project suggests a safety risk for driving for people with a reduced field of vision. The study identifies several driving conditions (curves, exit ramps) where drivers with VFL may be at increased risk.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Deterioration in vision through normal aging is a major contributing factor in changes in driving strategies and performance. Drivers may not always compensate for their deterioration appropriately resulting in higher crash risks. Understanding the degree to which visual field loss impairs driving will be helpful to older drivers.

Effectiveness: What is the impact and/or application of this research to older persons?

This research provides preliminary information about how visual field loss may impact the safe driving of older people.

Innovativeness: Why is this research exciting or newsworthy?

This research uses advanced simulator technology to examine how older drivers who have certain visual impairments that reduce the useable visual field perform on simulated driving tasks. Findings from this study will be used to build a taxonomy of driving scenarios that may increase crash risk, and suggest countermeasures to compensate for visual loss.

U.S. Department of Transportation: Functional Ability and Crash Risk

This project identified screening tools that can be used in an office-based setting to determine whether a driver might be at risk for crashing. Results revealed that a focus on functional ability rather than age was an effective way to examine crash risk. Recommendations for driver licensing policy reflect the importance of functional ability in assessing fitness to drive.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: Loren Staplin, Principal, TransAnalytics, 1722 Sumneytown Pike, Kulpsville, PA 19443, 215–855–5830, *lstaplin@transanalytics.com*.

Partner Agencies: Maryland Motor Vehicle Administration.

General Description: This research project studied the feasibility as well as the scientific validity and utility of performing functional capacity screening with older drivers. A Model Program was described encompassing procedures to detect functionally impaired drivers who pose an elevated risk to themselves and others; to support remediation of functional limitations if possible; to provide mobility counseling to inform and connect individuals with local alternative transportation options; and to educate the public and professionals about the link between functional decline and driving safety-all within a larger context of helping to preserve and extend the mobility of older persons.

Early in this project, a questionnaire was developed and distributed to Driver License Administrators in the U.S. and Canada to broadly determine cost and time parameters, while identifying legal, ethical, or policy implications that could influence implementation of Model Program activities. Subsequently, a battery of functional tests was developed and pilot tested in Motor Vehicle Administration sites, and in the community. A database of scores on functional ability measures, driving habits information, and crash and violation history was created for over 2,500 drivers in three samples drawn from license renewal, medical referral, and residential community populations. Cost estimates for functional capacity screening and related Model Program activities were developed for research and production settings. A set of guidelines for motor vehicle administrators was also produced to update the 1992 publication by NHTSA and AAMVA of the same title.

Excellence: What makes this project exceptional?

This research project is exceptional because it changed the dialogue within the Department from age-based testing to functional-ability based testing. The pivotal nature of this shift is reflected in all subsequent NHTSA research projects and in research conducted by outside organizations.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The change in perspective to functional abilities influences the 29 million currently licensed drivers not only in their dealings with their state's driver licensing authorities, but with their medical providers, social services providers, and law enforcement officers.

Effectiveness: What is the impact and/or application of this research to older persons?

The findings from this investigation have been incorporated into educational materials for all of the people who help determine if an older driver is safe.

Innovativeness: Why is this research exciting or newsworthy?

By shifting the thinking about safety from age to ability, we have the opportunity to help older drivers stay behind the wheel as long as they are safe to do so.

U.S. DEPARTMENT OF TRANSPORTATION: INFRASTRUCTURE SAFETY

In March 2008, a team of nine transportation safety, traffic engineering, and human factors experts from the U.S. visited Australia and Japan to evaluate infrastructure improvements designed to aid older road users. The scan tour members sought policy options and initiatives regarding transportation system planning, operations, and design as they relate to older road users. The information obtained during the trip identified several planning, design, and operational changes which could be implemented in the U.S. to improve the mobility and safety of older road users.

Lead Agency: U.S. (U.S.) Department of Transportation (DOT), Federal Highway Administration (FHWA).

Agency Mission: FHWA is charged with the broad responsibility of ensuring that America's roads and highways continue to be the safest and most technologically up-to-date.

Principal Investigators: Elizabeth Alicandri (Co-Chair), Director, Office of Safety Programs, FHWA, HSSP, E–71, Room 310, 1200 New Jersey Avenue, SE., Washington, DC 20590–9898; Pamela Hutton (Co-Chair), Chief Engineer, Colorado Department of Transportation, 4201 East Arkansas Avenue, Room 262, Denver, CO 80222.

Partner Agencies: Federal Highway Administration, Florida Metropolitan Planning Organization Advisory Council, Missouri Department of Transportation, Texas Transportation Institute, University of North Carolina Highway Safety Research Center, and West Virginia Department of Transportation.

General Description: In March 2008, a team of nine transportation safety, traffic engineering, and human factors experts from the U.S. visited Australia and Japan to evaluate infrastructure improvements designed to aid older road users. The scan tour members sought policy options and initiatives regarding transportation system planning, operations, and design as they relate to older road users. The group met with state and federal government transportation officials, University research centers, and staff from motorists' clubs and other non-governmental organizations interested in the mobility of older people. Although the primary focus of the scan was on infrastructure improvements, the team also learned about policies for older road user training, assessment, and licensing. In addition, general road safety programs were discussed with all agencies visited. The majority of these programs provided a benefit to older road users although they may not have been designed specifically with this user-group in mind. The converse of this is true as well; programs and policies developed for older road user safety and mobility will improve transportation for all users. The information obtained during the trip identified several planning, design, and operational changes which could be implemented in the U.S. to improve the mobility and safety of older road users.

Major issues of interest included the following:

- Infrastructure-based international best practices that improve safety and mobility for older road users that could be applied in the near term on U.S. roadways.
- Policy approaches to improving infrastructure to better meet the needs and capabilities of older road users.

• Transportation planning policy initiatives to address mobility of older citizens in terms of land-use, transit, and other alternatives to driving. Policy approaches to improving older driver assessment, licensing, and training.

• Safety research collaboration opportunities between international and U.S. transportation research centers.

• Ways to improve U.S. and international practices for long-term transportation planning for older road users.

Excellence: What makes this project exceptional?

This effort is part of a national program that allows transportation experts in the U.S. the opportunity to meet with and discuss the major roadway infrastructure design and operational issues that are particularly related to the older road user. It further provides a sound basis for evaluating the potential effectiveness of the foreign best practices and lessons learned in regard to the application of those findings to older road users in the U.S.

Significance: How is this research relevant to older persons, populations, and/or aging society?

FHWA has a multitude of programs that are devoted to the integration of older road user needs involving the full spectrum of transportation systems. However, the focus of this project was primarily on the implementation of infrastructure improvements for older road users. Many countries, including the U.S. and Australia, have published documents detailing how the physical, perceptual, and cognitive changes associated with aging affect a person's ability to use the existing transportation system. These documents include recommendations for improvements to infrastructure and operations to address the needs of older road users, but few have reported on the successful implementation of these recommendations. This project also investigated policy initiatives regarding transportation system planning, operations, and design as they relate to older road users. The role of older road users in road safety programming, funding, prioritization and evaluation were also discussed with all of the governmental agencies.

As a recent GAO report notes, knowledge sharing between the U.S. and other countries can help the U.S. prepare for the coming increase in the proportion of older road users as the baby boom population moves toward retirement in the coming years.

Effectiveness: What is the impact and/or application of this research to older persons?

The success of this international scan can be measured by the number of ideas brought back to the U.S. and translated into strategies that will improve safety and mobility for older road users. The following is a tentative list of items that will be further studied for implementation in the U.S.

Enhancement of U.S. Roadway Design and Operations Practice:

Integrate the knowledge of infrastructure improvements from Australia and Japan into relevant U.S. documents and training programs.

Outreach to Non-Government Organizations:

Further the development of partnerships between government agencies, such as departments of transportation and health, and between government and non-government organizations to address the needs of older road users.

Targeted Research Program:

Develop a research program on policies and interventions targeted at older road users. The scope of program should cover evaluation of specific interventions aimed at improving safety and mobility for older road users, development of new procedures and tools to aid practitioners in making decisions, and sharing of information on best practices through synthesis documents and professional conferences.

Establish Development Guidelines:

Develop planning and land development guidelines for congregate housing and related transportation facilities and services that are intended to meet the growing needs older populations and older road users. The guidelines would be developed to assist local governments and the development community in the planning and retrofitting of existing facilities, as well as to assist local governments in their evaluation of land development proposals as it relates to older populations and older road users. The proposal could become a joint venture research project to be cooperatively developed by national transportation and land development organizations.

Innovativeness: Why is this research exciting or newsworthy?

Application of innovative and successful ideas used in Australia and Japan.

Establish a dialogue between older road user experts in the U.S. and Australia and Japan.

Sharing of findings with transportation experts and practitioners in state DOTs, academia, industry, and transportation associations.

U.S. Department of Transportation: Medications and Crash Risk

This study examined medical insurance databases to show the relative frequency of various combinations of medications used by drivers who had a motor vehicle crash, analyzing the impairing effects of multiple medications, drug interactions, and drug-disease interactions on motor vehicle crashes for persons 50 years and older.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: Aida A. LeRoy, Iatrogen, LLC, World Gate IV, Suite 500, 12801 World Gate Drive, Herndon, VA 20170.

General Description: The main objectives of this study were to determine the relative frequency of various combinations of medications used by those who have experienced a motor vehicle crash and those who have not by analyzing proprietary and non-proprietary databases; and to conduct a case-control study of possible associations between the use of medications (and combinations thereof) and motor vehicle crashes among older drivers.

The results of the study revealed an association between the kinds and number of medications used by older adults and the risk of involvement in a motor vehicle crash. Drugs known to have an impairing effect on the driving ability of older drivers were the most commonly used by older adults who had been involved in crash. The case control analysis suggested an association between

crashes and many potentially driver impairing (PDI) medications, diseases, and various combinations of drugs and diseases.

Study subjects taking any medication were found to be 1.43 times more likely to be involved in a crash than older adults taking no medications. Compared to patients taking no PDI medications, those taking one or two PDI medications were 1.29 times more likely to be involved in a crash and that risk increased to 1.87 more likely in patients taking three or more PDI medications. The risk for patients with one or two PDI diseases was 1.49 times greater than that for older adults without any PDI diseases. Three or more PDI diseases further increased the risk for crash involvement to 2.20 times that of older adults with no PDI diseases. Drug interactions were also associated with a statistically significant increased risk of crash involvement (odds ratio of 1.47 for 1–2 drug interactions and 1.92 for patients with 3 or more drug interactions).

The results of this analysis suggest that both the kinds and number of medication exposures, and the characteristics of diseases/disorders present among study subjects may predict an increase in risk for crashes among older adults. By demonstrating a potential link between multiple drug therapies and crash involvement, this study highlights the need for a more thorough examination of the relationships between drugs, diseases, and the older driver, and the factors affecting aging adults and driving ability.

Excellence: What makes this project exceptional?

This is the only available report that provides current data on prescription medication use and its relationship to vehicle crashes.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This report provides valuable information to drivers about the potentially impairing effects that combinations of certain medications and illnesses have on the ability to drive safely. Older adults are more likely to take multiple prescription medications past the age of 50.

Effectiveness: What is the impact and/or application of this research to older persons?

The results of this research point to the need to develop educational programs to increase awareness among health care providers and older drivers about the potential driver impairing effects of pharmaceutical use.

Innovativeness: Why is this research exciting or newsworthy?

This research names drug classes and illnesses that are common to older drivers that are potentially dangerous when combined with the driving task. Data come from large medical databases.

U.S. Department of Transportation: Airline Passenger Health

To address the concerns of age and health-compromised airline passenger population, the FAA, Harvard university, and the Boeing Company collaborated to evaluate the physiological effects of normal cabin pressure on a passenger population that included both healthy and less than healthy older subjects.

Lead Agency: Department of Transportation (DOT)—Federal Aviation Administration (FAA), Office of Aerospace Safety (AVS)—office of Aerospace Medicine (AAM).

Agency Mission: Federal Aviation Administration's mission is to provide the safest, most efficient aerospace system in the world.

Aviation Safety and the Office of Aerospace Medicine's mission is to enhance aerospace safety through surveillance, research, education, medical standards, and the prevention of illness and injury.

Principal Investigators: John D. Spengler, Ph.D, Harvard University, School of Public Health, 677 Huntington Avenue, Boston, MA 02115; Dennis Burian, Ph.D, AAM–600, FAA Civil Aeromedical Institute, P.O. Box 25082, Oklahoma City, OK 73125.

Partner Agencies: Air Transportation Airliner Cabin Environment Research (ACER) Center of Excellence program, The Boeing Company, Harvard University School of Public Health, FAA Civil Aeromedical Research Institute, AAM–600.

General Description: The demographics of the US flying population show that airline passengers are rapidly getting older and increasingly have significant health problems. To address the concerns of age and health in the passenger population, the FAA (CAMI), Harvard University and the Boeing Company collaborated under the FAA Center of Excellence (COE) for Airliner Cabin Environment Research (ACER) program to evaluate the physiological effect of normal cabin pressure (7,000 ft altitude) on a passenger population that included both healthy and less than healthy older subjects. This project evaluated subjects older than 55 years of age and included three test groups: a normal group, a group that had implantable cardiac defibrillators (ICD group) and a group of heavy smokers. The medical condition of the subjects and the extensive physiological evaluation of the subjects made this program one of the most complex ever conducted at the Civil Aerospace Medical Institute.

Excellence: What makes this project exceptional?

The study group represents a flying population for which little data regarding the risk of flight in commercial aircraft has been gathered. It is the first altitude study that addressed the health effects of cabin pressure on older passengers with cardiac and respiratory disease.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The demographics of the US flying population show that airline passengers are rapidly getting older and increasingly have significant health problems. Flight in commercial aircraft typically exposes passengers to oxygen levels commensurate with 6,000 to 8,000 ft altitudes. Previous studies of altitude exposure have been performed at higher altitudes and/or used subjects of a relatively young age. This study is investigating the effects of cabin altitude exposure on 55- to 80-year-old groups of subjects, healthy subjects with little overall health impairment, cardiac patients with implanted defibrillators, and smokers without other overt clinical symptoms.

Effectiveness: What is the impact and/or application of this research to older persons?

Data gathered during the study includes changes in physical measurements from prolonged periods of being seated, physiological changes reflected in oxygen saturation, pulse and respiration rates, plasma and serum markers for organ function, cytokine markers of inflammation, and intracellular changes measured by

gene expression analysis. Cognitive test data and mood/sleepiness surveys are also being collected to assess neuropsychological effects of mild altitude exposure. The results of the research will provide guidance to passengers relative to commercial air travel.

Innovativeness: Why is this research exciting or newsworthy?

The research complexity has not been accomplished in past-related research and has never addressed the physiological aspects of older and health-compromised passengers.

The functional genomics scientific field defines the future of aerospace medicine.

U.S. DEPARTMENT OF TRANSPORTATION: THE PHYSICIAN'S GUIDE

The Physician's Guide is a tool for medical professionals to use to help their patients understand whether they are safe drivers. It provides office-based screening tools, information on the linkages between medical conditions, functional ability, and crash risk, and information on referring drivers to each state's driver licensing authority. The goal is to help drivers maintain their ability to drive safely, and to transition appropriately when they can no longer drive.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: Joanne Schwartzberg, American Medical Association, 515 N State Street, Chicago, IL 60610.

Partner Agency: American Medical Association.

General Description: The Physician's Guide to Assessing and Counseling Older Drivers was created by the American Medical Association (AMA) with support from the National Highway Traffic Safety Administration (NHTSA) to help physicians address preventable injuries—in particular, those injuries incurred in motor vehicle crashes. Currently, motor vehicle crashes are the number one cause of injury-related deaths in the 65–74 age group. While traffic safety programs have been successful in reducing the fatality rate for drivers under the age of 65, the fatality rate for older drivers has consistently remained high. Physicians are in a position to address and correct this problem. By providing effective health care, physicians can help their patients maintain a high level of fitness, enabling them to preserve safe driving skills later in life and protecting them against serious injuries in the event of a crash. By adopting preventive practices—including the assessment and counseling strategies outlined in this guide—physicians can better identify drivers at increased risk for crashes, help them enhance their driving safety, and ease the transition to driving retirement if and when it becomes necessary. Through the practice of medicine, physicians have the opportunity to promote the safety of their patients and of the public. The goal of the Physician's Guide to Assessing and Counseling Older Drivers is to forge a link between public health and medicine, and to provide doctors with the tools and information they need to advise their patients about safe driving.

Older drivers and their families consistently identify physicians as the most credible source for information related to a person's ability to drive. Unfortunately, physicians have not historically had

the tools to comfortably assist older patients in making a determination about driving. This Guide provides physicians with advice on how to screen a driver, how to counsel a driver on maintaining their driving abilities and to document conversations about driving. Developed with the American Medical Association, the Guide brings their medical expertise and methods regarding functional abilities and screening to an educational tool that promotes to physicians having conversations with their patients about safe driving. Thousands of physicians from around the world have been trained on the use of the guide. Teams from multiple states have brought driver licensing and state medical societies together to promote the use of the guide. In FY 2008, AMA and NHTSA have renewed their support for the Guide and are issuing a revision. The partners are also developing a computer-based course designed to train medical residents on the use of the Guide. By using the Guide, physicians can help countless older drivers stay safer, longer.

U.S. DEPARTMENT OF TRANSPORTATION: PILOT HEALTH STUDY

The FAA Aeromedical Research Program has included the study of diseases such as atrial fibrillation and diabetes that increase with age and their significance in aviation safety. The research provides the basis for ensuring the opportunity for aging pilots to continue to fly safely.

Lead Agency: Department of Transportation (DOT)—Federal Aviation Administration (FAA)—Office of Aviation Safety (AVS)—Office of Aerospace Medicine (AAM)—Civil Aerospace Medical Institute (CAMI)—Aerospace Medical Research Division (AAM–600).

Agency Mission: FAA: Federal Aviation Administrations mission is to provide the safest, most efficient aerospace system in the world.

Aviation Safety and the Office of Aerospace Medicine's mission is to enhance aerospace safety through surveillance, research, education, medical standards, and the prevention of illness and injury.

Principal Investigator: Estrella M. Forster, Ph.D., Aerospace Research Scientist, FAA CAMI, P.O. Box 25082, Oklahoma City, OK 73125.

Partner Agency: FAA CAMI Aerospace Medical Education Division (AAM–400), National University of Colombia School of Medicine.

General Description: Insulin is required to move glucose into cells where it can be metabolized. Diabetes is a disease in which the body is dysfunctional in the production or use of insulin. While still under investigation, both genetics and environmental factors appear to contribute to the development of the disease. The International Diabetes Federation projects the worldwide incidence of diabetes to climb from 5.1% in 2003 to 6.3% in 2025. It also estimates that the world adult population (age 20–79 yr.) will be 5.3 billion by 2025. By then, 333 million people will have diabetes. This figure signifies an increase from 2003 of 1.2% in the prevalence of world diabetes. The highest prevalence of diabetes is in the North American Region, expected to reach 9.7% by 2025. In 2005, more than 9,000 diabetic pilots were certificated by the Federal Aviation Administration (FAA) medical certification process.

Atrial fibrillation (AFIB) is an abnormal heart rhythm characterized as irregular, disorganized, electrical activity of the upper

chambers (atria) of the heart. The atria quiver instead of regularly beating which causes them to move around 300–600 times a minute (instead of 60–80 times a minute). Because the upper chambers are quivering so rapidly, the blood is not allowed to completely empty and causes pooling in the atria. Atrial fibrillation affects approximately 2.2 million adults in the United States and is the most common sustained heart rhythm disturbance observed in clinical practice. The rate of atrial fibrillation increases with age, from <1% among persons aged <60 years to approximately 10% among persons aged ≥80 years. Civil aviators with AFIB may, after the appropriate examination and follow-up, receive a special FAA medical issuance to enable flying status. By 2003, 2,446 diabetic pilots were certificated by the FAA medical certification process.

Worldwide aeromedical specialists have made significant changes in the criteria for allowing individuals with diabetes and atrial fibrillation to pilot aircraft. The progress that continues in the treatment of these diseases (medications, insulin pumps, tissue/organ transplantation), the monitoring of diabetes (glycosylated hemoglobin, glucometers), and improved diagnostic classification of the same (types 1 and 2), promise to push the frontiers of safety concerns in the future. With the rapid worldwide increase in the prevalence of diabetes, especially type 2 diabetes, along with an increase in the population age, more individuals with diabetes will be entering the aviation system as pilots, flight crew, air traffic controllers, and passengers. Likewise, the incidence of atrial fibrillation will increase as the pilot population ages with time. Each group of individuals with these conditions can affect safety in aviation. Factors that are of interest to assess the potential risk to aviation implied by these diseases have included the progression of the condition, associated pathologies, medications, flight experience, and accident/incident events if any experienced throughout the pilot's career. Thus, the aerospace medicine specialist will be relied upon to make wise, scientifically based decisions that ensure aerospace safety while simultaneously allowing individuals with diabetes or atrial fibrillation to have the maximum latitude to participate in aerospace activities.

Excellence: What makes this project exceptional?

The civilian pilot population is aging. Specific diseases such as atrial fibrillation and diabetes increase dramatically with age. Civilian pilots with these medical problems have been considered a risk for flying because of the potential for sudden in-flight incapacitation associated with the disease, associated co-morbidity, and treatment. This research project has allowed the FAA to develop an understanding of aging pilots with the diseases and verify the medical certification decisions that can allow them to fly longer and simultaneously ensure safely.

Significance: How is this research relevant to older persons, populations and/or an aging society?

More than half of the 16 million Americans estimated to have diabetes are over age 60. Of those over age 65, almost 1 in 5 has diabetes, mostly type 2. According to the American Diabetes Association, approximately 18.3% (8.6 million) of Americans age 60 and older have diabetes. The prevalence of the disease increases with age; an estimated 50% of all diabetes happens in those aged 55 and older. The risk of developing type 2 diabetes also increases with

age. Atrial fibrillation affects approximately 2.2 million adults in the United States and is the most common sustained heart rhythm disturbance observed in clinical practice. The rate of atrial fibrillation increases with age, from <1% among persons aged <60 years to approximately 10% among persons aged ≥80 years. Over the last 23 years there has been a continuous decline in the size of the population of civil aviation pilots as well as an increase in age of both male and female pilots. To maintain this pilot population and ensure their medical certification as well as their optimum flight performance, this research was conducted to increase our understanding of aging and its relationship to medical conditions that may render a pilot unable to safely continue his or her flying activities. As a pilot grows older medical problems that include atrial fibrillation and the current epidemic of type 2 diabetes become extremely important to understand so as to assess the potential risk to aviation implied by these diseases. The information gained from this line of research effort will expand the FAA's understanding these diseases and will assist in medical certification decision-making processes involving the U.S. aging pilot population.

Effectiveness: What is the impact and/or application of this research to older persons?

This research increases the opportunities for pilots in both private and commercial aviation to continue the safe participation in flying as they age, even when medical problems associated with aging are present. Diseases that have a greatly increased frequency with increasing age and were once totally disqualifying can now be carefully managed through proper fact-based medical certification that ensures individual and public safety. The cardiac problem of atrial fibrillation is a growing public health problem especially in our aging population. The incidence of atrial fibrillation in the United States currently is estimated at 2.3 million with a projection to increase to 5.6 million by 2050. Atrial fibrillation is associated with increased risk of stroke, heart failure, cognitive dysfunction, and premature death and has enormous socioeconomic implications. Glucose tolerance progressively declines with age, and there is a high prevalence of type 2 diabetes and the potential for sudden incapacitation associated with diabetes, its co-morbidity, and its treatment. Such problems are of specific concern for flight safety, especially with a pilot population that is increasing in age. Medical certification decision making in aging pilots with problems that increase with age is challenging but armed with fact-based research knowledge continued optimum flight performance of aging pilots can be accomplished while meeting the aviation safety goals of the agency.

Innovativeness: Why is this research exciting or newsworthy?

The FAA is making it possible for the pilots in our aging population to enjoy and earn a living flying for more years, even with disease processes (such as cardiac disease and diabetes that increase as humans age) and to do it safely. The development and utilization of the unique FAA Scientific Information System strengthens the National Aerospace System's medical research infrastructure and advances collaborative data collection efforts. The research represents the first aerospace medical research that integrates several fields of study relative to toxicology, biochemistry, medicine, accident investigation, functional genomics, and sophisti-

cated bioinformatics' data analysis methods. The SIS unique database and analysis system enables the comprehensive review of almost 20 million electronic medical records from 2.5 million pilots who were issued medical certificates between 1983 and 2005 and demonstrates a successful application of Safety Management Systems concepts. The research results provide the required fact-based knowledge to make aging pilot medical certification decisions that ensure safety while expanding the aging and disease related envelope.

U.S. Department of Transportation: Medications and Driver Safety

This project examined the driving safety of older adults who take multiple medications, comparing Occupational Therapists' driving assessments with in-vehicle video recordings of daily driving by older adults to assess safety risk.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: Loren Staplin, TransAnalytics, LLC, 1722 Sumneytown Pike, Box 328, Kulpsville, PA 19443.

Partner Agency: University of North Carolina Highway Safety Research Center.

General Description: The use of medications and multiple medications becomes more prevalent with increasing age. This pilot study explored the relationship between polypharmacy and driving functioning through separate but related research activities. A patient-level administrative claims database containing prescription information as well as E-codes identifying the incidence of motor vehicle injuries was mined, yielding combinations of drugs that became inclusion criteria in a field study of driver performance among 44 older adults (range: 57 to 89; mean: 79). Measures included driving performance evaluations by an Occupational Therapist/Certified Driving Rehabilitation Specialist, a brake response time measure, and functional screening measures for the study sample, whose drug profiles were documented through a "brown bag" review by a licensed pharmacist. Descriptive data summaries and regression analyses examined the relationship between medication usage and each of these outcome measures.

Additional project activities included a current (to October 2007) review of the literature on the prevalence of prescription medications and effects on driving of specific drugs and drug classes. The feasibility of conducting future studies using large, administrative claims databases was critically examined, with an overview of candidates and evaluation of their suitability for NHTSA research.

Excellence: What makes this project exceptional?

This project developed a methodology to examine the effects that talking multiple medications has on the ability of older adults to drive safely. Combinations of medications were selected using a patient-level administrative claims database linked to crash codes.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This study provides a potential alternative methodology for assessing driver functionality by using in-vehicle video cameras that collects objective driving behavior information to examine how these drivers perform under daily driving conditions.

Effectiveness: What is the impact and/or application of this research to older persons?

This research provides important information to older drivers on the risks associated with taking certain medications and driving and for older driver specialists such as Occupational Therapists or Certified Driver Rehabilitation Specialists who may be conducting remedial driver training.

Innovativeness: Why is this research exciting or newsworthy?

This research uses in-vehicle technology to examine how older drivers taking multiple medications drive under their normal daily conditions and compares it to how they drive during a driving assessment administered by an occupational therapist. There are differences in how they drive under these circumstances.

U.S. DEPARTMENT OF TRANSPORTATION: DRIVER SELF SCREENING

This project developed and tested a self-screening instrument for older drivers focused on health concerns that affect driving. It found the instrument useful as a first-tier screening tool for drivers 75 and older.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA).

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: David W. Eby, Research Associate Professor and Head, Social and Behavioral Analysis Division, University of Michigan Transportation Research Institute, 2901 Baxter Road, Ann Arbor, MI 48109–2150.

Partner Agency: University of Michigan.

General Description: The purpose of this project was to improve upon existing self-screening instruments for older drivers by focusing entirely on "health concerns" that affect driving—that is, the symptoms that people experience due to medical conditions, the medications used to treat them, and the general aging process. The objective was to create an easy-to-use self-screening instrument. The instrument identifies health symptoms experienced by the driver that relate to declines in driving abilities, and provides individualized feedback to the driver about those health conditions and what can be done to continue driving safely. The study included a literature review, deliberations by an expert panel, instrument development, and an evaluation/validation study.

The literature review generated a list of health concerns that might influence driving and a list of critical driving skills. The expert panel finalized the lists of health concerns and critical driving skills to include in the instrument; discussed how severity levels of the health concerns influence critical driving skills; and considered the content of the self-screening instrument's feedback. Based on earlier project activities, 27 health concerns and 15 critical driving skills were included in the instrument.

Results of the validation study showed that drivers who had a greater number of health concerns as identified by the self-screen-

ing instrument also tended to have poorer observed driving performance. In addition, drivers who had a greater number of health concerns as identified by the instrument also tended to have greater deficits in driving-related abilities as identified by an occupational therapist. These relationships were true only for subjects 75 and older, not for those 65–74.

Excellence: What makes this project exceptional?

It is well-established that aging can lead to declines in perceptual, cognitive, and psychomotor functions. Accurately assessing declines in driving abilities and relating them to increased crash risk has been a goal of traffic safety professionals for many years. This project provides promising self-screening driving ability tools.

Significance: How is this research relevant to older persons, populations and/or an aging society?

There are several benefits of self screening: reluctant drivers may be more willing to assess their own driving abilities than to be professionally assessed; people may discover declines at an earlier stage; and self screening instruments can reach a wide variety of people because such instruments are easily distributed.

Effectiveness: What is the impact and/or application of this research to older persons?

This project provides five types of individualized feedback for drivers: general awareness of how certain health concerns can affect driving; self awareness about individual health concerns and driving skills that may be declining; individualized recommendations for behavioral changes to maintain safe driving; individualized recommendations for further evaluation; and individualized recommendations for vehicle modifications to maintain safe driving.

Innovativeness: Why is this research exciting or newsworthy?

The results of this project suggest that the instrument may be a useful and valid self-screening instrument for older adult drivers 75 and older.

U.S. Department of Transportation: Improving Our Nation's Transportation System

The FHWA has revised the national standards for traffic signs, signals, and markings to require these devices to be bigger, brighter, more conspicuously located, and more appropriately operated, in order to better meet the unique needs of older people.

Lead Agency: U.S. Department of Transportation/Federal Highway Administration (FHWA).

Agency Mission: Improve mobility on our Nation's highways through national leadership, innovation, and program delivery.

Principal Investigator: Hari Kalla, MUTCD Team Leader, Federal Highway Administration, HOTO–1, 1200 New Jersey Avenue, SE., Washington, DC 20590.

General Description: FHWA is helping to improve the nation's transportation system so that our increasingly older population can safely travel and maintain productive and independent lifestyles well into their senior years. With increasing age, older persons often find driving more hazardous and difficult as a result of vision problems, cognitive limitations, side effects of medications, slower reaction times, muscular difficulties, and other causes. Older citizens also tend to walk at a slower pace and will continue to face challenges in crossing busy streets and highways on foot.

The FHWA is responsible for developing and regularly updating the Manual on Uniform Traffic Control Devices (MUTCD). Traffic control devices are the signs, signals, pavement markings, and other features that regulate, warn, and guide the traveling public as they traverse our Nation's most vital asset—its transportation system. Serving such a critical role requires a uniform set of cues to travelers so that those devices appear the same no matter where people travel throughout the United States. The MUTCD is, by law, the national standard governing all traffic control devices installed by State and local jurisdictions on all streets and highways open to public travel. With efforts that started in 2001 and are continuing through the present, the FHWA has revised the MUTCD standards to better serve the needs of older drivers and pedestrians by increasing the visibility of traffic control devices, improving advance notification of traffic situations and roadway patterns, and simplifying decision making at intersection and interchange approaches.

In 2003, the FHWA issued a new edition of the MUTCD to include a variety of new requirements designed to aid older drivers and pedestrians. These included larger lettering on street name signs to enhance readability, required use of advance street name signs that inform drivers of upcoming intersections, timing of pedestrian signals to provide longer times for pedestrians to cross, introduction of optional pedestrian countdown signal displays to inform pedestrians of the number of seconds left to complete crossing the roadway, and many other traffic control device enhancements.

In 2008, the FHWA initiated rulemaking to make further changes to the MUTCD aimed at enhanced safety and mobility for older citizens. One such change is a proposed increase in the sizes of many signs to meet the legibility needs of drivers with 20/40 corrected vision, the minimum in most states to obtain or keep a driver's license. Based on research showing better understanding by older drivers, a new, clearer diagrammatic guide sign design featuring an upward arrow above each lane has been proposed for standard use in some complex highway situations. Also, a slower walking speed is proposed for timing pedestrian crossing signals, to better accommodate the increasing numbers of slower-walking individuals, including wheelchair users. The FHWA has also proposed to change the existing option of using pedestrian countdown displays to a requirement for use with all pedestrian signals.

Excellence: What makes this project exceptional?

This project is exceptional because of its far-reaching effects in upgrading the safety and convenience of older people as drivers and as pedestrians. No other single project can claim to have such direct, everyday positive impacts on the mobility of older persons.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This project is relevant to all of the many millions of older persons who drive or walk as a part of their daily lives. The signs, signals, and markings older drivers and pedestrians rely on for their safe and convenient mobility have been and continue to be enhanced to better meet the needs of older persons and the physical effects of increasing age, such as declining vision, reaction times, and walking speeds.

Effectiveness: What is the impact and/or application of this research to older persons?

The FHWA has revised the standards to increase the visibility of traffic control devices, improve advance notification of traffic situations and roadway patterns, simplify decision making at intersection and interchange approaches, and provide more time and better information to pedestrians to aid their ability to cross streets. By upgrading the nation's standards for traffic control devices, our increasingly older population can safely travel and maintain productive and independent lifestyles well into their senior years.

Innovativeness: Why is this research exciting or newsworthy?

This project is newsworthy and exciting because of the far-reaching, direct impacts on the vast majority of the increasing population of older people who wish to maintain their mobility as drivers and pedestrians.

U.S. Department of Transportation: Taxonomy Project for Excellence

A Taxonomy Table will be developed that cross-references driver performance errors to age-related functional deficits, providing new insights into risk factors for older drivers. This will be augmented with evaluations of behavioral countermeasures to reduce crash risk for this group.

Lead Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA)

Agency Mission: Save lives, prevent injuries and reduce economic costs due to road traffic crashes through education, research, safety standards and enforcement activity.

Principal Investigator: Loren Staplin, Ph.D., TransAnalytics, LLC, 1722 Sumneytown Pike, Box 328, Kulpsville, PA 19443.

Partner Agency: University of North Carolina Highway Safety Research Center.

General Description: The project's objectives are to identify risky behaviors, driving habits, and exposure patterns that have been shown to increase the likelihood of crash involvement among seniors, and to classify these crash contributing factors according to a set of underlying functional deficits specific to or more prevalent among older people. Deficits may result from normal aging, age-related medical conditions, or medication use. A further goal is to identify and critically examine behavioral countermeasures with the potential to mitigate functional loss and/or diminish the occurrence of risky behavior(s)—and thus ameliorate crash problems among older drivers.

The centerpiece of this project will be the development of a Taxonomy Table that captures critical relationships between topics and subtopics highlighted in the project literature review and crash database analysis (FARS and GES). This table is expected to contain entries describing:

- Risky driving behaviors/driving errors associated with older driver crash involvement;
- Operational factors and conditions under which driving errors are most likely to occur;
- General and specific functional deficits that have been identified as underlying causes of driving errors and crash risk;

- Behavioral countermeasures that have been developed to address specific functional deficits and/or associated risky behaviors;
- Countermeasure evaluations, where they exist.

Age-related functional losses in specific vision, cognition, and physical abilities that have a demonstrated relationship to increased crash risk for older drivers will be listed. These will be followed by the driving behaviors identified in the database analysis and literature review that are associated with increased crash risk in this population.

Excellence: What makes this project exceptional?

The continuing growth of the older driver population dictates a need to revisit and expand upon the base of knowledge documenting older drivers' functional declines in the abilities needed to drive safely. Contemporary investigations into factors contributing to older driver crashes, together with an update of research describing how age-related functional changes translate into specific driving errors, will provide valuable input to evaluations of the effectiveness of existing behavioral countermeasures and to the development of improved strategies to enhance older driver safety and mobility in the future.

Significance: How is this research relevant to older persons, populations and/or an aging society

This project is exceptional because its main product, the Taxonomy Table, will be a resource that provides at-a-glance, state-of-the-knowledge practical and research-based information to assist researchers, health care practitioners, and others concerned about older drivers to identify particular risk factors, and what can be done to reduce the risk.

Effectiveness: What is the impact and/or application of this research to older persons?

Equipping individuals with strategies and tactics to help them safely negotiate problem situations should enhance older driver safety and mobility.

U.S. Department of Veterans Affairs: The Oregon Brain Aging Study

The Oregon Brain Aging Study focuses on healthy brain aging to determine factors that may confer resistance to cognitive decline in aging. "Average healthy" oldest old were found more resistant to dementia at advanced age than those "exceptionally healthy.

Lead Agency: U.S. Department of Veterans Affairs (VA), Veterans Health Administration (VHA).

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: William Goldberg, PhD, 810 Vermont Ave NW., Washington DC 20420.

Partner Agency: National Institutes of Health/National Institute of Aging (NIH/NIA)

General Description:

OREGON BRAIN AGING STUDY

The Oregon Brain Aging Study is a longitudinal study focused on factors associated with healthy brain aging. Current research ques-

tions are directed toward establishing biomarkers of brain aging protection associated with a recently identified, resistant to cognitive decline phenotype among the oldest old, and determining how these biomarkers map to rates or trajectories of functional decline prior to the emergence of dementia. Finally, the study ultimately focuses on establishing whether the resistive phenotype of cognitive decline and brain aging is associated with distinct neuropathology.

Subjects enrolled in the longitudinal aging study are followed semiannually with standardized clinical, cognitive and volumetric Magnetic Resonance Imaging (MRI) to mark the trajectories of the healthy aging cohorts who are more or less resistant to developing mild cognitive decline. The accelerated atrophy associated with incipient cognitive impairment will be tracked with annually obtained biomarkers that have been shown to be associated with relevant age-related neuropathology in elderly subjects. Subjects will be followed to autopsy. Post mortem examination will be used to correlate common age-associated pathologies (e.g., neuritic plaques, neurofibrillary tangles, micro infarcts) with rates of volume loss established with Magnetic Resonance Imaging, as well as the change in peripheral biomarkers.

Standardized clinical examinations and psychometric tests are used to identify trajectories of cognitive and functional change over time. Volumetric Magnetic Resonance Imaging is used to measure the rates of atrophy characterizing subjects destined to develop cognitive impairment compared to those relatively resistant to decline. Biomarkers of plasma amyloid, antioxidant stress (F2-isoprostanes), vascular disease and brain damage (24S-hydroxycholesterol, plasma lipids, homocysteine) are measured annually and examined for their change relative to MRI established brain atrophy and cognitive decline. Post mortem brain examination will follow a standardized histopathological protocol and the coding system of the National Alzheimer's Consortium.

Findings/Progress to Date: A cohort of average healthy oldest old have been discovered to paradoxically be more resistant to developing dementia at advanced age relative to an exceptionally healthy age-matched group. This suggests a human aging phenotype associated with the phenomenon of hormesis where chronic, non-lethal stressors may precondition the brain to be more capable of resisting insults than naïvely aging brains. Those relatively resistant to cognitive decline have a two phase acceleration of age-associated brain loss (on MRI) prior to developing cognitive decline such that there is a long premonitory period of accelerating loss followed by a more rapid phase of volume loss occurring approximately 2–3 years prior to apparent cognitive decline. This newly identified trajectory provides the opportunity to map plasma biomarkers as they emerge over time to detect signals of possible mechanisms associated with the earliest stages of neurodegeneration leading to cognitive decline. To date, plasma biomarkers have been collected on 96 individual subjects and are undergoing assay analysis.

Excellence: What makes this project exceptional?

Following a group of initially healthy aging subjects over time with semiannual standardized clinical examinations and psycho-

metric tests that are used to identify trajectories of cognitive and functional change.

Significance: How is this research relevant to older person, populations and/or an aging society?

This study will establish the different characteristics of neuropathology in two groups of healthy oldest old patients, those that do and do not develop dementia.

Effectiveness: What is the impact and/or application of this research to older persons?

This study will establish biomarkers in blood that may predict early stages of neurodegeneration leading to cognitive decline. The identification of these biomarkers, in aged individuals with and without the development of dementia, may also provide insights to the mechanism(s) that contributes to the normal and abnormal brain aging.

Innovativeness: Why is this research exciting or newsworthy?

To date, there are no reliable blood biomarkers that can predict the development of dementia. With the identification of these biomarkers, it will be possible to identify individuals in the very early stages of the development of dementia. Early diagnosis is important for physicians to identify treatable causes of dementia, to effectively manage dementia and related illnesses, and to offer support services to the patient and family.

U.S. Department of Veterans Affairs: Risk Factors for Cardiovascular Diseases

A sedentary lifestyle, high calorie-fat diets and genetic susceptibility increase obesity, diabetes and cardiovascular disease risk with aging. These can be modified by disease-specific exercise and dietary interventions to improve health and function in the elderly.

Lead Agency: Department of Veterans Affairs.

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: Andrew P. Goldberg, M.D., Director, Baltimore GRECC, Baltimore VA Medical Center, Geriatrics Service/GRECC (BT/18/GR), 10 N. Greene Street, Baltimore, MD 21201–1524.

Partner Agency: University of Maryland, Veterans Health Administration, Baltimore Geriatric Research, Education and Clinical Center.

General Description: Aging research at the Baltimore VA GRECC examines the hypothesis that physiological declines in cardiovascular and metabolic function that accelerate cardiovascular disease (CVD) risk are predominately related to the influence of genetic susceptibility, a sedentary lifestyle and obesity–and that these can be effectively modified by exercise and dietary interventions. Research designed to modify CVD risk investigates (1) the effects of exercise and weight loss on CVD risk, (2) genetic predictors of disease, and (3) functional and health outcomes of structured exercise in chronic stroke. A multidisciplinary team leverages resources from six National Institutes of Health (NIH) and VA centers of excellence to conduct patient-oriented translational research and clinical trials in genetics, exercise and low-calorie feeding that translates basic science research into clinical practice to improve the health, function and quality of life in older Americans.

Our research demonstrates that structured exercise and diet interventions modify fundamental biological processes that underlie diabetes and obesity in advancing age. GRECC researchers examine the molecular, cellular and genetic mechanisms by which fat produces inflammatory proteins and muscle accumulates fat in type 2 diabetes and obesity, and how these disease processes are reduced by exercise and weight loss. The clinical translation exercise and weight loss program in the VA—Managing Obesity for Veterans Everywhere (MOVE!) improves exercise capacity, functional performance and body composition to reduce diabetes and CVD risk. Research studies examining the molecular, genetic and physiologic basis of these improvements allow translation of basic mechanisms and novel rehabilitation techniques into effective treatment, prevention and rehabilitation modalities.

Researchers examine the genetic and environmental causes of adult onset diabetes in the genetically homogeneous "Founder Old Order" Amish population, ideal for studies of CVD-related diseases. The Amish are as obese as the U.S. population, but have half the prevalence of type 2 diabetes due to high levels of physical activity. Amish subjects who are genetically susceptible to weight gain reduce risk of obesity through physical activity, suggesting genetic risk of obesity is modifiable through healthy lifestyle choices. We have been able to identify several common gene variations that are associated with diabetes and metabolic syndrome. Extensions of these genetic studies have identified new genes for hypertension, hyperlipidemia, uric acid, and glucose levels that are under exploration in other US populations at high risk for CVD.

Stroke results in chronic impairments in walking and balance that limit functional independence and physical activity, even years after conventional rehabilitation care. This increases risk for diabetes and recurrent stroke. We developed a model of "task-oriented" treadmill training that facilitates recovery of walking by activating subcortical brain networks, while providing aerobic exercise to improve cardiovascular health and fitness in chronic stroke. This program improves glucose metabolism to reduce diabetes risk and reverse its prevalence in over half of exercising subjects. Hence, treadmill training offers a new approach for rehabilitation of older stroke victims that improves their health and function, and decreases the risk for diabetes and recurrent stroke.

Excellence: What makes this project exceptional?

This program is exceptional because it provides a unique interface between basic science and clinical medicine to advance knowledge into new approaches for the diagnosis and treatment of CVD risk factors and disability conditions prevalent in older people. There is an enriched environment of interdisciplinary collaboration in "bench to bedside" research among GRECC investigators that examines the cellular, molecular and genetic mechanisms by which lifestyle interventions reduce CVD risk and improve functionality. This in turn prevents obesity and diabetes-associated CVD and stroke-associated disability. The conceptual model posits that multiple physiological systems and genes interact to determine the long-term cardiovascular health and functional independence of older individuals. This multidisciplinary approach leverages resources across multiple NIH and VA centers of excellence to bring a basic science outlook to the design of novel structured physical

activity and exercise rehabilitation interventions. Our goal is to prevent and treat diabetes, cardiovascular disease and disability conditions to promote recovery in older Americans living with chronic diseases and disability.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Aging and a sedentary lifestyle are associated with an increasing prevalence of overweight and obesity. These place older adults at greater risk for the development of diabetes, CVD, functional impairments and disability. Innovative research that translates interventions to the community will increase physical activity and promote weight loss. This has the potential to decrease morbidity and mortality and improve quality of life in older adults with chronic CVD. GRECC genetic research demonstrates the value of genetic screening to identify susceptibility to disease. It also identifies who are most likely to experience health benefits from exercise and diet interventions. This will advance the science of rehabilitation research in aging, leading to new discoveries to identify, prevent and treat disease to reduce risk for frailty and prolonged disability requiring long-term care. Our programs provide hope and empower older Americans living with diabetes, CVD and stroke to combat their chronic disability and improve their health and well-being through exercise and dietary lifestyle modification.

Effectiveness: What is the impact and/or application of this research to older persons?

Our exercise training models are highly effective in improving cardiovascular fitness, strength and muscle mass, and glucose regulation to reduce CVD risk in older Americans living with diabetes, obesity and stroke. We thereby are enhancing the maintenance of functional independence even years after diagnosis. Routine clinical management of older adults with obesity, diabetes, CVD risk factors and disability associated with stroke do not provide resources for sustained or disease-specific exercise or nutritional interventions that are needed to improve long-term health outcomes in the elderly. Our research shows a synergy between exercise and dietary interventions to optimize CVD risk modification for diabetes, obesity and aging-related disability conditions. This research provides data for evidence-based translation into the clinical setting to develop national guidelines for disease, disability and age-specific exercise and dietary recommendations for older Americans.

Innovativeness: Why is this research exciting or newsworthy?

GRECC researchers have presented novel findings at the Institute of Medicine that task-oriented treadmill training which combines "motor learning" with aerobic exercise mediates brain plasticity to enhance mobility function, while improving fitness and reversing diabetes in older chronic stroke patients, even decades after the stroke. In 2008, these findings will be incorporated in National Academies of Science, Evidence-Based Guidelines for Physical Activity for All Americans. These guidelines requested by the Secretary for Health and Human Services, include the evidence for effectiveness of physical activity in aging, chronic diseases including diabetes and obesity, and disability including stroke, will form the basis for new models of care.

Genetic screening may allow us to target disease-specific interventions to subjects most likely to respond with improvements in

functional performance and cardio metabolic health, even older people with multiple chronic medical comorbidities and stroke. GRECC scientists investigate basic science mechanisms at the cellular and molecular level for these physiologic adaptations. This will generate new knowledge and technologies to provide the scientific foundation and rationale for the incorporation of disease-specific exercise and dietary approaches for the prevention and treatment of CVD and related disabilities into clinical practice.

U.S. Department of Veterans Affairs: Brain Monitoring Research

This research is defining how to monitor and classify the brain dysfunction that occurs in 70 percent of critically ill patients, determining its epidemiology in the aging population at risk for ICU admission, and the role that sedatives and analgesics play in causing these debilitating deficits.

Lead Agency: U.S. Department of Veterans Affairs.

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: Kenneth Shay, DDS, MS, Director of Geriatric Programs, Office of Geriatrics and Extended Care (114), Department of Veterans Affairs, 810 Vermont St., NW., Washington, DC 20420.

Partner Agency: Alliance for Aging Research (AFAR), John A. Hartford Foundation, National Institutes of Health; National Institute on Aging (NIH/NIA), Veterans Health Administration, Tennessee Valley VA Health Care System.

General Description: This research is the outgrowth of an unmet need in critical care medicine regarding the exceedingly common occurrence of (a) delirium (acute brain dysfunction) among patients, predominantly of advanced age, treated in intensive care units (ICU) and (b) the associated long-term cognitive impairment that occurs in over half of ICU survivors. Every day, over 40,000 ICU patients in the United States alone are suffering from delirium. This problem is getting larger every year due to the aging of the population and the immense growth of critical care beds. Traditionally, ICU delirium was called "ICU Psychosis," and professionals had erroneously not thought it to be clinically significant.

Using clinical tools designed and validated through the VA Geriatric Clinical Research Education Clinical Center (GRECC) and at Vanderbilt University, the ICU Delirium and Cognitive Impairment Study Group (www.icudelirium.org) has now shown that delirium is associated with a tripling of the risk of death within 6 months of ICU admission. They have further shown that delirium occurs in about 50 to 80 percent of ICU patients. Even considering other factors such as age, severity of illness, duration of coma, and the use of psychoactive medications, every day spent in delirium by ICU patients was associated with a 10 percent higher risk of death and a 35 percent increased risk of long-term cognitive impairment among survivors. The occurrence of ICU delirium is also associated with dramatically higher hospital costs of over $25,000 U.S. dollars per patient when comparing those with mild vs. severe courses of delirium, and this doesn't include the added costs and family burden of having patients unable to return home due to the ongoing neuropsychological deficits that we are finding in the majority of

younger and especially older survivors. We are only now learning about the relationships between the ICU delirium and the longer-term neuropsychological problems that plague ICU delirium survivors.

Awareness of these issues is reaching a tipping point among the medical and lay community. Thousands of ICUs around the world are now implementing routine bedside monitoring of all ICU patients for arousal levels and delirium based on the above mentioned facts. In addition, there is growing interest in post-ICU specialty clinics to help patients and families deal with the unique constellation of acquired problems involved in returning to a functional and whole human being. The tools available from this research (e.g., a sedation scale called the Richmond Agitation-Sedation Scale (RASS) and a well-validated and easy to conduct delirium instrument called the Confusion Assessment Method-ICU (CAM-ICU), as well as a new "wake up and breathe ABC sedation protocol" that is proven to save 1 life for every 7 patients so treated) have been translated into over 14 languages and international guidelines have recommended delirium monitoring as standard of care. Ongoing clinical trials are now exploring the safest and most effective ways to prevent and treat ICU delirium in hopes that treatment will not only reduce delirium but also the high morbidity and mortality associated with it.

Excellence: What makes this project exceptional?

Every day, 30,000 to 40,000 people in ICUs are suffering from delirium with potential devastating, long-lasting effects on how their brain will work and a higher chance of death. Once doctors and nurses in the ICU are aware of this problem, they can look out for it, perform simple bedside tests and take steps to reduce or maybe prevent it. The longer a person is delirious, the more likely they are to die.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Critical Care Medicine is a young field of Medicine, with early ICUs in this country appearing in the 1960s and not routinely being available in most hospitals until the 1970s. Survival rates for many critically ill conditions have shown striking increases, even without evidence of clinical trials of specific therapies showing objective benefits. Many more critically ill patients are now surviving and, in the last decade, it has become clear that these survivors of critical illness have a burden of illness that was previously unrecognized. This was first demonstrated by studies of the self-assessed quality of life in ICU survivors. Initially this finding was puzzling as the function of the failing organ resulting in critical illness often (usually) returned to normal or near-normal. This has been best studied in patients with acute lung injury (often only the most prominent and most severe clinical manifestation of multiple organ failure) where lung function returns to normal or near normal within 6 months whereas significant decrements in health-related quality of life persisted for years.

Subsequent work has demonstrated that the most severe abnormalities in these critical illness survivors are in three related areas: neurocognitive deficits; psychological disorders (depression, post-traumatic stress disorder and other anxiety conditions); and neuromuscular abnormalities. We call this the post-ICU syndrome.

Again, in the case of acute lung injury patients, a careful study showed that the majority of patients at one year following ICU discharge had neuropsychological abnormalities and 100 percent had significant neuromuscular complaints accompanied by objective findings. It would be difficult to over-exaggerate the magnitude of this problem; it is clearly one of public health importance. One of the major issues is that no medical discipline has owned this problem and taken responsible action on it. Although it came to light largely through the efforts of critical care investigators, critical care physicians rarely follow these patients once they leave the ICU. Primary care physicians, who will be following the great majority of these victims, are almost completely unaware of these abnormalities and they usually go unrecognized. Finally, rehabilitation specialists and psychiatrists have not been aware of these morbidities nor involved in their evaluation or management in any meaningful and organized way.

Effectiveness: What is the impact and/or application of this research to older persons?

This work will define the approach over the next 30 to 40 years to preserving the minds of the millions of older patients who plan to live productive and functional lives well into their 80s and 90s but who, along the way, will have to sustain care in an ICU for some length of time as they overcome an unexpected critical illness.

Innovativeness: Why is this research exciting or newsworthy?

In summary, the problem of post-ICU syndrome is one of public health proportions, has enormous clinical, economic and societal consequences, and yet the problem is largely unrecognized or is being ignored by the medical community. This is a problem which is ripe for attention and intervention, and yet interventions are not going to be funded through the NIH RO1 mechanism. The science of each of the components of the morbidity is not mature, an intervention would by necessity be complex, and preliminary data regarding interventions are lacking; combined, these result in a kiss of death for conventional NIH funding mechanisms, ensuring that the problem will continue over decades. A fresh, innovative, necessarily "high-risk" approach is required to jump start therapeutic solutions to this immense health problem.

U.S. Department of Veterans Affairs: Reducing the Risk of Dementia

This work explores the relationship between insulin resistance and the development of cognitive impairment and dementia in older adults. The team now is examining therapeutic strategies for reducing the risk of dementia and reducing cognitive impairment.

Lead Agency: U.S. Department of Veterans Affairs (VA), Veterans Health Administration (VHA), Veterans Affairs Puget Sound Health Care System.

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: Suzanne Craft, Ph.D., Associate Director, Geriatric Research, Education and Clinical Center, Veterans Affairs Puget Sound Health Care System, Professor of Psychiatry and Behavioral Sciences, University of Washington School of Medicine, GRECC S–182, VAPSHCS, 1660 South Columbian Way, Seattle, Washington 98108.

Partner Agency: National Institute on Aging.

General Description: Dr. Craft's research program examines the relationship between Alzheimer's disease and insulin resistance, a condition in which insulin does not work efficiently, leading to diabetes, obesity, and cardiovascular disease. In one set of projects her lab investigated the specific mechanisms through which insulin resistance affected pathology related to Alzheimer's disease. Older adults received infusions of insulin designed to mimic insulin resistance, and then underwent spinal taps to measure levels of proteins thought to cause Alzheimer's disease. High insulin levels caused temporary increases in levels of these toxic proteins and markers of inflammation that have been linked to Alzheimer's disease, illustrating an important relationship between insulin resistance and Alzheimer's disease. In an ongoing study, we are examining the effect of low fat and high fat diets on Alzheimer's disease markers in older adults and patients with Alzheimer's disease. This study will provide important data about environmental factors that can modulate the risk of developing Alzheimer's disease. In other studies, we have examined how treatments for insulin resistance have therapeutic benefit for patients with Alzheimer's disease. In a pilot study, medications used to treat patients with Alzheimer's disease were shown to benefit patients with Alzheimer's disease. In a second study, overcoming insulin resistance by providing insulin directly to the brain with a special nasal administration device resulted in improved memory and attention in patients with Alzheimer's disease. A larger clinical trial is now underway to determine whether long-term intranasal administration of insulin can benefit patients with Alzheimer's disease. Thus, her research projects have focused on important disease mechanisms that have yielded novel therapeutic approaches for this challenging disease.

Excellence: What makes this project exceptional?

These interrelated projects address important questions: How do insulin resistance and diabetes increase the risk of developing Alzheimer's disease and other dementias? Once potential mechanisms have been identified that appear to play a role in this risk, what therapies might be effective to improve the symptoms of Alzheimer's disease, or perhaps even delay or prevent its development?

Significance: How is this research relevant to older persons, populations and/or an aging society?

The importance of these questions is underscored by the current pandemic of conditions associated with insulin resistance, such as obesity, diabetes, hypertension and cardiovascular disease. The proliferation of these conditions, in the context of a rapidly aging society, may significantly increase the prevalence of dementia.

Effectiveness: What is the impact and/or application of this research to older persons?

This area offers one of the few potential approaches to preventing or at least delaying the onset of dementia, by diagnosing and treating insulin resistance prior to its onset.

Innovativeness: Why is this research exciting or newsworthy?

The approach used to address these questions is innovative, working with safe yet informative experimental models of insulin resistance in human patients that are then translated into novel therapies. The innovativeness of this work has been recognized by

the National Institute of Aging, who awarded a MERIT grant for excellence in aging research to Dr. Craft. The newsworthiness of this work has been acknowledged in a number of media reports, and as well as through its inclusion in an upcoming HBO series on Alzheimer's disease in March 2009.

U.S. DEPARTMENT OF VETERANS AFFAIRS: REACH VA

REACH VA is an effective intervention to decrease dementia caregiver stress and improve the management of dementia patient behaviors that can be implemented throughout the VHA system and in community health care settings.

Lead Agency: Department of Veterans Affairs.

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: Pauline Sieverding, MPA, JD, PhD, Scientific Program Manager, Health Services Research and Development, 810 Vermont Ave., NW., Washington DC 20420.

Partner Agency: National Institute on Aging (NIA), National Institute of Nursing Research (NINR).

General Description:

RESOURCES FOR ENHANCING ALZHEIMER'S CAREGIVERS HEALTH (REACH) VA

In 2000, 4.5 million individuals in the United Stated had Alzheimer's disease. Currently, informal caregivers provide the majority of care for those with dementia, on average 16–20 hours/day. As part of Congressional funding for caregiver assistance pilot programs to provide needed training and resources for caregivers who assist disabled and aging veterans in their homes, VHA funded REACH VA as a clinical translation of the successful Resources for Enhancing Alzheimer's Caregivers Health (REACH II) study. REACH II, funded by the NIA and the NINR, was the first national randomized clinical trial of a behavioral intervention to decrease stress and burden for racially and ethnically diverse dementia caregivers. The REACH VA program translates the REACH II intervention into clinical practice, which is the goal of research.

The REACH VA intervention provides education, a focus on safety for the patient, support for the caregiver, and skills building to help caregivers manage difficult patient behaviors and decrease their own stress. It includes 12 individual sessions in the home and by telephone, and five telephone support groups over six months. Across the country, 24 Home Based Primary Care (HBPC) programs, which treat frail dementia patients and their caregivers in the home, are participating, providing the intervention as part of clinical care to families and patients. VA Medical Center at Memphis serves as the coordinating center for this program, providing training to the clinical sites, certification of staff to provide the intervention, and evaluation of the results.

The goal of REACH VA is to implement an effective intervention to decrease caregiver stress and improve the management of patient behaviors throughout the VHA system. REACH VA is being discussed as an option to provide services to caregivers participating in VHA Adult Day Health Care. Specific objectives include: (1) improve emotional well-being and depression, burden, health,

social support, and management of patient dementia-related behaviors for family caregivers of dementia patients; (2) decrease health care utilization, including unanticipated admissions, unscheduled outpatient visits, emergency room visits, and placement, for dementia patients; (3) decrease time spent "on duty" and time providing actual care for caregivers; (4) assess caregiver satisfaction with the services provided; (5) assess VHA clinical staff satisfaction with the intervention; and (6) determine the cost of the intervention for VHA.

Excellence: What makes this project exceptional?

The goal of research is to translate research findings into clinical practice and personal behavior. The VA system has made it possible to implement the REACH II research findings broadly, through funding of REACH VA as the first national clinical translation of a proven dementia caregiver behavioral intervention. Clinical staff from 24 HBPC programs in more than 29 cities and 17 states have volunteered their time to train for and to deliver the intervention to stressed caregivers of dementia patients. Based on their dedication and their desire to provide the best possible care for their patients and their families, these staff are implementing the program as part of their clinical workload. Their goal is to raise the standard of care provided to dementia caregivers and patients using evidence based interventions. REACH VA materials are a practical resource for clinicians beyond the confines of the program, providing knowledge and materials to be used with other caregivers and patients.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Caregiving is a national and growing concern. Approximately 54 million people provided care in the past year and 59% of adults are now or expect to be family caregivers in the future. Unpaid family caregivers are the largest source of long-term care services in the U.S. The value of "free" services provided by family members is $257 billion annually (in 2000 dollars), more than nursing home and home health care combined. Factoring in all lost productivity and $36.5 billion in absenteeism, dementia costs American businesses $61 billion per year. REACH VA is designed to help caregivers cope with the stresses of caregiving.

Effectiveness: What is the impact and/or application of this research to older persons?

Although most dementia caregivers express a desire to provide care in the home, the emotional and physical costs are enormous. The REACH II intervention has been shown to significantly improve caregiver quality of life—caregiver burden, depression/emotional well-being, self-care and healthy behaviors, social support, and management of care recipient problem behaviors. It also provides that most scarce commodity for caregivers—time—in an additional hour per day not providing direct care at an intervention cost of $5.00 per day. This intervention will now be available across the VHA system. In addition, the VA is a testing ground for the intervention to be used nationally with community agencies. The Roslynn Carter Institute for Caregiving has selected REACH VA as one of its National Caregiver Quality Programs.

Innovativeness: Why is this research exciting or newsworthy?

An editorial in the Annals of Internal Medicine on REACH II suggested that if the intervention was a drug, it would be on the fast track to approval. The VA system has provided a means to implement this first national clinical translation of a dementia caregiver behavioral intervention. REACH VA is also an example of the efforts of two federal agencies, the National Institutes of Health and the Department of Veterans Affairs, working together to translate research into clinical practice. REACH VA showcases the efforts of Congress, through the Department of Veterans Affairs, to provide support for family caregivers. Their funding for VHA Caregiver Pilot Assistance Programs was designed to identify programs that would enhance the quality of life of veterans and reduce the strain on veterans' caregivers and then be replicated beyond the demonstration site.

U.S. Department of Veterans Affairs: Family Assessment of Treatment

This unique project has created a way for the VA to improve the care that it provides to veterans near the end of life by asking veterans' families whether the veteran received the best possible care and, if not, how that care could be improved.

Lead Agency: U.S. Department of Veterans Affairs (VA), Veterans Health Administration (VHA), Philadelphia VA Medical Center.

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: David J. Casarett, MD, Chairperson, Ethics Advisory/Faculty Leader End of Life Care/Staff Physician, VAMC Philadelphia, Office of Geriatrics, University and Woodland Avenue, Philadelphia, PA 19104.

General Description:

FAMILY ASSESSMENT OF TREATMENT AT END-OF-LIFE (FATE) SURVEY DEVELOPMENT

Over the past 10 years, growing attention has focused on opportunities to improve the care that older adults receive near the end of their lives. For instance, previous studies have found that symptoms like pain, nausea, constipation, and shortness of breath are very common, but that clinicians are often unable to recognize these symptoms and manage them adequately. Other studies have found that clinicians do not communicate with patients about their health care preferences, and that treatment decisions are not always consistent with those preferences. In particular, patients often receive aggressive life-sustaining treatment that is not consistent with their preferences.

The goal of this VA-funded project, the FATE study, was to develop and test a telephone survey that will allow the family members of veterans to evaluate the care that the veteran received near the end of his/her life. This survey allows family members to rate various aspects of the veteran's care including management of pain and other symptoms, and the availability of practical assistance (e.g. home care) and emotional and spiritual support. Families also are asked whether the veteran's preferences were respected, wheth-

er clinicians provided adequate information, and whether the veteran was treated with respect.

This survey is currently being implemented in eight Veterans Integrated Service Networks (VISN) as a measure of the quality of care that they are providing to veterans near the end of life and their families. These surveys are then used to produce quarterly reports that are made available to VISN and hospital leaders. These reports highlight each hospital's strengths, as well as opportunities for improvement.

Excellence: What makes this project exceptional?

This is the first-ever successful project to measure and improve the quality of end of life care across an entire health care system. VA is the nation's largest integrated health care system, and offers unique opportunities both to identify opportunities for improving end-of-life care and, more importantly to identify those hospitals that provide excellent care. This project is the first of its kind to measure and improve the quality of end-of-life care on such a large scale.

Significance: How is this research relevant to an older person, populations and/or an aging society?

As the population ages, it will become increasingly important to ensure that we are providing the best possible care to older adults throughout their lives, and this includes the care that they receive near the end of their lives, when they are most vulnerable. Just as it is essential to preserve older adults' function and independence as long as possible, for instance, when they reach the last months of their lives, then attention turns toward maintaining comfort and preserving dignity. It is especially important to ensure that older adults receive high quality compassionate care during this period not only for the patient's sake, but also for the sake of family members.

Effectiveness: What is the impact and/or application of this research to older persons?

This survey, which is currently being rolled out with a plan for national implementation in the VA health care system, will provide unique insights into the care that the VA is able to provide to patients near the end of life and their families. For instance, the results of these surveys have already begun to identify areas of care (e.g., pain management) that need to be improved. In addition, these results have begun to identify hospitals and nursing homes that are providing excellent care, both with respect to pain management and in all aspects of care. By understanding what makes these hospitals so successful, we are able to take the lessons learned and apply them to improve care throughout the VA health care system. Finally, this survey has begun to provide the VA with important data to guide policy. For instance, the finding that veterans receive better care from dedicated hospice or "palliative care" teams supports the VA's commitment to ensure that all veterans have access to this specialized care.

Innovativeness: Why is this research exciting or newsworthy?

This is the first national effort to measure and improve the quality of care that older adults receive near the end of life across a health care system. This project offers important opportunities to identify opportunities for improvement and to identify hospitals and nursing homes whose successes can be shared.

U.S. Department of Veterans Affairs: Aging Veterans Health Policy Model

HSR&D investigators, working with VHA policy and operations groups, and National Institute on Aging (NIA) investigators, combined VHA data on enrolled veteran demographics and health care use with similar data from the NLTCS and other federal survey to create a LTC projection model, validate the projections prospectively with data from CMS on nursing home use, and coordinate data collection with NIA in order to update the model for all veterans, both enrolled and non-enrolled.

Lead Agency: U.S. Department of Veterans Affairs (VA).

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: Bruce Kinosian, MD, Director of Community Options Program/Medical Director Hospital Home Care/Staff Physician, VAMC Philadelphia, Office of Geriatrics, University and Woodland Avenue, Philadelphia, PA 19104.

General Description:

AGING VETERANS HEALTH POLICY MODEL

The VA Aging Policy Model has been a collaboration between VA's Health Services Research and Development Service (HSR&D), the Assistant Deputy Under Secretary for Health Policy and Planning, the VA's Office of the Actuary, and the Office of Geriatrics and Extended Care; and investigators from the University of Pennsylvania, Duke University, and the University of Michigan. The group undertook to revise VA's original long term care planning model in 2003, using data from the National Long Term Care Survey (NLTCS) and other federal surveys, including linking the NLTCS to the VA enrollment file. These investigators then used Center for Medicare and Medicaid Services (CMS) data on national nursing home (NH) use (the "Minimum Data Set" or MDS), matched with VHA's enrollment file, to determine the actual number of veterans in NHs. Adjusting for methodologic differences, the LTC planning model accurately predicted total NH use among enrolled veterans. This was confirmed by using a subsequent round of the NLTCS (in 2004) to validate the projections based on the prior round.

These investigators combined all health care use by veterans in the NLTCS from CMS and VHA data files from 1994–2004, in order to estimate an updated model based on combined health care and LTC use in 1994–2002, with validation of use for 2003–2004.

Concurrently, these investigators used sophisticated regression techniques (CART) to map disability questions from the National Health Interview Survey to the U.S. Census detailed survey, in order to create county-level estimates of the prevalence of A disability among veterans.

These investigators coordinated the 2004–2005 rounds of the VHA Survey Of Enrollees (SOE) and the NLTCS in order to (a) validate the SOE, (b) extend enrolled veteran disability estimates to the Veterans Integrated Service Network (VISN) and market levels, and (c) to comprehensively survey all veterans, to determine differences in disability between enrolled and non-enrolled veterans, and the role of enrollment in altering those differences. This

coordination involved using same functional status question set in both surveys, and altering the NLTCS screening procedure so that every participant received the screen in 2004, and every participant was queried on veteran status. For the 3,727 veterans in the 2004 survey, it would have cost $5.6 M for VHA to have replicated the direct data collection, using per capita survey costs for the NLTCS. The modifications to the NLTCS provide the first comprehensive examination of functional and cognitive changes in an aging veteran population, how those changes segregate among enrollees and non-enrolled veterans, and the change over time in disability levels among the two groups. In contrast to the conventional finding of declining disability, which is true for all veterans, among enrolled veterans disability prevalence increased between 1999 and 2004, with relatively more disabled veterans continuing to enroll in VHA through 2004.

Future work includes validating the county-level disability projections, finishing updating the LTC projection model using the combined 2004 data, extending the projection validation to 2007 NH data, and re-surveying the NLTCS panel to determine continued enrollment and disability trends.

This research is exceptional in its breadth of topic, data, and participants over time. Investigators from outside and within VA worked with VA research, operations, and policy staff to leverage a variety of Federal data resources from the Census, the National Center for Health Statistics, VHA, and NIA to create a long term care planning model for both institutional and home and community based care in 2003, using data from 1999 and 2000 surveys, and linking the NIA survey directly to VHA data. This same group then coordinated the 2004/2005 rounds of VHA and NIA surveys in order to correct data gaps found in the first model, as well as to comprehensively characterize the entire veteran population, not just those who are enrolled in VHA. This process provided a test of the accuracy of the VHA survey of enrollees, finding that the VHA methodology resulted in a significant undercount of high-level impairments relative to the direct interviews of the NLTCS. By comprehensively surveying the entire veteran population, from a panel of male Medicare beneficiaries surveyed in 1999 and again in 2004, the study demonstrated a strong trend of increasing disability among enrolled veterans that continued to be driven by more disabled new enrollees in every age group >65 years of age. This coordinated survey found VHA with prevalences of functional disability and cognitive impairment from 1.5–2 times those found in the general veteran population, depending upon region, with significant regional variation in the concentration of disability and impairment. The investigators then used data from CMS to identify every veteran in a NH in 2003 and 2004, confirming the accuracy of the model's NH projections.

The new data are being used to update the current long-term care model, and improve its precision in projecting specific home and community care services at a regional level. Future developments include embedding the VHA long-term care demand model within the general U.S. long-term care supply, in order to incorporate enrollment decisions of disabled, aged veterans in VHA.

This work has demonstrated that VA is not experiencing the decline in functional disability found in the general population and

the general veteran population, because of adverse enrollment: a significant exception to prior planning assumptions, and an exception to the major finding in aging demography of the past 30 years. The earlier model was used to determine the target for VHA's supply of home and community-based services, resulting in a planned tripling of such services for aged veterans. The updated model will help target those investments to regions with greater demand, and distinguish the portion of total demand met by VHA and other payors for home and community based care. Characterization of cognitive and functional differences between the general elderly population that uses long-term care and those of enrolled veterans suggests that current VHA programs support veterans with greater levels of disability in the community than their non-veteran counterparts. Those comparisons also suggest the need for more creative programs to continue transitioning institutionalized veterans to supportive community settings.

Excellence: What makes this project exceptional?

Working across agencies and groups.

Significance: How is this research relevant to older person, populations and/or an aging society?

Demonstrated increased needs for home and community-based care (HCBC) services, and effectiveness of current services.

Effectiveness: What is the impact and/or application of this research to older persons?

Resulted in tripling of HCBC services provided by VHA in setting to reliance targets.

Innovativeness: Why is this research exciting or newsworthy?

Overturns conventional assumptions about future needs, puts VA on a realistic planning path and highlights opportunities to leverage resources to areas of greatest need (both programmatically and geographically).

U.S. Department of Veterans Affairs: Shingles Prevention Study

Shingles causes substantial pain and suffering in older adults. This study showed that a vaccine reduced the incidence of shingles by 51 percent, the pain severity of the illness by 61 percent and the incidence of postherpetic neuralgia by 66 percent.

Lead Agency: U.S. Department of Veterans Affairs (VA); Veterans Health Administration VA (VHA), Cooperative Trials and Durham VA Geriatric Research, Education and Clinical Center (GRECC).

Agency Mission: "To care for him who shall have borne the battle and for his widow and his orphan."

Principal Investigator: Michael Oxman, MD, Professor of Medicine, SPS 111F–1 San Diego VA Medical Center, 3350 La Jolla Village Drive, San Diego, CA 92161.

Partner Agency: National Institute of Allergy and Infectious Diseases; Merck & Co.

General Description: The Shingles Prevention Study is a VA Cooperative Study, carried out in collaboration with the NIAID and Merck & Co., to determine if the zoster vaccine would decrease the occurrence and/or severity of shingles (scientific name is herpes zoster) and postherpetic neuralgia, the painful condition that may persist afterwards. This disease mainly affects older adults. It is

caused by the varicella-zoster virus (VZV) which also causes chickenpox. After a person has had the childhood infection, the virus persists in a dormant state in nerve cells. As resistance to VZV weakens with age, the virus can reactivate, causing a blistering rash. There is acute pain due to shingles but many older individuals experience pain for months or years, a condition called postherpetic neuralgia. The acute and chronic pain of shingles markedly interferes with quality of life and daily living. All older adults are at risk for shingles. Half of people who live to age 85 will get shingles, and it is estimated that more than a million new cases of shingles occur in the United States each year.

The Shingles Prevention Study was a randomized, double-blind, placebo-controlled study of the zoster vaccine in 38,546 adults ≥60 years of age enrolled at 16 VA and 6 University sites across the U.S. Over the 5 years of the study, there were a total of 957 confirmed cases of herpes zoster (315 among vaccine recipients and 642 among placebo recipients) and 107 cases of postherpetic neuralgia (27 among vaccine recipients and 80 among placebo recipients). The zoster vaccine reduced the incidence of herpes zoster by 51 percent, the pain severity of the illness by 61 percent and the incidence of postherpetic neuralgia by 66 percent. Of individuals who developed herpes zoster, the severity of illness was less in persons who received the vaccine. The vaccine was safe and well tolerated. This landmark study showed that the zoster vaccine markedly reduced the suffering from herpes zoster and postherpetic neuralgia among older adults. Studies are ongoing to determine the durability of the response to the vaccine.

Excellence: What makes this project exceptional?

The scientific basis, the methodology, and the results of the Shingles Prevention Study make it truly exceptional. Shingles (herpes zoster) is caused by the reactivation of varicella-zoster virus (VZV) from a dormant or latent infection of sensory nerve cells. This reactivation occurs when the immune system is too weak to contain the virus. Almost all adults in the U.S. are latently infected with VZV and therefore at risk for shingles. The Shingles Prevention Study is unique in that is was the first study to determine that a vaccine can successfully prevent a reactivated infection. All other vaccines (e.g., measles, mumps, rubella, influenza, pneumococcal, etc.) prevent primary infections. The Shingles Prevention Study was the largest vaccine study ever conducted in older adults with over 38,000 participants. The follow-up in the study was outstanding with only 0.7 percent of persons lost to follow-up and it used an innovative computerized telephone response system to stay in touch with participants. The diagnosis of shingles was done using state-of-the-art DNA detection methods whereas all prior shingles clinical drug trials relied on clinical diagnosis which may not be fully accurate.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The occurrence of shingles increases dramatically with aging particularly after the age of 60 years. The increase in incidence with aging is due to a progressive decline in immunity to VZV with aging. The main problem with shingles is pain. The persistent pain that may follow shingles, known as postherpetic neuralgia, is much more common and severe in older adults. Shingles pain diminishes

the quality of life and functional capacity of older adults, and markedly reduces their enjoyment of life. The zoster vaccine is relevant to older adults in that it can reduce the pain and suffering from shingles and improve quality of life.

Effectiveness: What is the impact and/or application of this research to older persons?

The zoster vaccine reduced the incidence of herpes zoster by 51 percent, the pain severity of the illness by 61 percent and the incidence of postherpetic neuralgia by 66 percent, demonstrating that the vaccine markedly reduced suffering from shingles and postherpetic neuralgia among older adults. Even among individuals who developed shingles, the severity of illness was less in persons who received the vaccine. If the zoster vaccine was used in all older adults in whom it was recommended, approximately 283,000 cases of shingles and 46,000 cases of postherpetic neuralgia would be eliminated by vaccination each year in the United States.

Innovativeness: Why is this research exciting or newsworthy?

The zoster vaccine research adds a powerful new weapon in our armamentarium against shingles and the suffering that is causes in older adults. The science and methodology of the study as conducted by VA investigators was world-class. On the basis of the results of this one study, the U.S. Food and Drug Administration (FDA) approved the zoster vaccine for use in persons 60 years of age and older for the prevention of herpes zoster. The Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) recommends that individuals ≥60 years of age receive the zoster vaccine to prevent herpes zoster and postherpetic neuralgia. In October 2007, the zoster vaccine was added to the CDC's Schedule of Recommended Adult Immunizations. Their final recommendations for the use of the zoster vaccine was published in the CDC's Morbidity and Mortality Weekly Report, June 6, 2008 (MMWR Volume 57, No. RR–5 "Prevention of Herpes Zoster").

U.S. Environmental Protection Agency: Aging Initiative

EPA's "Aging Initiative," a research program focused on the environmental health of older adults, has increased our understanding of exposure to—and health effects of—environmental contaminants on older adults to enhance the Agency's efforts in health promotion and risk assessment.

Lead Agency: U.S. Environmental Protection Agency.

Agency Mission: The mission of the U.S. Environmental Protection Agency (EPA) is to protect public health and safeguard the natural environment.

Principal Investigator: Andrew Geller, PhD, Assistant Laboratory Director for Human Health and Computational Toxicology, National Health and Environmental Effects Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, MD B305–02, Research Triangle Park, NC 27711.

Partner Agencies: Environmental and Occupational Health Science Institute, Research Triangle Institute, Hamner Institute, University of Mississippi, University of North Carolina at Chapel Hill.

General Description: EPA's "Aging Initiative," a research program focused on the environmental health of older adults, has in-

creased our understanding of the environmental contaminants to which older adults are exposed and their resulting health effects. The program is identifying key aging-related factors that contribute to variability in environmental exposures and responses to those exposures that could result in adverse health outcomes. By soliciting and incorporating input from individuals in the community, advocacy groups, and scientific experts to derive a creative and comprehensive action plan based on sound science, EPA is helping to enhance and protect the health of aging Americans.

The rapid growth in the number of older Americans has many implications for public health, including the need to better understand the health risks posed by environmental exposures to older adults. Biological capacity declines with normal aging and with diseases of aging. This decline can result in compromised responses to environmental exposures encountered in daily activities, resulting in adverse health outcomes.

In recognition of these factors, and consistent with EPA's mandate to protect the health of vulnerable Americans, EPA developed the "Aging Initiative." This research program is designed to answer the following questions to insure that EPA's regulations and educational outreach programs promote the health of older Americans:

- Where do older adults live and what are the important pollution sources in those locations?
- What activities are older adults engaged in that bring them into contact with these pollutants?
- What happens to those pollutants inside the body?
- What are the critical adverse health effects and adverse outcomes?
- How do we link all of the above for effective risk assessment, management, and communication?

EPA pioneered this research program so that the Agency and its stakeholders will be able to anticipate, accommodate, and manage the environmental risks associated with this inevitable shift in American demographics toward an aging society. The program is generating data, models, and guidance to incorporate the susceptibility of this heterogeneous population into health promotion and intervention strategies to ameliorate risk from environmental exposures.

Excellence: What makes the project exceptional?

EPA's Aging Initiative is exceptional because it solicits and incorporates input from individuals in the community, advocacy groups and scientific experts to derive a creative and comprehensive action plan, based on sound science, to enhance and protect the health of aging Americans.

Significance: How is this research relevant to older persons, populations and/or aging society?

EPA's program to protect the health of older Americans is a unique combination of intra- and extramural research and public outreach. The two efforts have a common goal of identifying the pollutants that are most hazardous to older adults and the reasons why some older adults are more susceptible than others. This information can lead to more informed decisions in setting exposure standards for the public that insures protection of the aging population. The information is also valuable to the community in their

efforts to improve environmental quality and minimize the hazards they encounter.

Effectiveness: What is the impact and/or application of this research to older persons?

EPA's Aging Initiative has highlighted the importance of the aging population's vulnerability to pollutants through data generation and publications in peer-review scientific journals, communication with older adult stakeholder groups, and presentation of research findings in scientific conferences.

Innovation: Why is this research exciting or newsworthy?

EPA has mounted a program on susceptibility of the aging population that combines laboratory, clinical, and social research together with public outreach education. This multifaceted program insures that research findings can be quickly and accurately translated into regulatory decisions as well as public awareness and action.

U.S. Environmental Protection Agency: Air Quality and Its Effect on Heart Rates

Particulate matter and ozone levels are associated with alterations in heart rate variability, a measure of autonomic or involuntary nervous system control of cardiac function, among individuals living in eastern Massachusetts.

Lead Agency: U.S. Environmental Protection Agency.

Agency Mission: The mission of the U.S. Environmental Protection Agency (EPA) is to protect public health and safeguard the natural environment.

Principal Investigator: Joel Schwartz, PhD, Harvard School of Public Health, 665 Huntington Avenue, Boston, MA 02115.

Partner Agency: Harvard School of Public Health.

General Description: The EPA-funded Harvard Particulate Matter Center conducted a series of studies that focused on how air particles or particulate matter (PM) affect the rhythm of the human heart. The Harvard researchers found that particulate matter and ozone levels were associated with alterations in heart rate variability, a measure of cardiac function that is under autonomic or involuntary control, among individuals living in eastern Massachusetts. Harvard PM Center researchers have begun to examine different biologic control pathways that may play a role in the effect of PM on the heart. In addition, they are investigating the specific sources of PM that may be most important in influencing health responses in this study population, participants in the Normative Aging Study (NAS), a large longitudinal study established in 1963 by the U.S. Veterans Administration, because different types of particles may affect different biological pathways.

Heart rate variability reflects autonomic control of the rhythmic activity of the heart. The 2280 men enrolled in the Normative Aging Study were originally confirmed to be free of known chronic medical conditions, and active, continuing participants are examined every three years. This study analyzed information for 603 persons examined between 2000 and 2003. Ambient fine air particles ($PM_{2.5}$) and black carbon measurements were obtained from a monitoring site located 1 kilometer from the clinic and were evaluated in relation to the clinical measurements. Researchers found that ozone and ambient $PM_{2.5}$ and black carbon concentrations,

averaged over the previous 4 hours to 48 hours, were associated with reductions in heart rate variability. The greatest reductions were observed among hypertensive individuals and those with ischemic heart disease. Ambient black carbon concentrations were further found to be associated with increased C-reactive protein and fibrinogen levels in blood samples. These results suggest that the effects caused by PM could be brought about through pathways involving the autonomic nervous system and systemic inflammation.

More recent studies in the Normative Aging Cohort found that the effects of traffic-related PM are modulated by biologic markers of specific pathways that may be involved in the disease process. Particle exposure could increase adverse responses including oxidative stress, inflammation, and thrombosis (blood clots), leading to alterations in cardiac autonomic function and cardiovascular problems such as heart attacks. Researchers examined these effects using white blood cell counts, C-reactive protein, sediment rate, and fibrinogen from blood samples collected from study participants. Traffic-related PM components, black carbon, and particle number were related to increased levels of inflammatory and thrombotic markers, with associations most consistent for the blood clotting factor, fibrinogen. The association was strongest when exposures were averaged over the 4-weeks prior to the measurement.

Excellence: What makes this project exceptional?

This project has shown that markers of PM from traffic are associated with alterations in autonomic control of heart rhythms, which may increase the risk of cardiovascular disease and death from heart disease. The relation between particle pollution and cardiac effects was determined in the Normative Aging Study which provides very strong evidence for the observed link because new clinical data and information on risk factors is collected on the participants every 3 to 5 years. Subsequent studies in this cohort have confirmed the original observations and provided stronger evidence that traffic-related particle pollution is associated with cardiac autonomic control and inflammation.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Reductions of heart rate variability over long periods has been associated with increased risk of mortality in middle-aged and elderly subjects, in patients with diabetes, and in survivors of heart attacks and other cardiovascular diseases. Researchers found that ozone and ambient $PM_{2.5}$ and black carbon concentrations and particle number, averaged over the previous 4 hours to 48 hours, were associated with reductions in heart rate variability. The greatest reductions were observed among hypertensive individuals and those with ischemic heart disease. Individuals with these pre-existing conditions appear to be more susceptible to the adverse effects of PM exposure.

Effectiveness: What is the impact and/or application of this research to older persons?

This research indicates that older people, especially people with pre-existing health conditions, should be very cautious about their time spent outside on days when the air quality is poor. It reinforces the need for alerts on days with large amounts of fine particle pollution in the air. It also underscores the need to rigorously

enforce and periodically re-evaluate the National Ambient Air Quality Standards for particulate matter.

Innovativeness: Why is this research exciting or newsworthy?

This project has shown that markers of PM from traffic are associated with alterations in autonomic control of heart rhythms, which may increase the risk of cardiovascular disease and death from heart disease. The relation between particle pollution and cardiac effects was determined in the Normative Aging Study which provides very strong evidence for the observed link because new clinical data and information on risk factors is collected on the participants every 3 to 5 years. Subsequent studies in this cohort have confirmed the original observations and provided stronger evidence that traffic-related particle pollution is associated with cardiac autonomic control and inflammation.

U.S. Environmental Protection Agency: Air Quality and Cardiovascular Diseases

Older women living in areas with high levels of fine particles or particulate matter (PM) pollution have a greater risk of developing cardiovascular disease and subsequently dying from cardiovascular causes.

Lead Agency: U.S. Environmental Protection Agency.

Agency Mission: The mission of the U.S. Environmental Protection Agency (EPA) is to protect public health and safeguard the natural environment.

Principal Investigator: Joel Kaufman, M.D., Principal Investigator, Univ. of WA Dept. Env. & Occ. Health Sciences, P.O. Box 357234, Seattle, WA 98195.

Partner Agency: University of Washington.

General Description: EPA-funded research at the University of Washington found that older women living in areas with high levels of fine particles or particulate matter (PM) pollution have a greater risk of developing cardiovascular disease and subsequently dying from cardiovascular causes. Scientists studied more than 65,000 women, aged 50 to 79, with no history of cardiovascular disease. These postmenopausal women lived in 36 U.S. metropolitan areas throughout the United States and were part of the Women's Health Initiative Observational Study, initiated by the National Institutes of Health. Researchers found that long-term exposure to fine particulate air pollution was strongly associated with cardiovascular disease and death among postmenopausal women. Each 10 $\mu g/m^3$ increase in the level of fine particulate matter in ambient air was linked to a 76 percent increase in the risk of death from cardiovascular disease, after taking into account known risk factors such as blood pressure, cholesterol, and smoking. Increased average levels of fine particulate matter were associated with a 24 percent increased risk of cardiovascular disease problems, including stroke and heart attack. Finally, the study found that obese individuals, defined as having a high body mass index or high waist-to-hip ratio, were more susceptible to the health effects linked to increased particulate matter levels. These are intriguing new findings that have spurred additional research studies to verify and understand the link with obesity.

The people in this study were ideally suited for the investigation of the links between long-term air pollution exposure and cardio-

vascular disease and mortality. The very large cohort or population was established between 1994 and 1998, and study participants were followed for up to nine years to see who had heart attacks, stroke, coronary bypass surgery, or died from cardiovascular causes. Participants resided in 36 cities throughout the United States, allowing for comparisons of cities with a variety of air pollution levels and with different atmospheric composition. To estimate people's exposure to fine particles or $PM_{2.5}$, the researchers used the average $PM_{2.5}$ level recorded in the year 2000 (the midpoint of follow-up in the study) recorded by a monitor located closest to a participant's residence. Most women lived within 6 miles of a monitor. In addition, the investigators were able to explore differences in risk associated with particulate matter concentrations in the cities where participants lived and compare them to between-city effects. For cardiovascular events, the within-city effect was larger than the between-city effect.

Excellence: What makes this project exceptional?

This is the first study to follow, over time, the development of new cases of cardiovascular disease in a healthy population. Previous studies have relied solely on reviews of death records. The scientists studied air pollution exposure among participants of a longitudinal study established by the National Heart Lung and Blood Institute of NIH which has produced other important research on heart disease, cancers, and osteoporosis. The study was designed to document specific, first, cardiovascular "events" such as heart attacks. Study scientists conducted annual questionnaires to ascertain cardiovascular diagnoses and then reviewed medical records to confirm and classify them. Deaths were identified through family members and the National Death Index.

This is also one of the first studies to look at local air pollution levels within metropolitan areas. Local differences in particulate matter levels within a city, as well as exposure differences between cities, translate to a higher or lower risk of cardiovascular disease and related death. In previous studies of the long-term effects of air pollution, scientists averaged pollutant concentrations from monitors located in a city and then compared health effects between cities. The assignment of particulate matter concentrations measured at the monitor closest to the participants' homes probably resulted in more accurate estimates of PM exposure for each individual compared to previous studies.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This study establishes a stronger association between long-term exposure to fine particulate air pollution and death from coronary heart disease, one of the leading causes of illness and mortality among older adults, than was found in earlier studies. The finding that health risks associated with within-city differences in pollutant concentrations are higher than risks associated with between-city pollution levels suggests that, as pollution exposure estimates assigned to study participants become more precise, studies may find that health risks associated with fine particulate air pollution are higher than previously estimated.

Effectiveness: What is the impact and/or application of this research to older persons?

This research indicates that older people, especially people with pre-existing health conditions, should be very cautious about their time spent outside on days when the air quality is poor. It reinforces the need for alerts on days with large amounts of fine particle pollution in the air. It also underscores the need to rigorously enforce and periodically re-evaluate the National Ambient Air Quality Standards for particulate matter.

Innovativeness: Why is this research exciting or newsworthy?

This research is the first to look at fine air pollution levels in major metropolitan areas around the U.S. and connect exposure to pollution with the development of new cases of cardiovascular disease in a healthy population.

U.S. Environmental Protection Agency: Air Quality and Respiratory Diseases

Researchers at The Johns Hopkins Bloomberg School of Public Health found that hospital admission rates for cardiovascular and respiratory diseases were significantly associated with short-term, fine particle exposure in air in individuals over 65 years of age.

Lead Agency: U.S. Environmental Protection Agency.

Agency Mission: The mission of the U.S. Environmental Protection Agency (EPA) is to protect public health and safeguard the natural environment.

Principal Investigator: Francesca Dominici, PhD., Johns Hopkins University, Bloomberg School of Public Health, 615 N. Wolfe Street, Baltimore, MD 21205.

Partner Agency: Johns Hopkins Bloomberg School of Public Health.

General Description: A large study, funded by the EPA and published in the Journal of the American Medical Association in 2006, looked at Medicare recipients across the country and found that short-term exposure to fine particles or particulate matter (PM) is related to a greater risk of hospitalizations. Researchers at The Johns Hopkins Bloomberg School of Public Health found that hospital admission rates for cardiovascular and respiratory diseases were significantly associated with short-term, fine PM exposure in individuals over 65 years of age. The study used Medicare data for 11.5 million people living in 204 urban counties in the United States. This is one of the first studies to use an expanded, nationwide, monitoring network for ambient particulate matter less than 2.5 μm in diameter ($PM_{2.5}$). Interestingly, the average ambient concentration of fine PM in the locations during the study period was lower than the PM levels that existed during many previous studies. Region-specific differences in PM-associated deaths between the eastern and western United States also were reported.

Researchers compiled a data set of daily hospitalization admission rates for cardiovascular and respiratory disease and injuries between 1999 and 2002 from the billing claims of Medicare participants across the United States. The data were paired with ambient $PM_{2.5}$ concentrations in the same county on the date of hospitalization and up to two days prior. The resulting data set encompassed 204 urban counties in the United States and 11.5 million Medicare participants living within an average of 5.9 miles of a $PM_{2.5}$ monitor. Hospital admission rates increased in relation to increases in $PM_{2.5}$ concentration on the same or immediately preceding days for

all outcomes studied except injuries. The health outcomes found to be associated with $PM_{2.5}$ concentration were cerebrovascular disease including stroke, peripheral vascular disease, ischemic heart disease (where the blood supply to heart muscle is reduced), heart rhythm, heart failure, chronic obstructive pulmonary disease, and respiratory tract infection.

The study investigators also compared the mortality risks associated with fine particulate air pollution across seven regions of the United States. The risk for air pollution-related cardiovascular disease was highest in counties located in the eastern United States. In contrast, the risk of hospitalization for respiratory causes was consistent across all the counties. The regional differences seen by the researchers have focused their efforts to identify what factors are responsible. This is a complex question and may involve regional differences in the composition of PM in the atmosphere from specific sources of PM.

The research was conducted as part of a four-year project funded through a grant from the EPA to the Johns Hopkins University Bloomberg School of Public Health. The project started in 2003 and examined the effect of annual average and daily $PM_{2.5}$ concentration on illness and death among Medicare recipients. The study researchers are continuing to follow the Medicare study population as part of the Johns Hopkins Particulate Matter Center, one of five research centers established by the EPA to study particulate air pollution and health effects.

Excellence: What makes this project exceptional?

This was one of the first studies to show the effects of fine particles on Medicare recipients across the nation, comprising nearly all members of the U.S. population over the age of 65 years.

The size of the Medicare population allowed the researchers to assess risks pertaining to specific cardiovascular diagnoses. The findings have led to more specific investigations concerning the biologic pathways that are affected by exposure to particulate matter.

Significance: How is this research relevant to older persons, populations and/or an aging society?

For the first time, nationwide Medicare data were analyzed to assess the health effects of fine particulate matter (PM). EPA-funded grantees from Johns Hopkins University found that increases in hospital admission rates for cardiovascular and respiratory diseases were significantly associated with short-term changes in ambient levels of $PM_{2.5}$. When the risk estimates were evaluated for individuals in different age categories, the oldest group, aged 75 years and older, was at highest risk for several outcomes including ischemic heart disease, heart rhythm disturbances, heart failure, and chronic obstructive pulmonary disease.

Effectiveness: What is the impact and/or application of this research to older persons?

This research indicates that older people, especially people with pre-existing health conditions, should be very cautious about their time spent outside on days when the air quality is poor. It reinforces the need for alerts on days with large amounts of fine particle pollution in the air. It also underscores the need to rigorously enforce and periodically re-evaluate the National Ambient Air Quality Standards for particulate matter.

Innovativeness: Why is this research exciting or newsworthy?

For the first time, nationwide Medicare data were analyzed to assess the health effects of fine particulate matter (PM). EPA-funded grantees from Johns Hopkins University found that increases in hospital admission rates for cardiovascular and respiratory diseases were significantly associated with short-term changes in ambient levels of $PM_{2.5}$. When the risk estimates were evaluated for individuals in different age categories, the oldest group, aged 75 years and older, was at highest risk for several outcomes including ischemic heart disease, heart rhythm disturbances, heart failure, and chronic obstructive pulmonary disease.

U.S. Environmental Protection Agency: Air Pollution and Chronic Diseases

EPA scientists have developed tools that use air pollution levels and activities of older adults to estimate the exposure of older individuals to air pollution. These estimates, in turn, can be used to evaluate whether air pollution can exacerbate diseases of aging, such as heart attack, stroke, chronic obstructive pulmonary disease (COPD), and asthma in older adults.

Lead Agency: U.S. Environmental Protection Agency.

Agency Mission: The mission of the U.S. Environmental Protection Agency (EPA) is to protect public health and safeguard the natural environment.

Principal Investigator: Andrew Geller, PhD, Assistant Laboratory Director for Human Health and Computational Toxicology, National Health and Environmental Effects Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, MD B305–02, Research Triangle Park, NC 27711.

Partner Agency: Research Triangle Institute, University of North Carolina at Chapel Hill, Environmental and Occupational Health Science Institute.

General Description: Measuring air pollution levels at pollution sources, or even at monitoring sites around the nation, does not tell us what individuals are actually exposed to. This research helps EPA estimate the real, personal exposure of older individuals to environmental pollutants by taking into account their micro-environments and personal activities through the day.

EPA scientists have developed tools and information to estimate air pollution exposure to older individuals. These tools use air pollution levels measured at ambient (or background) monitoring sites plus information about where older adults spend their time and what they do. These estimates, in turn, can be used to evaluate whether air pollution can exacerbate diseases of aging, such as heart attack, stroke, chronic obstructive pulmonary disease (COPD), and asthma in older adults. This research has given EPA the ability to incorporate information on pollution sources, ambient air pollution levels, and personal micro-environments to produce estimates of real-world exposure to potentially hazardous environmental compounds.

Estimates of personal or population-group exposure tell EPA where to intervene with their risk mitigation efforts. These estimates are also used to evaluate whether or not air pollution can exacerbate diseases of aging. Importantly, EPA can thereby consider the health of older adults when setting National Ambient Air Quality Standards.

Excellence: What makes this project exceptional?

This research received EPA's highest level Science and Technical Achievement Award, an internal award given to excellent, scientific, peer-reviewed publications.

Significance: How is this research relevant to older persons, populations and/or aging society?

Measurement of air pollution levels at pollution sources, or even at monitoring sites distributed throughout the nation, does not tell us what individuals are exposed to. This research helps the Agency estimate the real, personal exposure of older individuals to environmental pollutants by taking into account their micro-environments and personal activities through the day.

Effectiveness: What is the impact and/or application of this research to older persons?

Estimates of personal or population-group exposure derived from ambient monitoring data tells the EPA where to intervene with risk mitigation efforts. These estimates are also used to evaluate whether air pollution can exacerbate diseases of aging. EPA can thereby consider the health of older adults when setting National Ambient Air Quality Standards.

Innovation: Why is this research exciting or newsworthy?

This research helps EPA estimate the real, personal exposure of older individuals to environmental pollutants by taking into account their micro-environments and personal activities through the day.

U.S. Environmental Protection Agency: Environmental Risk Factors for Older Adults

EPA researchers have developed the first publically-available database that can be used to model the physiology and metabolism of older adults to determine whether environmental pollutants put them at risk. This peer-reviewed database can be used to produce environmental health risk assessments that help protect older adults from environmental health hazards while still recognizing the need for the use of chemicals and pharmaceuticals in commerce.

Lead Agency: U.S. Environmental Protection Agency.

Agency Mission: The mission of the U.S. Environmental Protection Agency (EPA) is to protect public health and safeguard the natural environment.

Principal Investigator: Bob Sonawane, PhD, Chief, Effects Identification and Characterization Group, National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency.

General Description: EPA researchers have developed the first publically-available database that can be used to model the physiology and metabolism of older adults to determine whether environmental pollutants put them at risk. This peer-reviewed database can be used to produce environmental health risk assessments that help protect older adults from environmental health hazards while still recognizing the need for the use of chemicals and pharmaceuticals in commerce.

EPA engaged the world's top experts to collect the factors to produce this resource. Before this database was developed and made available to the public, risk assessors had to rely on physiological data that were scattered throughout the scientific literature.

In addition, mathematical models that incorporated older adult susceptibilities to environmental health hazards did not exist in the scientific or risk assessment literature. This database allows these critical models to be generated, enhancing the science-based evaluation of risk for older adults. This single, reviewed source standardizes risk assessment models while using the best available data. Importantly, it captures factors determined scientifically rather than using default factors which may underestimate or overestimate risk. This, in turn, ensures that these environmental health risk assessments provide better protection for older adults.

Although this database was only recently unveiled to the public, it has already attracted attention from the environmental health, occupational health, and pharmaceutical communities because of its general applicability to the concerns of older adults. Combined with information from similar databases providing parameters for young children and adults, this database will be instrumental in enhancing risk assessment across the entire human lifespan.

Excellence: Why is this project exceptional?

EPA engaged the world's top experts to collate factors to produce this peer-reviewed publically-available resource, the first of its kind to address the physiology of older adults.

Significance: How is this research relevant to older persons, populations and/or aging society?

Physiological factors are scattered throughout the scientific literature. This single, reviewed source provides for standardization of models and the use of the best available data. Science-based factors replace default uncertainty factors to produce environmental health risk assessments that provide better protection for older adults from environmental health hazards while recognizing the need for the use of chemicals in commerce.

Effectiveness: What is the impact and/or application of this research to older persons?

This database, only recently unveiled to the public, has already attracted attention from the environmental health, occupational health and pharmaceutical communities because of its general applicability to concerns of older adults. Taken together with information from similar databases providing parameters for young children and adults, risk assessment is enhanced across the entire lifespan.

Innovation: Why is this research exciting or newsworthy?

Mathematical models that incorporate older adult susceptibility to environmental health hazards do not exist in the scientific or risk assessment literature. This database will allow these critical models to be generated, enhancing the science-based evaluation of risk for older adults from environmental contaminants.

U.S. Environmental Protection Agency: Environmental Pollution and Liver Function

Lead Agency: U.S. Environmental Protection Agency.

Agency Mission: The mission of the U.S. Environmental Protection Agency (EPA) is to protect public health and safeguard the natural environment.

Principal Investigator: Andrew Geller, PhD, Assistant Laboratory Director for Human Health and Computational Toxicology, National Health and Environmental Effects Laboratory, Office of Re-

search and Development (ORD), U.S. Environmental Protection Agency, MD B305–02, Research Triangle Park, NC 27711.

General Description: EPA scientists are beginning to understand how the liver response changes with aging and exposure to environmental chemicals. The liver is both the most important part of the body for protecting individuals from toxic chemicals and the target organ for many environmental pollutants. Understanding how the liver responds to exposure to environmental chemicals is critical to characterizing risk to older adults.

Experimental models demonstrate that aging is accompanied by mild decreases in the capacity to detoxify and eliminate environmental pollutants. These models help the Agency understand how much of the toxic response is attributable to changes in metabolism and how much is due to other changes in biological capacity with aging.

This important research allows risk assessors to better understand how exposure to toxic chemicals can affect older adults' health. In addition, data generated by this study is helping the EPA include polypharmacy—the use of two or more drugs together, which is common in the older adult population—in its consideration of risk and its design of risk mitigation efforts.

This research complements EPA's efforts to address the scientific goals laid out by the National Academies of Science in their report on "Toxicity Testing in the 21st Century." An important aspect of this work is that it is helping EPA produce more efficient models that predict how to better protect older adults while reducing the use of animal testing.

Excellence: Why is this project exceptional?

U.S. EPA scientists have been invited to present this research at invited symposia for Health Canada, California EPA, and Society of Toxicology.

Significance: How is this research relevant to older persons, populations and/or aging society?

The liver is both the most important part of the body for protecting individuals from toxic chemicals and the target organ for many environmental pollutants. Understanding how the liver response changes with aging is critical to characterizing risk to older adults. EPA research suggests that there are decreases in liver detoxification capacity in older adults. These changes, in combination with other changes in the aging body's capacity to respond to toxicity, are likely responsible for increased sensitivity to environmental chemicals in the older adults.

Effectiveness: What is the impact and/or application of this research to older persons?

This research allows risk assessors to better understand how toxic exposures affect older adults' health. It allows the Agency to consider factors such as polypharmacy, common in the older adult population, in its consideration of risk and its design of risk mitigation efforts.

Innovation: Why is this research exciting or newsworthy?

This research complements EPA's efforts to address scientific goals laid out by the National Academies of Science in their report on "Toxicity Testing in the 21st Century." The work will allow EPA to produce predictive models to better protect older adults while increasing efficiency and reducing the use of animals in testing.

U.S. Environmental Protection Agency: Building Healthy Communities for Active Aging Award Program

The principal goal of the Building Healthy Communities for Active Aging Award program is to raise awareness across the nation about healthy synergies that can be achieved by communities combining Smart Growth and Active Aging concepts. Awards are presented to communities that demonstrate the best and most inclusive overall approach to implementing smart growth and active aging at the neighborhood, tribe, municipality, county, and/or regional levels.

Lead Agency: U.S. Environmental Protection Agency (EPA).

Agency Mission: The mission of the U.S. Environmental Protection Agency is to protect public health and safeguard the natural environment.

Principal Investigator: Kathy Sykes, MA, Senior Advisor, Aging Initiative, Office of Children's Health Protection and Environmental Education, Division of Child and Aging Health Protection, U.S. Environmental Protection Agency, Mail Code 1107A, Room 2512N (Ariel Rios North), 1200 Pennsylvania Ave., NW., Washington, DC 20460.

Partner Agencies: National Council on Aging, National Blueprint, Centers for Disease Control, Active for Life, President's Council for Fitness and Sports.

General Description: Communities built for healthy aging are characterized by development patterns that emphasize ease of getting around, with convenient housing options, walking and biking paths, and abundant green space to create an attractive environment. Conversely, unbridled growth or haphazard development harms not just the environment, but healthy and quality of life. As our population 85 years and older grows, many may no longer be driving. Communities that plan ahead and provide a variety of transportation options or housing developments situated near public transit will be better prepared to meet the needs of those who choose not to or no longer can drive their own automobile. Smart growth is a term used to control the spread of auto dependent development away from cities and traditional suburbs by revitalizing urban areas to be more attractive and healthy places to live. Older adults can play a critical role in making smart growth possible by getting involved in local planning efforts.

Chronic health conditions such as heart disease, stroke and diabetes result in adverse human costs and impacts. Lifestyle changes are a critical component of effective health promotion strategies. Obesity is reaching epidemic proportions and soon will pass smoking as a major cause of preventable disease and premature death. Daily physical activity is vital for keeping fit and controlling chronic conditions. Walkable communities, a principle of smart growth, encourage active aging and are essential to prevention and management of chronic diseases. Smart growth practices that promote walkable communities and shorter trips to work, to shop and to do other activities help protect the environment and the ability of people to maintain their independence and quality of life as they age. An added advantage is that walking through one's neighborhood increases awareness of neighbors, and expands social contacts and potential support networks.

Impervious surfaces will cause storm water runoff to bypass soil filtration, potentially affecting drinking water sources. Traveling long distances can be not only a barrier for elders seeking care, but also contributes to air pollution. Many studies have found an association between air pollution and aggravation of heart and lung diseases, resulting in increased medication use, more visits to health care providers and admissions to emergency rooms. Involvement in local planning efforts at the community level is critical for the implementation of smart growth principles.

In May 2007, EPA announced, with its partners, CDC, the President's Council for Fitness and Sports, the National Council on Aging, Active for Life, (funded by the Robert Wood Johnson Foundation) and the National Blueprint, a new awards program that encourages communities to adopt smart growth principles and encourage active aging, "Building Healthy Communities for Active Aging." In 2008, seven communities were recognized for their excellence in smart growth and active aging. The awards program is a voluntary effort allowing communities to lead by example and showcase their successes in building a health community for active aging.

SMART GROWTH

Older persons are a susceptible population with respect to air and water pollution, and research has demonstrated links between development and environmental degradation. Increases in impervious surfaces result in more storm water runoff that directly enters surface waters without being filtered through the soil, potentially contributing to contaminants in drinking water. Increasing distances between where people live, work, and play can contribute to longer trips, increasing motor vehicle emissions and air pollution. Smart growth practices combined with active aging provide choices that both protect the environment and help people maintain their independence as they age, resulting in environmental benefits and enhanced quality of life.

HEALTHY COMMUNITIES

The EPA Aging Initiative and a coalition of federal and non-governmental partners recognized that community design directly affects our health. Considerable attention has been paid to risk factors predicting longevity and quality of life. This award focuses our attention on the built environment. For example, encouraging communities to design neighborhoods for walking and biking is also directly influencing the quality of one's life and the livability of the community.

Cities will become healthier for Americans as they work to preserve their natural environment, reduce air pollution and improve water quality—key smart growth benefits. Those who move to the edge of towns expect amenities such as transportation, health care, shopping and recreation along with safe drinking water, waste water treatment and solid waste disposal, but they may not realize that those demands stress their environment. The location, configuration and scale of homes and communities within a watershed not only increase risks to wildlife, but also threaten environmental sustainability. Efforts to assure smart growth will produce huge divi-

dends for communities that want to retain a reputation for being a good place to live.

BUILDING HEALTHY COMMUNITIES FOR ACTIVE AGING

In February 2008, the EPA announced the seven winners and two communities received the highest awards, the achievement awards: the Atlanta Regional Commission and Kirkland, WA.

The Atlanta Regional Commission (ARC) launched Aging Atlanta, a partnership of 50 organizations focused on meeting the needs of the region's growing older adult population. Aging Atlanta's pilot projects laid the foundation for the Lifelong Communities Initiative. The Initiative works with local governments to create housing and transportation options that enable older adults to "age in place." To improve housing developments located close to services and connected to existing neighborhoods. With more than 90% of Atlanta's older adults relying on automobiles for transportation, ARC has taken steps to decrease auto dependency by promoting ride sharing through its six voucher programs and working to improve bus stops and routes. These efforts increase quality of life and offer environmental benefits. ARC and its partners converted traditional senior centers to wellness centers, emphasizing physical activity and social interaction. Currently, 46 of these centers offer programs for the 400,000 older adults in the metro area, and approximately 1,000 individuals have joined walking clubs. Through community involvement, ARC has incorporated older adults' needs into parks, trails and pedestrian paths. Work with city and county staff, ARC is integrating age-appropriate features into local sidewalk audits and plans.

The city of Kirkland, WA has succeeded in making its physical activities more accessible for its 19,000 older residents by organizing exercise opportunities and improving infrastructure. The city offers more than 50 physical activity programs specifically designed for older adults. The Kirkland Steppers Walk Program, which is free for adults over age 50, organizes group walks through downtown twice a week during the summer.

Over the next six years, the city of Kirkland will invest $6 million to improve sidewalk connections between commercial and residential developments to make the city more walkable. In addition, Kirkland is the first city in the state of Washington to adopt a Complete Streets Ordinance to design streets for the needs of walkers, bicyclists and drivers. It has adopted two innovative programs: the "PedFlag" Program, which has placed flags at 63 crosswalks to remind drivers to yield to pedestrians, and the Flashing Crosswalk Program, which has incorporated flashing lights into the pavement of 30 crosswalks. Both programs promote a safe pedestrian environment. By listening to the good counsel and recommendations from the Active Living Task Force and the Kirkland Senior Council, the city of Kirkland has and will continue to enhance the quality of life for its older residents.

HHS/FDA/Center for Biologics Evaluation and Research (CBER): Joint Studies for Potential Treatments of Joint Disorders for Americans

Using human gene studies as well as mouse and amphibian embryos, we discovered several proteins involved in the growth and development of joints that appear to have great potential as treatments for joint disorders caused by structural damage.

Lead Agency: HHS/FDA/Center for Biologics Evaluation and Research (CBER).

Agency Mission: The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Principal Investigator: Malcolm Moos Jr., M.D., Ph.D., 1401 Rockville Pike, Suite 200N, HFM–730, Rockville, MD 20852.

Partner Agencies: National Institute of Dental and Craniofacial Research (NIDCR). NIDCR is one of the National Institutes of Health (NIH).

General Description: Trauma (accident or injury), normal wear and tear, disease, and cancer surgery can all damage specific tissues and organs. The ideal treatment for repairing this damage would restore the tissue or organ to "like new" condition.

But before researchers can design such treatments, they must first have a detailed understanding of the biochemical processes the body itself uses to make these specific structures.

Among the most important elements that guides the growth of tissues and organs are biochemical signals called growth factors—proteins that trigger specific, immature cells to mature into a cell that is committed to a particular identity, such as a bone cell rather than a cartilage cell. The body uses dozens of different growth factors that cooperate under normal circumstances to direct proper formation of developing embryos as well as to repair tissues during the life of an individual.

Our laboratory uses a combination of experimental approaches to understand the role of growth factors in triggering growth and repair of tissues in the joints. We use a variety of strategies to identify and study several previously unknown growth factors crucial to the development of joints in vertebrates (e.g., humans). Specifically, we use conventional rodent models for studying bone and cartilage formation and use the embryos of the South African clawed frog (Xenopus) to work out the detailed biology of the growth factors that control joint development and other processes. In addition, we analyzed DNA from families affected by genetic disorders that lead to short stature and deformed limbs to identify the specific DNA sequence changes that caused two different clinical syndromes, thus confirming the role of the factors identified in human disease.

Our work has led to the discovery of several novel growth factors, the most important of which are Cartilage-Derived Morphogenetic Proteins (CDMP) 1, 2, and 3, and Frzb.

CDMPs 1 and 2 are found only in joint cartilage, and appear to be required for normal joint formation. For example, individuals who lack a functioning gene for CDMP1 are very short and have deformed limbs. Therefore, CDMP growth factors are now being evaluated to determine if they offer potential as therapies for joint disorders.

Unlike the CDMPs, the job of Frzb is to block the activity of other growth factors that belong to a group of molecules called Wnts. The family of Wnt growth factors is crucial to the formation and repair of many tissues, including joints; but when these growth factors are overexpressed (i.e., the genes that code for them are too active and make too much growth factor) the Wnt proteins sometimes trigger uncontrolled growth, that is, they cause cancer. Therefore, our work with Frzb and Wnts has the potential to lead to new strategies for repairing joints as well as for diagnosing and treating certain forms of cancer.

While both CDMPs and Frzb growth factors might prove useful as stand-alone therapies, it is more likely that they will be most valuable when used in combination with other growth factors, living cells, and various natural or synthetic biomaterials to manufacture various tissue-engineered medical products.

We are currently trying to identify at the molecular level other crucial biochemical steps that make up the signaling systems triggered by these growth factors. We hope this work will help us better understand these pathways that become active "downstream," after the initial growth factor signal.

The outcome of these studies would likely contribute to the design of improved products to repair joint disease. In addition, our finding could help improve techniques for testing products under clinical development in order to predict how well they will work in the clinic.

We are currently preparing for submission to scientific publications several manuscripts that describe our work in these areas.

Excellence: What makes this project exceptional?

We suggested, years ahead of most investigators in the field, that the processes controlling many types of tissue repair–especially skeletal repair–was generally similar to the processes that control embryonic development.

We tested the idea in two ways. First, we tested the activity of growth factors that we identified in newborn mammals to determine their effects in developing frog embryos; and then we searched both frog and fish embryos for growth factors that might be useful therapies for human joint diseases.

Both approaches were successful and enabled FDA researchers and their colleagues at the National Institutes of Health to obtain patents for molecules now proposed for testing in human clinical trials for the repair of damaged joints.

Also of interest is the fact we combined laboratory research techniques commonly used in embryology (in our case, frog embryos) with genetic studies of both mice and human families afflicted with certain short stature syndromes. This rather unconventional approach to the study enabled us to find key growth factors more efficiently and economically than would have been possible with conventional approaches.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Since virtually all older individuals develop joint damage, this work is relevant to a large and growing population of Americans.

Effectiveness: What is the impact and/or application of this research to older persons?

New therapies based on our growth factor discoveries could significantly improve the quality of life of the many older persons who develop joint damage (e.g., osteoarthritis), and help them retain their independent functioning.

Innovativeness: Why is this research exciting and newsworthy?

The findings hold promise for more effective treatments to repair, or perhaps even completely reconstruct, damaged joint tissues, eliminating the need for artificial joints.

U.S. Department of Health and Human Services/Food and Drug Administration: Neurodegenerative Diseases

Using mouse models of neurodegeneration disease in the aging brain, we showed that loss of normal connections between neurons precedes nerve death; and we are studying the impact of accumulating abnormal protein deposits in neurodegenerative disease.

Lead Agency: U.S. Department of Health and Human Services (HHS), Food and Drug Administration (FDA)

Agency Mission: The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Principal Investigator: Pedro Piccardo, M.D., Biologist, Senior Investigator 5516 Nicholson Lane, NLRC B1, Room 126 (HFM–313), Kensington, Maryland 20895.

Partner Agencies: Center for Biologics Evaluation and Research (CBER), Office of Blood Research and Review (OBRR), Division of Emerging and Transfusion-Transmitted Diseases (DTTD), Laboratory of Bacterial, Parasitic and Unconventional Agents (LBPUA), National Institutes of Health (NIH), USA, Biotechnology and Biological Sciences Research Council (BBSRC), UK.

General Description: Transmissible spongiform encephalopathies (TSEs or prion diseases) are neurodegenerative diseases that affect humans and animals. The most common human TSE is Creutzfeldt-Jakob disease (CJD), which the Centers for Disease Control and Prevention estimates strikes about one in 9,000 persons. Patients with TSEs become progressively demented and develop movement disorders.

Although TSEs are different from the more common Alzheimer's disease (AD), doctors sometimes find it difficult to tell the two diseases apart. Patients with AD tend to survive much longer; and unlike CJD, AD is not associated with a transmissible agent that could infect others. Therefore, it is critical to develop better criteria to diagnose the two dementing diseases of adults correctly.

Investigators in LBPUA, DETTD, OBRR, CBER, FDA, developed a quantitative system that might assist in the laboratory diagnosis of TSE. Currently, under the auspices of the National Institute of Allergy and Infectious Diseases (NIAID) interagency agreement, we are leading a project entitled "Potential of Candidate Cell Substrates for Vaccine Production to Propagate the Agents of Transmissible Spongiform Encephalopathies." In both TSEs and AD, aggregates of abnormally folded proteins called "amyloids" (that in some instances form microscopically visible plaques) accumulate in the brain—prion protein (PrP) in CJD and Aβ protein in AD. It has long been thought that amyloid plaques are accumulations of toxic proteins that cause neurodegeneration. A collaborative research project between an FDA staff member with investigators from Indiana University, Washington University, and the University of Edinburgh (funded in part by NIAID–NIH–FDA Interagency Agreement [see above]), has developed lines of transgenic mice with various genetic mutations implicated in the pathogenesis of some TSEs. These mice have already yielded useful information for better understanding basic mechanisms of human neurodegenerative diseases. Recent results indicate that specific alterations in connections between nerve cells of the brain (synaptic damage) preceded cell death and might be a common feature in the pathogenesis of neurodegenerative diseases. Others have proposed that, because some degenerating nerve cells show evidence of the phenomenon termed programmed cell death ("cell suicide") or apoptosis, treatments to inhibit apoptosis might be clinically useful. However, we found that such treatments failed to rescue mice with neurological disease. Thus, it seems unlikely that anti-apoptotic therapies alone will have a beneficial effect in human neurodenerative diseases unless combined with other treatments aimed at preventing synaptic damage and neuronal dysfunction. In a related project, we found that substantial amounts of amyloid proteins accumulated in brains of transgenic mice that developed no overt illness, no tissue changes of "spongiform" degeneration—the pathologic hallmark of TSEs—and contained no transmissible infectious agent. We propose that amyloid plaques may form as part of a "protective" mechanism that sequesters small toxic proteins; if that is true, then therapies designed to disrupt amyloid plaques might paradoxically enhance disease rather than reversing it. We are now investigating abnormalities in the brain that take place early in the course of neurodegeneration, seeking both a better understanding of the process and more promising targets for possible therapy.

Excellence: What makes this project exceptional?

This research program is based on our previous work (published in peer-reviewed, high-impact scientific journals) that showed that transgenic mice we developed have faithfully reproduced some of the same clinical and pathologic features found in patients with dementing diseases of aging. The ongoing research program takes advantage of a close collaboration between laboratories at FDA and academic institutions in the United States and the United Kingdom. The importance of our published studies was recently recognized by the editorial board of the Proceedings of the National Academy of Science, USA, which selected a publication for special editorial comment in the area of neuroscience.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Converging lines of evidence suggest that progressive accumulation of misfolded proteins in the brain plays a central role in causing neurodegenerative diseases of aging, such as Alzheimer's disease, as well as some forms of transmissible spongiform encephalopathies. Our work is shedding light on the causes of those diseases and suggesting new ways to treat them.

Effectiveness: What is the impact and/or application of this research to older persons?

A number of important questions about neurodegenerative diseases affecting older people cannot be answered by studies in cell culture systems and require animal models. We developed several lines of transgenic mice as models for human neurodegenerative diseases in which abnormal forms of prion protein accumulate in the brain. Those models have been useful for better understanding basic processes causing neurodegeneration and offer an opportunity for testing effects of new therapies.

Innovativeness: Why is this research exciting and newsworthy?

Our work challenges the long-held assumption that amyloid plaques are toxic and trigger the neurodegeneration that ultimately damages the aging brain. Instead, our findings suggest those conclusions might not be true.

Future studies aim to better explain the basic mechanisms of amyloid formation and neuronal cell death and to seek new targets for therapeutic intervention in neurodegenerative diseases of the aging brain.

U.S. FOOD AND DRUG ADMINISTRATION/CENTER FOR DRUG EVALUATION AND RESEARCH (CDER): PARKINSON'S DISEASE RESEARCH AND DRUG DEVELOPMENT

With increases in the aging population, the prevalence of neurodegenerative diseases such as Parkinson's disease will increase. Drugs that can slow the worsening of symptoms are clearly needed, but tools to guide the design of clinical trials which can measure the effect of a drug on disease progression are not available. Our research has used existing clinical trial data to develop publicly available quantitative models that may aid in the successful design of clinical trials that support evaluation of the disease modifying potential of newly developed therapies for Parkinson's disease.

Lead Agency: U.S. Department of Health and Human Services, Food and Drug Administration, Center for Drug Evaluation and Research (CDER).

Agency Mission: The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Principal Investigators: Dr. Venkatesh A. Bhattaram, 10903 New Hampshire Ave., Bldg 51, Rm. 3160, Silver Spring, MD 20993–

0002; Dr. Ohidul Siddiqui, 10903 New Hampshire Ave., Bldg 21, Rm. 4606, Silver Spring, MD 20993–0002; Dr. Leonard Kapcala, 10903 New Hampshire Ave., Bldg 22, Rm. 4368, Silver Spring, MD 20993–0002.

Partner Agencies: National Institute of Health, University of Rochester, NY, Parkinson's Study Group, Michael J. Fox Foundation for Parkinson's Disease, Parkinson's Action Network.

General Description: With an increasing aging population, the number of Americans who suffer from neurodegenerative diseases such as Parkinson's disease will increase. Parkinson's disease is a debilitating movement disorder that severely curtails the quality of life for patients and may lead to other serious secondary complications. Available drugs to treat this disease primarily provide symptomatic relief, but do not slow the disease progression. Drugs which may provide symptomatic relief when Parkinson's disease is first diagnosed become less effective as the disease progresses. Pharmaceutical companies are now developing drugs intended to slow the disease progression. Success of these development programs will have a major impact on public health. The scientific challenges associated with drug development programs are paralleled by scientific challenges associated with the development of objective evaluation tools to gauge the effectiveness of disease modifying treatments. Clearly, the trial designs, endpoints and analyses currently used for evaluating the effectiveness of drugs for symptomatic benefit are not applicable for testing whether a drug slows the progression of a disease. Thorough scientific research on the appropriate endpoints for discerning symptomatic and disease modifying effects is imperative if new therapies are to be successfully developed and evaluated.

A group of FDA scientists initiated the Parkinson's disease research project with the goal of developing objective models and tools to aid in the design and evaluation of clinical trials intended to demonstrate a disease-modifying effect. The approach focused on using previously collected clinical trial data to develop a quantitative description of multiple factors important to predicting disease progression in clinical trials. Patient level disease, demographic, trial design and other relevant data from several clinical trials within the FDA files and a NIH sponsored trial were collected and quantitative disease-drug-trial models for Parkinson's disease were developed. These models described the natural progression of the disease, patient disposition in terms of baseline disease severity, patient's age at disease onset, projected drug effects on disease progression, and reasons for patient discontinuation. Subsequently, the models were employed to explore competing endpoints and analyses that could demonstrate a disease-modifying effect. The results of the research were presented at the FDA Clinical Pharmacology Advisory Committee meeting (October 2006), and later at a public conference sponsored by FDA, Michael J. Fox Foundation, Parkinson's Study Group, and American Association of Pharmaceutical Scientists (April 2008).

The generalized mathematical model is a useful tool which may support the effective design of clinical trials by clinical investigators/researchers in the pharmaceutical industry and academia, thus advancing the public health by helping to speed innovations in drug development.

Excellence: What makes this project exceptional?

1. High public health value: Parkinson's disease is debilitating and patients need new therapies that not only provide relief of symptoms, but that retard the rate of disease progression. However, FDA and industry have little experience with drug development programs for drugs with this indication. Clear guidelines on how to develop such drugs and demonstrate disease-modification (i.e., slowing disease worsening) are lacking. FDA took a proactive step in leading the scientific thinking and building knowledge on how to efficiently develop and evaluate such drugs.

2. Objective use of prior knowledge: The first step in developing guidelines for future development is to accrue prior knowledge. FDA scientists evaluated prior trials submitted as part of New Drug Applications and a NIH sponsored study to appreciate the key features of the underlying disease. Specifically, the research set out to answer questions such as: How fast does a patient's disease worsen? What patient characteristics, if any, control the pace of the disease's progression? Do patients discontinue treatments because of toxicity or due to lack of effectiveness? Answering these questions was crucial to explore strategies to test if a new drug indeed modifies the pace of the disease. FDA is in a unique position to address these questions with its access to vast archive of clinical trial data and expertise in pharmacometrics, clinical trial design and biostatistics. Leveraging that knowledge is in the best interest of public health.

3. Effective collaboration across institutions/disciplines towards public health advancement: FDA scientists recognized the need for a collaborative approach to this research. The Offices of Clinical Pharmacology, Biostatistics and New Drugs within FDA collaborated actively in seeking answers to the above questions. At different stages of the research, different organizations/groups were engaged, which included: FDA, Michael J. Fox Foundation for Parkinson's Disease, University of Rochester, NY, Parkinson's Study Group, Parkinson's Action Network, several pharmaceutical industry representatives, and FDA advisors.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Parkinson's disease is a debilitating disease, which occurs mostly in the elderly. These aging patients need better drugs, which not only provide relief of symptoms, but retard disease progression.

Effectiveness: What is the impact and/or application of this research to older persons?

Developing guidelines on testing for drugs developed to slow disease progression is important to promote the design of efficient clinical trials that will provide for a clear and objective evaluation of new therapies which seek a disease modifying claim.

Innovativeness: Why is this research exciting and newsworthy?

This is an example of FDA scientists recognizing the tremendous public health benefit that can be realized by proactively leveraging prior knowledge in a systematic manner to aid future drug development. The creativity and dedication of the scientists involved is illustrated by the fact that much of the work was accomplished outside of their regular work assignments. This project exemplifies the tremendous potential of FDA's Critical Path Initiative to improve

the public health by providing tools that can reduce the uncertainties surrounding development of urgently needed new therapies.

U.S. FOOD AND DRUG ADMINISTRATION, NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH: SAFETY AND BIOACTIVITY OF ESTROGENIC DIETARY SUPPLEMENTS

Americans of all ages can be exposed to potent estrogenic compounds in dietary supplements, foods, and drugs, but many of the products are specifically marketed to older individuals, such as menopausal or postmenopausal women for their perceived health benefits and potential to relieve menopausal symptoms. This research project has critically investigated the role of dose, target tissue, and life stage timing of exposure in producing physiological effects, because both beneficial and detrimental effects are possible in mammary, adipose tissue, and the central nervous system.

Lead Agency: U.S. Department of Health and Human Services, U.S. Food and Drug Administration, National Center for Toxicological Research (NCTR).

Agency Mission: The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Principal Investigator: Daniel R. Doerge, Ph.D., Research Chemist, 3900 NCTR Road, Jefferson, AR 72079.

Partner Agencies: University of Illinois—CRADA (Cooperative Research and Development Agreement).

General Description: The overall goal of this project has been to evaluate the safety and bioactivity of estrogenic dietary supplements. The component projects are aimed collectively at defining the activity of estrogenic dietary supplements in various target tissues (including mammary gland, adipose tissue, and central nervous system) in which estrogens are known to have diverse—sometimes beneficial and sometimes detrimental—effects. All of the investigations were also designed to critically evaluate the important issue of safety, which with hormonal agents such as estrogens is typically complex, because it depends on dosage and exposure, metabolism, and age, and often can vary from target tissue to target tissue. Americans of all ages are exposed to these potent estrogenic compounds, but many of the products are specifically marketed to older individuals, such as menopausal or postmenopausal women for their perceived health benefits and potential to relieve menopausal symptoms. Therefore, the research has focused in particular on the benefits and risks from the use of these products by older individuals.

Excellence: What makes this project exceptional?

The overall goal of this research project was to evaluate the safety and bioactivity of estrogenic dietary supplements through the combined effort of several experienced investigators, who have a long-standing track record of scientific excellence and well-developed collaboration among them. Together, these investigators have

organized a series of interdependent research projects that collectively are aimed at defining the activity of estrogenic dietary supplements in mammary, adipose tissue, and the central nervous system, in which estrogens are known to have diverse effects.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The FDA has severely limited regulatory authority over dietary supplements, and, as a result, the safety and efficacy of most of these products are unknown. A significant proportion of the estrogenic dietary supplements currently on the market contain soy isoflavones. Many of the beneficial effects of isoflavones are associated with their estrogenic action. This presents a paradox—because dietary estrogens, like endogenous and hormone-replacement therapy, have both potential risks and benefits. Many of these products are specifically marketed to older individuals, particularly menopausal or postmenopausal women for their perceived health benefits and potential to relieve menopausal symptoms. Based on research from this project in appropriate animal models, consumption of dietary estrogens could affect growth of estrogen-dependent breast cancer, the development of adipose tissue and obesity, and affect cognitive function in the elderly.

Effectiveness: What is the impact and/or application of this research to older persons?

These studies contain important direct estrogenic comparisons of effects from purified isoflavones, which occur in dietary supplements, with more complex soy ingredients that occur in whole-soy foods and other commercial products. In this way, critical guidance can be provided to older Americans about the healthiest practices regarding consumption of soy-based products.

Innovativeness: Why is this research exciting and newsworthy?

Breast cancer is the second leading cause of cancer death in U.S. women, most breast cancer cases (~75%) occur in postmenopausal women, and most (~70%) are estrogen-dependent. The stimulatory effect of estrogens on the growth of breast cancers can be blocked by two manipulations: competitive binding interactions at the estrogen receptor (ER) by anti-estrogens like tamoxifen, and competitive inhibition of estrogen synthesis by aromatase inhibitors. These adjuvant endocrine therapies have proven to be highly effective and have led to significant improvements in survival for postmenopausal women with early-stage estrogen-dependent breast cancer. This research project has shown that dietary soy isoflavones can negate the inhibitory effects of tamoxifen and aromatase inhibitors on the growth of human breast tumors in a mouse xenograft model. These studies suggest that such diet-drug interactions have the potential to reduce the effectiveness of frontline endocrine therapy for breast cancer in postmenopausal women.

U.S. Food and Drug Administration/National Center for Toxicological Research (NCTR): Effects of Dietary Supplements in Aging Individuals

This research project is designed to investigate the possible toxic effects of the consumption of large doses of the over-the-counter dietary supplements glucosamine and chondroitin sulfate on the metabolism of sugar by aging individuals who may have Type II diabetes. The project will also evaluate the effects that glucosamine or

glucosamine and chondroitin sulfate in combination have on blood glucose, insulin, cholesterol, and triglycerides. Organ systems that will be investigated include liver, kidney, and eyes.

Lead Agency: U.S. Department of Health and Humans Services, U.S. Food and Drug Administration, National Center for Toxicological Research (NCTR).

Agency Mission: The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Principal Investigator: Julian Leakey, Ph.D., Research Biologist, 50 RM647 HFT–030, 3900 NCTR Road, Jefferson, AR 72079.

Partner Agencies: National Toxicology Program (NIEHS).

General Description: This research project is designed to investigate the chronic effects of the long-term use of glucosamine and chondroitin sulfate, over-the-counter dietary supplements commonly used for inflammation and chronic joint pain relief, and the possible interference of sugar metabolism in individuals who may have Type II diabetes. Approximately 40 million Americans have been reported to suffer from osteoarthritis; annual retail sales of these dietary supplements approached $750,000,000 in 2004. Use of these dietary supplements continues to increase among an aging U.S. population that seeks to maintain hip, knee, and spinal health and, therefore, preserve mobility and productive activity.

Data indicate that the subpopulation of consumers using these compounds for chronic joint or arthritic pain management is in its 50s or beyond, are usually overweight, and may consume doses in excess of manufacturer's recommended levels. It is thought that the compounds in question could accelerate the development of vascular degeneration and other physiological and clinical effects associated with Type II diabetes. The potential for kidney degeneration may also prove to be an increased risk for Type II diabetes when these drugs are used for extended periods of time. The primary concern is for the individuals in this sub-group who are not aware they are Type II diabetics. The lack of dietary control has been shown to be a contributing factor in the development of this disease. Joint pain is increased as the level of obesity rises, which tends to cause these self-medicated individuals to routinely increase the dose of dietary supplements to offset the discomfort. When one considers that most of this treatment is without the knowledge or advice of a medical professional, these individuals could be endangering their future health to the point of loss of limbs, blindness, vascular disease, or even death. The data from this project will provide much needed information for the education of this aging population.

Excellence: What makes this project exceptional?

While use of the dietary supplements, glucosamine and chondroitin sulfate, continues to increase in the aging U.S. population, there is currently no long-term toxicology data on these compounds. The depth and breadth of this study will provide insight

as to whether glucosamine or glucosamine and chondroitin sulfate in combination, dosed at various concentrations, will have a lasting effect on organ systems that are also affected by diabetes. Of particular interest is investigating whether these dietary supplements can cause kidney damage in normal or diabetic animal models. The use of lean (normal) and diabetic (obese) rat models in this study act as surrogates of two human populations of individuals. The models will allow a comparison of the effects of these drugs under both physiological conditions and whether these supplements will cause kidney damage in either or both rat strains. The obese, diabetic rat begins to develop kidney sclerosis at 20 weeks of age; osteoarthritis also begins to develop at an early age in the obese rat. We therefore have a model that develops signs of disease at an early age, and a normal animal to which we can compare that disease development.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Data indicate that the likely consumers of these readily available, over-the-counter dietary supplements, who use these compounds for chronic joint or arthritic pain management, comprise a large segment of the aging U.S. population. Frequently these individuals are overweight and likely candidates for development of Type II diabetes. It is further thought that these supplements have the potential to accelerate the development of vascular degeneration, kidney degeneration, and other physiological and clinical effects known to be associated with Type II diabetes.

Effectiveness: What is the impact and/or application of this research to older persons?

Glucosamine or glucosamine and chondroitin sulfate in combination are dietary supplements promoted and purchased to relieve the symptoms of chronic inflammation and joint pain. Consumers are predominately the middle-aged or older segment of our population; many are obese and at risk for the development of Type II diabetes. Significant numbers of these individuals self-medicate independent of medical supervision, to routinely increase the dosage to offset increased discomfort. There are currently no data to guide individuals on short- or long-term use of these dietary supplements. The data from this project will provide much needed information for the education of this aging population.

Innovativeness: Why is this research exciting and newsworthy?

As our population ages and becomes limited in mobility and productive activity, dietary supplements that are promoted to alleviate the pain and discomfort of inflammation, joint pain, and arthritis are used with greater frequency and at higher doses. Sound guidelines for use and appropriate dosages do not exist. As life expectancy of aging populations in the U.S. increases, the potential for long-term use of glucosamine or glucosamine and chondroitin sulfate in combination also increases. Currently, there is no toxicology data on the effects of these drugs on multiple organ systems or on the potential for associated diabetes risk among aging, obese populations. This study promises to provide sound scientific data for such risk assessment.

U.S. Food and Drug Administration/Office of Women's Health: Impact of Gender Analysis and Pharmacogenomics on Clinical Efficacy, Safety, and Pharmocokinetics of Drugs Used for the Treatment of Alzheimer's Disease

The objectives of this project were to examine the representation of women in Alzheimer's disease trials and to identify whether gender and ApoE genotype are predictive factors of the response to Alzheimer's disease drugs.

Lead Agency: U.S. Department of Health and Human Services (HHS), U.S. Food and Drug Administration (FDA), Office of Women's Health (OWH).

Agency Mission: The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Principal Investigator: Angela Men, Ph.D., Staff Fellow, Division of Clinical Pharmacology V, OCP, OTS/OCP/DCP5 Center for Drug Evaluation and Research, 10903 New Hampshire Avenue, Silver Spring, MD.

Partner Agencies: Center for Drug Evaluation and Research (CDER), Office of Clinical Pharmacology (OCP), Division of Neurology Products (DNP), Office of Drug Evaluation I (ODEI), Office of New Drugs (OND), Office of Pharmacoepidemiology and Statistical Science (OPASS), Office of Biostatistics (OB), Divison of Biometrics I (DBI).

General Description: Impact of Gender Analysis and Pharmacogenomics on Clinical Efficacy, Safety, and Pharmacokinetics of Drugs Used for the Treatment of Alzheimer's Disease. Alzheimer's disease (AD) is the most common cause of dementia in the elderly. Risk factors for AD include one form of the apolipoprotein E (ApoE) genotype and gender: females and ApoE4 carriers are at higher risk for AD. Several literature reports showed that certain patients respond better to the treatment than others. Thus, it will be very helpful to identify whether gender and ApoE genotype are predictive factors of the response to AD.

The medications approved at the time of the study are cholinesterase inhibitors and drugs regulating glutamate.

This project examined the clinical trials associated with AD for gender-based analysis. Historically females have been underrepresented in clinical research and thus have examined these clinical trials determine if the number of women enrolled is adequate. Further, since AD affects 1.5 to 3 times as many women as men and because there are studies that suggest gender is likely to be a more powerful determinant of outcome of cholinesterase inhibitor treatment than ApoE status in the short term, it was of increased importance that we track the inclusion of women and investigate the roles that gender may play.

Large strides have been made to ensure that women were not underrepresented in these clinical trials. Issues of insufficient en-

rollment are no longer significant in AD clinical trials. Available genomic data show that AD patients with homozygous ApoE4 responded more positively to treatment of these two drugs on the cognitive function than ApoE4 negative and heterozygous ApoE4 patients. This work shows that pharmacogenomic information in FDA submissions is useful for examining efficacy in important AD disease subgroups. To better understand the impact of ApoE on clinical efficacy, collection of pharmacogenomic information in the IND and NDA submission is recommended.

Excellence: What makes this project exceptional?

Alzheimer's disease (AD) is characterized by progressive impairment in memory, language, visual-spatial perceptions, and judgment. Risk factors for AD include one form of the apolipoprotein E (APOE) genotype and gender. Females are at higher risk for AD. Although AD affects both men and women, studies show that 1.5 to 3 times as many women suffer from AD as do their male counterparts. The results from the study showed that the ratios of women to men ranged from as low as 1.3 to 2.1. This study also explored the relationship between ApoE biomarker and clinical outcome of AD patients when treated with approved drugs. Since there is no cure for AD, any progress that can be made in understanding the disease is a tremendous step forward.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Alzheimer's Disease (AD), an age-related neurodegenerative disorder, is the most common cause of dementia in elderly people. There are two types of AD, early onset and late onset. In early onset AD, symptoms first appear before age 65. Early onset AD is much less common, accounting for only 5–10% of cases. Late-onset AD, the more common form, develops after age 65. Although AD affects both men and women, studies show that 1.5 to 3 times as many women suffer from AD as do their male counterparts. In 1992, researchers found that certain forms of the apolipoprotein E (ApoE) gene can influence AD risk. The ApoE4 is the main known genetic risk factor for AD. The ApoE4 alleles decrease and the ApoE2 alleles increase age at onset of AD. It is estimated that the number of AD patients will reach 9 million by the year 2040 if there are no curative treatments developed.

Effectiveness: What is the impact and/or application of this research to older persons?

One of the objectives of this project was to determine whether enrollment of women in AD clinical trials is sufficient and fairly representative of the disease demographic. Based on the obtained results, it can be said that large strides have been made to ensure that women were not underrepresented in these clinical trials. The results of the study demonstrate the importance of collecting pharmacogenomic data in AD trials.

Innovativeness: Why is this research exciting and newsworthy?

Tracking inclusion of women in these clinical trials and identifying the gender and the genomic effects on the pharmacokinetic/pharmacodynamic of drugs used to treat AD will help achieve the goal of personalized medicine.

U.S. FOOD AND DRUG ADMINISTRATION/OFFICE OF WOMEN'S HEALTH: EVALUATING THE EFFECTIVENESS OF VERTEBROPLASTY FOR IMPROVING THE MECHANICAL PROPERTIES OF THE SPINE IN PATIENTS WITH OSTEOPOROSIS

The objective of this project was to help surgeons identify osteoporosis patients for vertebroplasty surgery, optimize the quantity of cement being injected and provide information to FDA to facilitate regulatory decision making process on the use of cements for vertebroplasty surgery.

Lead Agency: U.S. Department of Health and Human Services (HHS), U.S. Food and Drug Administration (FDA), Office of Women's Health (OWH).

Agency Mission: The FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Principal Investigator: Jove Graham, Ph.D., Mechanical Engineer, Materials Engineering Branch (MEB), Office of Science and Technology (OST), Center for Devices and Radiological Health, Mail Code: HFZ–150.

Partner Agencies: University of California, Berkeley (Department of Bioengineering, Department of Mechanical Engineering, Department of Orthopaedic Surgery, Medical Polymers and Biomaterials Laboratory), and University of California, San Francisco (Engineering Systems).

General Description: Vertebral compression fractures are estimated to affect 33% of women over age 65, causing pain, disability, and increased mortality risk. An emerging surgical treatment is vertebroplasty, or injection of acrylic bone cement into the vertebral body. Previous work has suggested that bone porosity can have a significant effect on the integrity of cement fixation in joint replacement, so the potential benefit of vertebroplasty may depend on a patient's degree of osteoporosis. The hypothesis was to test whether bone mineral density (BMD) can be used to predict mechanical strength and stiffness of the vertebral body after cement injection. A corollary hypothesis was to test whether the relationship between mechanical properties and BMD varies with amount of cement injected. Vertebral columns from thirteen adult Caucasian female cadavers were obtained and bone mineral density was measured with DEXA. Vertebrae were randomly assigned to five groups: intact, untreated, 4%, 12% and 24% cement fill treatment. Specimens were first compressed to simulate a vertebral wedge fracture and then treated with cement. Strength and stiffness of all specimens were measured. The results suggest that there may be significant differences between patients with high and low bone density in terms of the relative improvement in strength that vertebroplasty can offer them. In the study, only the highest cement dose used (24% fill) had any effect on mechanical strength or stiffness. More importantly, samples with very low bone density

(i.e., highly osteoporotic) did not how as great an improvement in stiffness as high-density samples even when cement volume was increased to 24% fill. This study suggests that clinicians may be able to use DEXA to select a cement volume and to predict the mechanical integrity after vertebroplasty for a specific patient based on bone mineral density.

Excellence: What makes this project exceptional?

Among persons over 65, fracture rates are three times higher in women than in men, and women with osteoporosis are more likely to suffer vertebral compression fractures. Vertebral compression fractures are the most common injury resulting from osteoporosis, with an estimated incidence of 700,000 per year in the U.S. These fractures, if untreated, have been shown to cause acute and chronic back pain, disability, and increased mortality risk. In a 2000 study of 6,459 women with osteoporosis followed for 3.8 years, those women who sustained a spine fracture were 8.7 times more likely to die than those women who did not experience a fracture. One treatment for these fractures is vertebroplasty, or injection of acrylic bone cement into the vertebral body to restore its strength. This minimally-invasive approach is expected to result in earlier recovery times than other more conservative options, and it is used for severe, intractable cases where non-surgical treatments are not sufficient to relieve the pain and deformity caused by the fracture. Acrylic bone cement, normally reserved for joint replacement surgery, has not been FDA-approved for this procedure, but the cement is used "off-label" for vertebroplasty at the surgeon's discretion. The objective of this project was to test two important hypotheses related to the safety and effectiveness of vertebroplasty surgery. The first hypothesis is that, by diagnosing a patient's degree of osteoporosis with non-invasive clinical techniques, we will be able to predict the success of vertebroplasty as measured by improvement in mechanical strength of the vertebral body. The second hypothesis was that the volume of cement injected can be optimized to restore strength without causing an excessive stiffness of the vertebral body that might lead to secondary fractures.

This study suggests that clinicians may be able to use DEXA to select a cement volume and to predict the mechanical integrity after vertebroplasty for a specific patient based on bone mineral density.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Vertebral compression fractures are estimated to affect 33% of women over age 65, causing pain, disability, and increased mortality risk. An emerging surgical treatment is vertebroplasty, or injection of reinforcing acrylic bone cement into the vertebral body. Cements have not been FDA-approved for this procedure, but they are used "off-label" at surgeons' discretion.

Effectiveness: What is the impact and/or application of this research to older persons?

Recent studies performed by FDA investigators have established that bone porosity can have a significant effect on the quality of cement fixation in joint replacement, so it was hypothesized that there might also be limitations to the benefits of vertebroplasty surgery depending on a patient's degree of osteoporosis. A secondary long term complication of the surgery is that adjacent

vertebrae may fracture due to a redistribution of loads following the repair of the original fracture. It may be important to optimize the quantity of cement being injected in order to avoid excessive stiffening of the repaired segment relative to the adjacent bone. Such an optimization technique has not yet been studied or reported in the literature until this study was conducted.

As the off-label use of existing bone cements for vertebroplasty becomes more popular, the FDA anticipates a surge in submissions for new cement devices specific to this application. It is a very recent, emerging area with a lack of published data from the industry and very limited clinical follow-up data from surgeons. The results of this project could help FDA/ODE to develop a model for preclinical testing that could evaluate safety and effectiveness without the need for human studies. This project could provide important information to ODE reviewers about the proper clinical indications for these devices, thus reducing uncertainty in the review process and leading to faster review times. The results of this study should be beneficial to OSB by helping them to make informed decisions about actions that the FDA should or should not take in regulating these devices.

Innovativeness: Why is this research exciting and newsworthy?

Public health will be enhanced by helping surgeons use existing diagnostic tools to make better-informed decisions about benefits and limitations of vertebroplasty surgery for a specific patient.

HEALTH RESOURCES AND SERVICES ADMINISTRATION: ACCESS TO HEALTH CARE IN RURAL AMERICA

This research addresses issues of access to formal home health care in rural areas.

Lead Agency: U.S. Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA).

Agency Mission: HHS Mission: The HHS mission is to enhance the health and well-being of Americans by providing for effective health and human services and by fostering sound, sustained advances in the sciences underlying medicine, public health, and social services.

HRSA Mission: HRSA provides national leadership, program resources and services needed to improve access to culturally competent, quality health care. As the Nation's Access Agency, HRSA focuses on uninsured, underserved, and special needs populations in its goals and program activities.

Principal Investigator: William J. McAuley, Ph.D., Communication Department, George Mason University, Center for Social Science Research, 9201 Chain Bridge Road, Suite B100–MSN 1H5, Fairfax, VA 22030.

General Description:

ACCESS TO FORMAL HOME HEALTH CARE IN RURAL AREAS

This research addresses issues of access to formal home health care in rural areas, and examines the use of formal home health care in such areas. It also examines the impact of the Balanced Budget Act (BBA) of 1997 and other recent policies on the staffing characteristics of Medicare-certified home health agencies (HHAs)

across rural and urban counties from 1996 to 2002, a period encompassing changes of the BBA and related policies.

Excellence: What makes this project exceptional?

This research highlighted the policy impact on use of formal home health care in both small rural counties and remote counties. The risk of any formal home care use is significantly higher for Medicaid enrollees residing in small rural counties (i.e., with no town larger than 10,000). Use of Medicare home health care is significantly greater for residents of the most remote counties. There were substantial population-adjusted decreases in home health aides based in HHAs in all counties, including remote counties.

Significance: How is this research relevant to older persons, populations and or an aging society?

Results suggest that for the elderly in rural counties, Medicaid coverage, especially of case-management services, may facilitate access to acute and chronic care services, especially Medicare home health care. The limitedpresence of stable HHA staff in certain rural counties, especially in remote counties, has been exacerbated since implementation of the BBA.

Effectiveness: What is the impact and/or application of this research to older persons?

This research provides information for decision-makers about the impact of Medicaid in rural places as an important mechanism for linking the elderly to formal home care, especially to Medicare formal home health care. The loss of home health aides in more rural counties may limit the availability of home-based long term care in these locations. Formal home health care may substitute for less available forms of care in the most rural counties.

Innovativeness: Why is this research exciting or newsworthy?

This research is newsworthy because it suggests that policies that limit access to formal home care could lead to increased service-related vulnerabilities among the elderly in rural areas.

U.S. Department of Health and Human Services: Medicare Advantage Plans

This research focuses on the analysis of Medicare Advantage plan choices for rural beneficiaries.

Lead Agency: U.S. Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA).

Agency Mission: HHS Mission: The HHS mission is to enhance the health and well-being of Americans by providing for effective health and human services and by fostering sound, sustained advances in the sciences underlying medicine, public health, and social services.

HRSA Mission: HRSA provides national leadership, program resources and services needed to improve access to culturally competent, quality health care. As the Nation's Access Agency, HRSA focuses on uninsured, underserved, and special needs populations in its goals and program activities.

Principal Investigator: Keith Mueller, Ph.D, Director, RUPRI Center for Rural Health Policy Analysis, University of Nebraska Medical Center, Department of Health Services Research and Administration, 987835 Nebraska Medical Center, Omaha, NE 68198.

General Description:

IMPACT OF MEDICARE ADVANTAGE PLAN CONCENTRATION ON CHOICES AND COMPETITION IN RURAL AREAS

This research focuses on the analysis of Medicare Advantage (MA) plan choices for rural beneficiaries and what the concentration of plan choices in rural areas may mean in the context of how rural beneficiaries are making their choices. Using measures of concentration from the economics literature, this project explores the relationship between market concentration in MA plans and the generosity of MA plans, and how it varies by the location of residence of Medicare beneficiaries.

Excellence: What makes this project exceptional?

This research is exceptional because of its emphasis on assisting the elderly in rural America to obtain the benefits of the Medicare Advantage program.

Significance: How is this research relevant to older persons, populations and or an aging society?

This research is relevant because it examines the need for outreach and education of the rural elderly about the usefulness of the Medicare Advantage program.

Effectiveness: What is the impact and/or application of this research to older persons?

The research provides information for decision-makers concerned with the slow start in enrollment in rural areas to review policies concerning Medicare Advantage in rural areas.

Innovativeness: Why is this research exciting or newsworthy?

This research is exciting because it shows that enrollment in Medicare Advantage in rural areas, which was off to a slow start, is now growing rapidly so rural elderly can take advantage of the extra benefits provided by Medicare Advantage.

CONGRESSIONAL RESEARCH SERVICE: AFFORDABLE HOUSING FOR THE ELDERLY

This report gives a detailed history of how the Department of Housing and Urban Development (HUD) has funded, and continues to fund, housing for older households. The report describes how HUD supportive services programs can assist elderly residents to stay in their residential units as they age.

Lead Agency: Congressional Research Service.

Agency Mission: The Congressional Research Service provides, exclusively to the United States Congress, objective, non-partisan assessments of legislative options for addressing the public policy problems facing the nation.

Principal Investigator: Libby Perl, Analyst in Housing.

General Description: The Department of Housing and Urban Development (HUD) operates a number of programs that provide assisted housing specifically for low-income "elderly" households (defined by HUD as those with a head of household or spouse age 62 or older). Together with housing assistance, HUD also funds several programs that provide supportive services for residents to allow them to remain in their apartments as they age. This report describes those programs, along with current developments in the area of housing for elderly households.

This report also describes current issues involving HUD-assisted housing for elderly residents. Among the issues described is the

preservation of affordable housing for low-income elderly households. At the time affordable housing projects were developed, building owners entered into contracts with HUD in which they agreed to maintain affordability for a certain number of years. The duration of these contracts were generally between 20 and 50 years. In recent years, these contracts have begun to expire or, in some cases, property owners have chosen to pay off their mortgages early and end the use restrictions. When this occurs, owners may charge market-rate rents for the units, and the affordable units are lost. In coming years, more and more property owners will be in a position to opt out of affordability restrictions and thousands of units could be lost.

This report will be updated in the future to provide more information about HUD developments, in particular Section 202 developments, with updated data from HUD. The report will also discuss the new Intergenerational Housing Demonstration Project through HUD that has just begun to accept grant applications.

Excellence: What makes this project exceptional?

The report explains complicated concepts in a way that policymakers unfamiliar with the programs discussed as well as the complexities of housing finance can understand. The report chronicles Congressional efforts over nearly fifty years to develop housing for elderly households. These efforts began in 1959, when Congress created the Section 202 Supportive Housing for the Elderly program, which at the time was targeted to underserved, moderate income households (low-income households at the time were served through the Public Housing program). The report focuses on the Section 202 program because it is the only program devoted exclusively to serving elderly households and because its history is complex. The program has had many incarnations; the system of providing financing for developments has changed from loans to grants, the tenant population targeted has moved from moderate-income elderly households to very low-income elderly households, and the program has gone from serving only elderly households to serving elderly and disabled households, and then back to serving elderly households exclusively. This history of Section 202 is important to policymakers because many projects developed in the early years of the program continue to operate under the rules in place at the time they were built, and changes to the law must take account of those rules.

The report also discusses four programs that provide housing devoted to elderly households, but that do not receive as much attention as Section 202. Two of these programs, Section 221(d)(3) and Section 236, were created in 1961 and 1968 respectively, however they have not been used to build new housing since the 1970s. As a result, there is not much information available about the way in which these programs developed and currently operate. These sections of the report are therefore a good source of information that is otherwise difficult to find. The report also details how buildings developed through the Section 8 project based rental assistance program and Public Housing program may be dedicated to elderly residents exclusively and the rules involved in dedicating these facilities. Finally, the report brings in a discussion of HUD supportive services programs and how they work together with HUD-assisted housing. These programs are the Service Coordinator pro-

gram, Congregate Housing program, Assisted Living Conversion program, and the Resident Opportunity and Self Sufficiency program.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This report unifies the discussion of how the federal government supports affordable housing for Older Americans. Numerous funding streams for both housing and supportive services exist, and the way in which they interact to serve "elderly" households, defined by the Department of Housing and Urban Development (HUD) as those with a head of household or spouse age 62 or older, is not always clear. Over the years, HUD has developed assisted housing through multiple programs, and the structure of those programs, the financing arrangements, and the populations that they serve all differ to some degree. For example, some of these programs have not funded new housing developments since the 1970s, and others have changed their financing schemes as well as the characteristics of households eligible to live there.

Effectiveness: What is the impact and/or application of this research to older persons?

The report's purpose is to inform Congressional staff and Members of Congress about how existing programs operate as they consider future policy approaches to this issue. Knowing the evolution of the Section 202 program is important background for understanding pending legislation, since its provisions would affect Section 202 developments differently depending on which version of the program financed their construction.

Innovativeness: Why is this research exciting or newsworthy?

This report takes a comprehensive and detailed approach to chronicling these varied and complex housing programs. Although other existing reports may present information about the history of the Section 202 program, for example (both HUD and AARP have done this), this report differs in that it also discusses four other HUD programs that provide housing for elderly households in an attempt to cover the spectrum of assisted housing. Unlike the Section 202 program, these programs—Section 236, Section 221(d)(3), Section 8 project-based housing, and Public Housing—also provide housing for non-elderly households, but building owners may choose to dedicate their facilities to elderly residents. Nor do other existing reports include discussions of how HUD supportive services programs interact with HUD housing programs so that residents may remain in their units as they age.

CONGRESSIONAL RESEARCH SERVICE: LONG-TERM FAMILY CAREGIVING

This report describes the role of family caregivers in providing long-term care to older individuals; federal programs and initiative that directly and indirectly assist family caregivers; and, selected policy issues that would provide direct assistance to family caregivers.

Lead Agency: Congressional Research Service.

Agency Mission: The Congressional Research Service provides, exclusively to the United States Congress, objective, non-partisan assessments of legislative options for addressing the public policy problems facing the nation.

Principal Investigator: Kirsten J. Colello, Analyst in Gerontology.
General Description:

FAMILY CAREGIVING TO THE OLDER POPULATION: BACKGROUND, FEDERAL PROGRAMS, AND ISSUES FOR CONGRESS

This report describes the role of family caregivers in providing long-term care to older individuals; federal programs and initiatives that directly and indirectly assist family caregivers; and, selected policy issues that would provide direct assistance to family caregivers. These policy issues, which have been the subject of discussion among federal policymakers and other interested stakeholders, include the following: caregiver services and supports, flexible workplace accommodations and income security, and additional tax credits.

Family caregiving to older individuals in need of long-term care encompasses a wide range of activities, services, and supports. Caregiving can include assistance with personal care needs, such as bathing, dressing, and eating, as well as other activities necessary for independent living, such as shopping, medication management, and meal preparation. In addition, family caregivers may arrange, supervise, or pay for formal or paid care to be provided to the care recipient.

Family caregivers fulfill the majority of the need for long-term care among older persons with chronic disabilities in the United States. As a result of increases in life expectancy, as well as the aging of the baby-boom generation, demand for family caregiving to the older population is likely to increase. However, demographic trends such as reduced fertility, increased divorce rates, and greater labor force participation among women may limit the number of available caregivers to older individuals, as well as the capacity for caregivers to provide needed care.

Excellence: What makes this project exceptional?

This report assists Congress in identifying and describing the various federal programs and initiatives that provide both direct and indirect assistance to family caregivers. Recognizing family caregivers as an important part of the nation's long-term care delivery system, the federal government has established programs and initiatives that provide direct supports to caregivers, such as respite care, education and training, tax relief, and cash assistance. This report summarizes federal programs and initiatives that provide both direct and indirect support to family caregivers. Benefits that are targeted directly at family caregivers help to reduce stress and financial hardship, and to improve caregiving skills, among other things. Other federal programs and initiatives provide home- and community-based long-term care services and supports to the care recipient. These programs can indirectly benefit caregivers in relieving caregiver burden by either supplementing the informal care they are providing or substituting with paid support. This report assists federal policymakers by describing these federal programs and initiatives. The report also summarizes key policy issues for family caregivers to the older population that have been the subject of discussion among federal policymakers and other interested stakeholders.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The need for long-term care increases with advancing age. Family caregivers fulfill the majority of the need for long-term care among older persons with chronic disabilities in the United States. As a result of increases in life expectancy, as well as the aging of the baby-boom generation, demand for family caregiving to the older population is likely to increase. However, demographic trends such as reduced fertility, increased divorce rates, and greater labor force participation among women may limit the number of available caregivers as well as the capacity for caregivers to provide needed care to older individuals. Given these competing factors, it is likely that family caregiving to the older population will remain an important topic for consideration among policymakers.

Effectiveness: What is the impact and/or application of this research to older persons?

About 5.5 million adults aged 65 and older—about 16% of the U.S. population aged 65 and older—receive long-term care services and supports. Of those receiving services, the majority (70%, or 3.8 million) live in the community; the remaining 30% (1.7 million) live in institutional settings. It is estimated that between 7 and 54 million Americans provide assistance with personal care and other activities necessary for individuals to function independently in their own homes and communities. The majority of these individuals providing care to older relatives are family members, such as a spouse or adult child. Many do so willingly out of a sense of responsibility or personal obligation to their family member. As a result, some do not identify themselves as caregivers. However, researchers have increasingly paid more attention to the issue of family members providing unpaid care to older relatives, many of whom provide assistance with long-term care needs for extended periods of time. It is estimated that family caregivers provide on average, 46 hours of care per week for over 4 years. Family caregivers seeking information on available public and private long-term care services and supports for their older relative may be overwhelmed with what is often described as a fragmented and confusing system.

Innovativeness: Why is this research exciting or newsworthy?

Family caregivers will continue to play an important role in the delivery of long-term care services and support to the older population. Researchers are continuing to examine ways in which education, training, and other services and supports can best assist family caregivers. Policymakers will continue to debate ways in which the federal government can further assist family caregivers providing long-term care to older individuals.

SOCIAL SECURITY REFORM: POSSIBLE EFFECTS ON THE ELDERLY POOR AND MITIGATION OPTIONS

This report analyzes the projected effects of four possible options to mitigate the effects of Social Security (SS) benefit reductions on elderly poverty. The four options examined are (1) a poverty-line SS minimum benefit; (2) a sliding-scale SS minimum benefit; (3) a poverty-line Supplemental Security Income (SSI) benefit; and (4) a poverty-line SSI benefit with liberalized eligibility.

Lead Agency: Congressional Research Service

Agency Mission: The Congressional Research Service provides, exclusively to the United States Congress, objective, non-partisan

assessments of legislative options for addressing the public policy problems facing the nation.

Principal Investigator: Kathleen Romig, Analyst in Income Security.

General Description:

SOCIAL SECURITY REFORM: POSSIBLE EFFECTS ON THE ELDERLY POOR AND MITIGATION OPTIONS

This report analyzes the projected effects of four possible approaches to mitigating the effects of Social Security benefit reductions on elderly poverty in 2042, the first full year of projected trust fund insolvency. The options are compared to a payable baseline, which assumes current-law benefits would need to be cut across the board to balance Social Security's annual income and spending at the point of insolvency. The four options examined are (1) a poverty-line Social Security minimum benefit; (2) a sliding-scale Social Security minimum benefit; (3) a poverty-line SSI benefit; and (4) a poverty-line SSI benefit with liberalized eligibility.

Major findings include the following:

• Each of the four options would reduce elderly poverty compared to the payable baseline—ranging from a negligible reduction in the elderly poverty rate for the option to create a sliding-scale Social Security minimum benefit to a reduction of three percentage points for the poverty-line SSI benefit with liberalized eligibility.

• The elderly poverty rate under all of the options would be higher than under the current law scheduled baseline, which assumes the current benefit formula can be maintained with no reductions.

• The SSI options examined would target the additional spending more efficiently toward the poor elderly than would the Social Security options.

• The Social Security options examined would reduce the incomes of some elderly because of interaction effects; the SSI options would not create such interactions.

Excellence: What makes this project exceptional?

This program uses a microsimulation model to simulate the impact of alternative Social Security reform proposals on the elderly poor. This research can be distinguished from other research as it focuses on the poor elderly specifically and is able to simulate the interaction of Social Security and Supplemental Security Income (SSI). Most other research has focused on only the effects of Social Security on the low, median and high-wage earner. This information should help policymakers identify any potential unintended consequences through the interaction of these effects.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The Social Security system faces a long-term financing problem. The Social Security Trustees project cash-flow deficits beginning in 2017 and trust fund insolvency in 2041. Many recent proposals to improve system solvency would reduce Social Security benefits in the future. Benefit reductions could affect the low-income elderly, many of whom rely on Social Security benefits for almost all of their income. Such potential benefit reductions could lead to higher rates of poverty among the elderly compared to those projected under the current benefit formula. Because the low-income elderly

are especially vulnerable to benefit reductions, many recent Social Security reform proposals have included minimum benefits or other provisions that would mitigate the effect of benefit cuts on the elderly poor. This report is significant in that it quantifies the effect of four possible options for mitigating the effect of Social Security reform on the elderly poor.

Effectiveness: What is the impact and/or application of this research to older persons?

Congress will be faced with the addressing Social Security reform in the next few years and will be looking at many options. Since Social Security has played a unique role in reducing elderly poverty over time, the findings from this research can inform policymakers as they consider reforming the program.

Innovativeness: Why is this research exciting or newsworthy?

When discussing changes to public policy, it is important to keep in mind the possible unintended consequences of potential changes. This research uses a microsimulation model and provides an advantage in that it can identify unexpected interactions between policy options and existing program rules. Social Security is a complex program, and changes to its structure could lead to unexpected results—both within Social Security and in the relationship of Social Security to Supplemental Security Income (SSI). In the most extreme case, an increase in Social Security benefits could actually make some low-income beneficiaries worse off because they would lose eligibility for other programs as a result.

CONGRESSIONAL RESEARCH SERVICE: RETIREMENT SAVINGS: HOW MUCH WILL WORKERS HAVE WHEN THEY RETIRE?

This report shows how varying the age at which households begin to save for retirement, the percentage of their earnings that they save, and the rate of return on investment can affect the amount of retirement savings the household will have accumulated by age 65.

Lead Agency: Congressional Research Service.

Agency Mission: The Congressional Research Service provides, exclusively to the United States Congress, objective, non-partisan assessments of legislative options for addressing the public policy problems facing the nation.

Principal Investigator: Patrick Purcell, Specialist in Income Security.

General Description:

RETIREMENT SAVINGS: HOW MUCH WILL WORKERS HAVE WHEN THEY RETIRE?

This report presents the results of an analysis of the amount of retirement savings that households might be able to accumulate by age 65 under a number of different scenarios. The analysis shows how varying the age at which households begin to save for retirement, the percentage of their earnings that they save, and the rate of return on investment can affect the amount of retirement savings the household will accumulate. Based on Monte Carlo simulations of the variability of investment rates of return, a married-couple household that contributes 8% of pay annually for 30 years beginning at age 35 to a retirement plan invested in a mix of stocks and bonds could expect to accumulate $468,000 (in 2004 dollars) by

age 65 if rates of return were at the median over the 30-year period. Nevertheless, given the variability of rates of return, there is a 5% chance that the couple would have $961,000 or more and a 5% chance that the couple would have $214,000 or less. Higher contribution rates and longer investment periods lead to higher account balances, but also increase the impact of the variability of investment rates of return. At a 10% contribution rate over 30 years, the household could expect to accumulate $594,000, with a 90% probability that account would total between $301,000 and $1.2 million. Saving 8% of pay over 40 years, the household could expect to accumulate $844,000, with a 90% probability that the account would total between $370,000 and $2 million.

Excellence: What makes this project exceptional?

Rather than estimating future retirement account balances based on average historical rates of return on stocks and bonds, the estimates presented in this report are based on Monte Carlo analysis, which simulates thousands of possible outcomes. The results of the analysis provide estimates of retirement account balances under favorable and unfavorable market conditions as well as the average outcome.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Over the past 25 years, although the percentage of the workforce who participate in employer-sponsored retirement plans has remained relatively stable at approximately half of all workers, the type of plan by which most workers are covered has changed from defined benefit (DB) pensions to defined contribution (DC) plans. The responsibilities of managing a DB plan—making contributions, investing the assets, and paying the benefits to retired workers and their survivors—lie mainly with the employer. In a typical DC plan, the worker must decide whether to participate in the plan, how much to contribute, how to invest the contributions, and what to do with the money in the plan when he or she changes jobs or retires. As a result of the shift from DB plans to DC plans, workers today bear more responsibility for preparing for their financial security in retirement. This report illustrated the impact of those decisions on retirement savings.

Effectiveness: What is the impact and/or application of this research to older persons?

The impact of this report on older persons would be indirect, as a result of informing the Congress on this issue. The oldest members of the "baby boom"—the 78 million Americans who were born between 1946 and 1964—are 62 years old in 2008. The youngest members of the baby boom, however, are just 44 years old. The report illustrates how those who have postponed saving for retirement until after age 40 can still accumulate substantial retirement savings, but that it requires a substantially higher savings rate than would have been needed if they had begun to save for retirement at an earlier age.

Innovativeness: Why is this research exciting or newsworthy?

The research is innovative in the application of Monte Carlo simulation techniques that clearly illustrate the effects of the variability in rates of return on retirement savings.

THE HUMAN RESEARCH PROGRAM: ASTRONAUT HEALTH AND ELDERLY TREATMENT

Because some of the effects of space flight on astronauts have similarities to the effects of human aging, NASA's research can illuminate the mechanisms behind the effects common to both.

Lead Agency: The Human Research Program, Advanced Capabilities Division, Exploration Systems Mission Directorate, of the National Aeronautics and Space Administration.

Agency Mission: The Human Research Program (HRP) is instrumental in carrying out the Vision for Space Exploration (VSE), by developing and delivering research findings, health countermeasures, and human systems technologies for spacecraft that will support crews on missions to the moon, Mars, and beyond.

Principal Investigator: Jacob Bloomberg, Ph.D., Brian Crucian, Ph.D., Judith Hayes, M.S., Lauren Leveton, Ph.D., William Paloski, Ph.D., Steven Platts, Ph.D., Scott Smith, Ph.D., Human Research Program, NASA Johnson Space Center, Houston, TX 77058.

Partner Agencies: NASA's HRP funds research with a large number of academic institutions and collaborates with many national and international government agencies and commercial entities.

General Description: NASA's Human Research Program undertakes biomedical research and develops technologies to assure human health, safety, and performance during space exploration missions to the moon and Mars. Because some of the effects of space flight on astronauts have similarities to the effects of human aging, NASA's research on astronaut health may offer significant utility for treatment of the elderly. The following research areas demonstrate this linkage:

Balance and Gait Control: Falls in astronauts and the elderly can be caused by problems with the sense of balance. Astronaut's nervous systems adapt to weightlessness in ways that disturb balance and gait when they return to Earth or land on another planet. The human nervous system has evolved components that optimize body movements and posture control under Earth's gravity. Both space flight and aging affect the performance of the components. NASA is investigating ways to help astronauts "learn how to learn" to adapt to new gravitational environments. This involves techniques that systematically test and challenge the balance and gait control systems. (References: BG–1 to BG–12)

Orthostatic Hypotension: The decrease of blood pressure while standing upright may lead to fainting, falls and thus injuries in astronauts and the elderly. Astronauts' orthostatic hypotension has been shown to be related to dehydration and blunted functioning of the cardiovascular control system, and there is evidence of similar mechanisms in elderly hypotensive patients. NASA's work in understanding this problem in astronauts has suggested treatments ranging from mechanical support, to oral rehydration, to a medication named Midodrine that augments the nervous system's control of the circulation. (References: OH–1 to OH–4)

Osteoporosis and Bone Fracture Risk: The injuries from falls in the elderly are often manifested in bone fractures, which are also a significant risk to astronauts if they occur during stressful missions on another planet, at a great distance from definitive medical care on Earth. Osteoporosis is perceived as a disease of the elderly

because the inevitable loss of bone mass with aging occurs by a slow, chronic process that does not display symptoms until a low-trauma fracture occurs. But loss of bone strength happens in young, fit astronauts at a much faster rate than in the elderly, in a process that NASA calls premature osteoporosis. This is a long-term health risk to astronauts after a space flight, as well as a risk during the mission. (References: B–1 to B–4)

Impaired Nutrition and Vitamin D Metabolism: Many of NASA's nutritional biochemistry efforts have important applications to the elderly, foremost among them NASA's vitamin D research. This involves astronauts in spaceflight, scientists in the Antarctic, and the self-neglecting elderly. NASA collaborated with the Surgeon General's Office in 2004 and 2005 in conferences titled "Vitamin D and Bone Health Conference: An Update from Earth and Outer Space." (References: N–1 to N–2, VD–1 to VD–3)

Reduced Immunological Response: Innate immunity, the first line response to bacterial infections, is diminished in up to 20% of adults over age 65 who do not develop fevers in response to infections. Immunity has been found to be altered during and following space flight. In particular, the reversible nature of the space flight effects offers hope for slowing or even reversing the effects of aging. Specifically, astronauts have exhibited altered number and function of immune cells and reactivation of latent herpesviruses. (References: I–1 to I–7)

Noninvasive Behavioral Health Techniques: There are neurobehavioral and psychosocial factors that influence both the elderly and astronauts including risk of depression, sleep disorders, and cognitive function changes that can benefit from noninvasive techniques. These noninvasive behavioral health techniques can aid physicians to provide treatments for individuals at risk, to enable them to continue leading productive and healthy lives, whether in space or on Earth.

Excellence: What makes this project exceptional?

Unique perspective and contributions to aging research are resulting from NASA's space biomedical research program.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Balance and Gait Control importance to Aging: Falls in the elderly are a significant (and growing) public health problem because they lead to death, injury, and activity restrictions. Approximately one-third of community-dwelling persons over age 65 falls at least once per year. As a result, 40% of all nursing home admissions are due to fall-related injuries. The risk is greater in women.

Orthostatic Hypotension Importance to Aging: This risk increases rapidly with age and resulted in 164,000 hospitalizations in 1994 alone.

Osteoporosis and Bone Fracture Risk importance to Aging Research: The injuries from falls in the elderly are often manifested in bone fractures, which can lead to hospitalization and subsequent decline.

Nutrition and Vitamin D Research Importance to Aging: Insufficient exposure to the ultraviolet light in sunshine, through immobility or confinement whether on Earth or in a spacecraft, leads to decreased production of Vitamin D. This can increase the risk of diseases such as Alzheimer's and diabetes in the elderly, as well as

depression, cancer, impaired physical performance, weakened immune function and decreased bone health which the elderly on Earth may have in common with astronauts on long, hazardous space missions.

Reduced Immunological Response importance to Aging: Immune system dysregulation is observed in both the elderly and astronauts during space flight. Innate immunity, the first line response to bacterial infections, is diminished in up to 20% of adults over age 65 who do not develop fevers in response to infections.

Noninvasive Behavioral Health Techniques importance to Aging: There are neurobehavioral and psychosocial factors that influence both the elderly and astronauts including risk of depression, sleep disorders, and cognitive function changes that can benefit from noninvasive techniques.

Effectiveness: What is the impact and/or application of this research to older persons?

Balance and Gait Control Results/Application of Research: Some of these techniques were applied to community-dwelling participants in a study associated with John Glenn's second space flight in 1998. The techniques applied in spaceflight could also be used in rehabilitation of patients with balance disorders, and for fall prevention training in the elderly.

Orthostatic Hypotension Practical Applications of Research: The most beneficial discovery in this area for astronauts and the elderly in the form of a warning. It came from a study that determined that Midodrine may interact badly with Promethazine (Phenergan®), a medication used to control severe motion sickness whether due to space flight, radiation treatment, chemotherapy or surgical anesthesia. The effects may include twitching, anxiety and even violent behavior.

Osteoporosis and Bone Fracture Risk Results/Application of Research: NASA has just started funding a collaborative study with the Mayo Clinic to evaluate factors such as ethnicity, gender, genetics, age, nutritional status and fitness level and their importance on bone health in astronauts. This will have obvious implications for the elderly.

Nutrition and Vitamin D Results/Application of Research: NASA-funded research evaluated the ability of diet modification to mitigate bone loss, based on extensive ground research (N1–N2). Vitamin D is a dietary factor related to diseases such as cancers and diabetes, as well as bone health, in people on Earth and in space. The 2005 USDA Dietary Guidelines for Americans specifically called out the need for supplementation of vitamin D in at risk populations, including the elderly, and those with insufficient exposure to the ultraviolet light in sunshine, due to limited mobility and confinement in the elderly (ref. VD–3), or to being in a small spacecraft without many windows that protects astronauts from the unfiltered sun (refs. VD–1 to VD–2). On-going NASA research will determine safe and effective vitamin D dosing regimens in individuals with insufficient ultraviolet light exposure.

Reduced Immunological Response Results/Application of Research: A recent study has demonstrated that the elderly suffer higher levels of latent herpesvirus reactivation, which is usually associated with reduced immune function. NASA studies of astronaut immunity during space flight have revealed similar observa-

tions (ref. I–7). The flight of John Glenn (age 77) in 1998 specifically revealed differences in white blood cells and in stress hormone levels between him and his younger crewmates.

Noninvasive Behavioral Health Techniques Results/Application of Research: NASA is funding research at the National Space Biomedical Research Institute designed to address behavioral health risks including: (1) use of noninvasive near-infrared neuro-imaging technology to identify biomarkers indicating a tendency to depression, (2) development of speech monitoring technologies that can indicate damage to portions of the central nervous system that can result from radiation exposure or hypoxia (in astronauts) or the early stages of Alzheimer's disease (in the elderly), (3) use of blue light to maintain circadian rhythms and alertness, and (4) developing systems that can provide feedback to astronauts on long, stressful missions to warn them if their cognitive function is changing, so they can seek appropriate treatments and counseling, which could also be made available to the elderly on Earth.

Innovativeness: Why is this research exciting or newsworthy?

In many forms and areas, NASA's research into the causes of maladaptation to weightlessness, and the development of treatments and preventions for them, may offer significant utility and importance for the elderly. The opportunity to provide tangible benefits to the segment of the population who initiated and supported the development of America's exploration of space is a demonstration of the potential of space exploration to improve the lives of all Americans while extending our reach further into the universe.

NATIONAL SPACE BIOMEDICAL RESEARCH INSTITUTE ULTRASOUND TECHNOLOGY IN ASSISTED LIVING FACILITIES

This project trains non-medical personnel to use ultrasound to assess health situations for a space mission. These techniques can be applied on earth, e.g. staff at assisted living facilities, ambulance crews, rural medical caregivers and military medics.

Lead Agency: National Space Biomedical Research Institute (funded through a cooperative agreement with NASA).

Agency Mission: The National Space Biomedical Research Institute leads a national effort for accomplishing the integrated, critical path, biomedical research necessary to support long-term human presence, development and exploration of space and to enhance life on Earth by applying the resultant advances in human knowledge and technology acquired through living and working in space.

Principal Investigator: Scott A. Dulchavsky, M.D., Ph.D., Henry Ford Health System, 2799 W. Grand Boulevard, CFP 110, Detroit, MI 48202.

Partner Agency: Henry Ford Health System.

General Description: In spaceflight, a number of crew health situations, such as severe abdominal pain, tooth abscess, sinus infection, muscle and bone loss, broken or fractured bones, and eye, knee or shoulder trauma, could severely impact the success of long-duration missions. These same injuries are common in the elderly. Diagnosing and managing acute health problems in remote locations or non-hospital environments, including space, is challenging due to availability of equipment and trained personnel. Dr. Scott Dulchavsky's project, funded by National Space Biomedical Re-

search Institute, assessed the ability to use ultrasound in health situations which would have a high impact on mission success.

This project uses training regimens and CD–ROM refresher modules to teach non-medical personnel to easily perform ultrasound imaging. Trainees learn to use miniaturized ultrasound to assess health situations that could impact all aspects of a space mission. These same training techniques are transferable to Earth-based medicine, including staff at assisted living facilities, ambulance crews, rural medical caregivers and military medics.

The program gave trainees the tools to assess injuries using real-time remote assistance from medical experts, enabling persons working in a remote environment to assess and manage an emergency medical condition. His team developed training regimens and refresher modules that allowed non-physicians to operate ultrasound as if they were technicians. It normally takes 200 hours plus yearly updates to learn to operate ultrasound, but Dr. Dulchavsky and his team developed training methods that cut the time to two-three hours a year. The training program consists of a computer-based instructional presentation on the basics of ultrasound examination and examples of remote guidance. Trainees then participate in a hands-on session where they perform abdominal and musculoskeletal ultrasound scans.

With remote guidance, a modestly trained operator is coupled with an experienced medical expert, essentially making the non-physician the hands of the expert. The diagnostic, treatment, and training protocols developed in this study will also provide information which can be used in rural care, assisted living care, military conflicts, and third world medicine on Earth. The methods have been used with professional sports teams, in research projects studying athletes at the Olympics in Italy, and during a recent Mount Everest expedition.

Excellence: What makes this project exceptional?

This portable technology facilitates training of lay individuals in a complex medical task that results in improved disease detection and the potential to save lives.

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Because many elderly individuals are immobile or living in confined conditions, this technique allows the technology to come to the patient, without the patient having to come to the clinic or hospital.

Effectiveness: What is the impact and/or application of this research to older persons?

This technology provides improved capabilities for diagnosis of medical problems by a portable means that can be used by non-medical personnel.

Innovation: Why is this research exciting or newsworthy?

This ultrasound training concept is global in nature, in that it has no boundaries.

NATIONAL AERONAUTICS AND SPACE AGENCY: SURGICAL IMPLANT TECHNOLOGY RESEARCH

Orthopedic implant decontamination is an application developed from NASA research on combating the corrosive effects of atomic ox-

ygen in space. Understanding this corrosive gas has resulted in new methods to decontaminate surgical implants.

Lead Agency: National Aeronautics and Space Agency (NASA).

Agency Mission: NASA's mission is to pioneer the future in space exploration, scientific discovery and aeronautics research.

Principal Investigator: Bruce Banks, Senior Physicist, Consultant to Alphaport supporting NASA Glenn Research Center, 21000 Brookpark Road, M/S 309–2, Cleveland, OH 44135.

Partner Agency: Case Western Reserve University Department of Orthopedics and DePuy Orthopedics, Inc.

General Description: Orthopedic implant decontamination is a spinoff application that has been developed as a direct result of NASA's research on low Earth orbital atomic oxygen interactions with spacecraft materials. The contribution consists of a process for removal of biologically active contaminants from the surfaces of orthopedic implants. Currently most orthopedic implants have endotoxins on their surfaces, which cause inflammation and pain. Such responses can lead to joint loosening and implant failure. Sterilization does not remove endotoxins because they are non-living chemicals consisting of mostly bacterial cell wall fragments. Implant surface exposure to atomic oxygen has been demonstrated to fully remove all endotoxins thus minimizing the chances of inflammation in the patient after surgery.

The technology that inspired the spinoff applications was NASA's investigation of low Earth orbital atomic interaction with materials. All hydrocarbon materials and hydrocarbon polymers have been found to erode though oxidation when exposed to the low Earth orbital environment. As a result of this reactive environment polymers used for solar array blankets and thermal control materials can be eroded away unless protective coatings could be used to prevent chemical reactions from occurring. Protective coatings were developed to protect such polymers. Validation of protective coating solutions to atomic oxygen erosion needed to be performed in ground laboratory facilities. To address NASA's mission needs, ground based atomic oxygen facilities were developed and used to validate full mission durability for International Space Station (ISS) solar array blanket materials. Protective coatings developed for ISS solar array blankets are now used on all the USA supplied ISS solar arrays. The resulting knowledge of atomic oxygen interaction with materials and being made aware of specific biomedical needs provided the inspiration for the innovation of this biomedical application.

Excellence: What makes this project exceptional?

Exposure to atomic oxygen is the only known method that fully removes all endotoxins on surgical implants, thus minimizing the chances of inflammation in the patient after surgery.

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Osteoarthritis affects between 20% and 30% of the people in the USA over 70 years old and 32 million people of all ages. There are 350,000 hip fractures in the USA each year that require orthopedic implants for repair. It is estimated that by the year 2050 there will be 1,800 hip fractures per day that will require surgery. Almost all such surgeries will require implantation of orthopedic devices that are currently contaminated with biologically active chemicals which

can cause inflammation. The quality of life and financial cost associated with inflammation resulting from implant contamination is enormous. As the average life expectancy increases along with weight of Americans the incidence of restorative orthopedic surgery will obviously increase. Surveys indicate that the worldwide orthopedic implant market was $4.5 billion in 2002 and is expected to be $7 billion in 2007. The quality of life improvements and reduction in corrective orthopedic operations enabled by reduction in inflammation through use of atomic oxygen removal of biologically active contaminants would be significant.

Effectiveness: What is the impact and/or application of this research to older persons?

The value of this technology will increase as the life expectancy increases and average weight of adults increases. Although this nomination deals with orthopedic implants many other surgical implant surfaces may cause adverse biological responses which lead to functional compromises due to presence of biologically active contaminants. One example is titanium vascular stents which may occlude if there is a presence of organic contaminants which are used in the machining process during fabrication.

Innovation: Why is this research exciting or newsworthy?

Recent tests of commercially produced, sterilized and packaged bone screws from four different orthopedic supplier companies indicated that three quarters of the screws showed presence of endotoxins on their surface.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION: BIOWATCH MONITORS

Originally designed to monitor astronaut health, BioWATCH monitors multiple vital signs and transmits data to doctors. It can monitor various diseases across levels of acuity, which makes it ideal for patients at home. BioWATCH can dramatically increase a patient's quality of life.

Lead Agency: National Aeronautics and Space Administration (NASA).

Agency Mission: NASA's mission is to pioneer the future in space exploration, scientific discovery, and aeronautics research.

Principal Investigator: Alan Chmiel, Vice President, ZIN Technologies, 6745 Engle Road, Cleveland, Ohio 44130.

General Description: Biomedical Wireless and Ambulatory Telemetry for Crew Health (BioWATCH) is a wireless biometric monitoring system originally designed to monitor astronaut health in space. It can measure heart rate, blood pressure, glucose, temperature, joint angle, ECG, and blood oxygenation, and then send the information to doctors on Earth in real time. BioWATCH was developed by ZIN Technologies and The Cleveland Clinic Foundation under NASA Glenn's Small Business Innovation Research Program.

The commercial version of BioWATCH transmits data to doctors wirelessly via cell phone, wireless internet or Bluetooth. It can be configured to monitor various conditions, which makes it ideal for post-surgery patients, participants in clinical drug trials, and home healthcare patients.

Based on the success of the initial prototypes, ZIN and the Cleveland Clinic teamed to deploy BioWATCH in an application moni-

toring heart rhythm in patients following a procedure designed to eliminate a heart rhythm irregularity known as atrial fibrillation. BioWATCH can be used in applications to monitor patients with histories of heart disease, arterial disease, hypertension, diabetes, pulmonary disease, stroke, myocardial infarction, or sleep apnea.

The technology of BioWATCH allows for transmission of patient data from the patient to a health professional in real time. Since BioWATCH is a small wearable monitor, it can travel with the patient. All of these features allow for a substantial improvement in quality of life.

Ten percent of Americans over age 70 have a heart condition known as atrial fibrillation (AF), which is treated with anticoagulation drugs that require regular screenings. Typically, patients on these drugs are tested twice monthly for potentially fatal side effects. With BioWATCH patients can be tested daily, and results are available to the doctor instantaneously, reducing the risks. Also, patients facing long rehabilitation from orthopedic surgery can use BioWATCH to track their progress, thereby reducing rehabilitation time and readmission rates.

BioWATCH is a single solution that can affect the quality of life of millions of Americans.

Excellence: What makes this project exceptional?

BioWATCH is the only technology platform that can be used across various diseases and acuteness of symptoms. The real-time data transmission expedites diagnosis and treatment by keeping medical professionals accurately informed about a patient's specific symptoms and conditions. BioWATCH can measure a patient's pulse, blood pressure, glucose, temperature, joint angles and more, and then send the information to a doctor in another location in real time. Its batteries have an operating life more than four times longer than current monitoring systems. It is also much lighter than other systems. Its battery life, small size, and wireless transmission are a few of many factors that make the BioWATCH exceptional.

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Existing monitors allow for only one parameter to be monitored at a time. However, 40 percent of patients who need monitoring have multiple symptoms or complications, which is why BioWATCH's adaptability is so valuable.

The wearable monitor can be used in the car, at home, or outside to monitor cardiac, orthopedic, diabetic, or neurological disease. Remote monitoring technology will allow for increased efficiency of the over-tasked nursing population.

Because many older adults take an active role in monitoring their health, the BioWATCH is a significant product that allows comfortable at-home wellness and peace of mind for any adult concerned about their medical history. Rather than reacting to severe medical emergencies after a patient is already in distress, a patient and his or her doctor may be alerted to potentially dangerous conditions far earlier, enabling the patient to feel empowered while taking a pro-active approach to health and longevity.

Effectiveness: What is the impact and/or application of this research to older persons?

BioWATCH can be prescribed without the need for outside laboratories or technicians. It can reduce the cost or need for hospitalization, improve patient compliance with treatment, improve quality of life, and improve life expectancy.

Innovation: Why is this research exciting or newsworthy?

BioWATCH is the application of a flexible technology to the aging population. Unlike other monitoring products, BioWATCH's innovative technology allows a single monitor to be used in a variety of settings and disease severity. Results can be transmitted easily and wirelessly, without the patient needing to visit a lab or clinic; it allows for a better quality of life by increasing patient freedom, allowing patients to visit family or travel without missing routine medical testing.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION: BLOOD GLUCOSE MONITORING

NASA technology for Earth orbital atomic oxygen interactions is being applied to advanced concepts for blood glucose monitoring which would use blood analyte-responsive detection method in which blood only contacts the end of an optical fiber.

Lead Agency: National Aeronautics and Space Administration (NASA).

Agency Mission: NASA's mission is to pioneer the future in space exploration, scientific discovery and Aeronautics research.

Principal Investigator: Bruce Banks, Senior Physicist, Consultant to Alphaport, NASA Glenn Research Center, 21000 Brookpark Road, M/S 309–2, Cleveland, OH 44135.

Partner Agency: QuestStar Medical Inc.

General Description: This is a spinoff application that has been developed as a direct result of NASA's research on low Earth orbital atomic oxygen interactions with spacecraft materials. The contribution consists of a practical and effective method of constructing microscopic cones on the surface of optical fibers that are necessary for a fiber optic blood glucose monitoring device to function. Blood glucose monitoring for diabetics is typically performed by piercing the skin of a finger with a lance and applying a droplet of blood on a reagent pad or test strip. The quantity of blood that is required to perform the test determines size and depth of the cut required. The amount of blood required for blood glucose monitoring could be significantly reduced using this new technology. Advanced concepts for blood glucose monitoring are being considered which would use blood analyte-responsive detection method in which blood only contacts the end of an optical fiber. The process makes use of knowledge space environmental interactions and the atomic oxygen test facilities that exist at NASA's Glenn Research Center.

Excellence: What makes this project exceptional?

The technology developed by NASA Glenn Research Center to produce inexpensive glucose monitoring devices that require much smaller quantities of blood than conventional lance and absorbent strip devices will invite more frequent monitoring and thus better potential for control of blood glucose levels because of affordability and the fact that samples can be taken from almost anywhere on the body with reduced pain associated with blood sampling.

Significance: How is this research relevant to older persons, populations, and/or an aging society?

The National Institutes of Health reports that 7% of the U.S.A. population has diabetes (14.6 million diagnosed and 6.2 million undiagnosed) in 2005. For the same year 20.9% of the population aged 60 years or older is reported to have diabetes. Diabetes was the 6th leading cause of death in 2002. The total cost of diabetes in the U.S.A. in 2002 was a staggering $132 billion for direct medical costs and indirect costs (disability, work loss, and premature mortality).

Effectiveness: What is the impact and/or application of this research to older persons?

The surface modification technique used for the blood glucose optical fibers cannot be accomplished by conventional chemical or mechanical means because of the small scale and high aspect ratio (cone height-to-width ratio) shape of the morphology required. However, NASA technology developed for space simulation is both applicable and potentially cost effective to produce a glucose monitor that can function on an order of magnitude less blood than conventional monitors. It is for this reason that the development of the blood glucose monitor by QuestStar Medical has had numerous Reimbursable Space Act Agreements with NASA Glenn Research Center to assist in the development of the monitor.

Innovation: Why is this research exciting or newsworthy?

The U.S. population developing diabetes is growing.

NATIONAL COUNCIL ON DISABILITY: PROMOTING SELF SUFFICIENCY OF PEOPLE LIVING WITH DISABILITIES

Federal indicator systems should include people with disabilities to ensure effective enforcement, program monitoring, evaluation, and performance reporting. Indicators and data need to inform decision makers about quality of life status across all citizens.

Lead Agency: National Council on Disability.

Agency Mission: The mission of the National Council on Disability is to promote the full inclusion, independent living, and economic self-sufficiency of people with disabilities of all ages and backgrounds by providing advice, analysis, and recommendations on disability policy to the President, Congress, and other federal agencies.

Principal Investigator: Martin Gould, Ed. D., Director of Research, National Council on Disability, 1331 F Street, NW., Suite 850, Washington, DC 20004–1138.

General Description: Through this research, NCD sought to: (a) ensure appropriate Federal Government monitoring, program evaluation, and supports for people with disabilities, without duplicating ongoing efforts, and (b) determine how the Federal Government can contribute effectively to improve performance reporting across major social programs for Americans with disabilities and their families.

Nationally, a major reporting mechanism has been the use of indicator systems; yet, few adequately address (or even include) outcome data related to people with disabilities. Most indicator systems also are domain-specific (e.g., addressing health while omitting other areas of people's lives). On one hand, better information that presents a full picture can benefit people with disabilities,

business, and government. On the other hand, some of the proposed changes might require regulatory and legislative action.

NCD's research identifies valid federal indicators and data focused on people with disabilities. It also describes the status of the U.S. population of Americans with disabilities and points to knowledge gaps. NCD's report makes recommendations for transforming the existing indicator system and contributing to the knowledge base. This includes the prospect of gaining useful information about the extent that federal programs are beneficial to people with disabilities.

Excellence: What makes this project exceptional?

No other federal research report exists which has examined the issues of improving federal statistics, outcome data and indicator systems, and proposed a set of quality-of-life indicators for the United States based on extant, reliable and valid statistical data.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The research conducted for this report included a review of federal aging data collection, indicator projects, and statistical reports. The proposed set of quality-of-life indictors offered by this report are applicable to people up to 64 years of age.

Effectiveness: What is the impact and/or application of this research to older persons?

One impact is that this report has demonstrated the ability to use existing federal statistical data to depict the quality of life of people with disabilities who are aging. Extant federal indicator systems for older persons could adopt and/or adapt specific items from NCD's set of 18 for the purpose of enhancing the extant systems.

Innovativeness: Why is this research exciting or newsworthy?

There has been an almost immediate demonstration of public excitement and newsworthiness about this research. On June 4, 2008, less than two months after the report's public release, the U.S. House Committee on Oversight and Government Reform, Subcommittee on Information Policy, the Census, and National Archives conducted a hearing on the topic.

NATIONAL COUNCIL ON DISABILITY: CONSUMER DIRECTED HEALTH REPORTS

Non-government and government-wide reform should expand consumer-directed health care options/choices available for people with disabilities and/or who are aging. Consumers need cross-disability involvement from the planning to evaluation phases.

Lead Agency: National Council on Disability.

Agency Mission: The mission of the National Council on Disability is to promote the full inclusion, independent living, and economic self-sufficiency of people with disabilities of all ages and backgrounds by providing advice, analysis, and recommendations on disability policy to the President, Congress, and other federal agencies.

Principal Investigator: Martin Gould, Ed.D, Director of Research, National Council on Disability, 1331 F Street, NW., Suite 850, Washington, DC 20004–1138, Telephone (Voice): (202) 272–2004; (TTY): (202) 272–2074.

Partner Agency: Health and Disability Working Group, School of Public Health, Boston University.

General Description: NCD reviewed the literature on consumer-directed care, obtained guidance from a key informants and a Consumer Advisory Board, evaluated relevant policies, identified practices in consumer-directed health care for people with disabilities. The agency also made recommendations for improving how health care planning, services and outcomes are established, implemented, and/or evaluated.

In the health and supportive services arena, people's desire for independence and control is more likely to be satisfied when health care systems have several factors in place. First, such systems are consumer directed and provide care coordination. Second, they seek to eliminate barriers to care and give consumers choice about the location and type of services provided. Third, the favored health care systems provide high-quality, seamless, consumer-centered, and continuous care across settings and providers. Fourth, these systems provide support services linked to housing to increase the availability and efficiency of service provision. A fifth factor is that people with disabilities and their caregivers need and want access to timely, understandable, and culturally appropriate information. Combined, the factors help people navigate the maze of services and make informed choices.

The report informs policy discussions among policymakers, practitioners, researchers, consumers, and advocates for health reform. The report also examines current laws; program and policy trends in financing; outcomes; implementation of models; barriers to and facilitators of consumer-direction; the role of federal agencies; and includes recommendations for improvements.

Key NCD recommendations imply that shifts are needed in government and non-government strategies for organizing, locating, and managing health care for people with disabilities. The recommendations include replacing a narrow diagnosis-focused approach and limited service options with a cross-disability, lifespan approach that: (a) considers consumer input and (b) includes funding to meet individual needs. The role of government should change from the oversight of tightly defined program options. Broader responsibility of government should include ongoing assessments of consumer needs and a continuum of choices, provision of resources directed to fill gaps in the service continuum, and incorporation of programs and practices that meet rigorous evaluation standards for clear consumer-defined outcomes.

Excellence: What makes this project exceptional?

This report is based on a one-of-a-kind systematic analysis of federal policy, program, and research initiatives regarding the interaction of consumer-directed health care and the needs of individuals with disabilities including people who are elderly. Taken as a whole, the methodology, findings and recommendations in this report imply a major shift in the way government, private agencies, and even to some extent consumer organizations think about organizing and locating, and managing health care for people with disabilities and people who are elderly.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The systematic analysis relied on in this report included evidenced-based federal and state level research available regarding people who are elderly and people with disabilities. The evidence-

based research captured for analysis involved seminal demonstration projects (e.g., Cash and Counseling), traditional federal initiatives (e.g., Medicaid Waivers), and programs that provide a continuum of community-based care (e.g., Programs of All-Inclusive Care for the Elderly (PACE).

Effectiveness: What is the impact and/or application of this research to older persons?

Federal agencies play an important role in promoting research on consumer-directed and consumer-oriented health care. The Centers for Medicare and Medicaid Services, the Office of the Assistant Secretary for Planning and Evaluation, and the National Institute on Disability and Rehabilitation Research play leading roles in this area. This report's findings support federal initiatives needed to expand the implementation of consumer-directed and -oriented care, as demonstrated through:

Streamlining of the Waiver process and improved communication with states through Independence Plus;

Real Choice Systems Change and Medicaid Infrastructure Grants; and

The proposed Money Follows the Person Rebalancing Initiative.

CMS has implemented the Real Systems Change Grant Initiative to help states implement community-based care systems through partnership with community organizations. These grants support the development of programs that enable individuals to move out of institutions into the most integrated community setting appropriate to their individual needs and preferences. Real Systems Change programs also offer consumers choice in regard to living environments, care providers, the types of services they use, and the way these services are delivered (CMS Web site, 2004). This was the first major federal initiative to support consumer-oriented and directed care across the spectrum of disability and across the lifespan, and as such has facilitated the implementation of community-based care systems.

The joint support of CMS and the Administration on Aging of Aging and Disability Resource Centers in 40 states is intended to help those states develop "one-stop shopping" programs. These programs, which work at the community level to help people make informed decisions about their service and support options, serve as the entry point to the long-term care system. Eligible populations for these programs include people over 65 and at least one additional population (such as people with serious mental illness, developmental disabilities, or physical disabilities). Funds are used to coordinate or redesign information systems, to provide consumer education, or to facilitate access to care across multiple federal, state, and local programs (CMS Web site, 2004). This program has the potential to address some of the consumer education barriers to community-based care, and it also begins to break down some of the age-related barriers to care.

Innovativeness: Why is this research exciting or newsworthy?

The report, Consumer-Directed Health Care: How Well Does It Work?, offers a clear picture of the strengths and limitations of our Federal Government's current research agenda related to consumer-directed health care for Americans with disabilities. It sheds light on the relationship between consumer-directed health care and practice. It also provides a basis for policymakers who use

health research evidence to make informed policy decisions in keeping with the intent of the New Freedom Initiative.

NATIONAL COUNCIL ON DISABILITY: LIVABLE COMMUNITIES

Livable communities promote adult well-being, independence, and inclusion of people with disabilities and seniors in daily living. Coordinated government planning and funding can be useful to break barriers, establish, and sustain positive changes.

Lead Agency: National Council on Disability.

Agency Mission: The mission of the National Council on Disability is to promote the full inclusion, independent living, and economic self-sufficiency of people with disabilities of all ages and backgrounds by providing advice, analysis, and recommendations on disability policy to the President, Congress, and other federal agencies.

Principal Investigator: Penny Feldman, Mia Oberlink, Michal Gursen & Colleagues, Visiting Nurse Service of New York, Center for Home Care Policy and Research, 107 East 70th Street, New York, NY 10021, *http://www.vnsny.org/research.*

Partner Agency: The Center for Home Care Policy and Research.

General Description: NCD began this project with the premise that full community integration recognizes the needs of people with disabilities. Among those needs are safe and affordable housing; access to transportation; access to the political process; and the right to enjoy services, programs, and activities that public and private entities offer to all members of the community.

Livable communities enable citizens who choose to reside in their homes and communities to do so, regardless of age or disability. However, across America, many communities face difficult choices and decisions about how to grow, plan for change, and improve the quality of life for all citizens. Researchers for this NCD project adapted characteristics of a model or framework originally established to help communities measure and improve their livability by people who are aging. The resulting "livable communities" framework identifies elements that a number of communities around the country have incorporated in their approaches to inclusion.

NCD's project shines the spotlight on inclusive community practices that are working. Attention to common needs among people who are growing older and other adults with disabilities were not surprising. The project identifies and provides examples of the strategies used to transfer policy into actions. Broadly, the strategies address identifiable elements focused on environmental inclusion, safety and affordability. The project also makes recommendations for consideration by other entities.

Excellence: What makes this project exceptional?

This unique report clearly describes how communities can improve the quality of life for adults with disabilities, as well as for the growing population of seniors who may develop disabilities later in life. The report is organized around six key goals: (1) providing affordable, appropriate, accessible housing; (2) ensuring accessible, affordable, reliable, safe transportation; (3) adjusting the physical environment for inclusiveness and accessibility; (4) providing work, volunteer, and education opportunities; (5) ensuring access to key health and support services; and (6) encouraging participation in civic, cultural, social, and recreational activities. A

number of model programs from around the United States are highlighted. Individual's stories of livability are described. And one community's regional approach to incorporating livability principles for long-term planning and growth is presented.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This report is based on the research and the community model of livability as constructed by the American Association for Retired Persons (AARP). This research is organized around six key goals necessary for community living for people with disabilities and people who are elderly. The key goals involve: (1) providing affordable, appropriate, accessible housing; (2) ensuring accessible, affordable, reliable, safe transportation; (3) adjusting the physical environment for inclusiveness and accessibility; (4) providing work, volunteer, and education opportunities; (5) ensuring access to key health and support services; and (6) encouraging participation in civic, cultural, social, and recreational activities.

Effectiveness: What is the impact and/or application of this research to older persons?

Communities across the country are aging. By the year 2030, one out of five people in America will be over 65. Those 85 and older are the fastest-growing segment of the population. As they grow older, the overwhelming majority of Americans will remain in their homes and communities. In fact, contrary to popular perception of older adults relocating to retirement communities, people aged 65 to 85 are the least likely of any age group to move. The active involvement of vital, independent older citizens—those "aging in place"—can enhance the social and civic life of communities. At the same time, communities will need to provide services to a growing number of their frail and disabled elders. To prepare for this so-called "Age Boom," many communities need help in creating an environment that will support older people's health and well-being as they age.

Comprehensive regional planning approaches such as the one described in Livable Communities for Adults with Disabilities address at a macro level what community planners, policy makers, funders, home builders and remodelers, and citizens know at the local level—i.e., that lifespan planning may not have been a priority for Boomers in their financing of retirement but it has certainly begun to catch on. In many respects, these planning approaches call for new and achievable configurations of services for older adults that imitate what Centers for Independent Living for people with disabilities have refined over decades—i.e., that the goal of living independently is possible and of the highest priority.

Innovativeness: Why is this research exciting or newsworthy?

The discussion of livable community components in this research report includes many examples of communities across the United States that have successfully implemented measures to improve the quality of life for people of all ages and abilities. Communities large and small are increasingly looking toward the livable community concept to help them address some of the most challenging issues that they face today, such as a growing population of older residents, an increasing number of persons with disabilities from diverse cultures, rising housing costs, limited transportation alternatives, lack of coordination among agencies, and limited and "silo"

funding. The examples demonstrate what is possible when stakeholders work together and make livability a priority in their community.

NATIONAL COUNCIL ON DISABILITY: LONG TERM SUPPORT SERVICE

Seniors and people with disabilities need a coherent and comprehensive framework of long-term services and supports across states. Congress should authorize federal interagency coordination of essential public policies, programs, and funding.

Lead Agency: National Council on Disability.

Agency Mission: The mission of the National Council on Disability is to promote the full inclusion, independent living, and economic self-sufficiency of people with disabilities of all ages and backgrounds by providing advice, analysis, and recommendations on disability policy to the President, Congress, and other federal agencies.

Principal Investigator: Michael Morris, Director National Disability Institute, Johnette Hartnett, Ed.D., NCD Capitol Impact, National Cooperative Bank Development Corporation, National Disability Institute, 1667 K Street, NW., Suite 640, Washington, DC 20006.

Partner Agency: National Disability Institute.

General Description: The NCD report called attention to America's changing demographics—growing numbers of people age 65 and people with disabilities. More than 20 federal agencies and nearly 200 programs with varying policy objectives provide assistance and services. Elders (people who are seniors) and people with disabilities need choices when seeking assistance with daily living that maintains their self-determination and maximum dignity and independence. Significant reform should explore possibilities of a universal approach to the design and financing before existing financing mechanisms become unsustainable. NCD (1) analyzed the state of long-term services and supports, future market demand and system reform needs; (2) surveyed promising state practices and local innovations; (3) solicited suggestions and comments from an expert panel of public and private stakeholders; and offered the following recommendations to Congress:

• Decouple eligibility for Home- and Community-Based Services (HCBS) under an HCBS waiver from a determination of nursing home eligibility. Remove the institutional bias in the Medicaid program to give Medicaid beneficiaries greater choice in how financial assistance is provided to cover a range of LTSS.

• Increase support for families and significant others in their role as informal and unpaid caregivers. Eligibility for LTSS and the scope and intensity of covered services varies significantly from state to state. Despite state variability in criteria for Medicaid eligibility and scope of benefits, in all states, individuals with disabilities are dependent on informal caregivers, including parents, family members, and significant others. The estimated benefit of informal caregiving exceeds $200 billion annually. Services should be designed to support, not supplant, the role of the family and actions of informal caregivers.

• Improve the supply, retention, and performance of direct support workers to meet increasing demand. Authorize funding for collaborative demonstration projects between the U.S. Departments of

Labor and Health and Human Services that promote collaboration between community colleges and disability-related organizations to develop a high-quality set of competencies to be taught in a new support worker certificate program that expands supplies of quality workers to meet market demand in home- and community-based settings.

• Mandate coordination and collaboration among federal agencies to align public policy and transform infrastructure to be responsive to consumer needs and preferences for a comprehensive system of LTSS. Congress should consider holding hearings to evaluate possible options for improvement of multiple department collaboration to provide access to information and supports and services to meet the long-term needs of people with disabilities. Congress should also consider establishing an Interagency Council on Meeting the Housing and Service Needs of Seniors and Persons with Disabilities.

Excellence: What makes this project exceptional?

This is the most comprehensive policy analysis of LTSS that evaluates federal LTSS laws, regulations, policies, and programs for people over 65 years of age (with and without disabilities) and people with disabilities under 65 years of age who use LTSS.

Significance: How is this research relevant to older persons, populations and/or an aging society?

NCD undertook research for this report because it had grown increasingly concerned about the (a) lack of a coherent national long-term services and supports (LTSS) public policy for all people with disabilities; (b) fragmented nature of service and support delivery systems, with uneven access and services provisions; and (c) LTSS costs of 22 percent or more of state budgets, which are fast becoming unsustainable. Additionally, NCD noted in undertaking research for this report that no single federal program, federal agency, or congressional committee was charged with the responsibility for the management, funding, and oversight of LTSS; however, 23 federal agencies were actively involved in LTSS using the NCD definition.

Effectiveness: What is the impact and/or application of this research to older persons?

As demonstrated in the findings of this NCD report, the United States needs a coherent and comprehensive framework for its LTSS policies, programs, and funding based on five inter-related realities. First, that people who are elderly and people with disabilities both desire and deserve choices when seeking assistance with daily living that maintains their self-determination and maximum dignity and independence. Second, the current financing mechanisms (public and private) will become unsustainable in the near future without significant reform. The system must be affordable to all Americans regardless of income levels and must consider opportunities to leverage public and private support in new ways without impoverishing beneficiaries. Third, there is an opportunity with the changing demographic picture of the United States to explore the possibilities of a universal approach to the design and financing of supports that is responsive to individuals under the age of 65, as well as Americans over 65 who may or may not have disabilities, without sacrificing individual choice and flexibility. Fourth, formal and informal care giving must be sustained, including examination of

family needs and workforce recruitment and retention challenges. Fifth, the approach to quality must include consumer direction and control of resources in addition to traditional external quality assurance mechanisms.

Innovativeness: Why is this research exciting or newsworthy?

This is the first federal analysis of the issue of long-term services and supports (LTSS) which is based on an operational definition of LTSS identical to the one used by the American Association for Retired Persons. It is the first federal analysis that looks at LTSS for people over 65 years of age (with and without disabilities) and people with disabilities under 65 years of age who use LTSS. It is the first to review federal government LTSS policies, laws, and programs for both population groups. And it is the first to codify Executive Branch and Congressional operations involving LTSS initiatives.

NATIONAL COUNCIL ON DISABILITY: LIVABLE COMMUNITIES

Livable communities promote adult well-being, independence, and inclusion of people with disabilities and seniors in daily living. Coordinated government planning and funding can be useful to break barriers, establish, and sustain positive changes.

Lead Agency: National Council on Disability.

Agency Mission: The mission of the National Council on Disability is to promote the full inclusion, independent living, and economic self-sufficiency of people with disabilities of all ages and backgrounds by providing advice, analysis, and recommendations on disability policy to the President, Congress, and other federal agencies.

Principal Investigator: Penny Feldman, Mia Oberlink, Michal Gursen & Colleagues, Visiting Nurse Service of New York, Center for Home Care Policy and Research, 107 East 70th Street, New York, NY 10021, *http://www.vnsny.org/research.*

Partner Agency: The Center for Home Care Policy and Research.

General Description: NCD began this project with the premise that full community integration recognizes the needs of people with disabilities. Among those needs are safe and affordable housing; access to transportation; access to the political process; and the right to enjoy services, programs, and activities that public and private entities offer to all members of the community

Livable communities enable citizens who choose to reside their homes and communities to do so, regardless of age or disability. However, across America, many communities face difficult choices and decisions about how to grow, plan for change, and improve the quality of life for all citizens. Researchers for this NCD project adapted characteristics of a model or framework originally established to help communities measure and improve their livability by people who are aging. The resulting "livable communities" framework identifies elements that a number of communities around the country have incorporated in their approaches to inclusion.

NCD's project shines the spotlight on inclusive community practices that are working. Attention to common needs among people who are growing older and other adults with disabilities were not surprising. The project identifies and provides examples of the strategies used to transfer policy into actions. Broadly, the strategies address identifiable elements focused on environmental inclu-

sion, safety and affordability. The project also makes recommendations for consideration by other entities.

Excellence: What makes this project exceptional?

This unique report clearly describes how communities can improve the quality of life for adults with disabilities, as well as for the growing population of seniors who may develop disabilities later in life. The report is organized around six key goals: 1) providing affordable, appropriate, accessible housing; 2) ensuring accessible, affordable, reliable, safe transportation; 3) adjusting the physical environment for inclusiveness and accessibility; 4) providing work, volunteer, and education opportunities; 5) ensuring access to key health and support services; and 6) encouraging participation in civic, cultural, social, and recreational activities. A number of model programs from around the United States are highlighted. Individual's stories of livability are described. And one community's regional approach to incorporating livability principles for long-term planning and growth is presented.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This report is based on the research and the community model of livability as constructed by the American Association for Retired Persons (AARP). This research is organized around six key goals necessary for community living for people with disabilities and people who are elderly. The key goals involve: (1) providing affordable, appropriate, accessible housing; (2) ensuring accessible, affordable, reliable, safe transportation; (3) adjusting the physical environment for inclusiveness and accessibility; (4) providing work, volunteer, and education opportunities; (5) ensuring access to key health and support services; and (6) encouraging participation in civic, cultural, social, and recreational activities.

Effectiveness: What is the impact and/or application of this research to older persons?

Communities across the country are aging. By the year 2030, one out of five people in America will be over 65. Those 85 and older are the fastest-growing segment of the population. As they grow older, the overwhelming majority of Americans will remain in their homes and communities. In fact, contrary to popular perception of older adults relocating to retirement communities, people aged 65 to 85 are the least likely of any age group to move. The active involvement of vital, independent older citizens—those "aging in place"—can enhance the social and civic life of communities. At the same time, communities will need to provide services to a growing number of their frail and disabled elders. To prepare for this so-called "Age Boom," many communities need help in creating an environment that will support older people's health and well-being as they age.

Comprehensive regional planning approaches such as the one described in Livable Communities for Adults with Disabilities address at a macro level what community planners, policy makers, funders, home builders and remodelers, and citizens know at the local level—i.e., that lifespan planning may not have been a priority for Boomers in their financing of retirement but it has certainly begun to catch on. In many respects, these planning approaches call for new and achievable configurations of services for older adults that imitate what Centers for Independent Living for

people with disabilities have refined over decades—i.e., that the goal of living independently is possible and of the highest priority.

Innovativeness: Why is this research exciting or newsworthy?

The discussion of livable community components in this research report includes many examples of communities across the United States that have successfully implemented measures to improve the quality of life for people of all ages and abilities. Communities large and small are increasingly looking toward the livable community concept to help them address some of the most challenging issues that they face today, such as a growing population of older residents, an increasing number of persons with disabilities from diverse cultures, rising housing costs, limited transportation alternatives, lack of coordination among agencies, and limited and "silo" funding. The examples demonstrate what is possible when stakeholders work together and make livability a priority in their community.

NATIONAL ENDOWMENT FOR THE ARTS: INVOLVEMENT IN ARTS & HEALTH PROMOTION

The Creativity and Aging in America study evaluated the effects of active involvement in the arts on the physical health, mental health, and social functioning of adults ages 65–103, as compared to a Control Group. Results showed striking positive results relevant to health promotion and cost savings.

Lead Agency: National Endowment for the Arts.

Agency Mission: The National Endowment for the Arts is a federal agency dedicated to supporting excellence in the arts, both new and established; bringing the arts to all Americans; and providing leadership in arts education.

Principal Investigators: Gene D. Cohen, M.D., Ph.D, George Washington University, Center on Aging, Health & Humanities.

Partner Agencies: National Endowment for the Arts (Lead Sponsor), U.S. Department of Health and Human Services (DHHS), Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Mental Health Services, National Institute of Health (NIH), National Institute of Mental Health (NIMH), AARP, National Retired Teachers Association, Stella and Charles Guttman Foundation, International Foundation for Music Research.

General Description: In 2001, the National Endowment for the Arts engaged George Washington University to conduct a multisite, national study with the aim of measuring the impact of professionally conducted community-based cultural programs on the general health, mental health, and social activities of older persons, age 65 and older. The study measured participants engaged in ongoing, weekly programs in creative writing, visual arts, music, and theater. Referred to as the Creativity and Aging Study, the project's formal title is "The Impact of Professionally Conducted Cultural Programs on Older Adults." No previous study of this nature using an experimental or related scientific design and a control group had been carried out.

The study took place in three different sites across the country:

- The Levine School of Music, Washington, DC;
- Elders Share the Arts, Brooklyn, New York; and

• Center for Elders and Youth in the Arts, Institute on Aging, San Francisco, California.

Each site involved two groups—(1) the Intervention Group, comprised of older individuals who were involved in a weekly participatory art program, and (2) a Control Group, comprised of individuals involved in their ongoing activities as usual. Each site recruited at least 100 older persons—50 participants in the Intervention Group and Control Group alike. The overall study had 300 participants—150 in the Intervention Groups, 150 in the Control Groups. The average age in all three sites and all Intervention and Control Groups, was approximately 80 years old, which is older than the average American's life expectancy. Approximately 30 percent of the groups reflected racial and ethnic minorities.

The groups were very well matched in level of functioning at the start of the Study, with very similar physical health, mental health, and level of activity profiles. Participants were each interviewed three times by George Washington University research assistants:

(1) at the start of the Study to establish a baseline;
(2) a year later; and finally;
(3) two years after the baseline assessment.

Results reveal strikingly positive differences in the Intervention Group (those involved in intensive, weekly participatory art programs) as compared to the Control Group. The Intervention Group at the one-and two-year follow-up assessments, reported:

(1) better health, fewer doctor visits, and less medication usage;
(2) more positive responses on mental health measures; and
(3) more involvement in overall activities.

Since the study collected so much rich data, analyses of existing data are expected to continue through 2010.

In conclusion, the results suggest sharply positive intervention effects of these community-based art programs run by professional artists. The Study points to true health promotion and disease prevention effects. It also shows significant cost savings through fewer doctor visits and reduced medication usage. In that they also show stabilization and actual increase in community-based activities in general among those in the cultural programs, the Study reveals a positive impact on maintaining independence and reducing dependency. This latter point demonstrates that these community-based cultural programs for older adults appear to be reducing risk factors that drive the need for long-term care.

Excellence: What makes this project exceptional?

The Creativity and Aging study is the first theory-driven, multisite, national study with an experimental or related scientific design and a control group that sought to assess the impact of active involvement in community-based art programs on the physical health, mental health, and social functioning of older adults. Moreover, for a study cohort with an average age of 80, most scientists would expect that any positive effects would take the form of merely a slower decline in health. Instead, what makes this Study truly noteworthy are evidence-based, statistically significant findings that show actual improvement in overall health among those participating in the art programs, versus declines in the Control Group.

The partnership that supported the study is unique in itself. The study was conducted and supported by a diverse group of government agencies and private sector organizations in the scientific and arts fields with individual and common goals for older Americans—brought together by the National Endowment for the Arts through a series of interagency agreements and contracts.

For example, one of goals of the National Endowment for the Arts is to make the best art available to all Americans. Over the years, the Endowment and many of its grantees have observed how involvement in quality arts programming, including dance, creative writing, theater, painting, and music, appear to make a remarkable difference in participants' lives. However, there was no substantive data to validate the observation. The National Institutes of Health have long been concerned with improving the mental and physical health of older adults. And the AARP is dedicated to positive social change and enhancing the quality of life for people as they age. The International Foundation on Music Research works to advance active participation in music making across the lifespan. This effort addresses all of these important missions.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This research is highly relevant because it has shown, among older adults, clear health promotion and prevention effects. The Study results reflect a reduction in risk factors that drive the need for long-term care. It has also demonstrated important cost-saving outcomes highly relevant to an aging society. The arts programs in the Study can be replicated in urban, suburban, and rural settings across the country.

Effectiveness: What is the impact and/or application of this research to older persons?

The positive impact of this research on the physical health, mental health, independent social functioning, and health care cost-savings for older persons is of high relevance to older adults, their families, their communities, and society. In the two years following start-up Federal funding for the Levine School's Senior Chorale, the program doubled in size because of public demand and recognition of its effectiveness.

Innovativeness: Why is this research exciting and newsworthy?

The Creativity and Aging research is exciting and newsworthy because it illustrates surprising health improvements in a population group with an average age greater than normal life expectancy, when one would typically anticipate noticeable declines in health. It also reveals dramatic cost-saving ramifications without causing an added burden to Medicare or Medicaid programs. This study and participation by the Levine School's Senior Chorale were featured with in-depth coverage on the CBS Evening News with Dan Rather.

One year after the study began, Medicare D went into effect. The study had been measuring medication usage. In the Medicare D-eligible population, a savings of a mere 8 cents a day—extrapolated to the 36.5 million persons in this age group—comes to $1 billion per year in savings.* On the other hand, a dollar a day in savings nets $13 billion a year in total savings. In fact, the results from the just-completed cost analysis of the Senior Chorale reflect a savings close to a dollar a day. At the same time, doctor visits, though es-

sentially the same in number among those in the Senior Chorale and the control group at the start of the study, had grown to an average of 3.56 visits per year for the control group two years later. Extrapolating this finding to all Medicare-eligible Americans would mean a yearly savings of $6.3 billion a year by being in a chorale similar to the one in the Intervention Group. The Study reveals the profound role on healthcare cost savings that is played by creative engagement through involvement in community-based arts.

* Medicare data found under "Statistics" at: [1] *www.cms.hhs.gov.*

FACTORS THAT IMPACT THE DETERMINATION BY MEDICAL EXAMINERS OF ELDER MISTREATMENT AS A CAUSE OF DEATH IN OLDER PEOPLE

The professionals best equipped to determine that elder abuse caused an individual's death are medical examiners and coroners. However, medical examiners rarely deem elder mistreatment as a cause of death; this is likely due to a lack of research and evidence to support this determination. In response, this project was undertaken to begin to develop primary data and a literature base on the topic of death due to elder mistreatment.

Lead Agency: National Institute of Justice, Office of Justice Programs.

Agency Mission: NIJ is the research, development, and evaluation agency of the U.S. Department of Justice and is dedicated to researching crime control and justice issues. NIJ provides objective, independent, evidence-based knowledge and tools to meet the challenges of crime and justice, particularly at the State and local levels.

Principal Investigator: Dr. Carmel B. Dyer, Professor and Director of the Division of Geriatric and Palliative Medicine, University of Texas Health Center, Health Science Center at Houston, P.O. Box 20708, Houston, TX 77225.

Partner Agencies: U.S. Department of Justice's Elder Justice and Nursing Home Initiative.

General Description: The professionals best equipped to determine that elder abuse caused an individual's death are medical examiners and coroners. However, medical examiners rarely deem elder mistreatment as a cause of death; this is likely due to a lack of research and evidence to support this determination. In response, this project was undertaken to begin to develop primary data and a literature base on the topic of death due to elder mistreatment. The research team conducted four distinct projects to evaluate these three aspects of death determination by medical examiners:

- Phase I was a survey exploring the views of medical examiners, which showed that medical examiners infrequently determine elder mistreatment as a cause of death in older decedents even when the signs are there to do so.
- Phase II evaluated scene investigation and medical records and toxicology by studying the medical examiners' case conferences and case records. This study showed that while the medical examiners are expert at performing autopsies, interpreting toxicology and determining the cause and manner of death, they are not versed (nor

should they be expected to be) in the standard of care of older persons.

• Phase III was a study of the scene investigation, which showed that the scene investigation is not necessarily geared to the detection of forensic markers and risk factors for elder mistreatment and that the training of investigators in the specifics of elder mistreatment may be helpful.

• Phase IV explored autopsy and physical examination findings, which found that in cases where dementia was documented or pressure ulcers were present, the decedents were more likely to have been contacted by Adult Protective Services prior to their death.

Excellence: What makes this project exceptional?

This project was the first to examine the ability of medical examiners to determine whether someone died of elder mistreatment rather than the natural health complications and degeneration associated with old age. The results of each of these studies offers pilot data that inform readers of the factors that account for the low rate of determination of elder mistreatment as a cause of death in older persons. These studies not only increase understanding of elder mistreatment death determinations but also lay the groundwork for future research by a wide variety of disciplines including prosecutors, police officers, protective service workers and medical examiners.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As the American elderly population expands exponentially over the coming decades, law enforcement will need new tools and knowledge to detect signs of abuse of these members of this vulnerable population. These two projects lay the groundwork for the production and communication of such guidance.

Effectiveness: What is the impact and/or application of this research to older persons?

This research expands our knowledge of the signs of elder abuse and the ability (or inability) of medical and criminal justice personnel to detect such abuse in this population. These findings will lead to an increased ability of caretakers and law enforcement to detect and respond to these crimes, which are currently under-reported and go largely unaddressed.

Innovativeness: Why is this research exciting or newsworthy?

This project demonstrated the need for training for medical examiners in the area of elder mistreatment, as many are currently unable to distinguish between signs of elder abuse and other natural byproducts of aging. Such training would greatly increase detection of homicides of elderly individuals.

BRUISING AS A FORENSIC MARKER OF PHYSICAL ELDER ABUSE

Very little is known regarding the "red flags" that law enforcement and caretakers can use to look for signs of physical abuse of elderly people. This project will provide practical information to medical, forensic and law enforcement personnel on how bruises that are caused by abuse appear in the elderly population. In addition, it will greatly advance the science on physical signs and injuries that result from elder abuse.

Lead Agency: National Institute of Justice, Office of Justice Programs.

Agency Mission: NIJ is the research, development, and evaluation agency of the U.S. Department of Justice and is dedicated to researching crime control and justice issues. NIJ provides objective, independent, evidence-based knowledge and tools to meet the challenges of crime and justice, particularly at the State and local levels.

Principal Investigator: Dr. Laura Mosqueda, Professor of Clinical Family Medicine and Director of Geriatrics, UCI Medical Center, Pavilion III, ZC1150, 101 The City Drive, Orange County, CA 92868.

Partner Agencies: U.S. Department of Justice's Elder Justice and Nursing Home Initiative.

General Description: In 2001, NIJ took a significant step in building the medical forensic literature on elder mistreatment by funding a project entitled Bruising in the Geriatric Population. This project systematically documented the occurrence, location, color, progression, and resolution of accidental bruising in a sample of adults aged 65 and older. Using the results of this first study, the research team is now systematically documenting bruising known to have occurred in elders who have been physically abused. This project will provide practical information to medical, forensic and law enforcement personnel on how bruises that are caused by abuse appear in the elderly population; and will advance the science on forensic markers of physical elder abuse.

Excellence: What makes this project exceptional?

This project is the first to attempt to delineate how injuries (bruises, in this case) that result from abuse differ from those that occur accidentally. The findings will greatly aid first responders in determining whether signs of bruising are cause for concern and additional investigation.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As the American elderly population expands exponentially over the coming decades, law enforcement will need new tools and knowledge to detect signs of abuse of these members of this vulnerable population. These two projects lay the groundwork for the production and communication of such guidance.

Effectiveness: What is the impact and/or application of this research to older persons?

This research expands our knowledge of the signs of elder abuse and the ability (or inability) of medical and criminal justice personnel to detect such abuse in this population. These findings will lead to an increased ability of caretakers and law enforcement to detect and respond to these crimes, which are currently under-reported and go largely unaddressed.

Innovativeness: Why is this research exciting or newsworthy?

This project will give the field its first solid piece of evidence that bruises that result from abuse differ from those that result from accidental injury. This information has already changed investigative practices in Orange County, CA, and will hopefully influence the law enforcement practices across the country once results are reviewed and disseminated.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): ADVANCED COGNITIVE TRAINING FOR INDEPENDENT AND VITAL ELDERLY (ACTIVE)

The ACTIVE study showed that certain mental exercises can offset some of the expected decline in older adults' thinking skills and show promise for maintaining cognitive abilities needed to do everyday tasks such as shopping, making meals and handling finances.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

• Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

• Foster the development of research and clinician scientists in aging.

• Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Sharon L. Tennstedt, Ph.D., New England Research Institute, Inc., Institute for Studies on Aging, 9 Galen Street, Watertown, MA 02472.

Partner Agency: National Institute of Nursing Research (NINR).

General Description: Results from the NIH-supported Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) study demonstrated, for the first time in a randomized, controlled trial, that certain mental exercises can offset some of the expected decline in older adults' thinking skills and show promise for maintaining cognitive abilities needed to do everyday tasks such as shopping, making meals and handling finances. Some of the benefits of the short-term training tested in this study lasted for as long as five years.

Excellence: What makes this project exceptional?

The ACTIVE study is the first randomized, controlled trial to demonstrate long-lasting, positive effects of brief cognitive training in older adults, and the only trial to date in which the effects of mental exercises were assessed after five years for both cognitive and functional status.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Some studies suggest that as many as 22.2 percent of Americans age 71 and older—some 5.4 million people—display some level of cognitive impairment that does not reach the threshold for a diagnosis of dementia. This study offers hope that cognitive training may be useful, demonstrating that relatively brief targeted exercises can produce durable changes.

Effectiveness: What is the impact and/or application of this research to older persons?

Although these findings are promising, further research is needed to determine how these and similar interventions can best be employed in real-world settings.

Innovativeness: Why is this exciting or newsworthy?

This is the first randomized, controlled trial to demonstrate long-lasting, positive effects of cognitive training in older adults. Cog-

nitive exercises are potentially less expensive than pharmacological interventions, with fewer side effects.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): THE DYNAMICS OF HEALTH, AGING, AND BODY COMPOSITION

The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. 3,075 men and women between the ages of 70–79 who are free of disability were selected for this study. Body weight, lean body mass, and body fat are quantified from computed tomography images using software developed by CIT's Biomedical Imaging Research Services Section (BIRSS), Division of Computational Bioscience (DCB).

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Tamara B. Harris, M.D., M.S., Senior Investigator, Intramural Research Program, National Institute on Aging, Laboratory of Epidemiology, Demography, and Biometry, Gateway Building, 3C309, 7201 Wisconsin Avenue, Bethesda, MD 20892.

Partner Agency: NIH Center for Information Technology (CIT), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), National Research Council of Italy, American Heart Association, American Diabetes Association, and Hologic Inc.

General Description: The Center for Information Technology is collaborating with the National Institute of Aging to assist in image segmentation and quantification in a clinical research study, the Dynamics of Health, Aging and Body Composition (Health ABC). The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. 3,075 men and women between the ages of 70–79 who are free of disability were selected for this study. CIT is augmenting the analysis from computerized tomography scans. Lean body mass, and body fat are quantified from computed tomography images using software developed by CIT's Biomedical Imaging Research Services Section (BIRSS), Division of Computational Bioscience (DCB). Manual image segmentation is laborious and subject to inter and intra-observer variability when performing volumetric analysis. An extension of BIRSS' MIPAV software provides researchers with a multistage semiautomatic process for image segmentation, quantification, and visualization.

Excellence: What makes this project exceptional?

The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. This should help to address questions of morbidity related to body weight and weight related health conditions in old age.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Older people incur multiple health conditions as they age that affect multiple organ systems. Most studies of aging that had been performed prior to 1998 tended to emphasize the function of one organ system: heart, brain, bone rather than a comprehensive assessment. Health ABC used the principle of weight-related health conditions to organize a multi-dimensional study.

Effectiveness: What is the impact and/or application of this research to older persons?

This research has shown that the same risk factors that cause early declines in function contribute to later, major losses in function and the onset of frailty. This is a powerful prevention message for aging.

Innovativeness: Why is this exciting or newsworthy?

Early interventions on weight, heart disease, diabetes, inflammation, and depression may prevent later declines to frailty in old age.

NATIONAL CENTER FOR COMPLEMENTARY AND ALTERNATIVE MEDICINE ACUPUNCTURE RELIEVES PAIN AND IMPROVES FUNCTION IN KNEE OSTEOARTHRITIS

Acupuncture provides pain relief and improves function for people with osteoarthritis of the knee and serves as an effective complement to standard medical care.

Lead Agency: National Center for Complementary and Alternative Medicine (NCCAM)/National Institutes of Health (NIH).

Agency Mission:

- Explore complementary and alternative healing practices in the context of rigorous science.
- Train complementary and alternative medicine researchers.
- Disseminate authoritative information to the public and professionals.

Principal Investigator: Brian M. Berman, M.D., Family Medicine, University of Maryland School of Medicine, 419 W. Redwood Street, Suite 470B, Baltimore, MD 21201–1734.

General Description:

ACUPUNCTURE RELIEVES PAIN AND IMPROVES FUNCTION IN KNEE OSTEOARTHRITIS

The multi-site study team, including rheumatologists and licensed acupuncturists, enrolled 570 patients, aged 50 or older with osteoarthritis of the knee. Participants were randomly assigned to receive one of three treatments: acupuncture; sham acupuncture; or participation in a control group that followed the Arthritis Foundation's self-help course for managing osteoarthritis. Patients continued to receive standard medical care from their primary physicians, including anti-inflammatory medications, such as COX–2 se-

lective inhibitors, non-steroidal anti-inflammatory drugs, and opioid pain relievers.

After enrolling in the study, patients' pain and knee function were assessed using standard arthritis research survey instruments and measurement tools, such as the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Patients' progress was assessed at 4, 8, 14, and 26 weeks. By week 8, participants receiving acupuncture were showing a significant increase in function and, by week 14, a significant decrease in pain, compared with the sham and control groups. These results, shown by declining scores on the WOMAC index, sustained through week 26. Overall, those who received acupuncture had a 40 percent decrease in pain and a nearly 40 percent improvement in function compared to baseline assessments.

Excellence: What makes this project exceptional?

This study is a well-designed phase 3 clinical trial that demonstrated the safety and efficacy of Traditional Chinese Acupuncture as a complementary treatment for osteoarthritis of the knee.

Significance: How is this research relevant to older persons, populations and/or an aging society?

More than 20 million Americans have osteoarthritis, which is one of the most frequent causes of physical disability among adults. Acupuncture provides a non-pharmacologic, complementary treatment for osteoarthritis of the knee.

Effectiveness: What is the impact and/or application of this research to older persons?

These results demonstrate that acupuncture is an effective non-pharmacologic complementary treatment for osteoarthritis of the knee, potentially resulting in a higher-quality of life and functioning for individuals with osteoarthritis.

Innovativeness: Why is this research exciting or newsworthy?

A survey conducted by the Centers for Disease Control and Prevention showed that, in 2002, acupuncture was used by an estimated 2.1 million U.S. adults. This trial provides evidence that acupuncture is an effective non-pharmacologic complement to conventional treatment for osteoarthritis, and can be utilized successfully as a part of an integrated approach to treating the symptoms of osteoarthritis.

THE NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES: POWERFUL TECHNIQUES FOR STUDYING DNA DAMAGE RECOGNITION AND REPAIR

This research project uses very powerful electron microscopic techniques to study DNA repair and DNA damage recognition. The researchers also study telomeres, which are structures of repetitive DNA sequences at the ends of chromosomes.

Lead Agency: The National Institute of Environmental Health Sciences (NIEHS)/National Institutes of Health (NIH).

Agency Mission: The mission of the NIEHS is to reduce the burden of human illness and disability by understanding how the environment influences the development and progression of human disease.

Principal Investigator: Jack D. Griffith, Professor, Department of Microbiology/Immunology, CB# 7295, RM 11–119, Lineberger Com-

prehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599–7295.

General Description:

POWERFUL TECHNIQUES FOR STUDYING DNA DAMAGE RECOGNITION AND REPAIR

Single molecule electron microscopy provides a powerful approach for studying the way in which damaged DNA is remodeled by proteins. The focus of this application is to understand how a number of central human DNA repair and telomere binding proteins interact at large, complex DNA structures containing damage, and how they carry out repair or signal the presence of lesions. This is a highly interactive program which represents longstanding fruitful collaborations with Dr. Paul Modrich working on human mismatch factors, Dr. Aziz Sancar working on human repair signaling factors, and with Dr. Titia deLange working on telomere binding proteins. Together from our own work on this topic and through these collaborations we have published over 20 papers in the past 5 years. This is a highly propitious time to carry out these studies since we have developed two powerful new EM methods: nano-scale biopointers that provide a means of identifying the location of proteins within multi-protein complexes and glycerol spray/low voltage EM that provide a more gentle means of preparing samples for EM. Further, as substrates for these studies, we have produced large natural DNAs containing replication forks or Holliday junctions with nearby mismatched bases and a model telomere DNA. Work on the mismatch repair proteins will take advantage of the recent in vitro reconstitution of nick directed excision repair by the Modrich laboratory. Work on Claspin and the Rad 9- Husl-Radl complex will focus on learning how these proteins interact with replication forks containing damage. Studies of the remodeling of telomeres will take advantage of the recent discovery of discrete multi protein complexes at telomeres. Finally continuing work from our laboratory will focus on p53 as a facilitator of DNA damage recognition. Each system offers a unique window into basic questions of DNA protein remodeling at sites of damage and telomeres and information garnered from one study is immediately applied to the others.

Excellence: What makes this project exceptional?

The research team has discovered a fundamental difference between the telomeres of the roundworm *C. elegans* and those of mammals. Telomeres act like buffers preventing chromosomes from fusing together or rearranging. Those types of abnormalities can lead to cancer. The team found that roundworm telomeres are rich in the compound cytosine as opposed to mammalian telomeres which are rich in guanine.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As humans and all higher organisms age, the telomeres at the ends of their chromosomes shorten. Very short telomeres, reached after several cell divisions, signal the cell to go through programmed cell death, thus preventing the chromosomes from rearranging in ways that have been associated with the development of cancer. However, in some forms of cancer, the death signal is not

sent and the tumor cells continue to divide allowing the cancer to grow and spread.

Effectiveness: What is the impact and/or application of this research to older persons?

For the most part, cancer is a disease associated with aging. In fact, most people, if they live long enough, will develop some form of cancer in their lives. By identifying methods to prevent or treat cancer, we can extend the healthy years of life for all people.

Innovativeness: Why is this research exciting or newsworthy?

This research team will now search for cytosine-rich telomeres in mammalian cells. If they are found, they could play a role in extending telomere maintenance and in cancer prevention. The research team hopes to exploit these findings in stopping cells from becoming cancerous or killing early stages of cancer by blocking an enzyme critical in telomere synthesis.

OFFICE OF PORTFOLIO ANALYSIS AND STRATEGIC INITIATIVES: INTERDISCIPLINARY RESEARCH CONSORTIUM IN GEROSCIENCE

The Roadmap Interdisciplinary Research Program is intended to address significant research and health challenges by bringing together researchers from different fields to develop new approaches to solve problems. The Interdisciplinary Research Consortium in Geroscience will foster interdisciplinary collaborations that will help unravel the reasons why we age so that we can better understand what goes wrong in age-related diseases and disorders. Many avenues will be explored including how dietary restriction affects aging and why the aging brain recovers less easily from traumatic brain injury.

Lead Agency: Office of Portfolio Analysis and Strategic Initiatives (OPASI)/Common Fund, NIH Office of the Director.

Agency Mission: Strategic planning and implementation of trans-NIH initiatives that seek to transform the way health research is conducted.

Development and distribution of tools and methodologies to NIH Institutes and Centers for analysis and evaluation of NIH programs.

Principal Investigator: Dr. Gordon J. Lithgow, Associate Professor, Buck Institute for Age Research, 8001 Redwood Blvd., Novato, CA 94945.

Partner Agencies: All NIH Institutes and Centers participate in the planning and implementation of NIH Common Fund/Roadmap Programs. The NIDCR plays a lead role in implementing the Interdisciplinary Research Program. The Geroscience research program at the Buck Institute for Age Research is one of nine interdisciplinary research consortia funded by the NIH Director's Roadmap program.

General Description: The Roadmap Interdisciplinary Research Program brings together scientists from numerous fields to develop new approaches that will address significant research and health challenges. The Interdisciplinary Research Consortium in Geroscience will foster interdisciplinary collaborations between cell and molecular biologists, biochemists, geneticists, endocrinologists, physiologists, bioinformaticians, and chemists that will elucidate the fundamental mechanisms of aging in order to better understand what goes awry in age-related diseases and disorders. The

research will be carried out at the Buck Institute for Age Research, which is an NIH-designed Center of Excellence, and the only independent research institute in the United States focused solely on aging research. The Geroscience Consortium will synergize research on the basic mechanisms of aging with research on age-associated diseases and with designing and optimizing new technologies that may be of great value to the geroscience community.

The research will include determining how cellular signaling pathways (e.g., TOR) increase longevity in response to environmental cues (e.g., dietary restriction) and how the same genes that control cell division and thereby suppress cancer (e.g., HUR) also promote neurodegeneration. Chemical compounds will be searched for that increase lifespan and also protect mammalian neurons from stressors. How proteins interact and how they change shape in an aging cell vs. a diseased cell will be explored since these processes are fundamental to the development of several neurodegenerative diseases. The role of histone deacetylase in aging and neurodegeneration will be investigated since this enzyme plays a critical role in modifying the epigenome of many cell types and may play a role in the development of Huntington's Disease and Parkinson's Disease. In addition, the research will explore why it is harder for the aged brain to recover from injury.

Excellence: What makes this project exceptional?

The nine interdisciplinary research consortia including the Geroscience Consortium were chosen through an incredibly competitive process. Each proposed consortium had to have a team of exceptionally accomplished scientists drawn from many disciplines who could address significant research challenges not amenable to existing uni- or multidisciplinary approaches. The Geroscience Consortium is located at a premier aging research institute—The Buck Institute for Age Research in Novato, CA—which has no academic departments and is therefore ideal for fostering interdisciplinary research at the interface of different fields. The Geroscience Consortium will integrate research on the molecular mechanisms of aging with age-associated disease research and with designing and optimizing new technologies of great potential value to the geroscience community.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This research directly targets older persons. By determining what constitutes the "normal" aging process, one can better understand what biological processes go awry in age-related diseases and disorders, and find therapeutic agents to target these processes.

Effectiveness: What is the impact and/or application of this research to older persons?

Finding out how aging occurs at the molecular and cellular level will result in a better understanding of pathological processes associated with disease. The Geroscience Consortium has taken a multi-pronged approach to understanding aging and addressing age-related diseases from examining changes in the DNA (regulated epigenetic changes and stochastic oxidative damage), to looking at changing protein dynamics (including the formation of protein aggregates in Huntington's Disease and Parkinson's Disease), to why aging brains do not recover well from trauma (may be a paucity of stem cells). Knowing the molecular players in the aging

process and the factors that modulate their functions normally and during disease progression will allow for the development of therapeutic agents or adoption of lifestyle changes to increase longevity and combat disease.

Innovativeness: Why is this research exciting or newsworthy?

Much has yet to be elucidated with respect to the molecular pathways underlying aging in order to begin to get at what goes awry in these pathways during the development of age-related disease and to identify which molecules can be targeted by therapeutic agents or can be modulated by lifestyle choices—e.g., in diet.

NATIONAL INSTITUTE ON AGING: HEALTH AND RETIREMENT STUDY (HRS)

The Health and Retirement Study (HRS) surveys more than 22,000 Americans over the age of 50 every two years. Survey results and analyses paint an emerging portrait of an aging America's physical and mental health, insurance coverage, financial status, family support systems, labor market status, and retirement planning. The data contain unique and innovative features and are designed for cross-national comparisons with international counterparts that allow analysts to consider important research questions relating to aging societies.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission: Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

Foster the development of research and clinician scientists in aging.

Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: David Weir, PhD, Institute for Social Research, University of Michigan, 426 Thompson Street, Ann Arbor, Michigan 48106–1248.

Partner Agency: Social Security Administration.

General Description:

HEALTH AND RETIREMENT STUDY (HRS)

Since 1992, the NIH-supported Health and Retirement Study (HRS) has painted a detailed portrait of America's older adults, helping us learn about this growing population's physical and mental health, insurance coverage, financial situations, family support systems, work status, and retirement planning. Through its unique and in-depth interviews with a nationally representative sample of adults over the age of 50, the HRS provides an invaluable, growing body of multidisciplinary data to help address the challenges and opportunities of aging. During each 2-year cycle of interviews, the HRS team surveys more than 20,000 people who represent the Nation's diversity of economic conditions, racial and ethnic backgrounds, health, marital histories and family compositions, occupations and employment histories, living arrangements, and other aspects of life. Since the inception of the HRS, more than 27,000 peo-

ple have given 200,000 hours of interviews. The design and content of the HRS provides opportunities to analyze individual aging and population trends and subgroup differences, develop and test causal models, and simulate policy. The data have proven to be a valuable scientific and policy resource to both academic and federal researchers—there are over 7,000 registered users of the data and nearly 1,000 researchers have employed the data to publish more than 1,300 reports, including more than 600 peer-reviewed journal articles and book chapters, and 70 doctoral dissertations. The HRS is managed jointly through a cooperative agreement between the National Institute on Aging (NIA) and the Institute for Social Research (ISR) at the University of Michigan. The study is designed, administered, and conducted by the ISR, and decisions about the study content are made by the investigators. The principal investigators at the University of Michigan are joined by a cadre of co-investigators and working group members who are leading academic researchers from across the United States in a variety of disciplines, including economics, medicine, demography, psychology, public health, and survey methodology. In addition, a Data Monitoring Committee is charged with maintaining HRS quality, keeping the survey relevant and attuned to the technical needs of researchers who use the data and ensuring that it addresses the information needs of policymakers and the public. The development of international longitudinal aging studies using the HRS as a model is leading to the production of a network of cross-nationally comparable data sources to conduct timely research on population aging.

Excellence: What makes this project exceptional?

The Health and Retirement Study (HRS) has provided an invaluable, long-term look at the complex interplay of health, work, and economic status of Americans age 51 and older. Over the years, the study has been recognized for its high level of innovation and unique approaches within the social science research arena and has become the premier source of retirement data. The data is widely used by both academic and federal researchers. In terms of budget, sample size, number of interview hours, and number of researchers involved, the HRS ranks among the largest and most ambitious social and behavioral studies ever undertaken. Rather than being a narrowly controlled investigation of the hypotheses of a small group of scientists, it provides a laboratory for many researchers to explore their theories. The HRS has served as a model for other countries to develop harmonized cross-nationally comparable surveys.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The HRS is widely recognized as the leading data source for research on the health and retirement behavior of older populations. The data are being used by federal and academic researchers to address critical questions facing aging populations. Broad national representation in the study allows it to look at the older population in general as well as the great diversity and variability of aging. The structure of the data allows researchers to investigate both current issues and changes over time. The HRS tracks the health of respondents over time allowing researchers to probe the impacts of unexpected health events on other aspects of individuals' lives.

The HRS, along with harmonized international companion studies, allows for comparisons of trends in aging and retirement worldwide.

Effectiveness: What is the impact and/or application of this research to older persons?

The HRS has enabled a significant amount of research supported by the federal government and private institutions of aging. Data and analyses from HRS have been used to publish more than 1,300 reports, including more than 600 peer-reviewed journal articles and book chapters and 70 doctoral dissertations on health and retirement.

Innovativeness: Why is this research exciting or newsworthy?

The HRS contains many survey innovations, including:

• Providing improved measurement of key concepts like assets using random entry bracketing, which reduces the number of nonresponses by eliciting ranges of values from respondents who would otherwise give no information at all.

• Innovative concepts like participants' future expectations such as how long people expect to work in the future, their estimates of how long they will live, the likelihood of giving major financial assistance to family members in the future, whether or not they expect to leave a bequest and the amount of that bequest, and whether they think they will enter a nursing home or move to a new home or other living arrangement in the future.

• Short experimental modules administered to randomly selected subgroups of participants to test new concepts and explore narrowly focused topics such as physiological capacity, early childhood experiences, personality, quality of life, and employment opportunities.

• The largest national study of the prevalence of dementia in the United States using in-home assessments (the Aging, Demographics, and Memory Study—ADAMS).

• Collection of biomarker data including grip strength, lung capacity, walking ability, blood pressure, blood spot samples to assay for some common disease markers and salivary DNA samples.

• Consumption and time-use data.

• Linkages to administrative records on benefits and earnings from federal programs like Social Security and Medicare as well as employers to better understand pension plans.

• International data collections modeled after the HRS provide opportunities for comparable data for cross-national analyses.

NATIONAL EYE INSTITUTE (NEI)/NATIONAL INSTITUTES OF HEALTH (NIH): AGE-RELATED EYE DISEASE STUDY: WOMEN INTERAGENCY HIV STUDY (WIHS)

AREDS investigators reported on clinical trial findings that a daily, high-dose combination of antioxidant vitamins C, E, and beta-carotene, and the trace element zinc reduced the risk of developing advanced AMD by 25% over a five-year period.

Lead Agency: National Eye Institute (NEI), National Institutes of Health (NIH).

Agency Mission: The National Eye Institute (NEI) was established by Congress in 1968 to protect and prolong the vision of the American people. As one of the Federal government's National Institutes of Health (NIH), the NEI conducts and supports research

that helps prevent and treat eye diseases and other disorders of vision. This research leads to sight-saving treatments, reduces visual impairment and blindness, and improves the quality of life for people of all ages. NEI-supported research has advanced our knowledge of how the visual system functions in health and disease.

Principal Investigators: Dr. Frederick Ferris, Address: 10–CRC—Hatfield Clinical Research Center, 3–2531, 10 Center Drive, Bethesda, MD 20892.

General Description:

AGE-RELATED EYE DISEASE STUDY (AREDS)

The two most common eye diseases associated with aging are lens opacities (cataract), a leading cause of worldwide blindness, and age-related macular degeneration (AMD), the leading cause of irreversible vision loss in the United States among persons over 65 years of age. Cataract surgery replaces the opaque, natural lens with a clear, synthetic lens and is highly successful in the United States. However, in developing countries, the procedure is costly and not readily available. There are no cures for AMD, which causes the loss of light sensing photoreceptor cells in the central portion of the retina (macula) that provides us with sharp visual acuity and color vision. In the initial phases of the disease, patients experience trouble reading fine print and seeing in dim light. During the advanced stages, the disease destroys the macula, resulting in severe vision loss and legal blindness. Patients with advanced AMD can no longer read, recognize faces, drive a car, or perform simple daily tasks that require hand-eye coordination. AMD greatly diminishes mobility, independence and the quality of life. A delay in the progression of AMD would provide improved visual function for afflicted individuals. As the U.S. population ages, the prevalence of AMD and cataracts is expected to rise sharply, placing ever greater burdens on healthcare and social services.

The NEI initiated the Age-Related Eye Disease Study (AREDS) to evaluate, in part, the effects of antioxidants on the development and progression of AMD and cataracts. AREDS included a large, multi-center clinical trial involving 4,757 participants, 55 to 80 years of age, in 11 clinical centers nationwide. Researchers found that people at high risk of developing advanced stages of AMD lowered their risk of progression by about 25 percent over a five-year period when treated with a daily, high-dose combination of antioxidant vitamins C, E, and beta-carotene, and the trace element zinc. No effect of these nutrients on cataract formation was observed. This nutritional therapy represents the first treatment to slow the progression of AMD and delay the onset of severe and debilitating vision loss. Based on published prevalence data, an estimated 8 million Americans at least 55 years old are at high risk to develop advanced AMD. Based on results from the AREDS, 1.3 million of these people would develop advanced AMD over the next five years if no treatment were given to reduce their risk. If this at-risk population avails themselves of the AREDS nutritional formulation (vitamins C, E, beta-carotene, and zinc), greater than 300,000 would avoid advanced AMD and its associated vision loss over the next five years.

AREDS also added to our understanding of the epidemiology of AMD and cataract. Data from AREDS and other studies suggested

that lutein/zeaxanthin and omega-3 long chain polyunsaturated fatty acids might also have benefit in AMD and cataract. Leveraging these findings, NEI began AREDS 2 in 2005, a multicenter study that will include up to 100 clinical sites to evaluate these supplements and other modifications of the original AREDS formulations on AMD and cataract.

WOMEN INTERAGENCY HIV STUDY (WIHS)

The Women's Interagency HIV Study (WIHS) was established in August 1993 to investigate the impact of HIV infection on women in the United States. Approximately 3,700 women have been enrolled, of which 2,400 are still attending visits every six months (the remaining have either died or lost to follow-up). The core portion of this NIH-supported study includes a detailed and structured interview, physical and gynecologic examinations, and laboratory testing. The WIHS participants are also asked to enroll in various sub-studies, including cardiovascular, metabolic, and physical functioning.

Excellence: What makes this project exceptional?

AREDS offers the first treatment to slow the progression of AMD.

Significance: How is this research relevant to older persons, populations and/or an aging society?

AMD is the leading cause of blindness in older Americans in the United States.

Effectiveness: What is the impact and/or application of this research to older persons?

If the more than 8 million older Americans at high risk of developing advanced AMD took the AREDS formulation, more than 300,000 would avoid severe vision loss over the next 5 years.

Innovativeness: Why is this exciting or newsworthy?

AREDS offers a valuable therapy to prevent severe vision loss simply by taking a relatively low-cost antioxidant supplement.

NATIONAL CENTER FOR COMPLEMENTARY AND ALTERNATIVE MEDICINE: TURMERIC AND RHEUMATOID ARTHRITIS SYMPTOMS

Using an experimental animal model of rheumatoid arthritis, NCCAM-supported investigators demonstrated that a curcuminoid-containing turmeric extract, similar to that found in turmeric dietary supplements, significantly inhibited joint inflammation and joint destruction.

Lead Agency: National Center for Complementary and Alternative Medicine (NCCAM)/National Institutes of Health (NIH).

Agency Mission:

- Explore complementary and alternative healing practices in the context of rigorous science.
- Train complementary and alternative medicine researchers.
- Disseminate authoritative information to the public and professionals.

Principal Investigator: Barbara Timmermann, Ph.D., Department of Medicinal Chemistry, University of Kansas, School of Pharmacy, 4070 Malott Hall, 1251 Wescoe Hall Dr., Lawrence, KS 66045–7582.

Partner Agencies: Office of Dietary Supplements (ODS), Office of the Director/National Institutes of Health.

General Description:

TURMERIC AND RHEUMATOID ARTHRITIS SYMPTOMS

Rheumatoid arthritis (RA) is an autoimmune disease that causes inflammation in the joints, resulting in pain, swelling, stiffness, and loss of function in the affected joints. Scientists estimate that about 2.1 million people in the United States have RA, which occurs in all races and ethnic groups. The financial and social impact of this disease is substantial: the medical and surgical treatment costs and the wages lost because of disability add up to billions of dollars annually.

Using an experimental animal model of arthritis, NCCAM-supported investigators demonstrated that a curcuminoid-containing turmeric extract, similar to that found in turmeric dietary supplements, significantly inhibited joint inflammation and joint destruction. These findings suggest a mechanism for turmeric's protective, antiarthritic effect. The investigators documented the chemical composition of a curcumin-containing compound tested in an animal model for antiarthritic activity; provided evidence of antiarthritic efficacy of a turmeric extract similar to turmeric dietary supplements; and proposed a mechanism of action of curcumin-containing extracts in arthritis treatments.

The centuries-old practice of Ayurvedic medicine supports the use of turmeric as an anti-inflammatory agent. Turmeric, a botanical supplement, has been widely promoted in the United States as a treatment for arthritis, despite the lack of standardization of over-the-counter products and paucity of scientific efficacy data. This scientific advance builds on and extends previous findings that turmeric can prevent joint inflammation in an animal model of RA. It also demonstrates the application of sophisticated research techniques to assess the potential therapeutic benefits of botanicals. Thus, these results lay the foundation for further clinical evaluation of turmeric dietary supplements in the treatment of RA.

Excellence: What makes this project exceptional?

More than 2 million Americans suffer from rheumatoid arthritis (RA), a condition in which the body's immune system attacks the joints, causing pain, swelling, stiffness, and loss of function. Using an animal model, this project provided evidence of antiarthritic activity of a turmeric extract, similar to that in turmeric dietary supplements.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Rheumatoid arthritis affects the middle-aged and occurs with increased frequency in older individuals. This study has demonstrated that a turmeric extract, similar to that found in turmeric dietary supplements, significantly inhibited joint inflammation and joint destruction. The successful translation of these results from an animal model to human use would provide another effective treatment for arthritis and, potentially, other inflammatory diseases.

Effectiveness: What is the impact and/or application of this research to older persons?

These investigators demonstrated in vivo efficacy and identified the mechanism of action for a well-characterized turmeric extract, which lays the groundwork for clinical evaluation of turmeric dietary supplements for the treatment of RA.

Innovativeness: Why is this research exciting or newsworthy?

A variety of medical and lifestyle approaches are used to treat RA-associated pain and inflammation, and slow down or halt the subsequent joint damage. This study lays the foundation for the clinical evaluation of a potentially new treatment for a painful and debilitating disease that affects older adults. In addition, the research results provide a proof-of-concept for the potential use of a botanical to treat other inflammatory diseases, such as inflammatory bowel disease, asthma, and multiple sclerosis.

NATIONAL CENTER FOR COMPLEMENTARY AND ALTERNATIVE MEDICINE: TAI CHI BOOSTS IMMUNITY TO SHINGLES VIRUS IN OLDER ADULTS

This is the first rigorous clinical trial to suggest that a mind-body intervention, tai chi, alone or together with a vaccine, can help protect older adults from the varicella virus, which causes both chickenpox and shingles.

Lead Agency: National Center for Complementary and Alternative Medicine (NCCAM)/National Institutes of Health (NIH).

Agency Mission:

- Explore complementary and alternative healing practices in the context of rigorous science.
- Train complementary and alternative medicine researchers.
- Disseminate authoritative information to the public and professionals.

Principal Investigator: Michael R Irwin, M.D., University of California, Los Angeles, Neuropsychiatric Institute, 300 UCLA Medical Plaza, Suite 3109, Los Angeles, CA 90095–7076.

General Description:

TAI CHI BOOSTS IMMUNITY TO SHINGLES VIRUS IN OLDER ADULTS

In a randomized, controlled clinical trial, NIH-supported researchers demonstrated that tai chi increases the immunity of older adults to the varicella zoster virus that causes both chickenpox and shingles and boosts their immune responses to the chickenpox vaccine. Tai chi, developed in China around the 12th century as a martial art, is a low-impact form of exercise and moving meditation that can improve physical condition, muscle strength, coordination, and flexibility.

One hundred twelve healthy adults, ages 59 to 86, took part in a 16-week program in which they received either a tai chi intervention or participated in a health education control group. After completing the program, both groups received a single injection of VARIVAX®, the chickenpox vaccine. Periodic blood tests determined levels of viral immunity during the program and nine weeks following vaccine administration. Prior to vaccination, tai chi was found to increase pre-existing immunity to varicella. Following vaccination, the level of immunity to varicella was significantly higher in the tai chi group, about a 40 percent increase, compared to the education group.

The researchers further showed that the tai chi group's rate of increase in immunity over the course of the study was double that of the control group. The tai chi group also reported significant improvements in physical functioning, body pain, vitality, and mental health.

Excellence: What makes this project exceptional?

Tai chi, a traditional Chinese form of exercise, may help older adults avoid getting shingles by increasing immunity to varicella-zoster virus (VZV) and boosting the immune response to varicella vaccine in older adults. This study is the first rigorous clinical trial to suggest that a behavioral intervention, alone or in combination with a vaccine, can help protect older adults from VZV, which causes both chickenpox and shingles.

Significance: How is this research relevant to older persons, populations and/or an aging society?

One in five people who have had chickenpox will get shingles later in life, usually after age 50, and the risk increases as people get older. More research is needed, but this study suggests that the tai chi intervention tested, in combination with immunization, may enhance protection of older adults from this painful condition.

Effectiveness: What is the impact and/or application of this research to older persons?

Tai chi, developed in China around the 12th century as a martial art, is a low-impact form of exercise and moving meditation that can improve physical condition, muscle strength, coordination, and flexibility. It is also said to improve balance, which may lower the risk of falls, especially in the elderly, and to ease pain and stiffness caused, for example, by arthritis. Tai chi is considered to be particularly suitable for older people because it is low-impact and can be modified easily to accommodate health limitations.

Innovativeness: Why is this research exciting or newsworthy?

This is the first rigorous clinical trial to suggest that a mind-body intervention, tai chi, alone or together with a vaccine, can help protect older adults from the varicella virus, which causes both chickenpox and shingles.

NATIONAL CANCER INSTITUTE: ELDERLY MEDICAID PATIENTS LESS LIKELY TO RECEIVE CHEMOTHERAPY FOR COLORECTAL CANCER

A study using data from the Michigan Tumor Registry and the Centers for Medicare and Medicaid Services showed that elderly Medicaid-insured patients in the state are less likely to initiate or complete chemotherapy for colorectal cancer compared with Medicare-insured patients. Previous studies have shown that Medicaid-insured patients have worse survival rates for colorectal cancer, but it had not been known if they receive less treatment than patients with other forms of insurance.

Lead Agency: National Cancer Institute (NCI)/National Institutes of Health (NIH).

Agency Mission: The National Cancer Institute coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients. Specifically, the Institute:

Principal Investigator: Cathy J. Bradley, Virginia Commonwealth University, 1008 East Clay St., Richmond, VA.

General Description: Elderly Medicaid Patients Less Likely to Receive Chemotherapy for Colorectal Cancer. While major improvements have been made in the collection of epidemiologic data, special populations such as minorities and the medically underserved have been excluded. No accurate epidemiologic information exists on the cancer incidence, diagnosis, and treatment of these populations. The investigators collected data from 4,765 patients aged 65 or older who were diagnosed with colorectal cancer between January 1997 and December 2000 and insured through Medicaid, Medicare, or both. In addition to data on chemotherapy initiation and completion, the investigators compared whether patients were evaluated by an oncologist, subsequently hospitalized, and experienced comorbidities; demographic variables including age, race, sex, household income, and whether patients lived in a metropolitan, urban, or rural area were also studied.

Patients insured through Medicaid were more likely to be African American or of another minority race, female, and to live in a low-income area. For all patients, those with Medicaid insurance were less likely to initiate or complete chemotherapy and less likely to be evaluated by a medical oncologist. Older patients were also less likely to initiate chemotherapy, even though studies have shown that these patients benefit from adjuvant treatment. Future projects using the data can include the prevention of disease or disability, the restoration or maintenance of health, and interventions for more effective health care.

Excellence: What makes this project exceptional?

This research provides evidence that elderly patients with Medicaid are less likely to initiate or complete chemotherapy for colorectal cancer. Previous studies have shown that Medicaid-insured patients have worse survival rates for colorectal cancer, but it had not been known if they receive less treatment than patients with other forms of insurance.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Between 2001 and 2005 the median age at diagnosis for colorectal cancer was 71, and approximately 66% of those diagnosed were over 65. This research shows that older patients with Medicaid are less likely to initiate chemotherapy, even though studies have shown that these patients benefit from adjuvant treatment.

Effectiveness: What is the impact and/or application of this research to older persons?

Medicaid enrollment is associated with disparate colon cancer treatment, which likely compromises the survival of these patients. Recognizing the deficiencies in the quality of care Medicaid patients with colorectal cancer receive will hopefully encourage the changes in policies and practices needed to reduce this trend.

Innovativeness: Why is this research exciting or newsworthy?

This research demonstrates the substantially disparate treatment uptake and compliance received by Medicaid patients. Ensuring access to appropriate care for Medicaid recipients with colorectal cancer has the potential to greatly improve the quality

of life, and life expectancy of these patients, especially if similar trends are seen in other states around the nation.

NATIONAL CANCER INSTITUTE: SURVIVAL WITH TREATMENT VS. OBSERVATION OF LOCALIZED PROSTATE CANCER IN ELDERLY MEN

Prostate-specific antigen screening has led to an increase in the diagnosis and treatment of localized prostate cancer. However, the role of active treatment of low- and intermediate-risk disease in elderly men is controversial. This study estimates the association between treatment (with radiation therapy or radical prostatectomy) compared with observation and overall survival in men with low- and intermediate-risk prostate cancer. This study suggests a survival advantage is associated with active treatment for low- and intermediate-risk prostate cancer in elderly men aged 65 to 80 years.

Lead Agency: National Cancer Institute (NCI)/National Institutes of Health (NIH).

Agency Mission: The National Cancer Institute coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients.

Principal Investigator: Dr. Timothy Rebbeck, Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania School of Medicine, 904 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104–6021.

General Description: Survival with Treatment vs. Observation of Localized Prostate Cancer in Elderly Men. Prostate-specific antigen screening has led to an increase in the diagnosis and treatment of localized prostate cancer. However, the role of active treatment of low- and intermediate-risk disease in elderly men is controversial. This study estimates the association between treatment (with radiation therapy or radical prostatectomy) compared with observation and overall survival in men with low- and intermediate-risk prostate cancer using the US cohort from Surveillance, Epidemiology, and End Results Medicare data. A total of 44,630 men aged 65 to 80 years who were diagnosed between 1991 and 1999 with organ-confined, well- or moderately differentiated prostate cancer and who had survived more than a year past diagnosis. Patients were followed up until death or study end and were classified as having received treatment if they had claims for radical prostatectomy or radiation therapy during the first 6 months after diagnosis. They were classified as having received observation if they did not have claims for radical prostatectomy, radiation, or hormonal therapy. Patients who received only hormonal therapy were excluded. At the end of the 12-year study period, 37% of men in the observational group 23.8% in the treatment group had died. The treatment group had longer 5- and 10-year survival than the observation group. After using propensity scores to adjust for potential confounders (tumor characteristics, demographics, and comorbidities), there was a statistically significant survival advantage associated with treatment. A benefit associated with treatment was seen in all subgroups examined, including older men (aged 75–80 years at diagnosis), black men, and men with low-risk disease. This study suggests a survival advantage is associated with active treatment for

low- and intermediate-risk prostate cancer in elderly men aged 65 to 80 years. Because observational data cannot completely adjust for potential selection bias and confounding, these results must be validated in randomized controlled trials of alternative management strategies in elderly men with localized prostate cancer.

Excellence: What makes this project exceptional?

This observational study suggests a reduced risk of mortality associated with active treatment for low- and intermediate-risk prostate cancer in the elderly Medicare population examined. Although a randomized controlled trial design is needed to confirm these findings, they help begin to answer the long-standing questions regarding treatment decisions for older men.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This study is relevant to older populations because prostate cancer primarily affects older men. In fact, from 2001–2005, the median age at diagnosis for cancer of the prostate was 68 years of age, with over 62% of all persons diagnosed over 65. This study supports the use of treatment to prolong life for these older men.

Effectiveness: What is the impact and/or application of this research to older persons?

This research is especially applicable to older men because of the large percentage of prostate cancer cases in this population. Upon further study, confirmation of these results will lead to the more effective treatment of older men.

Innovativeness: Why is this research exciting or newsworthy?

This study suggests a survival advantage is associated with active treatment for low- and intermediate-risk prostate cancer in elderly men aged 65 to 80 years. By helping to answer long-standing questions about appropriate types of treatment for prostate cancer, especially for older men, these findings propel researchers to begin to confirm these findings. Through future randomized studies the finding that treatment is effective for older men can be confirmed and put into practice holding the promise to affect countless older men diagnosed with this disease.

NATIONAL CANCER INSTITUTE: INTEGRATING AGING AND CANCER RESEARCH AT NCI-DESIGNATED CANCER CENTERS

The goal of this program is to expand the capacity of the NCI-designated Cancer Centers to carry out research that concentrates on aging and age-related aspects of human cancer through support of new investigators, pilot projects, and shared resources focused on aging and cancer. Grantees are expected to develop a formal research program that would become a stable component of the cancer center dedicated to collaborative research in aging and cancer and translation of findings into the clinical and population settings.

Lead Agency: National Cancer Institute (NCI)/National Institutes of Health (NIH).

Agency Mission: The National Cancer Institute coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients.

Principal Investigator: Richard H. Weindruch, Ph.D., University of Wisconsin, VA Hospital (GRECC–4D), 2500 Overlook Terrance, Madison, Wisconsin 53705–2286.

Partner Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

General Description: Planning and Development Grants Integrating Aging and Cancer Research at NCI-Designated Cancer Centers. The goal of this program is to expand the capacity of Cancer Centers to engage in pioneering research that concentrates on aging- and age-related aspects of human cancer through support of new investigators, pilot projects, and shared resources focused on aging and cancer. Grantees are expected to design and coordinate a research effort in a five-year project period that will result in a formal aging/cancer "Program" or an equally effective integrated research activity that becomes a component of the NCI-funded Cancer Center. A solid, focused infrastructure for the conduct and continued development of an aging/cancer research program, allowing for incorporation of multiple disciplines and creative exploration of new approaches to cancer, is also expected.

A broad range of cancer research falls under this scientific initiative, based on seven thematic areas defined in a 2001 NIA/NCI Workshop Report: Treatment Efficacy and Tolerance; Effects of Comorbidity; The Biology of Aging and Cancer; Patterns of Care; Prevention, Risk Assessment, and Screening; Psychosocial and Medical Effects; and Palliative Care, End-of-Life Care, and Pain Relief.

Excellence: What makes this project exceptional?

It was specifically designed to build research capability in aging- and age-related aspects of human cancer through the NCI-designated Cancer Centers, building upon their abilities to work across organizational boundaries, foster transdisciplinary research, create long-term stability for scientists and research programs, provide extensive core resources to investigators, and link to their communities.

Significance: How is this research relevant to older persons, populations and/or an aging society?

There is a clear need to encourage research which draws from expertise in many disciplines to focus on the problems of cancer in older persons. This initiative is an effort to mobilize expertise through a planning and implementation effort that accelerates research at the aging/cancer interface. The research initiative provides the initial resources to develop and create an integrated, interactive research capability with a significant base of externally funded, peer reviewed research projects in NCI-designated Cancer Centers that focuses on problems of cancer in the elderly. The unique cancer center infrastructure and its critical mass of multidisciplinary expertise provide an ideal research setting for meeting the challenges inherent in integrating aging and cancer research. Cancer Centers have well-established interactive research environments, and they have the leadership, space, equipment, structure and resources available to take advantage of new research directions as opportunities arise.

Effectiveness: What is the impact and/or application of this research to older persons?

Persons 65 and older are at highest risk for cancer and have a higher mortality rate than younger persons. This initiative is still

underway and it will be some time before the true and long-term impact can be assessed. However, it should accelerate research specifically focused on in cancer and aging research.

Innovativeness: Why is this research exciting or newsworthy?

This program is the culmination of several years of effort by NIA and NCI and extramural scientists with expertise in many areas relevant to cancer and aging. It should stimulate research capability in this area in the funded institutions and visibility for aging/cancer issues, build a cadre of future investigators at the cancer/aging research interface, and identify important focal areas for further research and infrastructure support, thus serving as a platform for additional efforts in the future.

NATIONAL HUMAN GENOME RESEARCH INSTITUTE: HUTCHINSON-GILFORD PROGERIA SYNDROME

The gene responsible for the rare and deadly accelerated aging syndrome known as progeria is called LMNA, which is translated into a mutant form of a protein called progerin. The research aims to understand the specific dysfunctions of mutated progerin in the cell by observing cell division, creating a mouse model, testing inhibitors, and starting the first ever human clinical trial. Understanding the variations in the gene and protein product can potentially help treat children with progeria, as well as shed light on the normal aging process.

Lead Agency: National Human Genome Research Institute (NHGRI)/National Institutes of Health (NIH).

Agency Mission: The National Human Genome Research Institute (NHGRI) led the National Institutes of Health's (NIH) contribution to the International Human Genome Project, which had as its primary goal the sequencing of the human genome. This project was successfully completed in April 2003. Now, the NHGRI's mission has expanded to encompass a broad range of studies aimed at understanding the structure and function of the human genome and its role in health and disease.

To that end, NHGRI supports the development of resources and technology that will accelerate genome research and its application to human health. A critical part of the NHGRI mission continues to be the study of the ethical, legal, and social implications (ELSI) of genome research. NHGRI also supports the training of investigators and the dissemination of genome information to the public and to health professionals.

Principal Investigator: Francis S. Collins, MD, PhD, Director, NHGRI, Building 31, Room 4B09, 31 Center Dr, MSC 2152, Bethesda, MD 20892–2152.

General Description: Hutchinson-Gilford progeria syndrome (HGPS) is the most dramatic human syndrome of premature aging. Children with this rare condition are normal at birth, but by age 2 they have stopped growing, lost their hair, and shown skin changes and loss of subcutaneous tissue that resemble the ravages of old age. They rarely live past adolescence, dying almost always of advanced cardiovascular disease (heart attack and stroke). The classic syndrome has never been observed to recur in families. The laboratory conducting this research discovered that nearly all cases of HGPS harbor a de novo point mutation in codon 608 of the LMNA gene. This mutation causes disease by creating an abnormal

splice donor, generating a mRNA with an internal deletion of 150 nt. This is translated into a mutant form of the lamin A protein (referred to now as progerin) that lacks 50 amino acids near the C-terminus. This research has shown that progerin acts as a dominant negative to disrupt the structure of the nuclear membrane scaffold. Recent data has also demonstrated that progerin interferes with proper chromosome segregation during mitosis. A mouse model for HGPS has been developed. Animals carrying a human BAC transgene bearing the codon 608 mutation show progressive loss of smooth muscle cells in the media of large vessels, with replacement by proteoglycan. Thus, the mouse model nicely replicates the cardiovascular phenotype of HGPS.

This project has also explored the possibility that farnesyl transferase inhibitors (FTIs) might be beneficial in HGPS, since lamin A is a farnesylated protein. Treatment of progeria fibroblasts growing in cell culture demonstrates that FTIs are capable of reversing the dramatic nuclear blebbing that is the hallmark of the disease. Based on this data, the research team is conducting a trial of FTIs in the progeria mouse model. A clinical trial of FTIs in children with the disease is planned to be initiated shortly.

Finally, it is hypothesized that other structural or regulatory variants in the LMNA gene might actually be protective against the normal aging process. Accordingly, the lab is also comparing haplotypes in well-matched cohorts of controls and individuals who have achieved exceptional longevity.

Excellence: What makes this project exceptional?

The research team has uncovered remarkable findings about the syndrome as well as its basic biological malfunctions. In addition to discovering the gene responsible and its regulatory pathway inside the cell, the team has discovered that drugs known as farnesyltransferase inhibitors (FTIs), which are currently being tested in people with myeloid leukemia, neurofibromatosis and other conditions, might also provide a potential therapy for children suffering from Hutchinson-Gilford Progeria Syndrome.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Progeria studies are crucial to understand the normal aging process. Understanding the biology of progeria and the mutated form of the LMNA protein also helps researchers understand the normal process that happens in the rest of us.

Effectiveness: What is the impact and/or application of this research to older persons?

If the mutated progerin proteins are able to be slowed down by drugs, the research may provide potential ways to extend longevity and health in the normal population as well.

Innovativeness: Why is this research exciting or newsworthy?

Not only does this research hold promise for children and families affected by progeria by initiating the first ever clinical trial, it also sheds light on the biology of aging and common elderly conditions such as atherosclerotic disease.

NATIONAL HUMAN GENOME RESEARCH INSTITUTE: UNDERSTANDING OF THE MOLECULAR MECHANISMS OF CARDIOVASCULAR DISEASES

This innovative laboratory team seeks to identify the molecular, cellular, and genetic mechanisms that cause vascular disorders. In

particular, their research focuses on defining the pathways that regulate cell growth in the vasculature, remodel the vasculature after injury, and lead to genetic susceptibility to vascular diseases. Taken together, these studies focus on the molecular genetics of vascular diseases, with an emphasis on cell cycle regulation of proliferation, inflammation, and apoptosis.

Lead Agency: National Human Genome Research Institute (NHGRI)/National Institutes of Health

Agency Mission: The National Human Genome Research Institute (NHGRI) led the National Institutes of Health's (NIH) contribution to the International Human Genome Project, which had as its primary goal the sequencing of the human genome. This project was successfully completed in April 2003. Now, the NHGRI's mission has expanded to encompass a broad range of studies aimed at understanding the structure and function of the human genome and its role in health and disease.

To that end NHGRI supports the development of resources and technology that will accelerate genome research and its application to human health. A critical part of the NHGRI mission continues to be the study of the ethical, legal and social implications (ELSI) of genome research. NHGRI also supports the training of investigators and the dissemination of genome information to the public and to health professionals.

Principal Investigator: Elizabeth G. Nabel, M.D., Director, NHLBI, Building 50, Room 4525, 50 South Dr, MSC 8016, Bethesda, MD 20892–8016.

General Description:

UNDERSTANDING THE MOLECULAR MECHANISMS OF CARDIOVASCULAR DISEASES

Cardiovascular diseases are the leading cause of morbidity and mortality in industrialized countries. Most cardiovascular diseases result from complications of atherosclerosis, which is a chronic and progressive inflammatory condition characterized by excessive cellular proliferation of vascular smooth muscle cells, endothelial cells, and inflammatory cells that leads to occlusive vascular disease, myocardial infarction, and stroke. Recent studies have revealed the important role of cyclins, cyclin-dependent kinases (CDKs), and cyclin-dependent kinase inhibitors (CKIs) in vascular and cardiac tissue injury, inflammation, and wound repair. This research seeks to understand the circuitry of the cyclin-CDK–CKI interactions in normal physiology and disease pathology, providing a better understanding of the molecular mechanisms of cardiovascular diseases. This approach will hopefully lead to the rational design of new classes of therapeutic agents.

Given the role of cyclins in vascular health, a major focus of the study is CKIs, which are primarily involved in inhibiting the proliferation of a variety of normal cell types. Previous research identified a particular CKI, known as $p27^{Kip1}$, as a major regulator of vascular cell proliferation during arterial remodeling. In one set of studies, her group found that $p27^{Kip1}$ plays a major role in cardiovascular disease through its effects on the proliferation of bone marrow-derived immune cells that migrate into vascular lesions. To demonstrate whether $p27^{Kip1}$ regulates arterial wound repair, NHGRI Investigators recently subjected $p27^{-/-}$ (homozygous

knockout), $p27^{+/-}$ (heterozygous knockout), and $p27^{+/+}$ (wild-type) mice to a wire injury in the femoral artery and examined subsequent cell proliferation and lesion formation. Cell proliferation was significantly increased in the innermost lining of the blood vessels of $p27^{-/-}$ mouse arteries compared with $p27^{+/+}$ arteries. Arterial lesions also were markedly increased in the $p27^{-/-}$ mice compared with those of $p27^{+/+}$ mice. The heterozygous knockout mice ($p27^{-/+}$) had an intermediate phenotype. These findings suggest that vascular repair and regeneration are regulated by the proliferation of hematopoietically and nonhematopoietically derived cells through a $p27^{Kip1}$-dependent mechanism, with immune cells largely mediating these effects.

A related area of study focuses on the structural and functional analysis of a serine-threonine kinase called kinase interacting stathmin, or KIS. A nuclear protein that binds the C-terminal domain of $p27^{Kip1}$, KIS phosphorylates a serine residue at position 10 (Ser 10) in the sequence and thereby promotes its export to the cytoplasm. KIS is activated by mitogens during G0/G1, and expression of KIS overcomes growth arrest induced by $p27^{Kip1}$. Depletion of KIS with small interfering RNA (siRNA) inhibits Ser 10 phosphorylation and enhances growth arrest. In addition, treating $p27^{-/-}$ cells with KIS siRNA causes them to grow and progress to S/G2, similar to control-treated cells, implicating $p27^{Kip1}$ as the critical target for KIS. Previous research cloned and characterized the gene encoding this kinase and is studies are now examining its structure and function, including the transcriptional control of the KIS promoter, the phenotypic consequences of knockout out the KIS gene in mice, and the effect of knock-in mutations at different phosphorylation sites of p27.

NHGRI investigators are also involved in a clinical study of the genetics of restenosis, which is the recurrence of a blockage in an artery after it has been manually reopened with an artificial stent. Restenosis is a major limitation of stent therapy for coronary artery disease. In this study, the investigators are following patients who have received bare metal stents for the treatment of a blocked coronary artery and then comparing the genetic profiles of patients with restenosis with those of patients with no restenosis. The genetic analyses include gene expression profiling, serum proteomics, and genotyping using candidate gene and genome-wide scanning approaches. The goal is to identify gene, RNA, and protein profiles of patients with recurrent restenosis, so as to advance our understanding of the pathogenesis of this problem and to target potential therapies.

Excellence: What makes this project exceptional?

This project utilizes both cardiovascular and genetic medicine to create innovative therapeutic targets for conditions that affect millions worldwide.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Cardiovascular disease remains the leading cause of death and disability in the elderly population, and cardiovascular risk increases steadily with age.

Effectiveness: What is the impact and/or application of this research to older persons?

Understanding the molecular pathophysiology of vascular diseases, such as in-stent restenosis, is critical to the design and development of novel therapeutics.

Innovativeness: Why is this research exciting or newsworthy?

This research has the potential to identify key genetic variants responsible for cardiovascular inflammation, a wide-spread condition, with the aim of eventually tailoring therapies specifically for each group.

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE: ACTION TO CONTROL CARDIOVASCULAR RISK IN DIABETES (ACCORD)

ACCORD (Action to Control Cardiovascular Risk in Diabetes) is evaluating approaches to decrease the occurrence of major CVD events—heart attack, stroke or death from CVD—among high-risk patients with type 2 diabetes.

Lead Agency: National Heart, Lung, and Blood Institute (NHLBI)/National Institutes of Health (NIH).

Agency Mission:

- Provide leadership for a national program in diseases of the heart, blood vessels, lung, and blood; blood resources; and sleep disorders.
- Plan, conduct, foster, and support an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases; and sleep disorders.
- Conduct educational activities for health professionals and the public with an emphasis on prevention.
- Support research training and career development of new and established researchers in fundamental sciences and clinical disciplines.

Principal Investigator(s):

Coordinating Center PI: Robert Byington, Ph.D, Email: *bbyingto@wfubmc.edu*, Phone: 336–716–2885.

Steering Committee Chairman: William Friedewald, M.D., Email: *william.cushman@med.va.gov*, Phone: 212–305–3017.

NHLBI Project Officer: Denise Simons-Morton, M.D., Ph.D, Email: *simonsd@nhlbi.nih.gov*, Phone: 301–435–0384.

Partner Agencies: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Center on Minority Health and Health Disparities (NCMHD), National Institute on Aging (NIA), National Eye Institute (NEI), Centers for Disease Control and Prevention (CDC), and Sanofi Aventis (Conditional gift fund).

General Description:

ACTION TO CONTROL CARDIOVASCULAR RISK IN DIABETES (ACCORD)

ACCORD (*www.accordtrial.org*) is a large clinical trial of adults with established type 2 diabetes who are at especially high risk of cardiovascular disease (CVD). Type 2 diabetes is a complex metabolic disease characterized by high blood glucose (sugar) levels. People with this form of diabetes have insulin resistance and a progressive loss of the ability to produce insulin.

Type 2 diabetes increases the risk of a number of complications, especially CVD. Adults with type 2 diabetes are two to four times more likely to die of heart disease and stroke than adults without diabetes; about 65 percent of people with diabetes succumb to these diseases. Many people with type 2 diabetes are overweight and have high blood pressure and undesirable cholesterol levels—conditions that further add to CVD risk.

ACCORD is testing approaches to decrease the high rate of major CVD events—heart attack, stroke, or death from CVD—among high-risk patients with type 2 diabetes. Three treatment approaches are being evaluated: intensive lowering of blood sugar levels compared with lowering to the conventional target level, intensive lowering of blood pressure compared with lowering to the conventional target level, and modification of blood cholesterol levels using a fibrate plus a statin compared with a statin alone.

The study began enrolling participants in 2001 at 77 clinical sites across the United States and Canada. A total of 10,251 adults with established type 2 diabetes are participating. At enrollment, they were 40–79 years of age (average age, 62), had diabetes for an average of 10 years, and either had diagnosed CVD or had at least two CVD risk factors (high LDL cholesterol, high blood pressure, smoking, obesity) in addition to type 2 diabetes.

In addition to CVD, outcomes of interest include microvascular diseases, cognition, and quality of life.

Treatment is scheduled to end in 2009, with final results reported in 2010.

Excellence: What makes this project exceptional?

ACCORD is testing aggressive strategies to reduce the burden of CVD among highly vulnerable patients with type 2 diabetes.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Type 2 diabetes primarily affects older persons, and its prevalence is growing as the population ages and risk factors such as obesity affect increasing numbers of people.

Effectiveness: What is the impact and/or application of this research to older persons?

Recently, ACCORD found that intensively lowering blood sugar to near-normal levels did not significantly reduce the risk of major CVD events, such as fatal or non-fatal heart attacks or strokes. In fact, when compared with standard treatment this approach appeared to increase the risk of death. This is important evidence to help guide treatment of adults with type 2 diabetes who already have CVD or are at high risk of developing it. For such individuals, intensively lowering blood sugar may be too risky.

Innovativeness: Why is this research exciting or newsworthy?

The research addresses an important clinical problem for which no effective preventive strategies have heretofore been identified.

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE: HOME OXYGEN THERAPY TRIAL FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE?

The LOTT will determine the effectiveness and safety of long-term, home-administered oxygen therapy in patients with moderate COPD. Findings will inform decision-making about extending coverage for home oxygen treatment to such patients.

Lead Agency: National Heart, Lung, and Blood Institute (NHLBI)/National Institutes of Health (NIH).

Agency Mission:

• Provide leadership for a national program in diseases of the heart, blood vessels, lung, and blood; blood resources; and sleep disorders.

• Plan, conduct, foster, and support an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases; and sleep disorders.

• Conduct educational activities for health professionals and the public with an emphasis on prevention.

• Support research training and career development of new and established researchers in fundamental sciences and clinical disciplines.

Principal Investigator:

Steering Committee Chairman: William Bailey, M.D., UAB Hospital 1802 6th Avenue South, Birmingham, AL 35249.

NHLBI Project Officer: Thomas Croxton, M.D., Ph.D.

Partner Agencies: The Centers for Medicare and Medicaid Services (CMS).

General Description:

HOME OXYGEN THERAPY TRIAL FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE

The NHLBI, in collaboration with the Center for Medicare and Medicaid Services (CMS), has launched a large randomized clinical trial of the effectiveness and safety of long-term, home oxygen therapy for COPD (chronic obstructive pulmonary disease). The six-year, $28 million project will study patients with moderate disease.

COPD, a lung disease that severely impairs the ability to breathe, is the fourth most common cause of death in the United States. In the Long-Term Oxygen Treatment Trial (LOTT), researchers at 14 clinical centers across the United States will study approximately 3,500 COPD patients to determine whether supplemental oxygen will improve longevity, exercise capacity, and quality of life.

The results will provide a scientific basis for decisions about whether to extend Medicare coverage for home oxygen treatment to patients with moderate disease. Currently, coverage of home oxygen therapy is limited to beneficiaries with severe COPD (very low blood oxygen levels while resting).

Excellence: What makes this project exceptional?

LOTT is the largest randomized clinical trial of the effectiveness and safety of long-term, home oxygen therapy for COPD.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Approximately 12 million adults in the United States have been diagnosed with COPD, and it is believed that another 12 million have the disease but are unaware of it. COPD typically develops in older persons after years of cigarette smoking. It is a major cause of disability and death.

Effectiveness: What is the impact and/or application of this research to older persons?

If the LOTT determines that home oxygen treatment is beneficial for patients with moderate COPD, it is likely that Medicare coverage for this therapy will follow.

Innovativeness: Why is this research exciting or newsworthy?

Many individuals with COPD are desperate for approaches to alleviate symptoms and improve function, and they are largely dependent on Medicare coverage to pay for treatment.

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE (NHLBI)/NATIONAL INSTITUTES OF HEALTH (NIH): WOMEN'S HEALTH INITIATIVE (WHI): HORMONE REPLACEMENT THERAPY

The WHI is a 15-year study of strategies for preventing heart disease, breast and colorectal cancers, and osteoporosis in postmenopausal women.

Lead Agency: National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health (NIH).

Agency Mission:

• Provide leadership for a national program in diseases of the heart, blood vessels, lung, and blood; blood resources; and sleep disorders.

• Plan, conduct, foster, and support an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases; and sleep disorders.

• Conduct educational activities for health professionals and the public with an emphasis on prevention.

• Support research training and career development of new and established researchers in fundamental sciences and clinical disciplines.

Principal Investigators: Dr. Marcia Stefanick, Steering Committee Chair, National Heart, Lung, and Blood Institute, NIH, Bethesda, MD 20892–2482.

Partner Agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), Office of Research on Women's Health (ORWH), Health Resources and Services Administration (HRSA), and National Cancer Institute (NCI).

General Description: The WHI is a 15-year study of strategies for preventing heart disease, breast and colorectal cancers, and osteoporosis in postmenopausal women. Launched by the NIH in 1991, it has been administered by the NHLBI since fiscal year 1998. More than 160,000 women from across the United States, who were between 50 and 79 years of age at the time of their recruitment, enrolled in the WHI clinical trials and observational study; almost 30,000 of them are minorities. The clinical trial component, now completed, consists of three prevention studies examining the effects of postmenopausal hormone therapy on risk of coronary heart disease (CHD), osteoporosis, and breast cancer; the effects of a low-fat diet on risk of breast and colorectal cancers and CHD; and the role of calcium and vitamin D supplementation in preventing fractures and colorectal cancer. The Observational Study component has focused on identifying predictors of disease. In addition, a Community Prevention Study was conducted in collaboration with the Centers for Disease Control and Prevention to

examine strategies for enhancing adoption of healthful behaviors, particularly among minority and under-served women.

Excellence: What makes this project exceptional?

The WHI is the largest disease prevention study ever undertaken in postmenopausal women.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Given the remarkable increases in life expectancy that have occurred in recent years, the average American woman can expect to live more than a third of her life after menopause and, thus, experience a high risk of developing CHD, breast and colorectal cancer, and osteoporosis. Effective strategies are needed to prevent these chronic diseases and thereby enhance longevity and quality of life.

Effectiveness: What is the impact and/or application of this research to older persons?

The WHI postmenopausal hormone trials produced startling results that had an immediate effect on prescribing practices. They included two placebo-controlled components—a study of estrogen plus progestin in women who had an intact uterus and a study of estrogen alone in women who had undergone a hysterectomy. Both studies were designed to test the hypothesis that long-term use of hormone therapy could reduce risk of CHD.

The estrogen-plus-progestin trial was halted ahead of schedule in July 2002. Compared with women taking a placebo, study participants taking hormones experienced higher rates of heart attack, stroke, blood clots, and invasive breast cancer. Although the women taking hormones also had a lower incidence of colon cancer and fewer hip fractures, the overall balance of risks and benefits was unfavorable.

In March 2004, the second hormone trial component also was halted ahead of schedule. With an average of nearly 7 years of follow-up completed, the trial revealed that estrogen-alone therapy had no effect on CHD risk, but it increased risk of stroke and of blood clots in the legs. No evidence of elevated breast cancer risk was found, and a favorable effect on bone health emerged. On balance, however, the trial indicated that postmenopausal hormone therapy should not be prescribed for chronic disease prevention, but only for short-term relief of menopausal symptoms.

The WHI hormone trials also failed to find evidence of other putative benefits of hormone therapy—on cognitive function, urinary incontinence, or quality of life, for example.

A follow-up study published in 2008 found that the unfavorable balance of risk versus benefit associated with long-term use of estrogen-plus-progestin therapy persisted even after the drugs were stopped. Although the increased risk of CHD diminished three years after halting treatment, overall risks including stroke, blood clots, and cancer, remained elevated.

Innovativeness: Why is this exciting or newsworthy?

For many years postmenopausal hormones were prescribed to women not only because they alleviate symptoms (e.g., hot flashes) but also because they were believed to be helpful in preventing CHD and other chronic conditions. The surprising findings of the WHI trials fundamentally changed perceptions of the role of hormone therapy in health promotion among postmenopausal women.

NATIONAL INSTITUTE ON AGING: ALZHEIMER'S DISEASE RESEARCH CENTERS

Much of the progress in Alzheimer's disease research in the United States over the past 20 years has been made through the NIH-supported Alzheimer's Disease Centers, where ADC scientists have conducted exemplary research and provided rich resources to investigators across the community of Alzheimer's disease researchers.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission: Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

Foster the development of research and clinician scientists in aging.

Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Creighton Phelps, Ph.D., National Institute on Aging, Division of Neuroscience, 7201 Wisconsin Avenue, Bethesda, MD 20892.

General Description:

ALZHEIMER'S DISEASE RESEARCH CENTERS

Much of the important progress made in Alzheimer's disease (AD) research in the United States over the past 20 years has come through studies conducted by the NIH-supported Alzheimer's Disease Centers (ADCs). For example, ADC scientists have conducted much of the research on protein processing related to plaque and tangle formation—the hallmark of AD. Other studies are examining changes in brain structure at different clinical stages of AD, developing brain imaging technologies, and conducting neuropathology autopsy evaluations. ADC researchers have also focused on evaluating cognitive changes associated with normal aging, the transitions to mild cognitive impairment and early dementia, and factors that contribute to changes in cognitive abilities. Relationships and commonalities between Alzheimer's and other neurodegenerative diseases are also emphasized as well as the contributions of non-neurological co-morbid conditions such as cardiovascular disease, diabetes, and inflammation.

By pooling resources and working cooperatively, the ADCs have produced research findings and developed resources resulting in accomplishments that could not have been achieved by individual investigators. In addition, the ADCs have provided resources for hundreds of research projects conducted outside of the ADC network. Shared resources include biological samples and data from longitudinal studies on the development of dementia in particular populations, brain and specimen banks comprised of well-characterized specimens collected under standardized protocols, and a National Cell Repository for Alzheimer's Disease which collects and stores blood, well-documented phenotypic data, DNA, and cell lines from families that have multiple affected members. The repository is part of the NIA *AD Genetics Initiative* to identify genetic risk fac-

tors for late onset AD. Other ADC collaborative efforts that have led to the establishment of other research resources such as the *Consortium to Establish a Registry for Alzheimer's Disease*, the *National Alzheimer's Coordinating Center*, the *Alzheimer's Disease Cooperative Study*, and the *Alzheimer's Disease Neuroimaging Initiative.*

Excellence: What makes this project exceptional?

The ADC program has brought together the top experts in the country to accelerate progress in developing a more comprehensive understanding of the mechanisms that underlie the development of AD. The program has also greatly enhanced the work of many more researchers by providing much needed resources to the larger community of AD researchers as they search for better strategies to prevent and treat the disease.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Alzheimer's disease (AD) is the most common form of dementia among older people. It is a neurodegenerative disease that damages the parts of the brain controlling thought, memory, and language. AD is estimated to affect approximately 4.5 million older people in the United States. Although occasionally it is diagnosed in patients in their forties and fifties, AD most frequently is associated with advancing age. The disease doubles in prevalence with every 5 years past the age of 65; thus, extending life by 10 years quadruples the probability of the disease occurring. AD is the most frequent cause of institutionalization for long-term care. It destroys the active productive lives of its victims and devastates their families financially and emotionally.

Effectiveness: What is the impact and/or application of this research to older persons?

The ADCs have produced research findings and developed resources that could not have been achieved by individual investigators working alone. Biological samples from Alzheimer's patients have provided the materials for hundreds of non-ADC funded projects including genetic projects currently underway. Several major longitudinal studies on the development of dementia in particular populations rely on ADC core facilities, and integrate their findings with those of the centers.

Innovativeness: Why is this research exciting or newsworthy?

It has been estimated that the United States spends as much as $148 billion per year for the direct and indirect costs of care for patients with AD. With the rapidly increasing percentage of the population over the age of 65, the number of people with AD will increase proportionately, as will the toll it takes. If interventions cannot be found, the large number of people who will develop AD will overwhelm the health care system. As we learn about the causes of AD, we are better positioned to finding new interventions and, ultimately, a cure for this devastating disease.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): THE DYNAMICS OF HEALTH, AGING, AND BODY COMPOSITION

The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. 3,075 men

and women between the ages of 70–79 who are free of disability were selected for this study. Body weight, lean body mass, and body fat are quantified from computed tomography images using software developed by CIT's Biomedical Imaging Research Services Section (BIRSS), Division of Computational Bioscience (DCB).

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

• Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

• Foster the development of research and clinician scientists in aging.

• Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Tamara B. Harris, M.D., M.S., Senior Investigator, Intramural Research Program, National Institute on Aging, Laboratory of Epidemiology, Demography, and Biometry, Gateway Building, 3C309, 7201 Wisconsin Avenue, Bethesda, MD 20892.

Partner Agency: NIH Center for Information Technology (CIT), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), National Research Council of Italy, American Heart Association, American Diabetes Association, and Hologic Inc.

General Description: The Center for Information Technology is collaborating with the National Institute of Aging to assist in image segmentation and quantification in a clinical research study, the Dynamics of Health, Aging and Body Composition (Health ABC). The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. 3,075 men and women between the ages of 70—79 who are free of disability were selected for this study. CIT is augmenting the analysis from computerized tomography scans. Lean body mass, and body fat are quantified from computed tomography images using software developed by CIT's Biomedical Imaging Research Services Section (BIRSS), Division of Computational Bioscience (DCB). Manual image segmentation is laborious and subject to inter and intra-observer variability when performing volumetric analysis. An extension of BIRSS' MIPAV software provides researchers with a multistage semi-automatic process for image segmentation, quantification, and visualization.

Excellence: What makes this project exceptional?

The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. This should help to address questions of morbidity related to body weight and weight related health conditions in old age.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Older people incur multiple health conditions as they age that affect multiple organ systems. Most studies of aging that had been performed prior to 1998 tended to emphasize the function of one organ system: heart, brain, bone rather than a comprehensive assessment. Health ABC used the principle of weight-related health conditions to organize a multi-dimensional study.

Effectiveness: What is the impact and/or application of this research to older persons?

This research has shown that the same risk factors that cause early declines in function contribute to later, major losses in function and the onset of frailty. This is a powerful prevention message for aging.

Innovativeness: Why is this exciting or newsworthy?

Early interventions on weight, heart disease, diabetes, inflammation, and depression may prevent later declines to frailty in old age.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): EXEMPLARY RESEARCH CONDUCTED THROUGH THE EDWARD R. ROYBAL CENTERS

Investigators at the Edward R. Roybal Centers for Translational Research in the Social and Behavioral Sciences are working to improve the health, quality of life, and productivity of middle-aged and older people by translating findings from the social and behavioral sciences into practical outcomes.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Tamara Jones, Ph.D., National Institute on Aging, 7201 Wisconsin Avenue, Bethesda, MD 20892, NIA Legislative Officer.

General Description: The Edward R. Roybal Centers for Translational Research in the Social and Behavioral Sciences, first authorized by Congress in 1993, are designed to improve the health, quality of life, and productivity of middle-aged and older people by facilitating the translation of knowledge learned in the social and behavioral sciences into practical outcomes. Investigators at the Roybal Centers have made a number of key discoveries in the emerging field of translational behavioral and social research. For example:

- The Roybal Center at the University of Alabama at Birmingham has developed tools and technologies for identifying older adults at risk for automobile crash involvement, and is working with industry partners to develop and disseminate products based on these tools.

- The Roybal Center at the University of Illinois at Chicago (UIC) has developed two evidence-based interventions from its in-depth work on physical activity for older adults. One program, Fit and Strong!, is targeted to older adults with lower extremity osteoarthritis, and one is targeted to older adults with developmental/intellectual disabilities (primarily Down syndrome). Both programs are currently being used in several states; in addition, the Center has partnered with the National Arthritis Foundation (NAF) to replicate Fit and Strong! through NAF chapters nationwide.
- Another investigator at the UIC Roybal Center has developed instruments for self-efficacy appropriate for use with older adults with developmental/intellectual disabilities, and these have been adopted internationally.
- The Oregon Center for Aging and Technology (ORCATECH), a Roybal Center, has developed a "living laboratory" model methodology for in-home assessment of activity to facilitate early detection of changes in health or memory. This new technology provides a continuous data stream, which provides a more complete view of real-world function and an improved understanding of the variability of in-home activity. Other companies have used the ORCATECH model to develop related products, and the model has spurred several new grant-funded research projects, including the development of a new medication tracker for older adults.

Excellence: What makes this project exceptional?

As recent years have seen an explosion of fundamental insights in the basic social and behavioral sciences, translating this knowledge into practical advances to benefit the health and well being of older Americans has increasingly become a priority for the NIH. Since 1993, the Roybal Centers have been at the forefront of the NIH's efforts in translational behavioral and social science aimed at older Americans.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The development and testing of interventions that will benefit the health and well being of older Americans, and the effective translation of these interventions into routine practice, is becoming increasingly important: Between now and 2030, the number of individuals age 65 and older will likely double, reaching 71.5 million and comprising a larger proportion of the entire population, up from 13 percent today to 20 percent in 2030.

Effectiveness: What is the impact and/or application of this research to older persons?

Because the mission of the Roybal Centers is the translation of scientific and technological findings into practical applications for older adults, their findings may be expected to have a widespread impact. For example, the tools for identifying at-risk older drivers (referenced above) are currently being translated into practice in several states, and the Roybal-developed instruments for self-efficacy among intellectually disabled older adults (also referenced above) are being used internationally.

Innovativeness: Why is this exciting or newsworthy?

By identifying ways to move interventions from the clinic to the mainstream, the Roybal Centers are poised to make a real-world difference in the lives of everyday Americans.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): USEFUL FIELD OF VIEW TEST FOR OLDER DRIVERS

A new test of visual function may ultimately help older adults, their families, and physicians decide when it's okay for an older person to continue driving or when it may be time to hang up the car keys. Using a novel "useful field of view" measure to assess how drivers process visual information, researchers at the University of Alabama at Birmingham found that poor performance on the test was linked to an increased risk of car crashes. Drivers who showed a 40 percent or greater impairment in their useful field of view were more than twice as likely to be involved in a crash within 3 years of testing.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Karlene Ball, Ph.D., University of Alabama at Birmingham, Campbell Hall/Suite 415, 1300 University Blvd., Birmingham, AL 32594–1170.

General Description: A new test of visual function may ultimately help the elderly, their families, and physicians decide when it's okay for an older person to continue driving or when it may be time to hang up the car keys. Using a novel "useful field of view" (UFOV) measure to assess how older adults process visual information, researchers at the University of Alabama at Birmingham (UAB) found that poor performance on the test was linked to an increased risk of car crashes. Drivers who showed a 40 percent or greater impairment in their useful field of view were more than twice as likely to be involved in a crash within 3 years of testing.

The study marks the first time that scientists have attempted to find out whether or not a visual processing test can predict the likelihood of future crashes for individual older adults. The test differs substantially from standard eye exams, which measure acuity or visual function or the ability to see an object at a given distance. To assess their visual processing abilities, participants in this study looked at a computer screen with figures of cars, trucks, and other objects. The drivers were asked to identify a particular object amid different kinds of visual distractions on the screen. The useful field of view was defined as the area in which rapidly presented visual information can be used. People who had measured difficulty with the task were considered to have an impaired useful field of view.

Some 294 drivers ranging in age from 55 to 87 participated in the study. In addition to being tested for visual function, information was collected on the participants' general health, mental status, and how often they drove so that the researchers could determine the factors involved in crashes over the three-year follow-up period from 1990 to 1993. Crash reports involving the participants were collected from a state agency, and researchers compared the useful field of view scores and results from the other types of vision tests with the crash information.

Performance on the useful field of view test was found to be directly related to involvement in a crash. People with a 40 percent or greater impairment in their useful field of view were more than twice as likely to be involved in a crash. For every 10 points of reduction in a driver's useful field of view measure, his or her crash risk rose by 16 percent, regardless of age. Other vision tests did not predict the risk of future crashes.

Excellence: What makes this project exceptional?

The test used in this study differs substantially from standard eye exams, which measure acuity or visual function or the ability to see an object at a given distance. To assess their visual processing abilities, participants were asked to identify a particular object amid different kinds of visual distractions on a computer screen with figures of cars, trucks, and other objects. The useful field of view was defined as the area in which rapidly presented visual information can be used. People who had measured difficulty with the task were considered to have an impaired useful field of view.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Older drivers are over-represented in fatal crashes per mile driven, and those in oldest age groups are the fastest-growing group in the United States. However, age alone is not a very good predictor of driving ability. There are large differences in the skills and abilities of older drivers, and denying an older adult a driver's license can have significant implications for their mobility and quality of life.

Effectiveness: What is the impact and/or application of this research to older persons?

This evidence-based UFOV test is being effectively translated into practice in the motor vehicle departments in three states to date: California, Maryland, and Florida. State Farm Auto Insurance Company is also using the test and offering insurance discounts for people who take the UFOV test and "qualify" for a discount.

Innovativeness: Why is this exciting or newsworthy?

The useful field of view test is a demonstrated method of screening high-risk older drivers and may be a more appropriate way to address individual differences than using age-based restrictions on driving.

NATIONAL INSTITUTE ON AGING: RESTRICTING CALORIC INTAKE MAY IMPROVE THE BODY'S METABOLIC EFFICIENCY

NIH-supported investigators demonstrated that restricting caloric intake may improve the body's metabolic efficiency, an effect that

could contribute to slowing of adverse changes that often accompany aging.

Lead Agency: National Institute on Aging, National Institutes of Health (NIH).

Agency Mission: Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

Foster the development of research and clinician scientists in aging.

Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Eric Rauvussin, Louisiana State University, Pennington Biomed Research, 6400 Perkins Rd., Baton Rouge, LA 70808.

General Description:

RESTRICTING CALORIC INTAKE MAY IMPROVE THE BODY'S METABOLIC EFFICIENCY

Calorie restriction (CR) is the most robust, nongenetic intervention that increases lifespan and reduces the rate of aging in a variety of species. Mechanisms responsible for the antiaging effects of CR remain uncertain but effects on efficiency of energy metabolism and mitochondria (subunits within cells that are the primary source of cellular energy) remains a major focus of research. To understand CR's effects in energy metabolism and mitochondrial function in humans, NIH-supported researchers studied its effects over six months in overweight people. They found that CR lowered body temperature and lowered metabolic rate by more than would be expected based on weight loss alone. They also found evidence of new mitochondria. Combined, these results suggest that CR may cause the body to shift to more "efficient" mitochondrial function, resulting in less energy expenditure and cooler body temperature. The latter is of particular interest because in one study, cooler body temperature was associated with longer human lifespan.

Excellence: What makes this project exceptional?

Numerous studies in laboratory animals have shown that chronic caloric restriction extends lifespan by as much as 40 percent and delays age-related pathologies correspondingly. However, little has been known about the effects of CR in humans. This study is a first step in understanding whether CR's effects in people resemble those found in laboratory animals.

Significance: How is this research relevant to older persons, populations and/or an aging society?

By understanding the effects of caloric restriction in people, we may gain insights into interventions to slow the development of age-related diseases.

Effectiveness: What is the impact and/or application of this research to older persons?

There are no immediate clinical or public health applications. We need to learn more about the effects of caloric restriction in humans before evaluating its potential for improving health, aging, or lifespan.

Innovativeness: Why is this research exciting or newsworthy?

Caloric intake is a topic of broad interest as concerns increase regarding obesity and weight gain. This study sheds new light on the effects of decreased caloric intake on metabolic processes.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): CLINICAL PRACTICE GUIDELINES FOR COMORBIDITIES

Clinical practice guidelines (CPGs) are based on clinical evidence and consensus of experts to guide physicians and standard care. Most CPGs focus on a single disease, and don't always address the needs of the approximately half of persons 65 years and older who have three or more concurrent medical conditions. An NIH-supported study demonstrated that for older patients with co-occurring medical problems, adherence to CPGs for individual diseases may be counterproductive and sometimes harmful.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Linda P. Fried, M.D., Johns Hopkins University, Department of Medicine/Suite 2–700, 2024 E. Monument Street, Baltimore, MD 21205.

General Description: In recent years, Clinical Practice Guidelines (CPGs), which are based on clinical evidence and the consensus of experts, have been developed to guide physicians regarding the management of common medical problems, thus to standardize care and improve its quality for many chronic conditions. However, most CPGs focus on a single disease, and approximately half of persons 65 years or older have three or more concurrent medical conditions. To explore the applicability of current CPGs to the care of older individuals with several co-occurring diseases, NIH-supported researchers identified the most common chronic medical problems among older adults and assessed whether the corresponding CPGs addressed issues relevant to older patients with combinations of co-occurring diseases. Issues included goals of treatment, burden to patients and caregivers, patient preferences, and quality of life. Researchers discovered that most CPGs did not modify or discuss the application of their recommendations for older patients with comorbidities, did not comment on short- or long-term goals of treatment or the burden of care associated with treatment, did not give guidance about incorporating patient preferences into the treatment plan, and in general did not "fit together" well for patients with multiple medical problems. Overall, this study demonstrated that, for older patients with co-occurring medical problems, adherence to CPGs for individual diseases may be counterproductive and even sometimes harmful.

Excellence: What makes this project exceptional?

This research provides crucial information to better understand the special clinical care needs of older patients and improve their quality of care.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This research is specific to the clinical care of patients 65 years or older and addresses a crucial issue for the treatment of older patients with comorbidities for whom appropriate practice guidelines could lead to improved health.

Effectiveness: What is the impact and/or application of this research to older persons?

Addressing the clinical management problems identified by this research could greatly improve the clinical care of older patients.

Innovativeness: Why is this exciting or newsworthy?

This research provides a dramatic illustration of the need to expand guidance for the management of health care specific to the needs of older patients.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): TRANSLATING RESOURCES FOR ENHANCING ALZHEIMER'S CAREGIVER HEALTH TO COMMUNITY SETTINGS

REACH was a multi-site randomized clinical trial for family caregivers of patients with Alzheimer's disease or related disorders. The intervention is now being translated into various community settings and could provide a valuable and potentially cost-saving resource for caregivers and their care recipients.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Richard Schultz, Ph.D., University of Pittsburgh, University Center for Social and Urban Research, 121 University Place, Room 607, Pittsburgh, PA 15213.

Partner Agency: National Institute of Nursing Research (NINR), Department of Veterans' Affairs, Administration on Aging.

General Description: Resources for Enhancing Alzheimer's Caregiver Health to Community Settings (REACH) was a multi-site randomized clinical trial for family caregivers of patients with Alzheimer's disease or related disorders funded by NIA and the National Institute of Nursing Research. The intervention is designed to provide education, support, and skill building to help caregivers manage patient behaviors and their own stress. It includes 12 individual sessions in the home and by telephone and five telephone support groups over a six-month period.

The Department of Veterans Affairs (VA) will provide nearly $4.7 million for eight "caregiver assistance pilot programs" across the country to expand and improve health care education and provide

needed training and resources for caregivers who assist disabled and aging veterans in their homes. One of these programs will be a translation of the REACH intervention. The VA Medical Center (VAMC) at Memphis/University of Tennessee, one of the participating sites for REACH, will serve as the Coordinating Center for this program, providing evaluation and training to the clinical sites, with the assistance of the REACH investigators. Across the country, 17 Home Based Primary Care (HBPC) programs for treating frail dementia patients and their caregivers in the home are providing the intervention to 200 caregivers. The VA Palo Alto Health Care System, which was also one of the REACH sites, will also participate, providing services to 150 caregivers.

Specific objectives for the REACH VA translation are to:

- Assess the feasibility of translating a multi-component, community-based intervention for family caregivers of patients with dementia in VA settings.
- For patients with dementia, evaluate the intervention's efficacy in decreasing health care utilization, including unanticipated admissions, unscheduled outpatient visits, ER visits, and placement.
- For family caregivers of patients with dementia, evaluate the intervention's efficacy in improving clinical outcomes relating to quality of life as measured by (1) emotional well-being and depression, burden, health, social support, and management of patient dementia-related behaviors and (2) time spent "on duty" and time providing actual care.
- Assess caregiver satisfaction with the services provided.
- Determine the cost of the intervention for VHA clinical staff.

Materials and protocols from REACH have also been adapted for wide-spread community use by the Administration on Aging for use in their Area Agencies on Aging and the Alzheimer's Association through their ongoing contact with caregivers. Implementation at the community level can enhance the lives of caregivers, potentially delay institutionalization of care recipients, and decrease the need for professional intervention for both caregiver and care recipient. Cost analysis of the outcomes is ongoing and may provide additional evidence of the cost savings. By making such an intervention available, REACH implementation in community settings, with physician referral, can provide a valuable resource for caregivers and their care recipients.

Excellence: What makes this project exceptional?

The project involves a thoroughly tested and proven intervention that is being implemented through collaborative efforts across public and private organizations.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Family members and friends provide most of the care for millions of people with dementia who live at home, often facing challenges that can seriously compromise their own quality of life. REACH tells us that a well-designed, tailored intervention can make a positive, meaningful difference in caregivers' lives.

Effectiveness: What is the impact and/or application of this research to older persons?

The intervention is being translated into practice.

Innovativeness: Why is this exciting or newsworthy?

This novel research demonstrates that an intervention can readily address a significant need and benefit the diverse communities of people who provide care to individuals with Alzheimer's disease.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): HOSPITAL QUALITY AND RACIAL DIFFERENCES IN HEART ATTACK TREATMENT AND OUTCOMES

Differences between black and white heart attack patients in quality of care received are due in part to the quality of the hospital in which they are treated. These results suggest that hospital-level interventions to improve quality of care may be needed.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Jonathan Skinner, Ph.D., Center for Evaluative Clinical Sciences, Dartmouth Medical School, HB 7251, Hanover, NH 03755; Amber E. Barnato, MD, MPH, MS, Center for Research on Health Care, University of Pittsburgh, 230 McKee Place, Suite 600, Pittsburgh, PA 15213.

Partner Agency: The Robert Wood Johnson Foundation.

General Description: Black patients who have suffered a heart attack or are at risk are less likely than white patients to receive invasive procedures such as percutaneous coronary interventions (PCI) and coronary artery bypass grafts (CABG), and much evidence suggests that they are also less likely than whites on average to receive effective low-intensity treatments such as aspirin and beta blocker prescriptions. A key unresolved question is the extent to which these racial disparities result from physicians and hospitals providing poorer quality care for their black patients than for whites, or from black patients more often than whites being treated in facilities providing lower quality care for all their patients. In a recent study, NIH-supported researchers analyzed the records of more than one million adults who were treated for acute myocardial infarction (AMI) at over 4,000 non-federal hospitals from 1997 to 2001. They found that patients of all races were at higher risk of mortality in hospitals with a disproportionate share of African-American heart attack patients. Patients treated at largely minority-serving hospitals were not sicker and did not have more severe heart attacks than patients at other hospitals. The differences in outcomes also were not explained by patients' income, the hospitals' AMI patient volume, region of the country, or urban status.

In related work, NIH-supported investigators reviewed data on Medicare patients treated for AMI in 1994 and 1995 to assess the extent to which differences in the actual hospitals where blacks and whites were treated explain the differences observed in the fre-

quency of specific treatments and in subsequent mortality. They used statistical techniques that allowed them to study whether black and white patients treated at the same hospital received different care and had different outcomes, rather than—as in previous studies—whether patients treated at hospitals with similar measurable characteristics had similar outcomes. They found that the overall black-white gap in lower-intensity medical procedures such as prescription of beta-blockers and ACE inhibitors was entirely explained by differences in hospitals. However, blacks were given fewer surgical treatments requiring complex referrals and follow-up, such as catheterization, PCI, and CABG than whites attending the same hospitals. Both of these studies suggest that black-white differentials in medical procedures known to be effective would be greatly reduced by hospital-level interventions to improve quality of care.

Excellence: What makes this project exceptional?

Previous studies have documented racial disparities in heart attack treatment among Medicare beneficiaries. However, it has not been clear whether these differences are due primarily to differential treatment of black and white patients within the same institutions or to differences in the quality of care across hospitals. These studies suggest that quality differences between hospitals (as opposed to differential treatment of races within the hospitals) accounts for the larger share of these disparities.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Age is a risk factor for heart disease, and over a million Americans have heart attacks each year and approximately half of these individuals die from the attacks. Heart attack is most common among African-American men and is more common among African-American women than white women.

Effectiveness: What is the impact and/or application of this research to older persons?

Understanding the origins of health disparities is the crucial first step toward eliminating them. The development of effective hospital-level interventions to eliminate disparities in heart attack treatment may lead to improved outcomes for vulnerable groups.

Innovativeness: Why is this exciting or newsworthy?

This research helps explain treatment differences between black and white heart attack patients observed at the aggregate level and offers insight into avenues—i.e., hospital-level interventions—to ameliorate these differences.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES ON HEALTH (NIH): IMPROVING THE QUALITY OF HEALTH CARE FOR OLDER ADULTS: DOCTORS MAY NOT DIAGNOSE AND MANAGE CORONARY HEART DISEASE AS ACTIVELY FOR WOMEN AS FOR MEN

Researchers used video vignettes to assess how primary care doctors' diagnostic questions differed significantly by patient gender. Results suggest that doctors' actions may contribute to gender disparities in health and health care. Investigators observed no influence of social class or race.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

• Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

• Foster the development of research and clinician scientists in aging.

• Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Dr. Sara Arber, Department of Sociology, Centre for Research on Ageing and Gender, University of Surrey, Guildford, Surrey GU2 7XH, UK.

General Description: Previous studies have established that women are less likely than men to receive thorough diagnostic investigations and surgical treatments for coronary heart disease (CHD). Few studies have focused on the exact points in the process at which disparities arise (initial access, interactions with physicians, hospitalizations) and few have examined the possibility of age-by-gender interactions in the process. The authors examined the influence of gender, age, race and social class, singly and in combination, on diagnostic and management decisions for patients presenting with symptoms of CHD. They trained professional actors to portray patients on videos in realistic first consultations with a doctor, presenting with symptoms either of CHD or of depression. Participating primary care physicians (256, selected randomly in Massachusetts and two regions in England) watched the 7–8-minute tapes and answered questions about how they would diagnose and manage the patient. In the two countries combined, physicians reported fewer follow-up questions for women (mean 5.7) than for men (7.0); proposed fewer examinations for women (4.3 compared with 5.1); proposed fewer diagnostic tests for the CHD diagnosis (80 percent for women; 90 percent for men), and were less likely to prescribe medications appropriate for treating heart disease for women than for men (52% of women; 64% for men). In both countries, the female patient reported to be age 55 was less likely to have a medication prescribed, and doctors were less sure of the CHD diagnosis, than for men the same age. But even with lower certainty, in England (though not in the US) doctors reported that they would ask fewer questions of the woman aged 55 than of a man, and fewer than for a woman aged 75. The black patients and those portraying working-class men and women were not treated differently than white and middle-class patients in these simulations.

This analysis was based on "video vignettes," and the correspondence of self-reports to actual behavior is unknown. The clinical significance of differences in diagnosis and management after a first consultation is also not clear. But the finding of significant differences between the diagnostic and management activities that physicians think appropriate for women and for men warrants further research.

Excellence: What makes this project exceptional?

Previous studies have established that women are less likely than men to receive thorough diagnostic investigations and surgical treatments for coronary heart disease. This research represents an

important step in clarifying the nature of these disparities, as well as the circumstances under which the disparities arise.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Coronary heart disease is the leading cause of death among both women and men in the United States and is particularly common in individuals over age 65. One in four American women die of heart disease.

Effectiveness: What is the impact and/or application of this research to older persons?

This research was based on "video vignettes," and the extent to which physicians' reactions to the vignettes correlate with their actual behavior in the clinic remains unknown. However, this finding does underscore the need for women and their physicians to become aware of the risk factors and symptoms of heart disease and for physicians to ensure thorough diagnostic and treatment efforts for both men and women.

Innovativeness: Why is this exciting or newsworthy?

Few studies have focused on the exact points in the diagnostic process for CHD where disparities arise (initial access, interactions with physicians, hospitalizations) and few have examined the possibility of age-by-gender interactions in the process.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): INTEGRATING EFFECTIVE STRATEGIES TO PREVENT FALLS INTO COMMUNITY SETTINGS

Two recent studies funded by the National Institute on Aging and the Administration on Aging on integrating fall risk evaluation and prevention strategies into community programs show promise for future development of public health and medical practice education, reducing barriers or obstacles to pursue fall risk evaluation, and application into practice settings.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Mary E. Tinetti, M.D., Director of Yale Program on Aging, School of Medicine, 20 York Street, New Haven, CT 06504.

Partner Agency: U.S. Administration on Aging (AoA).

General Description: NIH-supported researchers tested the ability to integrate effective strategies to prevent falls in older persons into community care settings. The studies found that practitioners could adopt these strategies, although organizational and financial barriers limited the ability to implement them fully.

Excellence: What makes this project exceptional?

Translation to practice.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Among older adults, falls are the number one cause of fractures, hospital admissions for trauma, loss of independence and injury-related deaths. Only half of older adults hospitalized for a broken hip return home or live on their own after the injury, which is why prevention of falls is so important. Previous clinical trials showed that fall risk evaluation and management programs can lessen risk of falls in older persons, but application of these findings to the "real world" of health care practice faces significant challenges in integrating and organizing activities of health care providers from a variety of specialties and care settings.

Effectiveness: What is the impact and/or application of this research to older persons?

The results of these studies show that the fall risk evaluation and management strategies can be integrated into existing programs, although significant obstacles to full integration remain.

Innovativeness: Why is this exciting or newsworthy?

This research is an excellent example of evidenced-based outcomes translated to the community. This project is also an example of prevention research to address an important health risk for seniors and demonstrates an effective collaboration among federal agencies.

NATIONAL INSTITUTE ON AGING: UNDERSTANDING THE GENETIC UNDERPINNINGS OF PARKINSON'S

NIA intramural scientists have successfully identified mutations of the LRRK2 gene that cause Parkinson's disease, first in five families in Spain and England and later in approximately 1 percent of sporadic PD and 5 percent of cases of PD with a positive family history in the United States and Canada, making it the most common genetic cause of PD identified to date. Ongoing work from NIA scientists is aimed at turning this genetic discovery into new avenues for treatment.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Andrew Singleton, Investigator, Molecular Genetics Section, Laboratory of Neurogenetics, NIA/NIH, Building 35, Room 1A1014, 35 Convent Drive, Bethesda, MD 20892; Mark R. Cookson, Investigator, Cell Biology and Gene Expression Unit, Laboratory of Neurogenetics, NIA/NIH, Building 35, Room 1A116, MSC3707, 35 Convent Drive, Bethesda, MD, 20892–3707.

General Description:

UNDERSTANDING THE GENETIC UNDERPINNINGS OF PARKINSON'S

In November 2004, NIA intramural scientists discovered mutations in a gene called LRRK2 that cause Parkinson's disease (PD). The investigators studied four families with a history of PD who lived in the Basque region of Spain and one family with a similar disease in England. The LRRK2 gene encodes dardarin, a protein named by the researchers from the Basque word dardara, which means tremor, a major symptom of PD. In addition, the group identified a LRRK2 mutation, called G2019S, as a cause of disease in PD families in the United States and Canada. This single mutation causes disease in approximately one percent of all PD and five percent of cases of PD with a positive family history, an estimated 10,000 Americans. In other populations, the same mutation accounts for 9–30 percent of PD based on clinical analysis. As such, LRRK2 mutations are the most common genetic cause of PD identified to date, and they may represent an attractive target for developing new therapies for treating PD. NIA scientists have shown that the same mutations will trigger cell death in cultured neurons, and this can be limited by inactivating the protein. This suggests that a small, drug-like molecule might be developed to achieve the same goal. To develop this idea further, these investigators have started to explore the three dimensional structure of the protein so that drug-like compounds can be 'designed' in the future. This work is ongoing and is stimulating a great deal of interest in the field.

Excellence: What makes this project exceptional?

Researchers demonstrated that LRRK2 is the gene commonly mutated in people with Parkinson's disease (PD) and that these mutations result in toxic effects to neurons that can result in PD.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Parkinson's disease (PD) is a neurological condition that typically causes tremor and/or stiffness in movement. The condition affects about 1 to 2 percent of people over the age of 60 years and the chance of developing PD increases as we age.

Effectiveness: What is the impact and/or application of this research to older persons?

The onset of Parkinson's disease (PD) most frequently occurs in older people. The long-term goal of NIH studies is to develop new ways to influence specific activity of LRRK2, which is a potential therapeutic target for PD.

Innovativeness: Why is this research exciting or newsworthy?

Further understanding the LRRK2 gene and mutations to that gene may enable us to identify molecules and pathways as targets for therapeutic and preventive interventions that could potentially benefit thousands of older Americans who have PD or are at risk.

NATIONAL INSTITUTE ON AGING (NIA)/NATIONAL INSTITUTES OF HEALTH (NIH): STUDIES ON THE POTENTIAL OF RESVERATROL TO HELP CONTROL AGE-RELATED DISORDERS [NIA]

Resveratrol (RSV) is an activator of a family of enzymes that may be able to control age-related disorders such as the aging process, obesity, metabolic syndrome, and type 2 diabetes. In this study, middle-aged male mice on a high calorie diet and adminis-

tered RSV lived longer than the mice who were on a high calorie diet but were not supplemented with RSV. The mice that were administered RSV also showed an improved metabolic profile and activity levels similar to those observed in mice on a standard diet. Although, the effect of this small molecule in humans is unknown, preclinical observations suggest that RSV is safe and has enormous potential in the treatment of obesity and insulin resistance in humans.

Lead Agency: National Institute on Aging (NIA), National Institutes of Health (NIH).

Agency Mission:

• Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

• Foster the development of research and clinician scientists in aging.

• Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators: Rafael de Cabo, National Institutes of Health, National Institute on Aging, Intramural Research Program, Biomedical Research Center, 251 Bayview Boulevard, Suite 100, Baltimore, MD 21224–6825.

Partner Agencies: Salk Institute in La Jolla, CA and Sirtris Pharmaceuticals of Cambridge, MA, which is developing therapeutics to modulatesirtuins.

General Description: Studies over the last few years have shown that resveratrol (RSV), a natural compound found in common foods such as grapes, wines, and nuts, can extend lifespan in yeast, worms, flies, and fish. Resveratrol is an activator of a family of enzymes known as sirtuins, which may be able to control age-related disorders such as the aging process, obesity, metabolic syndrome, and type 2 diabetes in various organisms and in humans. An NIH study placed middle-aged male mice on one of three different diets: a standard mouse diet, a high calorie diet, and a high calorie diet supplemented with resveratrol. After six months, the scientists observed a clear trend toward increased survival and insulin sensitivity (important for the body's efficient processing of glucose into energy) in the high calorie diet supplemented with resveratrol relative to that seen in middle-aged male mice on the high fat diet without resveratrol supplementation. In effect, resveratrol shifted the physiology of middle-aged mice on a high calorie diet toward that of mice on a standard diet, essentially preempting most of the negative effects of the high calorie diet and extending the animals' lives. Although, the effect of this small molecule in humans is unknown, preclinical observations suggest that RSV is safe and has enormous potential in the treatment of obesity and insulin resistance in humans.

Excellence: What makes this project exceptional?

The findings are the first to demonstrate that resveratrol can affect the health and longevity of mammals. However, the safety and effectiveness of dietary supplementation with resveratrol in humans have not been established.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Since the beginning of the 20th century, life expectancy at birth in the United States has increased from less than 50 years to more than 76 years. By the middle of the 21st century, the number of Americans over the age of 65 will double, and the number of Americans over age 85 will increase fivefold or more, placing a significantly greater number of people at risk for disease and disability.

Effectiveness: What is the impact and/or application of this research to older persons?

Resveratrol has become the subject of intensive scientific inquiry for its potential to improve health among older adults. By activating sirtuins, resveratrol may be the first known compound that has the potential to control aging processes, obesity, and metabolic syndrome as well as potentially extend lifespan.

Innovativeness: Why is this exciting or newsworthy?

Compounds such as resveratrol, which may have protective effects against the aging process and certain age-related disorders and conditions such as obesity, may provide a new avenue for therapeutic intervention.

NATIONAL INSTITUTE ON AGING: NIHSENIORHEALTH WEB SITE

NIHSeniorHealth is a website for older adults, designed in keeping with scientific evidence on the cognitive and vision changes that occur with age and the effect of these changes on computer use. The site makes aging-related health information easily accessible to those seeking reliable, easy to understand online health information. It also has specially designed features to make the web site easier for older adults to use such as large print, short, easy-to-read segments of information, simple navigation and a read-aloud feature.

Lead Agency: National Institute on Aging (NIA) and National Library of Medicine (NLM)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Stephanie Dailey, Public Affairs Specialist, National Institute on Aging, Bldg. 31, Room 5C27 MSC 2292, Bethesda, MD 20892–2292; Jennifer Heiland, Unit Head, Web & Information Management, National Library of Medicine, 8600 Rockville Pike, MSC 3821, Bethesda, MD 20894.

Partner Agency: National Library of Medicine, National Institute on Aging.

General Description:

NIHSENIORHEALTH.GOV

NIHSeniorHealth is a web site specifically designed for older adults. This site was developed by the National Institute on Aging

(NIA) and the National Library of Medicine (NLM), both part of the National Institutes of Health (NIH). It features authoritative and up-to-date health information from institutes and centers (ICs) at NIH. In addition, the American Geriatrics Society provides expert and independent review of some of the material found on this web site. Each health topic includes general background information, quizzes and frequently asked questions (FAQs). Most topics include open-captioned videos. New topics are added to the site on a regular basis.

A research-based approach guided the development of NIHSeniorHealth. The design of the site grew out of NIA's research on the types of cognitive and vision changes that are a part of the normal aging process. Changes in memory, text comprehension, information processing speed and vision can interfere with older adults' use of computers. Research indicates older adults can effectively use computers if information is provided in a cognitively-friendly manner. NIH extensively tested NIHSeniorHealth with adults age 60 to 88 to ensure that it is easy for them to see, understand and navigate.

The web site features include large print, short, easy-to-read segments of information and simple navigation. A "talking" function reads the text aloud and special buttons to enlarge the text or turn on high contrast make text more readable. NIHSeniorHealth complies with Section 508 of the Rehabilitation Act of 1973, which aims to make federal electronic technology accessible for persons with disabilities.

In the future, NIH intends to add more topics and more videos, as well as improve the navigation and accessibility of the site, using evidence from usability testing, customer satisfaction surveys and industry best-practices to ensure the site continues to be as senior-friendly in the future as it has been thus far.

Excellence: What makes this project exceptional?

NIHSeniorHealth.gov is exceptional because it was conceived as a website to meet the cognitive and visual needs of older adults, primarily 60 or older. Many web sites have information aimed at seniors, but few have carefully designed the entire user experience around that age group. The site's design grew out of research conducted and supported by the National Institute on Aging and others about cognitive and vision changes that people experience as they age. The site presents basic health information in easy-to-read, consumer-friendly language and then reinforces it with quizzes, videos, and FAQs to help counteract changes in memory. To address aging-related changes in text comprehension and information processing speed, the text is presented in short snippets of information (one or two paragraphs per page) using a large text size as default with a very simple navigation structure. Finally, to aid older adults with vision changes NIHSeniorHealth includes a set of accessibility buttons across the top of each page that users may use to enlarge the text, change the color contrast, or hear the text read aloud.

Significance: How is this research relevant to older persons, populations and/or an aging society?

By putting health information into a format that recognizes age-related changes, NIHSeniorHealth gives seniors tools to help understand their own health care and wellness concerns. Topics on

the site range from diseases such as Alzheimer's Disease, Arthritis, and Glaucoma to wellness topics such as Eating Well as You Get Older and Exercise and Older Adults. NIHSeniorHealth also functions as a training resource for older adults. Many seniors are just beginning to use the Web. NIHSeniorHealth features a simple navigation structure and large text and navigation buttons, "easing" seniors into using the Internet. Older adults can then use the skills they've built on NIHSeniorHealth to effectively navigate the larger universe of government and health resources available online. In fact, the web site features a series of training materials called the Toolkit for Trainers developed by the National Institute on Aging. Trainers can use these free, easy-to-use training materials to help older adults find reliable, up-to-date online health information on their own. The training features two web sites from the National Institutes of Health: NIHSeniorHealth.gov and MedlinePlus.gov. Trainers start students off with NIHSeniorHealth and then transition them to the more complex MedlinePlus web site.

Effectiveness: What is the impact and/or application of this research to older persons?

NLM and NIA have consistently sought to assure the effectiveness of NIHSeniorHealth. NIH extensively tested the site with adults age 60 to 88 before launching the site. As the site has grown, NIH determined that the top-level navigation needed an update so it could accommodate many more topics. Usability testing with adults aged 60 and above was again included as an integral part of the design process. NIH also employs the American Customer Satisfaction Index to regularly monitor the effectiveness of the site for older adults. Content is reviewed and updated every 18 months to make sure it remains authoritative. The increasing numbers of unique visitors to the website reflect the growing interest in and awareness of the website by the public. For example, during the first quarter after it was launched in 2003, NIHSeniorHealth had around 94,000 unique visitors. As of March 2008, that quarterly total had risen to nearly a quarter million people.

Innovativeness: Why is this research exciting or newsworthy?

NIHSeniorHealth has been innovative in a number of ways. It was the first website developed for older adults using cognitive aging and vision research and has served as a model for web developers seeking to make their websites senior-friendly. NIHSeniorHealth has also been innovative in its use of accessibility features. Not only does it allow users to easily change the font size—a feature now found on a number of senior-friendly sites—it also lets them change the color contrast and hear the text read aloud, functions not typically available on other websites targeted to older adults. NLM regularly reviews the pronunciation by the computerized voice that reads the text, continually improving the dictionary the system uses to include new terms as they are added to the web site. Finally, as a repository of health information from 13 institutes and centers, NIHSeniorHealth is a unique and successful example of inter-Institute collaboration and was featured as a model for project managers at a STEP (Staff Training in Extramural Programs) forum presentation for NIH staff.

NATIONAL INSTITUTE ON ALCOHOL ABUSE AND ALCOHOLISM: EDUCATING OLDER ADULTS AND PHYSICIANS ABOUT ALCOHOL RISKS

The project involves a unique approach in which brief advice will be provided both to older patients and their physicians who identify them as "at-risk drinkers" (e.g., a single risk comprising drinking and using benzodiazepines, or multiple risks comprising drinking and using narcotics, drinking and having depression, etc.).

Lead Agency: National Institute on Alcohol Abuse and Alcoholism (NIAAA)/National Institutes of Health (NIH).

Agency Mission: NIAAA provides leadership in the national effort to reduce alcohol-related problems by:

- Conducting and supporting research in a wide range of scientific areas including genetics, neuroscience, epidemiology, health risks and benefits of alcohol consumption, prevention, and treatment;
- Coordinating and collaborating with other research institutes and Federal Programs on alcohol-related issues;
- Collaborating with international, national, state, and local institutions, organizations, agencies, and programs engaged in alcohol-related work;
- Translating and disseminating research findings to health care providers, researchers, policymakers, and the public.

Principal Investigator: Alison Moore, M.D., University of California, Los Angeles, School of Medicine, Division of Geriatrics, 10945 Le Conte Avenue, Suite 2339, Los Angeles, CA 90095–1687.

General Description:

EDUCATING OLDER ADULTS AND PHYSICIANS ABOUT ALCOHOL RISKS

Older adults have risks associated with alcohol use that differ from those among younger persons. This increased risk is due to physiological changes with aging that increase the effects of a given dose of alcohol as well as age-associated increases in comorbid illnesses (e.g., hypertension, gastroesophageal reflux disease, impairments in gait and cognition) and medication use (e.g., sedatives, selected antihypertensives, analgesics). The occurrence of these conditions may cause adverse effects in individuals even when small amounts of alcohol are consumed. Clinical guidelines for alcohol use disorders in the elderly released by the American Geriatrics Society and the American Medical Association are targeted toward identification and management of those who drink above low risk drinking limits or who have symptoms of alcohol abuse and dependence. However, they do not specifically address risks associated with small amounts of alcohol in combination with other illness or disorders or medication use.

In a current study, NIH-supported researchers are examining the effects of educating physicians and older at-risk drinkers about these risks. Although many older persons who drink alcohol may be at risk for adverse consequences, clinicians rarely ask questions about alcohol use in their older patients. Nor do they recognize many older persons who may be having alcohol related problems. The primary aims of the study are to reduce the risks of drinking (e.g., the amount of drinking, and associated problems) among older drinkers through screening and brief advice by their primary care providers. Findings indicate that these measures identify not

only those older persons who are abusing or dependent on alcohol but also those persons whose moderate use of alcohol may be risky or causing harm.

Excellence: What makes this project exceptional?

Other studies of community-based samples in primary care have demonstrated the efficacy of providers' use of screening protocols to identify older adults at risk for alcohol problems and reduction in at-risk drinking following brief motivational interventions. However, current measures are not designed to identify older persons whose use of alcohol, in conjunction with their chronic conditions, medications and functional status, places them at risk or may be causing them harm. Because existing screening instruments are less relevant to the elderly, this project developed two new measures, the Alcohol-Related Problems Survey (ARPS), and its shorter version (shARPS), that identify older drinkers whose use of alcohol alone, or in combination may be placing them at risk for harm.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Older persons differ biologically, psychologically and socially from younger people, resulting in different health needs and health care utilization patterns. Older men (and women of all ages) have a smaller volume of total body water than younger men; therefore, they attain a higher blood alcohol concentration from a given dose. The greater vulnerability of older persons to the effects of alcohol may be augmented by age-related changes in functional status, nutritional status, and psychological and cognitive status. Body composition continues to change with age; therefore an 85 year old may be more vulnerable to alcohol's effects than a 65 year old.

While only 2 to 4 percent of persons aged 65 or older meet criteria for a diagnosis of alcohol abuse and dependence, some studies have reported that up to 10 percent of older people have other serious problems related to alcohol (e.g., hospitalizations, falls, insomnia, confusion and drug-alcohol interactions). In primary care settings, up to 15 percent of older persons have reported exceeding recommended drinking limits.

Effectiveness: What is the impact and/or application of this research to older persons?

Up to 40 percent of older drinkers may be at risk for negative consequences either due to drinking above recommended limits or by experiencing illness or symptoms that could be worsened by alcohol use or use of medication that may negatively interact with alcohol. Alcohol also may affect the health of an older person by exacerbating sleep problems, elevating blood pressure, and negatively affecting bone mineral metabolism. Alcohol use in older adults is also associated with hip fractures due to falls and other unintentional injuries including automobile crashes. The increased risk of hemorrhagic stroke seen in the general population may be especially important in this age group. Consumption of over one to two drinks a day poses significant risks for cancer, liver cirrhosis, brain damage, and unintentional injuries.

This study is the first to assess a preventive intervention among older adults in primary care aimed to reduce risks of alcohol use alone, or in conjunction with comorbid illness or medication use. Thus, at-risk status, as indicated by the screening instrument ex-

amined in this study, rather than alcohol consumption alone, may be the most relevant indicator of this intervention's success.

Innovativeness: Why is this research exciting or newsworthy?

The majority of older persons take medications, and alcohol interacts adversely with many prescription and over-the-counter drugs. Studies indicate that between 60 to 90 percent of elderly persons use some form of medication, often more than one at a time. Medications that have a high potential for a negative reaction with alcohol, and commonly are taken by older people, include: analgesics, antihypertensives, anticoagulants, diuretics, antiarthritics and psychoactive agents.

Successful completion of this project can provide a valuable model for translation of alcohol-related screening and brief intervention conducted among older adults by community-based, primary care physicians. The most innovative feature of the study is the use of a new instrument to both determine risk and evaluate changes in risk. Through feedback from physicians, investigators have streamlined the screening process (e.g., via telephone rather than in-person), thereby creating greater efficiency to conduct brief interventions.

NATIONAL INSTITUTE ON ALCOHOL ABUSE AND ALCOHOLISM: RETIREMENT AND DRINKING BEHAVIOR

The purpose of an NIH-supported study is to examine four risk perspectives associated with the retirement process and the evaluation of their impact on drinking behavior in a cohort of retirement-eligible blue-collar workers employed in the construction, service, and manufacturing sectors.

Lead Agency: National Institute on Alcohol Abuse and Alcoholism (NIAAA)/National Institutes of Health (NIH).

Agency Mission: NIAAA provides leadership in the national effort to reduce alcohol-related problems by:

- Conducting and supporting research in a wide range of scientific areas including genetics, neuroscience, epidemiology, health risks and benefits of alcohol consumption, prevention, and treatment;
- Coordinating and collaborating with other research institutes and Federal Programs on alcohol-related issues;
- Collaborating with international, national, state, and local institutions, organizations, agencies, and programs engaged in alcohol-related work;
- Translating and disseminating research findings to health care providers, researchers, policymakers, and the public.

Principal Investigator: Samuel B. Bacharach, Ph.D., Director, Institute for Workplace Studies & Smithers Institute, Cornell University, ILR School, 16 E. 34th St., 4th Floor, New York, NY 10016.

General Description:

RETIREMENT AND DRINKING BEHAVIOR

Although studies have shown that the prevalence of excessive alcohol consumption declines with age, a substantial proportion of older adults engage in consumption patterns that exceed the suggested guidelines of one drink per day for senior adults. In addition to the risk of adverse interactions with comorbidities and medica-

tions, changes in life course conditions are believed to contribute to increased risk for alcohol problems among older adults. These conditions may include retirement-related unstructured free time and availability of disposable income, gambling associated with binge drinking, or losses due to death of loved ones. Rates of problem drinking vary widely depending on methods and definitions of alcohol abuse and dependence.

A current longitudinal NIH-supported study aims to determine the impact of older blue-collar workers' transition to retirement on their post-retirement levels of alcohol consumption and associated alcohol-related problems. The focus of the research is to examine how four different risk perspectives (social isolation—depth and breadth of social support or lack thereof; social control—loss of or relief from work-based systems or rules governing drinking or permissive drinking norms; stress—e.g., financial, social role changes, marital strain; and social marginalization—e.g., lowered self efficacy, loss of self esteem) experienced over the course of retirement influence post-retirement drinking behavior.

Excellence: What makes this project exceptional?

Results of cross-sectional as well as longitudinal studies have shown that older adults consistently consume less than younger age groups. However, there is a paucity of published data on long-term trends in alcohol consumption among older adults. For example, one study comparing survey responses from two large national surveys showed increased prevalence of alcohol abuse but not dependence among respondents over 65 years of age from 1992–2002. Another longitudinal study based on national survey data found that while alcohol consumption declined with age from 1975 to 1992, consumption declined more slowly among more recent birth cohorts. These results are suggestive of a potential shift in consumption patterns among older adults as birth cohorts continue to age. Thus, these data provide the basis for development of improved surveillance of consumption patterns through the latter part of the life course.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Population-level data show that about 48 percent of older men (age 65 or older) and 32 percent of older women drink. Most do so in moderation as defined by the US Dietary Guidelines. These studies have shown that only 10 percent of older men and 2.4 percent of older women are heavier drinkers. However, population-level data could obscure problem-drinking occurring in certain populations. Studies suggest that a significant proportion of "hidden" alcoholics may be age 60 or older. The diagnosis of alcohol abuse and dependence can be difficult in older people because its symptoms can be erroneously attributed to other age-related medical or psychiatric conditions (e.g., depression, insomnia, poor nutrition, and frequent falls) or to medication side-effects.

Effectiveness: What is the impact and/or application of this research to older persons?

Reported rates of alcohol consumption range from as low as 4 percent among representative longitudinal samples to well over 50 percent among smaller targeted community samples of older at-risk drinkers (e.g., in primary care and hospitals, geriatric mental health clinics, nursing homes). The current study of older workers'

transition into retirement found that a shift from full-time work to bridge employment and full retirement was associated with higher amounts of alcohol consumption per drinking occasion.

Innovativeness: Why is this research exciting or newsworthy?

This research has the potential to provide timely information on important, emergent social factors that may increase the risk for alcohol problems in a growing understudied group during a critical period of life transition. This research expands beyond a more limited, short-term examination of retirement in prior studies to a broader view of retirement as a changing process. For example, the extent to which the drinking-retirement relation is altered by retirement status, occupation, gender, ethnicity, and time will be determined. Investigators are providing valuable information on the differential effects of retirement patterns (e.g., early vs. late; forced vs. voluntary; followed by full-, part-time or no additional employment) on drinking behavior. Results of the study will provide a better understanding of life course processes underlying the non-negligible rates of alcohol problems among older adults, due in part, to the stressor of retirement.

NATIONAL INSTITUTE ON ALCOHOL ABUSE AND ALCOHOLISM: LONGITUDINAL STUDY OF ALCOHOL USE AND RELATED PROBLEMS IN OLDER ADULTS

This is a longitudinal survey of alcohol use and alcohol related problems in older adults. The subjects were aged 55 to 65 years when originally surveyed; they will be aged 75 to 86 years when the 21 year longitudinal follow-up survey is administered. Thus, the survey permits an examination of the natural course of drinking behaviors between young-old age and old-old age.

Lead Agency: National Institute on Alcohol Abuse and Alcoholism/National Institutes of Health.

Agency Mission: NIAAA provides leadership in the national effort to reduce alcohol-related problems by:

- Conducting and supporting research in a wide range of scientific areas including genetics, neuroscience, epidemiology, health risks and benefits of alcohol consumption, prevention, and treatment;
- Coordinating and collaborating with other research institutes and Federal Programs on alcohol-related issues;
- Collaborating with international, national, state, and local institutions, organizations, agencies, and programs engaged in alcohol-related work;
- Translating and disseminating research findings to health care providers, researchers, policymakers, and the public.

Principal Investigator: Rudolph Moos, Ph.D., Research Career Scientist, VA Palo Alto Health Care System, Professor of Psychiatry and Behavioral Sciences, Stanford University, Center for Health Care Evaluation, 152 MPD, 795 Willow Road, Menlo Park, CA 94025.

General Description:

LONGITUDINAL STUDY OF ALCOHOL USE AND RELATED PROBLEMS IN OLDER ADULTS

The purpose of this research is to describe the long-term course of late-life problem drinking and to examine how health and help-seeking, life context and coping, and gender and family factors influence late-life drinking careers. Specifically, the applicants propose to extend an NIAAA-funded 10-year study of late-life problem drinking to 21 years in order to determine the course of older adults' alcohol consumption and problem drinking as they move from being young-old (55 to 65 years at baseline) to being old-old (75 to 86 years at follow-up). Guided by a stress and coping model, the investigators will focus on four sets of issues: (1) They will examine the 21-year course of late-life alcohol consumption and problem drinking and identify high-risk patterns of alcohol consumption and the predictive validity of alternative alcohol consumption guidelines. In addition, they will focus on the rates and predictors of new late-life drinking problems and of remission, and consider the consequences of late-life drinking problems and remission, including whether stably remitted problem drinkers' functioning and life contexts normalize over time or whether there is permanent "scarring" associated with prior drinking problems. (2) They will examine health-related factors, such as medical conditions, medication use, pain, and depression and suicidal ideation, in relation to fluctuations in late-life drinking patterns. They will also focus on late-life and the lifetime history of help-seeking for alcohol-related and personal problems, as well as natural recovery of drinking problems. (3) They will consider the role of social context and coping, including friends and social resources, and life history factors, in fluctuations in late-life alcohol consumption, drinking problems, and remission and relapse. Finally, (4) they will examine gender and current family influences on the course of late-life problem drinking. By spotlighting the extent of at-risk drinking, late-onset problem drinking, and relapse among adults of advanced age, this research should help health care providers more readily recognize the existence and potential for drinking problems among their oldest patients. By providing insight into reasons adults at this life stage do or do not seek help for drinking problems, and patterns of help-seeking predictive of more favorable drinking outcomes, the research may help to provide the scientific underpinnings to promote development of more accessible and effective alcohol prevention programs for older adults.

Excellence: What makes this project exceptional?

Because the proportion of older people who drink is small and the amounts drunk by older people are typically small, there is a limited amount of useful epidemiological research on alcohol use in later life. This study will be one of the few alcohol studies focusing on older age groups. Also, the study's longitudinal design permits a rare opportunity to examine changes in drinking behavior as individual's transition between relatively young old age and older old age.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This study is examining such important issues as: (a) The high risk patterns of drinking are over time; (b) the predictive validity

of alternative alcohol consumption guidelines; (c) whether stable remission leads to normalization of life functioning, or whether there is permanent "scarring"; (d) long term health outcomes such as medical conditions, medication use, depression and suicidal ideation related to changes in drinking behavior; (e) the natural histories of help seeking and natural remission, and the role of social contexts, both concurrent and past, as well as of later life drinking adaptations. These data do not currently exist in any other prospective study, and this project has the potential to provide new findings of special import, given the increasing aging of the U.S. population.

Effectiveness: What is the impact and/or application of this research to older persons?

Considering the aging of the American population, sound epidemiological information about drinking on later life will provide the critical basis for planning the health care needs of older Americans, recognizing the unique patterns of problems that attend on alcohol use in older age, developing age-appropriate screening and brief intervention tools, and ensuring the availability of sufficient treatment capacity for these individuals.

Innovativeness: Why is this research exciting or newsworthy?

Again, the key element in innovativeness is the lack of comparable information from any other available sources. Although the research techniques are standard ones, they have not been applied to this segment of the population in previous research.

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES (NIAID)/NATIONAL INSTITUTES OF HEALTH (NIH): MORE EFFECTIVE FLU VACCINES FOR THE ELDERLY

Influenza causes illness and death in elderly persons, who are at increased risk for serious complications associated with the flu. For this reason, finding flu vaccines that are more effective in elderly populations is an important public health concern. The findings of this study suggest that higher doses of seasonal influenza vaccine may be a safe and viable way to enhance protection against influenza among elderly persons.

Lead Agency: National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Allergy and Infectious Diseases is to conduct and support basic and applied research to better understand, identify, treat, and prevent infectious and immune-related diseases.

Principal Investigators: Dr. Wendy Keitel, Baylor College of Medicine, One Baylor Plaza, BCM–385, Houston, Texas 77030.

Partner Agency: Sanofi Pasteur.

General Description: NIAID has a longstanding commitment to advancing scientific research focused on the development of therapies, diagnostics, and devices needed to reduce the threat posed by both seasonal and pandemic influenza. Influenza causes significant morbidity and mortality in the elderly, a population at increased risk for serious flu complications, including pneumonia, bronchitis, and sinus infections. Support for the development of new influenza vaccines is a major focus of the NIAID Influenza Research Program. One aspect of this vaccine effort focuses on developing flu vaccines that are more effective in elderly populations, where influ-

enza morbidity and mortality is significantly high. The findings from this NIAID-funded study suggest that a higher dose of seasonal influenza vaccine can safely and significantly increase the immune responses of older people to the virus. Investigators observed that vaccinated, elderly patients produced higher levels of antibodies to influenza. These results suggest that larger doses of vaccine may be a safe and viable way to enhance protection against influenza among elderly persons.

Excellence: What makes this project exceptional?

This study provides a basis for further evaluation of enhanced potency vaccines in the elderly.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Influenza causes significant morbidity and mortality in the elderly, a population at increased risk for serious flu complications, including pneumonia, bronchitis and sinus infections. These findings are an important first step in developing new strategies to better protect the elderly against influenza-associated hospitalizations and mortality.

Effectiveness: What is the impact and/or application of this research to older persons?

Influenza morbidity and mortality is significant in the elderly as they do not mount as robust an immune response as younger persons. Research looking at how to optimize the immune response in the elderly could lead to improved prevention strategies that could reduce the incidence rate of influenza in elderly persons.

Innovativeness: Why is this exciting or newsworthy?

This research helps provide the foundation for the support of influenza vaccines that may induce a higher antibody response in the elderly than the currently recommended vaccine.

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES: EFFECTS OF AGING AND IMMUNE SUPPRESSION ON THE INNATE IMMUNE SYSTEM

This NIH-supported study has shown how the innate immune system may become less effective against infection as people age and stresses the importance of development of new vaccine formulations and other intervention strategies to boost the immune response.

Lead Agency: National Institute of Allergy and Infectious Diseases (NIAID)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Allergy and Infectious Diseases is to conduct and support basic and applied research to better understand, identify, treat, and prevent infectious and immune-related diseases.

Principal Investigator: Erol Fikrig, M.D., Department of Internal Medicine, Yale University, 300 Cedar Street, Room S525A, New Haven, CT 06520–8031.

General Description:

EFFECTS OF AGING AND IMMUNE SUPPRESSION ON THE INNATE IMMUNE SYSTEM

Understanding the consequences of aging and immune suppression upon infection with, or vaccination against, West Nile virus or influenza is essential to the development of clinical tests and inter-

ventions aimed at individuals at particular risk for adverse outcomes in the event of an epidemic. This project focused on the effects of aging and immune suppression on the function of the innate immune system, which is responsible for the body's first response to infection. The NIH-supported project assessed how innate immune system proteins, such as Toll-like receptors (TLRs) and macrophage inhibitory factor (MIF)—two key molecules that direct the innate immune response—may change as people age. Initial findings suggest that the amount and function of different TLRs, such as TLR1, decrease during aging in human innate immune cells. Additionally, when TLR1 and TLR2 are stimulated in older adults, they produce less tumor necrosis factor alpha and interleukin 6, two important proteins that help defend against viral infections. This evidence indicates that lowered expression and function of certain TLRs may be associated with increased infection-related morbidity and mortality and the impaired vaccine responses observed in aging humans. As this project progresses, further studies will assess how these innate immune system mediators change during aging and how they affect the immune response to infection by West Nile Virus or vaccination against influenza.

Excellence: What makes this project exceptional?

This project assessed the components of the host response that are the first activated by infection; these components represent the initial contact between microbes and host immune cells. This project has identified key parts of the innate immune system that change during aging in humans.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Although it is known that the immune system becomes less effective as it ages, it is not known which specific elements of the immune system break down first. This NIH-supported project will provide an important definition of the changes that occur in host-pathogen interactions in the elderly. Results from this study could have vital implications for vaccine development and immunotherapeutics targeted for the protection of older individuals.

Effectiveness: What is the impact and/or application of this research to older persons?

West Nile Virus and influenza are known to cause greater morbidity and mortality in the elderly than in the general population. The information that is gained from these studies will guide future efforts to develop better diagnostics, vaccines, and immunotherapies for the elderly against these diseases.

Innovativeness: Why is this research exciting or newsworthy?

The innate immune system is critically important in the body's response to many pathogens. In addition to identifying potential mechanisms for augmenting immune responses to West Nile Virus infection and influenza vaccination, findings from this project may also be of general benefit to the treatment and prevention of other types of infections.

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES: MULTICENTER AIDS COHORT STUDY (MACS)

The Multicenter AIDS Cohort Study (MACS) is an ongoing prospective study of the natural and treated histories of HIV infection in homosexual and bisexual men conducted since 1984 by sites located in Baltimore, Chicago, Pittsburgh, and Los Angeles. The MACS is also one of the only cohorts that enrolled HIV-negative men who have sex with men to serve as controls. The broad scientific agenda of the MACS includes sub-studies on aging issues such as immune function, cardiovascular disease, brain structure and function, frailty, and hearing loss.

Lead Agency: National Institute of Allergy and Infectious Diseases (NIAID)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Allergy and Infectious Diseases is to conduct and support basic and applied research to better understand, identify, treat, and prevent infectious and immune-related diseases.

Principal Investigator: Joseph Margolick, M.D., Ph.D., Bloomberg School of Public Health, The Johns Hopkins University, 615 North Wolfe St., Baltimore, MD 21205; John Phair, M.D., Feinberg School of Medicine, Northwestern University, 645 N. Michigan Ave., Suite 900, Chicago, IL 60611; Roger Detels, M.D., Center for the Health Sciences, UCLA School of Public Health, Room 71–267, P.O. Box 951772, Los Angeles, CA 90095–1772; Charles Rinaldo, Ph.D., Graduate School of Public Health, University of Pittsburgh, 130 DeSoto Street, Pittsburgh, PA 15261; Lisa Jacobson, Sc.D., Bloomberg School of Public Health, Johns Hopkins University, 615 N. Wolfe Street, E7646, Baltimore, MD 21205.

Partner Agency: National Cancer Institute, National Heart, Lung, and Blood Institute, National Institute on Deafness and Other Communication Disorders.

General Description:

MULTICENTER AIDS COHORT STUDY (MACS)

The MACS is one of the oldest longitudinal cohorts of HIV-infected men in the world that includes the natural and treated histories of HIV–1 infection in 6,973 homosexual and bisexual men conducted by sites located in Baltimore, Chicago, Pittsburgh and Los Angeles (4,954 men from April 1984–March 1985; 668 men from April 1987–September 1991; and 1,351 men from October 2001–August 2003). In addition to a blood sample, more than 8,500 individual pieces of information are collected on each man during the biannual study visits. The more than 1 million deposited specimens and corresponding data form a rich dataset that describes the clinical outcomes, treatment responses, and behavior of these HIV-infected gay men over a 25-year period. The MACS is also one of the only cohorts that enrolled HIV-negative men who have sex with men to serve as controls. Finally, more than 650 initially HIV-negative men have become HIV-infected during the course of the study and their clinical and behavioral information and specimens form a very valuable subset of data in the MACS. MACS data and deposited specimens are available to outside investigators conducting research on HIV/AIDS.

The broad scientific agenda of the MACS includes sub-studies on aging issues such as immune function, cardiovascular disease, brain structure and function, frailty, and hearing loss.

(1) Supply a three line summary of the research project using terms reasonable for an educated lay audience:

> The Multicenter AIDS Cohort Study (MACS) is an ongoing prospective study of the natural and treated histories of HIV infection in homosexual and bisexual men conducted since 1984 by sites located in Baltimore, Chicago, Pittsburgh, and Los Angeles. The MACS is also one of the only cohorts that enrolled HIV-negative men who have sex with men to serve as controls. The broad scientific agenda of the MACS includes sub-studies on aging issues such as immune function, cardiovascular disease, brain structure and function, frailty, and hearing loss.

(2) Respond to the following questions in a narrative about the research project using terms reasonable for an educated lay audience:

Excellence: What makes this project exceptional?

The more than 1 million deposited specimens and corresponding data form a rich dataset that describes the clinical outcomes, treatment responses, and behavior of these HIV-infected gay men over a 25-year period.

Significance: How is this research relevant to older persons, populations and/or an aging society?

With a significant number of HIV-infected individuals now advancing toward old age, it is vital to examine the effects of the many years of HIV infection and HIV-treatment on the aging process. The median age of the men in the MACS is 52.7 years and the oldest participant is 82.2 years old. The MACS is mining its 25 years of data to evaluate how these HIV-infected men are aging in relation to their HIV-negative counterparts.

Effectiveness: What is the impact and/or application of this research to older persons?

This research will describe the impact of long-term HIV infection and treatment on the aging process and potentially identify clinical outcomes that could be prevented or treated to extend longevity and ensure a better quality of life for HIV-infected persons.

Innovativeness: Why is this exciting or newsworthy?

HIV-infected persons now live far longer than ever anticipated when the AIDS virus was first identified. As these individuals live into older age, the HIV community recognizes the need for more information on HIV and aging.

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES: INCREASE WITH AGE: WOMEN INTERAGENCY HIV STUDY (WIHS)

This is the largest and longest ongoing NIH-supported study of HIV-infected women in the United States and one of few studies that follows minority women. The WIHS aims to understand how HIV/AIDS and its treatment affects women, the relationship between HIV/AIDS and other diseases, and the impact of hormonal factors on HIV disease.

Lead Agency: National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH)

Agency Mission: The mission of the National Institute of Allergy and Infectious Diseases is to conduct and support basic and applied research to better understand, identify, treat, and prevent infectious and immune-related diseases.

Principal Investigators: Steven Gange, Ph.D., Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe Street, Baltimore, MD 21205; Kathryn Anastos M.D., Bronx WIHS, Montefiore Medical Center, 3311 Bainbridge Avenue, 2nd Floor, Bronx, NY 10467; Howard Minkoff, MD, Department of Obsetrics and Gynecology, Maimonides Medical Center, 967 48th Street, Brooklyn, NY 11219.

Partner Agency: National Cancer Institute, National Center for Research Studies, National Institute of Child Health and Human Development, National Institute of Deafness and Other Communication Disorders, National Institute of Drug Abuse.

General Description:

WOMEN INTERAGENCY HIV STUDY (WIHS)

The Women's Interagency HIV Study (WIHS) was established in August 1993 to investigate the impact of HIV infection on women in the United States. Approximately 3,700 women have been enrolled, of which 2,400 are still attending visits every six months (the remaining have either died or lost to follow-up). The core portion of this NIH-supported study includes a detailed and structured interview, physical and gynecologic examinations, and laboratory testing. The WIHS participants are also asked to enroll in various sub-studies, including cardiovascular, metabolic, and physical functioning.

Excellence: What makes this project exceptional?

WIHS is the largest and longest running NIH-supported study of HIV in minority women in the United States and closely reflects the population of American women infected with HIV.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Many subjects followed through the WIHS have gone, or are going, through menopause. The study allows the investigation of the interplay between hormonal changes in women, HIV therapy, and aging.

Effectiveness: What is the impact and/or application of this research to older persons?

The study allows investigators to sort out the effects of HIV infection and its therapy from the effects of aging on chronic disease outcomes.

Innovativeness Why is this exciting or newsworthy?

The results of WIHS studies are important in guiding research into the effects of HIV and clinical research into effective therapy or their adverse effects. The longitudinal WIHS study now has 15 years of data and more than 2 million biological specimens in frozen storage, permitting comprehensive studies of the natural history of HIV and its therapy.

NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL AND SKIN DISEASES DURATION OF RHEUMATOID ARTHRITIS AND FUNCTIONAL IMPROVEMENT IN CLINICAL TRIALS

Rheumatoid arthritis patients often experience limitations in physical function, due to joint pain and swelling during active inflammation, or residual joint damage and deformity in the absence of active inflammation. Because joint damage is irreversible and increases over time, patients with longstanding rheumatoid arthritis would be expected to display less physical function improvement with treatment than patients with early rheumatoid arthritis.

Lead Agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases.

Principal Investigator: Anita M. Linde, Director, Office of Science Policy and Planning, National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health, 9000 Rockville Pike, Bldg. 31, Rm. 4C13, Bethesda, MD 20892.

Partner Agency: Austrian Science Foundation.

General Description:

DURATION OF RHEUMATOID ARTHRITIS AND FUNCTIONAL IMPROVEMENT IN CLINICAL TRIALS

Limitations in physical function are common in patients with rheumatoid arthritis, occurring either because of joint pain and swelling in patients with active inflammation, or due to residual joint damage and deformity in patients without active inflammation. Current measures of physical limitations do not reveal the cause of the limitations, or whether the limitations are due to inflammation or joint damage. Because joint damage is irreversible and increases over time, less physical function improvement with treatment would be expected in patients with longstanding rheumatoid arthritis, in comparison with patients with early rheumatoid arthritis. NIH-supported researchers studied reports of patients enrolled in rheumatoid arthritis clinical trials to determine whether there was a lower degree of physical function improvement among patients with a longer duration of the disease. They selected articles from all clinical trials of disease-modifying anti-rheumatic medications in rheumatoid arthritis published from 1980 to 2004. Thirty-six trials that measured physical function using the Health Assessment Questionnaire Disability Index (HAQ: the most common measure of physical function for arthritis patients) were studied. The average duration of rheumatoid arthritis in these trials ranged from 2.5 months to 12.2 years. Physical function, as measured by the HAQ, improved in all trials, but improved more in trials that studied patients with early rheumatoid arthritis. Each additional year of rheumatoid arthritis was associated with about a 7 percent decrease in physical function improvement; among trials of more contemporary medications, this decrease was approximately 14 percent per additional year of rheumatoid arthritis.

These findings indicate that physical function is less responsive to treatment in late rheumatoid arthritis than early rheumatoid arthritis. This difference is probably due to the various causes of physical limitations in early and late arthritis.

Excellence: What makes this project exceptional?

Physical function is an important component of health; it includes one's mobility and ability to wash, dress, and eat, and is often limited in patients with rheumatoid arthritis.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Current measures of these physical limitations do not distinguish whether they are due to active inflammation or joint damage. Because joint damage is irreversible and increases over time, it would be expected that older patients with longstanding rheumatoid arthritis would show less improvement than patients with early rheumatoid arthritis.

Effectiveness: What is the impact and/or application of this research to older persons?

This study is a significant contribution to the development of treatments aimed at improving physical function. The results indicate that it is important to consider the degree of joint damage when evaluating the ability of different treatments to improve physical function. This could lead to better targeting of treatments for older rheumatoid arthritis patients with longstanding disease.

Innovativeness: Why is this research exciting or newsworthy?

Physical function is a major driver of health care costs. Confounding factors in evaluating treatments, such as differences in the degree of joint damage and the sensitivity of physical function measures to change, may affect estimates of the relative cost-effectiveness of different rheumatoid arthritis medications.

NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL AND SKIN DISEASES BISPHOSPHONATES WITH ESTROGEN SHOW ADDITIVE BENEFITS AGAINST OSTEOPOROSIS

NIH-supported investigators identified the mechanism of action of bisphosphonates, used to treat osteoporosis. Unlike the effects of bisphosphonates and PTH, the effects of bisphosphonates and estrogen are additive; thus, combining these two medications may prove more effective than unpleasant and costly injections of PTH.

Lead Agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases.

Principal Investigators: Dr. Stavros C. Manolagas, Dr. Joel Finkelstein, Dr. Felicia Cosman, Dr. Dennis Black.

Partner Agency: National Institute on Aging (NIA), Department of Veterans Affairs.

General Description:

BISPHOSPHONATES WITH ESTROGEN SHOW ADDITIVE BENEFITS AGAINST OSTEOPOROSIS

The mechanism by which estrogen decreases cell death in bone forming cells, the osteoblast, has been identified, and new therapies based on this action of estrogen are being designed and tested as a result. However, increasing evidence indicates that the bone-maintaining and primary stress-sensing cell, the osteocyte, also contributes to the mechanical competence of the skeleton. Both estrogen and bisphosphonates, also used to treat osteoporosis, act to prevent death of osteocytes. However, until recently the bisphosphonate mechanism of action was not well understood, and questions remained as to how to optimize this therapy as well as how to best combine it with other osteoporosis therapies in order to achieve the best effect while minimizing drug use and cost.

In a recent study, NIH-supported investigators found that bisphosphonates act through a novel intracellular signaling pathway triggered by opening of special channels in the osteocytes' membranes. Their findings demonstrate that estrogen and bisphosphonates act on osteocytes to prevent cell death via different mechanisms. The effects of the two drugs are additive in vitro. Thus, this work helps to explain clinical observations that the combination of these two drugs may be more effective than either drug alone as a treatment for osteoporosis.

Earlier NIH-funded research has provided guidance about using bisphosphonates concurrently with another medication, PTH, which closely resembles human parathyroid hormone. Unlike bisphosphonates and estrogen which slow bone loss by preventing cell death, PTH stimulates bone formation. Many thought that bisphosphonates and PTH combined would be more protective than either taken separately. NIH-supported researchers refuted that belief, demonstrating that not only did the combined regimen of PTH injections and oral bisphosphonate therapy fail to provide more benefit than bisphosphonate alone, combining the oral drug and PTH injections somewhat diminished the therapeutic effect of PTH alone.

Despite its health benefits, patients are reluctant to give themselves daily injections of PTH. Therefore, researchers continued to search for strategies to minimize the cost and burden of PTH therapies—with important results that provide good news for people with osteoporosis. In a subsequent study, women taking PTH for one year were given either no drug in the second year or were switched to bisphosphonate. Those who received no drug after a year of PTH began to lose the bone they had gained during treatment, while those who switched to bisphosphonate in the second year continued to gain bone, demonstrating that the sequential use of PTH as a bone building drug followed by bone-conserving bisphosphonate maximized the bone gain.

In a related study in a different laboratory, researchers found that treatment with PTH does not need to be continuous throughout the year. In fact, cyclic treatment with PTH for three months followed by three months of bisphosphonate alone was as effective in stimulating bone gain as the continuous use of PTH for 12 months. Taking 3-month breaks from PTH not only provides cost

benefits, but also improves quality of life for patients who do not need to inject the drug every day.

Excellence: What makes this project exceptional?

This new work demonstrates a novel mechanism of action of bisphosphonates and shows that this mechanism differs from and is additive to the action of estrogen. These new insights open the path for optimizing use of both types of drugs individually and in combination to achieve the best treatment for osteoporosis.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Osteoporosis affects over ten million people in the United States and is a major cause of morbidity, loss of function, and mortality among older adults.

Effectiveness: What is the impact and/or application of this research to older persons?

Physicians and patients can use the results of these studies to strategize for the best therapeutic benefit while minimizing drug use and cost.

Innovativeness: Why is this research exciting or newsworthy?

Optimizing treatments for osteoporosis has the potential to affect quality of life and reduce costs of care for millions of Americans.

NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL AND SKIN DISEASES: TRAINING INTERVENTION FOR FAMILY CAREGIVERS

A coping intervention (COPE) designed to support family caregivers of hospice patients may have a positive effect on patients' perceived symptom distress via a reduction in the perceived symptom and task burdens experienced by caregivers.

Lead Agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases.

Principal Investigators: Susan J. Diem, M.D., MPH, 450 McNamara Alumni Center, 200 Oak Street, SE., Minneapolis, MN 55455–2070; Elizabeth Haney, M.D., Sam Jackson Hall, 3rd Floor, 3181 S.W. Sam Jackson Park Road.

Partner Agency: National Institute on Aging (NIA).

General Description:

USE OF ANTIDEPRESSANT MEDICATION LINKED WITH INCREASED RISK FOR OSTEOPOROSIS

In 2004 the Surgeon General's Report on Bone Health and Osteoporosis pointed to the need to identify secondary causes of osteoporosis in order to prevent fractures in the elderly. A number of diseases, conditions and treatments have consequences on bone that can be successfully mitigated if recognized. Depression was mentioned as a possible condition associated with lower bone mass and an increased risk of osteoporosis and fractures, although the mechanism is not completely understood. Now, recent papers from two large cohort studies, the Osteoporotic Fractures in Men (Mr.

OS) Study and the Study of Osteoporotic Fractures (SOF), point to the deleterious effect on bone of selective serotonin re-uptake inhibitors (SSRIs), a very common treatment for depression, in both older men and women.

The SSRIs account for over 60 percent of the prescriptions for depression particularly in the elderly since they have a better safety profile for cardiovascular disease. This could lead to a high exposure in a population vulnerable to bone loss and osteoporosis. Results of Mr. OS and SOF indicate that use of SSRIs is associated with reductions in bone mineral density among men and an increased rate of bone loss at the hip in women. Because bone loss is common among older people, with the most severe loss generally seen among post-menopausal women, the finding that SSRIs may be a significant contributing factor to osteoporosis could have major public health implications.

Excellence: What makes this project exceptional?

The finding that a common treatment for depression may contribute to or accelerate bone loss in this already vulnerable population has potentially major clinical implications.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Depression is common and 8.5 percent of Americans use anti-depressive medication. The SSRIs account for over 60 percent of the prescriptions for depression, particularly in the elderly, since they have a better safety profile for cardiovascular disease. At the same time, some 10 million Americans currently have osteoporosis and 34 million more have low bone mass, placing them at increased risk for this disease.

Effectiveness: What is the impact and/or application of this research to older persons?

These provocative findings, if confirmed, could lead to major changes in the way depression is managed in middle aged and older individuals. For example, even if treatment with SSRIs appears to be clinically appropriate in a given case, measures to forestall bone loss may also be indicated. However, further research is needed to confirm these findings and to determine the best interventions to ameliorate depressive symptoms without compromising bone health among older Americans.

Innovativeness: Why is this research exciting or newsworthy?

A common treatment for depression may have unexpected and harmful side effects on bone. If the association between SSRI use and bone loss is confirmed through additional studies, this research could lead to major changes in the standard of care for depression in older people.

NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL AND SKIN DISEASES: USE OF ANTIDEPRESSANT MEDICATIONS LINKED WITH OSTEOPOROSIS RISK

Selective serotonin reuptake inhibitors (SSRIs), a commonly-prescribed class of antidepressants, have been associated with bone loss in women and reduced bone mineral density in men.

Lead Agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases is to support research

into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases.

Principal Investigators: Susan J. Diem, M.D., MPH, 450 McNamara Alumni Center, 200 Oak Street, SE., Minneapolis, MN 55455–2070; Elizabeth Haney, M.D., Sam Jackson Hall, 3rd Floor, 3181 S.W. Sam Jackson Park Road.

Partner Agency: National Institute on Aging (NIA).

General Description:

USE OF ANTIDEPRESSANT MEDICATION LINKED WITH INCREASED RISK FOR OSTEOPOROSIS

In 2004 the Surgeon General's Report on Bone Health and Osteoporosis pointed to the need to identify secondary causes of osteoporosis in order to prevent fractures in the elderly. A number of diseases, conditions and treatments have consequences on bone that can be successfully mitigated if recognized. Depression was mentioned as a possible condition associated with lower bone mass and an increased risk of osteoporosis and fractures, although the mechanism is not completely understood. Now, recent papers from two large cohort studies, the Osteoporotic Fractures in Men (Mr. OS) Study and the Study of Osteoporotic Fractures (SOF), point to the deleterious effect on bone of selective serotonin re-uptake inhibitors (SSRIs), a very common treatment for depression, in both older men and women.

The SSRIs account for over 60 percent of the prescriptions for depression particularly in the elderly since they have a better safety profile for cardiovascular disease. This could lead to a high exposure in a population vulnerable to bone loss and osteoporosis. Results of Mr. OS and SOF indicate that use of SSRIs is associated with reductions in bone mineral density among men and an increased rate of bone loss at the hip in women. Because bone loss is common among older people, with the most severe loss generally seen among post-menopausal women, the finding that SSRIs may be a significant contributing factor to osteoporosis could have major public health implications.

Excellence: What makes this project exceptional?

The finding that a common treatment for depression may contribute to or accelerate bone loss in this already vulnerable population has potentially major clinical implications.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Depression is common and 8.5 percent of Americans use anti-depressive medication. The SSRIs account for over 60 percent of the prescriptions for depression, particularly in the elderly, since they have a better safety profile for cardiovascular disease. At the same time, some 10 million Americans currently have osteoporosis and 34 million more have low bone mass, placing them at increased risk for this disease.

Effectiveness: What is the impact and/or application of this research to older persons?

These provocative findings, if confirmed, could lead to major changes in the way depression is managed in middle aged and older individuals. For example, even if treatment with SSRIs ap-

pears to be clinically appropriate in a given case, measures to forestall bone loss may also be indicated. However, further research is needed to confirm these findings and to determine the best interventions to ameliorate depressive symptoms without compromising bone health among older Americans.

Innovativeness: Why is this research exciting or newsworthy?

A common treatment for depression may have unexpected and harmful side effects on bone. If the association between SSRI use and bone loss is confirmed through additional studies, this research could lead to major changes in the standard of care for depression in older people.

NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL AND SKIN DISEASES (NIAMS)/NATIONAL INSTITUTES OF HEALTH (NIH): REDUCING THE MORBIDITY AND MORTALITY FROM PRESSURE ULCERS AMONG ELDERLY PATIENTS

Pressure ulcers, particularly in hospitalized elderly patients, are one of the major contributors to the morbidity, mortality, and economic burden of skin diseases. Because these ulcers begin developing early in an elderly patient's hospitalization, NIH-supported researchers conducted a small study to identify patient risk factors for pressure ulcer development that could be addressed in wound prevention. This project revealed risk factors that included age, male gender, dry skin, urinary and fecal incontinence, difficulty turning in bed, nursing home residence prior to admission, recent hospitalizations, and poor nutritional status.

Lead Agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS).

National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases.

Principal Investigator: Mona Baumgarten, Ph.D., *mbaumgar@epi.umaryland.edu,* (410) 706–1531.

Partner Agency: National Institute on Aging (NIA).

General Description: A group of patients 65 years or older, admitted through the emergency department to the inpatient medical service of four collaborating hospitals, were examined during the initial days of their admission for evidence of the development of pressure ulcers and studied for predisposing factors. The patients were examined by specially trained research nurses under the standard methodology used by most hospitals for determining the severity of pressure ulcers. Of the 201 patients studied, 6.2 percent developed a pressure ulcer within the first three days of hospitalization. The majority were on the sacral area (lower back) or on the heel. The primary predictive factors were age, male gender, dry skin, urinary and fecal incontinence, difficulty turning in bed, nursing home residence prior to admission, recent hospitalizations, and poor nutritional status. These findings will help hospitalists focus on those individuals at greatest risk for developing pressure ulcers soon after hospitalization, and should allow for the design of nursing care practices to reduce wound incidence.

The ability to expand this to a much larger study would be limited by the training of additional personnel, unless some method of using less highly-trained individuals could be developed. The same research group analyzed photographs to determine whether they could be viewed remotely at a later time by a smaller number of research nurses, and provide dermatology information electronically (teledermatology), similar to that obtained by live-patient examination by the same nurses. The methodology allowed determination of the reliability of evaluations, comparing interrater (one research nurse to another) and intrarater (a particular nurse on several occasions). Overall, the sensitivity and specificity were quite high (97 and .81, respectively), and the inter- and intrarater reliability was also good (69 and .84, respectively). These data indicate that it would be possible to use photographs and teledermatology techniques to allow for the collection of a much larger number of participants, without requiring specially trained research nurses at each site. These methods would also allow multiple readings of the same patient materials by different research nurses, which should improve the reliability of data interpretation.

Excellence: What makes this project exceptional?

Pressure ulcers, particularly in hospitalized elderly patients, are one of the most significant contributors to morbidity, mortality, and economic burden of skin diseases. The development of these ulcers begins early in the hospitalization of an elderly patient, but this aspect had not been investigated until recently.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Identification of patients at risk for developing such pressure ulcers will focus preventive measures on patients who might obtain the most benefit. Continuation of these studies and application of their results to nursing care have the potential for greatly reducing the morbidity, mortality, and burden of such wounds.

Effectiveness: What is the impact and/or application of this research to older persons?

Data collection on large numbers of patients is important in determining the appropriate criteria for pressure ulcer risk. This research also provided a methodology for extending these studies to a larger number of patients.

Innovativeness: Why is this exciting or newsworthy?

A limited number of specially trained research nurses can evaluate patients using photographs and teledermatology. This approach would minimize training of additional research nurses, and reduce staff time and other study costs, relative to the initial pilot study.

NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL AND SKIN DISEASES: SURGICAL VERSUS NON-SURGICAL TREATMENTS FOR LOW BACK PAIN

Results from the Spine Patient Outcomes Research Trial (SPORT) will help patients who have low back pain determine if they should undergo surgery or try other, non surgical treatments.

Lead Agency: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases is to support research into the causes, treatment, and prevention of arthritis and mus-

culoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases.

Principal Investigator: James N. Weinstein, M.S., D.O., Chair of Orthopaedic Surgery, Dartmouth-Hitchcock Medical Center, 1 Medical Center Drive, Lebanon, NH 03756.

Partner Agency: Office of Research on Women's Health (ORWH), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC).

General Description:

SURGICAL VERSUS NON-SURGICAL TREATMENTS FOR LOW BACK PAIN

The Spine Patient Outcomes Research Trial (SPORT) has provided evidence that will help patients who have low back pain determine if they should undergo surgery or try other, nonsurgical treatments. The 13-center study followed patients who had low back pain caused by herniated disk or spinal stenosis (with or without the forward slippage of one vertebra on top of another) and who were randomly assigned to undergo surgery or to receive non-surgical therapies, or who wanted to choose their own treatment but agreed to participate in an observation study. For people who have both spinal stenosis (a narrowing of the bony elements around the spinal cord and nerve roots in the lower back) and vertebral instability, SPORT clearly demonstrated that patients who underwent decompression and fusion surgery to relieve pressure on the spinal cord and to prevent additional slippage showed substantially greater improvement in pain and function during a 2-year period, as compared with those who received non-operative treatments. The benefits were particularly noteworthy for those patients with more severe disease, whereas patients with minor complaints appeared to do comparably well with non-operative treatments.

Decompression surgery provided a similar benefit for patients for whom spinal stenosis was not complicated by vertebral slippage. Patients reported significantly less pain and disability, and increased physical functioning, within 6 weeks of surgery—benefits that persisted for the 2-year study period. Of note, the functional status of patients who received non-surgical interventions improved slightly during the study, suggesting that people who are reluctant to have surgery to correct spinal stenosis are not subjecting themselves to further damage.

Of the somewhat younger candidates for lumbar diskectomy for a herniated disk (an average age of ~42 years), researchers found that those who opted to forego surgery for nonoperative care fared similarly to those who had the surgery. In general, surgery patients experienced slightly more improvement (i.e., less pain, better physical function) over the study period, and particularly in the first 3 months, than those who opted for other treatments. In other words, lumbar diskectomy was generally effective in relieving pain from herniated disks, but nonoperative therapies seemed to offer equivalent benefits for patients who could not or chose not to have surgery.

Excellence: What makes this project exceptional?

The study provides valuable information to patients, providers, and policy makers, when making treatment decisions about whether surgery would relieve pain associated with intervertebral disc

herniation or degenerative spondylolisthesis with or without spinal stenosis (the three leading reasons people undergo surgery for low back pain).

Significance: How is this research relevant to older persons, populations and/or an aging society?

Low back disorders are common, costly, and often disabling. Back surgeries in aging Americans are one of the fastest growing areas of medical care, with hospital costs exceeding $21 billion per year. Spinal stenosis (a narrowing of the bony elements around the spinal cord and nerve roots in the lower back) is the most common reason for spinal surgery in Americans over age 65 years. Lumbar diskectomy—the surgical removal of all or part of an intervertebral disk—is commonly performed surgical procedure for patients of all ages who have back or leg pain due to a herniated disc. Despite the widespread use, the procedures' effectiveness in comparison with that of non-surgical treatments had not been demonstrated in controlled trials.

Effectiveness: What is the impact and/or application of this research to older persons?

Clinicians now have evidence that older patients who suffer from stenosis are likely to benefit more from decompression and surgery than from non-operative treatments, particularly if they are severely disabled by the disease. However, patients who have spinal stenosis that is not complicated by vertebral slippage and want to delay or avoid having surgery are not subjecting themselves to further damage.

Innovativeness: Why is this research exciting or newsworthy?

Before SPORT, many patients with back pain were conflicted about whether to undergo surgery. Now, people who have back pain due to a herniated disc can be assured that a surgical procedure called lumbar diskectomy is generally effective in relieving pain from herniated disks, but—if their pain is tolerable and their condition is not progressing—their symptoms will likely subside over time, even without surgery. On the other hand, older patients who suffer from stenosis are likely to benefit more from decompression and surgery than from non-operative treatments. However, surgical complication rates increase substantially after 80 years of age, and this must be considered when making treatment selections in older patients.

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT: COMBINED SURGERY FOR PELVIC ORGAN PROLAPSE AND INCONTINENCE

NICHD-supported investigators showed that continent women with advanced prolapse who received a procedure to prevent stress incontinence (called the Burch colposuspension) at the same time that abdominal sacral colpopexy is performed to correct prolapse, reduced postoperative symptoms of stress incontinence.

Lead Agency: Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/National Institutes of Health (NIH).

Agency Mission: The mission of the NICHD is to ensure that every person is born healthy and wanted, that women suffer no harmful effects from reproductive processes, and that all children have the chance to achieve their full potential for healthy and pro-

ductive lives, free from disease or disability, and to ensure the health, productivity, independence, and well-being of all people through optimal rehabilitation.

Principal Investigator: Morton B. Brown, Geoffrey Cundiff, Ingrid E. Nygaard, Linda Brubaker, Holly E. Richter, Halina M. Zyczynski, Paul Martin, Anthony G. Visco.

General Description:

COMBINED SURGERY FOR PELVIC ORGAN PROLAPSE AND INCONTINENCE

By performing two surgical procedures during the same operation, researchers in NICHD's Pelvic Floor Disorders Research Network reduced the incidence of urinary incontinence by half in women with a condition known as pelvic organ prolapse. Ordinarily, a single surgery is performed to correct pelvic organ prolapse, and a second surgery is performed only if incontinence develops.

Pelvic organ prolapse occurs when the pelvic muscles and connective tissue within the pelvic cavity weaken or are injured. The tissue ordinarily supports the vagina and holds it in place within the pelvis. Without normal support, however, the uterus, bladder, and bowel press down on the vagina, causing it to invert and, in some women, these organs eventually protrude through the vaginal opening. With advanced pelvic organ prolapse, the vaginal protrusion may cause a kinking of the urethra, blocking the flow of urine and preventing the bladder from emptying completely (called partial retention). This retention, in turn, may lead to frequent or persistent urinary tract infections. In other cases, depending on the individual, pelvic organ prolapse may occur along with stress incontinence—urine leakage from the bladder during a cough or a sneeze.

To treat pelvic organ prolapse, gynecologists may recommend that patients have a surgical procedure known as sacrocolpopexy. In this procedure, surgical mesh and sutures are used to anchor the vagina to the sacrum. However, after sacrocolpopexy, many women experience incontinence, which makes them candidates for a second surgical procedure, the Burch colposuspension. With Burch colposuspension, additional sutures are sewn through the wall of the vagina and anchored to ligaments inside the pelvic cavity, near the pubic bone.

The Network investigators undertook a study to determine if proactively performing the Burch colposuspension at the same time as sacrocolpopexy might prove effective at preventing incontinence in women with prolapse who did not have symptoms of stress incontinence before surgery. For their study, with the women's consent, the researchers randomly assigned women who were undergoing sacrocolpopexy to receive either Burch colposuspension or no additional surgery. Three months after their surgery, the women were evaluated according to standardized criteria for urinary stress incontinence. These criteria measured incontinence that occurred in response to such activities as coughing, sneezing, laughing, physical exercise, lifting, or bending over. Of the Burch group, 23.8 percent met one or more criteria for stress incontinence. In comparison, of the group that underwent sacrocolpopexy alone, 44.1 percent met one or more criteria for stress incontinence.

Excellence: What makes this project exceptional?

Pelvic organ prolapse is a common problem among older women that can lead to major surgical treatments. Women who do not have urinary stress incontinence before the surgery to treat pelvic organ prolapse may develop incontinence after the surgery. The research findings definitively resolve the question of whether performing a procedure to prevent postoperative stress incontinence (Burch colposuspension) at the same time as a procedure to treat pelvic organ prolapse (sacrocolpopexy) improved outcomes compared to performing the surgery to correct the prolapse alone.

Significance: How is this research relevant to older persons, populations and/or an aging society?

By performing both procedures at the same time, women may both avoid a second surgery and maintain their quality of life after surgery.

Effectiveness: What is the impact and/or application of this research to older persons?

In many cases, clinicians have adopted principles of care and surgical techniques before rigorous, objective, controlled evaluation has been conducted. The study findings enable healthcare providers to recommend an evidence-based treatment that not only remedies pelvic organ prolapse, but also prevents post-operative urinary incontinence.

Innovativeness: Why is this research exciting or newsworthy?

Pelvic organ prolapse is a common problem among older women that can lead to major surgical treatments. Women who do not have urinary stress incontinence before the surgery to treat pelvic organ prolapse may develop incontinence after the surgery. The research findings definitively resolve the question of whether performing a procedure to prevent postoperative stress incontinence (Burch colposuspension) at the same time as a procedure to treat pelvic organ prolapse (sacrocolpopexy) improved outcomes compared to performing the surgery to correct the prolapse alone.

NATIONAL INSTITUTE ON DRUG ABUSE: AGING AND THE EFFECTS OF ABUSED SUBSTANCES

This animal research seeks to find differences in how opiates, the key ingredient in most pain medications, affect pain and produce pleasure in older populations, with implications for pain management and opiate abuse in the elderly.

Lead Agency: National Institute on Drug Abuse (NIDA)/National Institutes of Health (NIH).

Agency Mission: The mission of the National Institute on Drug Abuse is to lead the Nation in bringing the power of science to bear on drug abuse and addiction. This charge has two critical components. The first is the strategic support and conduct of research across a broad range of disciplines. The second is ensuring the rapid and effective dissemination and use of the results of that research to significantly improve prevention, treatment, and policy as it relates to drug abuse and addiction.

Principal Investigator: Conan Kornetsky, Ph.D., Professor, 715 Albany Street, 560, Boston, MA 02118.

General Description:

AGING AND THE EFFECTS OF ABUSED SUBSTANCES

Featured are two projects by the same principal investigator, which have informed each other and yielded interesting findings. The long-term objective of this basic research was to compare young and old rats' responses to opiates and cocaine. Considerable evidence shows that aging alters brain systems implicated in the pleasurable effects of abused substances. The first study examined the functional consequences of these brain alterations using a number of animal models for seeing how abused substances stimulate the brain. The second study looked at whether the hedonic potency (i.e., degree of pleasurable response) of opiates decreases with age, via experiments to determine differences in the hedonic effects of morphine—the prototypic opiate—as measured by the drug's effect on the threshold for rewarding intracranial stimulation in young, middle-aged, and aged rats. The pharmacokinetics (drug absorption, distribution, metabolism, and elimination) of morphine were compared.

Excellence: What makes this project exceptional?

These experiments were exceptional for being among the first to examine the relationship between analgesic and hedonic effects of opiates and aging.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As the baby boomer generation (born 1946–1964) prepares to swell the ranks of older adults in this country, we will likely also see an increase in drug abuse among older Americans, including prescription medications and illicit substances. Indeed, studies suggest that 4.4 million Americans over the age 50 will present with addiction problems by 2020, and even more will misuse painkillers and other prescription drugs.

Effectiveness: What is the impact and/or application of this research to older persons?

The basic research represented by these studies is needed to fill major gaps in our current knowledge. For while it is now evident that the brain changes continuously across life, how drugs of abuse interact with these age-related changes remains unclear. Substance abuse during older age may augment the risks and require unique considerations for diagnosis and treatment, which studies like these will begin to elucidate. In addition, baby boomers may be carrying forward into old age some risky behaviors that they've been living with and dying from since they were young adults.

Innovativeness: Why is this research exciting or newsworthy?

This research is exciting because it provides important clues about age-related brain differences, about how aging affects brain systems involved in drug abuse, and about the potential impact of drug abuse on the aging brain.

NATIONAL INSTITUTE ON DRUG ABUSE: ROLE OF SUBSTANCE ABUSE PATTERNS IN CLINICAL AND HEALTH MANAGEMENT OF HIV IN OLDER ADULTS

This research will use novel statistical techniques for measuring substance abuse exposure to better capture trajectories of substance abuse over time and to assess their effects on relevant clinical and public health HIV outcomes.

Lead Agency: National Institute on Drug Abuse (NIDA)/National Institutes of Health (NIH).

Agency Mission: The NIDA mission is to lead the Nation in bringing the power of science to bear on drug abuse and addiction. This charge has two critical components. The first is the strategic support and conduct of research across a broad range of disciplines. The second is ensuring the rapid and effective dissemination and use of the results of that research to significantly improve prevention, treatment and policy as it relates to drug abuse and addiction.

Principal Investigator: Susan Weiss, Ph.D., Chief, Science Policy Branch, NIDA, Address: 6001 Executive Blvd., Suite 5230, Bethesda, MD 20892.

General Description:

ROLE OF SUBSTANCE ABUSE PATTERNS IN CLINICAL AND HEALTH MANAGEMENT OF HIV IN OLDER ADULTS

The proposed study will measure and analyze substance abuse (alcohol and non-medical use of prescribed psychoactive drugs) over time among HIV positive and negative adults to characterize their distinct trajectory classes. Among those with HIV, the study will examine the role of substance abuse patterns in determining outcomes important to the clinical and health management of HIV in an aging, adult population. These include disease progression, adherence to HIV medication, and mortality. The study will use data accumulated from a large, multi-site prospective cohort study—the Veteran's Aging Cohort Study (VACS)—to derive a better understanding of the influence of substance use and abuse in HIV treatment and care. Analyses will also explore how broader contextual characteristics (e.g., perceived accessibility of one's healthcare provider and neighborhood-level disadvantage) interrelate with patterns of substance abuse and HIV outcomes.

Excellence: What makes this project exceptional?

A key problem with the data emanating from large observational cohort studies of HIV-infected people in the U.S. and Europe, which show an unequivocal relationship between substance abuse and HIV progression, is the varied definition of substance abuse used in the analyses.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This study is exceptional in that it addresses these limitations using novel statistical techniques to better assess effects of substance abuse across time on health outcomes.

Effectiveness: What is the impact and/or application of this research to older persons?

Results may help clinicians in making treatment decisions about their substance abusing HIV-positive patients and identify those at greatest risk for poor health outcomes. Findings may also suggest areas for more targeted public health prevention and treatment interventions for HIV-positive substance abusers and inform drug, alcohol, mental health, and HIV/AIDS treatment guidelines.

Innovativeness: Why is this research exciting or newsworthy?

This study also makes use of a large existing data set on aging veterans, making the most of extant information and extending knowledge about a high-risk subgroup.

NATIONAL INSTITUTE ON DRUG ABUSE: FUNCTIONAL LIMITATION MEASURES AMONG WOMEN WITH HIV

This research advances disability prevention by identifying subgroups at highest risk of functional decline and disability, providing a benchmark for future evaluations, and informing prevention and treatment strategies for planning or modifying services.

Lead Agency: National Institute on Drug Abuse (NIDA), National Institutes of Health (NIH).

Agency Mission: The NIDA mission is to lead the Nation in bringing the power of science to bear on drug abuse and addiction. This charge has two critical components. The first is the strategic support and conduct of research across a broad range of disciplines. The second is ensuring the rapid and effective dissemination and use of the results of that research to significantly improve prevention, treatment and policy as it relates to drug abuse and addiction.

Principal Investigator: Arpi Terzian, student, Address: 220 East 31st Street, Apt. 3E, Baltimore, MD 21218.

General Description:

FUNCTIONAL LIMITATION MEASURES AMONG WOMEN WITH HIV

The proposed study will characterize functional limitation and disability among a cohort of women infected with HIV, who are part of the Women's Interagency HIV Study (WIHS). The study is nested as a cross-sectional study within the prospective WIHS study. Functional limitation measures include indices of hand grip strength and timed gait tests, while disability measures assess activities of daily living. Prevalence and severity are compared across groups of women according to HIV, HCV, and illicit drug use status. Women infected with HIV or HCV are also compared with uninfected WIHS participants and uninfected external' women from the Cardiovascular Health Study and the Women's Health and Aging Study. Epidemiologic associations will involve more than 3,000 WIHS women, representing the domestic epidemiology of HIV/AIDS in women. Logistic regression analyses will use HIV, HCV, drug use, and age-related predictors.

Excellence: What makes this project exceptional?

This study will provide vital, comprehensive data on the prevalence and severity of HIV- and HIV/HCV-coinfected women. Findings should help generate inferences about the etiology of particular disabilities and limitations.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Given that more than 60,000 Americans aged 50 or older are living with HIV, attention to disability prompts studies that look at people's functioning in the presence of disease as health outcome rather than disease onset and mortality.

Effectiveness: What is the impact and/or application of this research to older persons?

This study helps to fill a critical gap in that data on the epidemiology of disability among older HIV- and HIV/HCV-coinfected women area particularly scarce.

Innovativeness: Why is this research exciting or newsworthy?

The study also takes advantage of other large data sets and promotes collaboration across disciplines.

NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES: UNDERSTANDING ANEMIA OF INFLAMMATION AND CHRONIC DISEASE

NIH-supported investigators have identified mechanisms underlying disturbances of iron balance that cause "anemia of inflammation and chronic disease" (AICD), a common and debilitating form of anemia in older people. These research findings have laid the groundwork for developing novel therapeutic drugs with which to effectively treat this common type of anemia in the elderly.

Lead Agency: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)/National Institutes of Health NIH).

Agency Mission:

• Conduct and support basic, clinical, and translational research on diseases of internal medicine and related subspecialty fields, including diabetes and other endocrine and metabolic diseases; liver and other digestive diseases; nutritional disorders; obesity; kidney and urologic diseases; and hematologic diseases; as well as fundamental research in many basic science disciplines.

• Foster research training and mentoring at multiple career stages to maintain pipeline of outstanding investigators in these research fields.

• Disseminate science-based knowledge gained from NIDDK-funded research to health care providers and the public through outreach and communications.

Principal Investigator: Tomas Ganz, MD, PhD, Division of Pulmonary and Critical Care Medicine, David Geffen School of Medicine at UCLA, 37–055 Center for Health Sciences, 10833 Le Conte Avenue, Los Angeles, CA 90095–1690.

Partner Agency: National Heart Lung and Blood Institute.

General Description:

UNDERSTANDING ANEMIA OF INFLAMMATION AND CHRONIC DISEASE

Many chronic diseases and inflammatory conditions are associated with anemia (abnormally decreased numbers of circulating red blood cells). This type of anemia has been called "anemia of inflammation and chronic disease" (AICD) and is characterized by disturbances in iron metabolism that impair red blood cell production. AICD is particularly common among the elderly, and it can seriously limit not only the function and quality of life but also the longevity of those affected. Until recently, the underlying cause of disturbed iron metabolism in AICD was unknown and a longstanding unsolved mystery in medicine. Research supported by the NIH identified Hepcidin (a small molecule hormone produced by the liver) as a central regulator of iron balance in humans. This research has also determined the mechanisms by which Hepcidin negatively regulates the transport of iron into the blood stream from the GI tract, where dietary iron is absorbed, and from tissue sites where recycled iron is stored. Moreover, this research has defined signaling pathways by which Hepcidin production in the liver is regulated, including those responsible for the abnormally elevated circulating levels of Hepcidin that are now recognized to be hallmarks of AICD. This research has not only provided new insights into the causes of AICD and anemia of the elderly, but has also laid the groundwork for the development of novel therapeutic

drugs that may provide the means to effectively treat AICD and anemia of the elderly in the future.

Excellence: What makes this research exceptional?

By determining the cause of AICD, a very common form of anemia, this research has not only solved a longstanding medical mystery, it has provided the basis for developing new effective treatments for this form of anemia, which is particularly common and debilitating in elderly people.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Analysis of the most recent National Health and Nutrition Examination Survey (NHANES III) data indicates that approximately 10 per cent of all non-hospitalized men and women older than 65 in the United States anemic and that a substantial proportion of these have laboratory evidence of AICD as the cause of anemia. This research has not only defined the underlying mechanisms for this common form of anemia, it has also provided the basis for developing novel, effective treatments.

Effectiveness: What is the impact and/or application of this research to older persons?

Further research is now underway to realize the promise of this basic research with respect to developing new and more effective approaches to detect, prevent, and treat AICD, a common and debilitating form of anemia among the elderly.

Innovativeness: Why is this research exciting or newsworthy?

Effective approaches for accurately detecting and effectively preventing or treating the so-called "anemia of inflammation and chronic disease" (AICD) have the potential to positively affect the quality of life and longevity of millions of Americans. This research has provided for the first time a clear path forward to achieve these goals.

NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES: BIOFEEDBACK FOR MANAGING CONSTIPATION AND FECAL INCONTINENCE

Randomized controlled clinical trials of biofeedback to self-monitor pelvic floor muscle contraction exercises have demonstrated the benefits of this treatment for constipation and fecal incontinence. Biofeedback was shown to work even better than some standard treatments such as laxatives or unmonitored exercises. Additional analyses of data from these trials continue to yield new information on long-term benefits of this treatment.

Lead Agency: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)/National Institutes of Health (NIH).

Agency Mission:

a. Conduct and support basic, clinical, and translational research on diseases of internal medicine and related subspecialty fields, including diabetes and other endocrine and metabolic diseases; liver and other digestive diseases; nutritional disorders; obesity; kidney and urologic diseases; and hematologic diseases, as well as fundamental research in many basic science disciplines.

b. Foster research training and mentoring at multiple career stages to maintain pipeline of outstanding investigators in these research fields.

c. Disseminate science-based knowledge gained from NIDDK-funded research to health care providers and the public through outreach and communications.

Principal Investigator: William E. Whitehead, PhD, Center for Functional GI and Motility Disorders, University of North Carolina, Campus Box 7080, Chapel Hill, NC 27599–7080, USA.

Partner Agency: NIH Office of Research on Women's Health, National Center for Research Resources (General Clinical Research Center Program), Milan Pharmaceuticals, Jansen Pharmaceuticals, Sandhill Scientific Incorporated.

General Description:

BIOFEEDBACK FOR MANAGING CONSTIPATION AND FECAL INCONTINENCE

Constipation, lodging of stool in the rectum, and fecal incontinence, an inability to control bowel movements, are more common in older adults. These conditions can lead to embarrassment and social isolation, and they often go untreated. Constipation commonly causes fecal incontinence, such that approaches to managing these conditions are similar. One of the available treatments for these conditions is biofeedback, which involves the use of monitors that record contractions of the pelvic floor muscles in order to help individuals to train these muscles and achieve better control over their bowel movements. In this study, NIDDK-supported researchers tested the use of biofeedback to assess whether it was truly effective relative to other treatment options in managing constipation and fecal incontinence.

Biofeedback sessions were used in a randomized controlled clinical trial to teach patients with constipation to relax their pelvic floor muscles in order to reduce straining. The trial showed that this treatment was helpful to patients with a type of constipation known as pelvic floor dyssynergia, associated with inappropriate contraction rather than relaxation of the pelvic floor muscles during defecation. Biofeedback treatment in these patients resulted in improvements in terms of their bowel movement frequency and straining, bloating, and abdominal pain. Compared to continuous use of a laxative or muscle relaxant, biofeedback was shown to be more effective, and its benefits were sustained in one study throughout 2 years of follow up.

This project also demonstrated a benefit for biofeedback in patients with fecal incontinence, which commonly results from constipation. Results from a randomized controlled clinical trial indicated that biofeedback is better at alleviating fecal incontinence than the standard practice of Kegel exercises (contractions of the pelvic floor muscles) performed without the benefit of biofeedback monitoring. Individuals with fecal incontinence found that biofeedback improved their symptoms, including reducing episodes of incontinence. Continuing analyses of the information collected in these trials have assessed the long-term durability of biofeedback's effects on fecal incontinence and analyzed the health care costs associated with this condition.

Excellence: What makes this project exceptional?

The researchers showed that biofeedback works better than some commonly used treatments to reduce symptoms of constipation or fecal incontinence.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Older persons are at increased risk for developing constipation and fecal incontinence. These conditions can lead to embarrassment and isolation, severely reducing quality of life and preventing individuals from seeking medical care to alleviate them.

Effectiveness: What is the impact and/or application of this research to older persons?

Research to identify which available treatments are effective and safe for alleviating constipation and fecal incontinence can improve the clinical management of these conditions in older persons, who are commonly affected by them.

Innovativeness: Why is this research exciting or newsworthy?

Prior to this research, findings from uncontrolled studies suggested, but did not conclusively prove, that biofeedback might be helpful for individuals suffering from constipation or fecal incontinence. Biofeedback is an attractive treatment option because it carries very little risk of adverse events compared with other possible treatments. These randomized, controlled clinical trials were the first to provide definitive support for the efficacy of biofeedback as a treatment for these conditions.

NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES (NIDDK)/NATIONAL INSTITUTES OF HEALTH (NIH): DIABETES PREVENTION PROGRAM (DPP) AND DPP OUTCOMES STUDY

NIH-supported investigators found in a clinical trial that type 2 diabetes could be prevented or delayed in people at high risk of the disease. A lifestyle intervention of diet, exercise, and behavior modification was most effective at diabetes prevention, especially in older Americans. Ongoing research with the clinical trial participants is revealing more information about diabetes risk, onset, prevention, and outcomes.

Lead Agency: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)/National Institutes of Health (NIH).

Agency Mission:

- Conduct and support basic, clinical, and translational research on diseases of internal medicine and related subspecialty fields, including diabetes and other endocrine and metabolic diseases; liver and other digestive diseases; nutritional disorders; obesity; kidney and urologic diseases; and hematologic diseases; as well as fundamental research in many basic science disciplines.
- Foster research training and mentoring at multiple career stages to maintain pipeline of outstanding investigators in these research fields.
- Disseminate science-based knowledge gained from NIDDK-funded research to health care providers and the public through outreach and communications.

Principal Investigators: David M Nathan, M.D., DPP/DPPOS Study Chair, Professor of Medicine, Harvard Medical School, Director, Diabetes Research Center, Massachusetts General Hospital, 50 Staniford Street, Suite 340, Boston, MA 02114.

Partner Agency: NIDDK, Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), National Institute on Aging (NIA), National Eye Institute (NEI), National Center on Minority Health and Health Disparities (NCMHD), NIH

Office of Research on Women's Health (ORWH), NIH Office of Behavioral and Social Sciences Research (OBSSR), Indian Health Service (IHS), Centers for Disease Control and Prevention (CDC), National Heart, Lung, and Blood Institute (NHLBI). Non-federal funding partners: Warner-Lambert (WL), Bristol-Meyers Squibb (BMS), American Diabetes Association (ADA), National Center for Research Resources (NCRR), Merck & Co., Hoechst Merion Roussel, Sankyo, Life Scan, Slim Fast, and Health-O-Meter.

General Description:

DIABETES PREVENTION PROGRAM (DPP) AND DPP OUTCOMES STUDY

Understanding and preventing type 2 diabetes and its health complications is an important public health goal being addressed by NIH-supported research. Researchers continue to gain new insights into type 2 diabetes and its prevention from the landmark Diabetes Prevention Program (DPP) clinical trial and the follow up DPP Outcomes Study. The DPP was a randomized, controlled clinical trial that examined the effects of lifestyle and medical interventions on the development of type 2 diabetes in over 3,200 adults at risk for this disease. The DPP compared intensive lifestyle modification, treatment with the medication metformin, and standard medical advice. Published in 2002, the striking results of the DPP trial tell us that millions of high-risk people can use diet, exercise, and behavior modification to avoid or delay developing type 2 diabetes. In its most dramatic result, participants in the DPP lifestyle intervention group—those receiving intensive counseling on effective diet, exercise, and behavior modification—reduced their risk of developing diabetes by 58 percent. This finding was true across all participating ethnic groups and for both men and women. *Lifestyle changes worked particularly well, in fact best, for participants aged 60 or older, reducing their risk by 71 percent.* The DPP also found that metformin is effective in delaying the onset of diabetes, but the study suggests it works best in younger, more overweight individuals and was much less effective in those over 60.

During the study, the DPP collected a broad array of health data and biological samples from the large, racially and ethnically diverse group of participants—some of whom developed diabetes during the course of the trial. This tremendous diabetes research resource is supporting informative analyses of diabetes risk factors and disease development. For example, recent analyses of DPP data have shown that steps taken to prevent or delay type 2 diabetes can also apparently help reduce risk factors for diabetes complications. In one study, it was found that hypertension, a classic risk factor for cardiovascular disease, was present in nearly one third of all DPP participants at the beginning of the trial, and increased in the patients who received either placebo or metformin—however, it significantly decreased in the lifestyle intervention group. The DPP data and samples have also enabled researchers to examine the influence of genetic risk factors for type 2 diabetes on progression to disease in trial participants, and to investigate more readily the possible biological mechanisms associated with genetic risk.

Currently, the majority of DPP participants are being followed in the "DPP Outcomes Study" (DPPOS). The DPPOS is examining longer-term effects of the trial interventions on prevention of type

2 diabetes and its health complications—including heart disease, eye and kidney disease, and nerve damage. The DPPOS will also compare outcomes for women and men, by age and ethnicity.

Excellence: What makes this project exceptional?

The Diabetes Prevention Program clinical trial is the largest and most racially and ethnically diverse study of people at high risk for developing type 2 diabetes (based on impaired glucose metabolism). There has been high retention of the DPP volunteers in both the clinical trial phase and the outcomes study phase. The collection of health and biological information obtained from the DPP volunteers is an invaluable diabetes research resource that is still being analyzed to understand development of this disease and its complications in people at high risk.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The risk of developing type 2 diabetes increases dramatically with age. According to recent estimates by the Centers for Disease Control and Prevention, diabetes affects over 23.6 million Americans, approximately 90–95 percent of which is type 2 diabetes, and in the 60 and over age group, about 12.2 million, or 23.1 percent, have diabetes. Approximately 57 million more adults are at risk for developing diabetes. In 1988–1994, among U.S. adults aged 40–74 years, 40.1 percent had pre-diabetes (impaired glucose metabolism). In 2003–2006, 35.4 percent of adults aged 60 years or older had impaired fasting glucose (one form of pre-diabetes). Moreover, it was recently estimated that costs of diabetes in 2007 were $174 billion, including direct medical costs of $116 billion. After adjusting for population age and sex differences, average medical expenditures among people with diagnosed diabetes were 2.3 times higher than what expenditures would be in the absence of diabetes. According to the analysis, over half (56 percent) of all health care expenditures attributed to diabetes are for health resources used by the population age 65 years or older, much of which is borne by the Medicare program (Diabetes Care 31:1–20, 2008).

Diabetes is the leading cause of kidney failure and new onset blindness in adults. Heart disease and stroke together are the leading cause of death in people with diabetes. The DPP results showed that type 2 diabetes could be prevented or delayed in people at high risk, including older people. Through its "Small Steps. Big Rewards. Prevent Type 2 Diabetes" campaign, the National Diabetes Education Program has turned the DPP results into a message of diabetes prevention tailored to different populations in the United States, including older Americans, in order to help decrease the burden of type 2 diabetes and its health complications on our society.

Effectiveness: What is the impact and/or application of this research to older persons?

Older Americans at risk of type 2 diabetes now have evidence-based information and tools that can enable them to take steps to prevent or delay this disease and its complications.

Innovativeness: Why is this exciting or newsworthy?

This work was the first evidence that type 2 diabetes could be prevented in an ethnically and racially diverse population at high risk. The interventions tested were effective for people of all ages, particularly older Americans. Analyses of health and biological in-

formation collected from the DPP participants during the clinical trial have continued to reveal new information about diabetes development and risk factors. The DPPOS should provide new insights into the sustainability of the DPP interventions and their long-term effects on diabetes health complications.

THE NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES: MOUSE MODELS TO STUDY DNA REPAIR FOLLOWING ENVIRONMENTAL EXPOSURES

The objective of this NIH supported project is to develop mouse models containing human genes. The mice are used to study the ability of cells to repair DNA damage in response to environmental exposures. DNA repair is a major component in diseases influenced by aging such as cancer.

Lead Agency: The National Institute of Environmental Health Sciences (NIEHS)/National Institutes of Health (NIH).

Agency Mission: The mission of the NIEHS is to reduce the burden of human illness and disability by understanding how the environment influences the development and progression of human disease.

Principal Investigator: Warren C Ladiges, DVM, Professor, Department of Comparative Medicine, T–140 HSB, University of Washington, Box 257190, Seattle, Washington 98195–7190.

Partner Agency: Fred Hutchinson Cancer Research Center.

General Description:

MOUSE MODELS TO STUDY DNA REPAIR FOLLOWING ENVIRONMENTAL EXPOSURES

DNA repair is a major component in diseases influenced by aging such as cancer. The overall objective of this NIH supported project is to develop mouse models for studying the biological function of environmentally sensitive DNA repair/cell cycle control gene variants found in the human population. The capacity for DNA repair is a major influence in the sensitivity to carcinogenic stimuli, so genetic variants must be considered in risk assessment. The concept that common variants in the population contribute to genetic risk for common diseases has triggered intense interest in identifying DNA sequence variants known as single nucleotide polymorphisms (SNPs). However, the functional significance of SNP variants in relation to environmental carcinogens is largely unknown. This study is designed to establish a genetically engineered mouse system as a mammalian model for human functional genomics and SNP variant-environment interactions. The development of these mouse models will mirror specific human, environmentally responsive polymorphic gene variants found in the general population, and provide a biological system for understanding the functional significance of these polymorphic variants.

Excellence: What makes this project exceptional?

Mitochondria are organelles found in most cells that are responsible for chemical energy production. They are involved in a range of processes including cellular signaling, differentiation, cell cycle control, growth, and death. Mitochondria dysfunction has been implicated in several human disorders including neurological dis-

eases, cardiac dysfunction, cancer, diabetes, and may play a role in the aging process.

Results from this research project contradict a widely-believed theory that mitochondrial mutations drive the aging process. In the study, mice with mitochondrial mutations 500 times higher than normal levels did not show signs of premature aging.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As organisms age, some cellular processes are perturbed and don't work as well as they do in younger organisms. Previous research led to the theory that accumulated mitochondrial mutations throughout life eventually cause the decline in tissue functioning associated with aging. However, this research shows that transgenic mice engineered to have a high degree of mitochondrial mutation age the same as normal mice.

Effectiveness: What is the impact and/or application of this research to older persons?

This basic research may have future impacts on the prevention or treatment of diseases in aging populations. It provides knowledge on what is considered normal for cells in aging organisms.

Innovativeness: Why is this research exciting or newsworthy?

This research opens new pathways for discovery in the aging process and questions what was previously accepted as normal. It could be the first step in developing new preventive methods or drugs and interventions that could stop or reverse declines in cellular function as an organism ages.

THE NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES (NIEHS)/NATIONAL INSTITUTES OF HEALTH (NIH): ENVIRONMENTAL EXPOSURES AND DECLINE IN RENAL FUNCTION

The primary focus of this research project is to study the contributions of a variety of environmental agents in the development of end-stage renal disease. The project is being conducted with a cohort of people occupationally exposed to the element lead. The investigators have also found other health affects including declines in mental ability as the cohort ages.

Lead Agency: The National Institute of Environmental Health Sciences (NIEHS)/National Institutes of Health (NIH).

Agency Mission: The mission of the NIEHS is to reduce the burden of human illness and disability by understanding how the environment influences the development and progression of human disease.

Principal Investigators: Virginia M. Weaver, MD, Assistant Professor Environmental Health Science Department, Bloomberg School of Public Health, Johns Hopkins University, 615 N. Wolfe Street, W7041, Baltimore, Maryland 21205.

Partner Agency: Institute of Industrial Medicine Soonchunhyang University, Republic of Korea, Mt. Sinai Medical Center, New York.

General Description: End stage renal disease (ESRD) is associated with substantial morbidity and mortality. Strategies to prevent the renal function decline that can ultimately result in ESRD are essential. The impact of environmental exposures has received relatively little attention in this regard, despite the fact that exposures such as cadmium and lead are known renal toxicants that

are stored long-term in the body and ubiquitous in humans. In fact, the lead and cadmium dose-effect curves for renal function remain uncertain for the low to moderate range of doses. The project will investigate a broad set of causes of renal function decline, including lead, cadmium, blood pressure, diabetes, nephrotoxic medication use, genetic polymorphisms, and age. This research project will build on data, from the large cohort of current and former lead workers and participants without occupational lead exposure in the originally funded grant. Study subjects have a wide range of lead exposure and dose measures and renal outcome data from three visits each over an average of 2.2 years. Analysis of existing data has already provided very important results, including longitudinal decline in renal function associated with lead dose measures; interaction between age and lead dose on renal function and renal function decline; interaction between ALAD genotype and lead dose on renal function; and associations of environmental level cadmium dose with elevated NAG in a subset of lead workers. We believe the proposed work will allow a more complete understanding of the causes of renal function decline and lead to the development of public health interventions to prevent this considerable public health problem.

Excellence: What makes this project exceptional?

Results from this project suggest that the "normal" cognitive decline experienced as people age may be related to recent and lifetime exposure to lead. In three separate independent epidemiologic studies, bone lead content was associated with poorer measures of cognitive function.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Lead exposure is widely known to cause problems in learning in children along with reducing the peak intelligence children can obtain. Lead is readily stored in bone tissue and there are few effective treatments for removing lead from the body once exposure has occurred. It can be released from bone during gestation and milk production and in aging people if osteopenia or osteoporosis develops. The neurological effects of long-term lead exposure on aging populations have not been well described.

Effectiveness: What is the impact and/or application of this research to older persons?

Added to the knowledge that exposure to lead lowers the peak IQ a person reaches, these studies show that lead exposure is a life-long issue. The researchers point out that the current occupational safety standards for lead workers are inadequate to protect them. The researchers believe that blood lead levels in adults should be kept below 20 micrograms per deciliter of blood and tibia lead should be kept below 15 micrograms per gram to prevent cognitive function loss.

Innovativeness: Why is this research exciting or newsworthy?

This research draws into question that cognitive decline as people age is normal and that their life-long exposure to lead may influence their mental abilities later in life. It demonstrates again that there is no safe level of lead exposure at any age and that current efforts to protect adult workers from lead exposure may be inadequate.

THE NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES: SOCIO-ECONOMIC DISADVANTAGES AND RISK FOR POOR HEALTH AND DISABILITY

The study aims are to identify neighborhood conditions that have an adverse affect on health and to examine the stress levels by which living in disadvantaged neighborhoods lead to increased risk for poor health and disability in an older, urban, and ethnically diverse population.

Lead Agency: The National Institute of Environmental Health Sciences (NIEHS)/National Institutes of Health (NIH).

Agency Mission: The mission of the NIEHS is to reduce the burden of human illness and disability by understanding how the environment influences the development and progression of disease.

Principal Investigator: Mendes De Leon, Carlos F., Rush Institute for Health Aging, 1645 W. Jackson Blvd, Suite 675, Chicago, IL 60612.

General Description:

SOCIO-ECONOMIC DISADVANTAGES AND RISK FOR POOR HEALTH AND DISABILITY

These NIEHS-funded researchers will investigate the effect of socio-economic disadvantages and neighborhood conditions on disability in older blacks and whites. The project takes place in a population of persons aged 65 years and over who live in an urban, biracial community in Chicago. The overall aims of this study are to identify the specific nature of neighborhood conditions that have an adverse affect on health and to examine the stress-related physiological mechanisms by which living in disadvantaged neighborhoods lead to increased risk for poor health and disability in an older, urban, and ethnically diverse population. To accomplish this aim, the investigators propose to collect yearly disability data and obtain blood samples and salivary cortisol from over 7,000 participants. These data will be integrated with a rich set of existing data on personal characteristics, health conditions, and neighborhood factors to test a series of specific hypotheses related to the overall goals. Disability is a common and highly prevalent consequence of age-related chronic diseases, and a critical indicator of overall health among older people. Prevention of disability is essential to improve the lives of older people and reduce health care costs. The proposed work will contribute to a better understanding of the specific neighborhood conditions that are associated with increased disability, laying the foundation for more effective policies to prevent disability in future generations of older adults.

Excellence: What makes this project exceptional?

This project is exceptional as it relates to measures of neighborhood environment, social cohesion and neighborhood disorder and the effects upon disability and stress levels. Other associations are being explored more fully such as the association between neighborhood conditions and walking behavior in older adults. In addition the researchers are investigating the role of body weight in aging-related decline in physical and cognitive function as well as racial differences in quality of life. The association between perceived discrimination and mortality are also examined along with ongoing analyses on perceived discrimination and blood pressure,

on neighborhood conditions and psychosocial outcomes, and on SES related differences in mortality and disability.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This research focuses on disability in older adults. Disability is the result of the impact of chronic diseases on a person's ability to perform specific tasks and activities that are essential for self-care and independent living. Because disability forms the common consequence of different, and often co-occurring chronic conditions, it is an essential indicator of overall physical health in older adults. Disability and resulting loss of independence is a condition of enormous consequence for older people. It is highly prevalent; affecting about 10% of persons aged 65–74 to about 50% of those aged 85 and over. It is the primary cause of institutionalization, and accounts for a large amount of the informal and formal health care needs of older adults.

Effectiveness: What is the impact and/or application of this research to older persons?

The existence of major health disparities in the U.S. population is widely accepted, and elimination of these disparities is a primary objective of Healthy People 2010. Disparities are evident across major indicators of health at all stages of life, including conditions that affect infants and children, adult-onset chronic diseases, such as cardiovascular disease, diabetes, and cognitive impairment and Alzheimer's disease, mental disorders, and all cause-mortality. Previous studies indicate that there are substantial socioeconomic and racial disparities in disability. This project will provide a better understanding of how to reduce and ultimately prevent disability in regard to the built environment of older persons that addresses racial disparities and socioeconomic status.

Innovativeness: Why is this research exciting or newsworthy?

This study examines disability in older persons, disparities among whites and blacks, neighborhood factors and health, and socioeconomic differences in health among older adults. Prevention of disability is essential to improve the lives of older people and reduce health care costs. The proposed work will contribute to a better understanding of the specific neighborhood conditions, including differences in socioeconomic status and race, which may directly affect increased disability, laying the foundation for more effective policies to prevent disability in future generations of older adults.

NATIONAL INSTITUTE OF MENTAL HEALTH (NIMH)/NATIONAL INSTITUTES OF HEALTH (NIH): ANTIDEPRESSANT ADMINISTRATION FOR OLDER ADULTS

This study found that people age 70 or older who continued taking the antidepressant that helped them to initially recover from their first episode of depression were 60 percent less likely to experience a new episode of depression than those who stopped taking the medication.

Lead Agency: National Institute of Mental Health (NIMH), National Institutes of Health (NIH).

Agency Mission: The mission of NIMH is to transform the understanding and treatment of mental illnesses through basic and clinical research, paving the way for prevention, recovery, and cure.

Principal Investigators: Dr. Charles Reynolds, Departments of Psychiatry and Neurology, Western Psychiatric Institute and Clinic, 3811 O'Hara Street, Room E–1135, Pittsburgh, PA 15213.

Partner Agency: National Center for Minority Health and Health Disparities (NCMHD).

General Description: There is controversy over the benefits and risks of administering long-term antidepressant treatment to elderly patients who have only one lifetime occurrence of major depression. Currently, the consensus has been that older patients experiencing their first episode of depression should be treated to full remission, after which they should have a limited period of continuation treatment for 6 to 12 months to ensure the stability of the remission and further improve recovery. This clinical trial tested whether maintenance therapy—long-term treatment given to patients to enable them to maintain a symptom-free or disease-free state—is effective in preventing future episodes of depression in patients 70 years or older. It also tested whether antidepressant medication and psychotherapy were effective, and whether the extent of patients' medical burden had an impact on rates of recurrence.

Patients ages 70 or older with depression who achieved full remission of symptoms after treatment using a combination of paroxetine (a selective serotonin reuptake inhibitor) and interpersonal psychotherapy (IPT) (psychotherapy that focuses on interpersonal relationships) were administered maintenance treatment where researchers tested the effectiveness of different treatment regimens in keeping patients symptom-free for up to two years. These patients were randomly assigned to one of four maintenance treatment groups: (1) Paroxetine; (2) placebo; (3) paroxetine and monthly IPT; and (4) placebo and IPT.

The study found maintenance treatment was effective in older people with depression. Across all four treatment groups, rates of remission significantly differed. Among patients who received paroxetine in the maintenance phase, 63 percent remained in remission; 42 percent of those who received placebo remained in remission; 65 percent of patients who received paroxetine and IPT remained in remission; and 32 percent of patients who received placebo and IPT remained in remission.

The study also showed that older people with multiple chronic physical disorders did not do as well on paroxetine as those with fewer medical problems, although they did show some benefit. The burden associated with more chronic and disabling diseases often drives the depression, making it more difficult to treat. Despite this, the researchers indicate that maintenance antidepressant medication may be effective in primary care settings where patients have multiple chronic diseases.

Excellence: What makes this project exceptional?

This study is one of the few that shows the practical benefits of continued treatment for depression in older adults after they become symptom free. The study also helps to establish some clinical guidelines for the long-term treatment of older adults with late life depression. This research adds substantially to our knowledge on how best to treat older adults with late life depression and helps to build practical, clinical utility for the treatment of depression.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This study, which focused on older adults with depression, is part of an overall NIMH effort to conduct practical clinical trials in "real world" settings that address public health issues important to persons affected by major mental illnesses.

Effectiveness: What is the impact and/or application of this research to older persons?

This study demonstrates the benefits of keeping older patients on an antidepressant long after they become symptom-free. What makes this study practical is that it shows that physicians can combine chronic disease management of depression with the chronic disease management of other illnesses to benefit the older individual as a whole—addressing both the patient's mental illness and his or her physical well-being.

Innovativeness: Why is this exciting or newsworthy?

The study addresses a major question in the treatment of depression—when to discontinue medication. People age 70 or older who continued taking the antidepressant that helped them to initially recover from their first episode of depression were 60 percent less likely to experience a new episode of depression than those who stopped taking the medication.

NATIONAL INSTITUTE OF MENTAL HEALTH (NIMH)/NATIONAL INSTITUTES OF HEALTH (NIH): PREVENTIVE TREATMENT TO REDUCE DEPRESSION FOLLOWING A STROKE

NIMH-funded researchers have shown that preventive treatment with an antidepressant medication or talk therapy can significantly reduce the risk or delay the start of depression following an acute stroke.

Lead Agency: National Institute of Mental Health (NIMH), National Institutes of Health (NIH).

Agency Mission: The mission of NIMH is to transform the understanding and treatment of mental illnesses through basic and clinical research, paving the way for prevention, recovery, and cure.

Principal Investigators: Dr. Robert Robinson, Department of Psychiatry, University of Iowa, 200 Hawkins Drive 2887 JPP, Iowa City, IA 52242–1057.

General Description: Over 700,000 people in the United States suffer a stroke every year. Those who suffer an acute stroke are at increased risk for developing post-stroke depression, which can impede rehabilitation and recovery of functional skills, reduce quality of life, and may also shorten an individual's lifespan. Thus, prevention of post-stroke depression is an important goal.

Recent NIMH-funded research has shown that preventive treatment with an antidepressant medication or talk therapy can significantly reduce the risk or delay the start of depression following an acute stroke. The study compared the effects of the antidepressant medication escitalopram (Lexapro) with placebo in adults, ages 50–90, who had suffered an acute stroke within the previous three months. Another group of individuals were randomly selected to receive Problem Solving Therapy (PST), a talk therapy that helps people identify problems that interfere with daily living and contribute to depressive symptoms. PST then helps the individuals develop strategies to solve those problems. People

who received either escitalopram or PST were less likely to develop depression (8.5 percent and 11.9 percent, respectively) than those who received the placebo (22.4 percent).

This is the first study of its kind to show some cases of post-stroke depression can be preempted with early intervention. In addition to the need for further studies, greater attention needs to be given to improving the early detection of and interventions for depression during standard stroke care.

Excellence: What makes this project exceptional?

For the first time, researchers show that preventive treatment with an antidepressant medication or talk therapy can significantly reduce the risk or delay the start of depression following an acute stroke. These findings differ from past studies attempting to prevent post-stroke depression because the researchers included larger numbers of patients, multi-site enrollment to achieve a more varied sample, and a comparison of both psychological and pharmacological intervention.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The chance of having a stroke approximately doubles for each decade of life after age 55, so a large proportion of stroke patients are elderly. In addition, more than half of all stroke patients develop symptoms of depression. Post-stroke depression has been demonstrated in previous studies to impair recovery in activities of daily living and increased mortality. Thus, depression is a common problem in this population and early detection and intervention for depression, including preventive methods, must be considered important components of post-stroke treatment for older adults.

Effectiveness: What is the impact and/or application of this research to older persons?

Post stroke depression can impede rehabilitation and recovery of functional skills, reduce quality of life, and may also shorten a person's lifespan. While further studies are needed, this research has shown that multiple forms of preventive intervention can be effective in reducing depression and its associated problems during standard stroke care in elderly populations. The researchers specifically chose PST over other forms of talk therapy because it was developed for use in elderly people with depression.

Innovativeness: Why is this exciting or newsworthy?

This is the first study of its kind to show that some cases of post-stroke depression can be preempted with early intervention. In addition to pointing the way toward further studies, the research has demonstrated the value of specific clinical methods in improving the early detection of and interventions for depression during standard stroke care.

NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE: WARFARIN ASPIRIN SYMPTOMATIC INTRACRANIAL DISEASE TRIAL

Aspirin was shown to be equally as effective as warfarin at preventing stroke in patients with partial blockage of arteries in the brain and more effective at preventing other major adverse events including hemorrhage and death.

Lead Agency: National Institute of Neurological Disorders and Stroke (NINDS)/National Institutes of Health (NIH).

Agency Mission: The mission of the NINDS is to reduce the burden of neurological disease through research.

Principal Investigator: Marc I. Chimowitz, MB ChB, Department of Neurology, Emory Clinic, 4th Floor, Clinic A Bldg., 1365 Clifton Rd., Atlanta, GA 30322.

General Description:

WARFARIN ASPIRIN SYMPTOMATIC INTRACRANIAL DISEASE TRIAL

Intracranial stenosis, or partial blockage of arteries in the brain resulting in restricted blood flow, has long been considered a risk factor for stroke, causing about 10 percent of stroke cases annually (between 70K and 90K). Reducing stenosis has historically been achieved by treatment with agents that decrease the function of clot forming cells in the blood (e.g., aspirin) or those that inhibit the clotting process (e.g., warfarin); however, until recently, physicians were lacking the evidence necessary to make an informed decision about which treatment was best.

In the Warfarin Aspirin Symptomatic Intracranial Disease (WASID) trial, a double-blind, randomized, multi-center clinical trial sponsored by the NINDS, investigators compared warfarin to aspirin in a total of 569 patients for an average of 1.8 years. All of the participants had a greater than 50 percent blockage of a major artery in the brain, and all had experienced a non-disabling stroke within the 90 days prior to their enrollment in the trial. This trial demonstrated that patients treated with aspirin were equally protected from a secondary stroke compared to those treated with warfarin, but were significantly less likely to experience a major hemorrhage or death, further contributing to the ability of physicians to make informed decisions regarding patient care.

Excellence: What makes this project exceptional?

This study provides new insights and clarity to the ability of clinicians to effectively manage patient care in stroke prevention.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Although ischemic stroke can affect individuals of all ages, the chance of having a stroke nearly doubles every decade after the age of 55, making the identification of safe and effective measures for reducing patient risk an imperative.

Effectiveness: What is the impact and/or application of this research to older persons?

This study suggests clear therapeutic benefits of utilizing aspirin over warfarin as a measure for preventative stroke care. While this treatment strategy may not apply to all patients at risk for stroke, it is clearly advantageous in a subpopulation of patients with a high degree of risk.

Innovativeness: Why is this research exciting or newsworthy?

This study provides unequivocal evidence that a low-cost, relatively safe therapeutic regimen is a preferred measure in stroke prevention. It has been estimated that in addition to reducing the risk of death and the occurrence of other major adverse events in patients with arterial blockage in the brain, that preventative therapy with aspirin could save $20 million dollars annually in health care costs in the United States.

NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE EXTREMITY CONSTRAINT-INDUCED THERAPY EVALUATION TRIAL

The results of the EXCITE trial identify the potential for constraint-induced movement therapy to alter the clinical practice of stroke rehabilitation. By combining constraint and training of the weaker limb, patients experience a clinically meaningful improvement to limb and hand motor function.

Lead Agency: National Institute of Neurological Disorders and Stroke (NINDS)/National Institutes of Health (NIH).

Agency Mission: The mission of the NINDS is to reduce the burden of neurological disease through research.

Principal Investigator: Steven L. Wolf, Ph.D., Center for Rehabilitation Medicine, Emory University School of Medicine, 1441 Clifton Rd. NE, Atlanta, GA 30322.

Partner Agency: National Institute of Child Health and Human Development (NICHD).

General Description:

EXTREMITY CONSTRAINT-INDUCED THERAPY EVALUATION TRIAL

It is estimated that 750,000 Americans suffer a new or recurring stroke each year. Up to 75 percent of surviving stroke patients experience partial paralysis affecting the upper extremity on one side of their body that results in diminished health-related quality of life. Until recently, stroke rehabilitation strategies generally relied on experiential approaches rather than scientifically-validated evidence. NINDS and NICHD supported the EXCITE (Extremity Constraint-Induced Therapy Evaluation) trial, a multisite, randomized study, to determine the effectiveness of a rehabilitation-based intervention in post-stroke care.

Constraint-induced movement therapy, the basis for the EXCITE trial, evolved out of the observation that monkeys with partial paralysis affecting one extremity appear to learn "non use" when their attempts to use the limb immediately after injury are met with failure. Subsequent research suggested that this "non use" could be unlearned by immobilizing or constraining the unaffected arm for a period of two weeks.

Investigators used the principles of these findings to inform the design of the EXCITE trial, which resulted in a treatment of constraint-induced intervention where movement in the less affected arm was restricted for 90 percent of waking hours for a period of 14 consecutive days. With the constraint in place, patients practiced performing functionally-relevant, repetitive tasks with the paralyzed limb for up to six hours each workday. Results from the EXCITE trial indicate that patients treated with constraint-induced movement therapy following stroke experienced a significant degree of clinically-meaningful improvement to their upper limb and hand motor function compared with patients who received alternative forms of customary therapy. As the benefits of constraint-induced therapy were still evident up to 24 months following treatment, it may form the foundation for the future development of evidence-based stroke rehabilitation.

Excellence: What makes this project exceptional?

The EXCITE trial is the first multi-site randomized study to demonstrate the efficacy of a rehabilitative intervention in the

treatment of stroke patients with deficits to their upper extremities. This trial moves neurorehabilitative care into the area of evidence-based medicine.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The risk of stroke nearly doubles each decade over 55, and up to 75 percent of patients that survive a stroke experience functional limitations in the upper extremity, which are associated with diminished health-related quality of life. Developing effective, evidence-based strategies to treat these quality of life deficits is critical to the well-being of the aging population.

Effectiveness: What is the impact and/or application of this research to older persons?

The participants in the EXCITE trial experienced lasting (up to 24 months), clinically-significant improvements in upper-extremity motor function and in real-world arm use. Constraint-induced movement therapy has the potential to significantly benefit stroke patients affected by upper extremity deficits if moved into the clinic.

Innovativeness: Why is this research exciting or newsworthy?

The results of the EXCITE trial will potentially provide clinicians and rehabilitation specialists with the tools necessary to apply evidence-based treatment strategies to patients that experience upper limb paralysis following stroke.

NATIONAL INSTITUTE OF NURSING RESEARCH: ACUTE CORONARY SYNDROME AND TYPE 2 DIABETES

Older patients with type 2 diabetes experience less chest pain during acute coronary syndrome than those without diabetes. This indicates that type 2 diabetics may need additional training in recognizing other symptoms of ACS to reduce their chances of adverse health outcomes.

Lead Agency: National Institute of Nursing Research (NINR)/National Institutes of Health (NIH).

Agency Mission: The mission of NINR is to support research to establish the evidence base for patient care across the lifespan. From premature infants in the neonatal intensive care unit to middle-aged adults with chronic illness and elders at the end of life, NINR-supported research focuses on developing innovative and effective techniques and interventions that prevent disease and disability and improve quality of life and health outcomes for patients and their caregivers.

Principal Investigator: Dr. Holli A. DeVon, College of Nursing, Marquette University, PO Box 1881.

General Description:

ACUTE CORONARY SYNDROME AND TYPE 2 DIABETES

Twenty-two percent of persons with type 2 diabetes have cardiac autonomic neuropathy. Cardiac autonomic neuropathy (CAN) involves damage to autonomic fibers innervating blood vessels and the heart. It is hypothesized that this damage may affect sensory pathways that carry pain messages from the heart to the brain, leading to diminished or absent chest pain (silent myocardial ischemia). The consequences of silent ischemia in diabetic patients are

particularly serious because a lack of symptoms or symptom recognition such as chest pain can lead to delays in seeking medical assistance during acute coronary syndrome (ACS).

This study examined symptoms of ACS in patients with and without diabetes. A convenience sample of 256 patients from two large medical centers in the Midwest participated. An inventory of ACS syndromes, classification of angina, and medical record reviews were used to collect data over a 25-month period. The results indicated that patients with diabetes were nearly half as likely to experience chest pain and more than twice as likely to experience unusual fatigue compared to a patient of the same age and sex without diabetes. Patients with diabetes experienced diminished physical functioning and higher levels of angina and were more than 2 times as likely to experience unusual fatigue during ACS.

Long-standing fatigue resulting from diabetes may present an added risk for patients with diabetes by masking the symptoms associated with ACS. Patients who had diabetes for at least 10 years were more likely to experience difficulty breathing compared to either patients who had diabetes for less than 10 years or patients without diabetes.

The most significant predictors of the absence of chest pain were age and diabetes. Given that the incidence of coronary heart disease increases (CHD) with age, this finding is important as an older person with or without diabetes is 4 percent *less* likely to suffer chest pain as a person with the same diabetes status who is one year younger.

This study demonstrated that patients with type 2 diabetes experience silent myocardial ischemia. Patients with diabetes, therefore, may need to receive training in recognizing other symptoms of ACS to reduce their chances of experiencing adverse health outcomes.

Excellence: What makes this project exceptional?

This study demonstrated that patients with type 2 diabetes experience silent myocardial ischemia. Patients with type 2 diabetes, therefore, may need to receive training in recognizing other symptoms of ACS to reduce their chances of experiencing adverse health outcomes

Significance: How is this research relevant to older persons, populations and/or an aging society?

Heart disease is the foremost public health issue in the United States for both women and men. Age is a significant risk factor for coronary heart disease and diabetes, both underlying factors in heart acute coronary syndromes.

Effectiveness: What is the impact and/or application of this research to older persons?

The most significant predictors of the absence of chest pain were age and type 2 diabetes. Given that the incidence of CHD increases with age, this finding is important as an older person with or without diabetes is 4 percent *less* likely to suffer chest pain as a person with the same diabetes status who is one year younger.

Innovativeness: Why is this research exciting or newsworthy?

Type 2 diabetes and obesity, twin epidemics and major risk factors for heart disease in the elderly, have increased 61 percent and 74 percent respectively in only 10 years. Furthermore, in every year since 1984, more women than men have died from cardio-

vascular disease. By identifying aging and/or symptom differences in acute coronary syndromes and determining if these differences persist after controlling for age, type 2 diabetes, functional status, and mood, may lead to age-specific assessment and treatment tools.

NATIONAL INSTITUTE OF NURSING RESEARCH: DEPRESSIVE SYMPTOMS IN SPOUSAL CAREGIVERS

The researchers utilize a specific type of longitudinal analysis ('Latent Class Trajectory Analysis' or LCTA) in an effort to improve understanding of the changes over time in the depressive symptoms of spousal caregivers of elderly men with dementia.

Lead Agency: National Institute of Nursing Research (NINR)/National Institutes of Health (NIH).

Agency Mission: The mission of NINR is to support research to establish the evidence base for patient care across the lifespan. From premature infants in the neonatal intensive care unit, to middle-aged adults with chronic illness and elders at the end of life, NINR-supported research focuses on developing innovative and effective techniques and interventions that prevent disease and disability, and improve quality of life and health outcomes for patients and their caregivers.

Principal Investigator: Dr. Donald Taylor, Duke University, 112 Rubenstein Hall, Box 90253.

General Description:

DEPRESSIVE SYMPTOMS IN SPOUSAL CAREGIVERS

Approximately 7 million persons in the United States provide informal care to a family member aged 65 or older who is suffering from a long-term debilitating illness or disability. Virtually all of the more than 5 million Americans living with Alzheimer's disease in the community receive such care. Caregiving has been found to be costly and, on balance, impacts caregivers. As the prevalence of caregiving is anticipated to increase to 40 million persons caring for 28 million elderly disabled persons by 2050, development of statistical procedures such as 'Latent Class Trajectory Analysis (LCTA),' provides new techniques to identify the effects of spousal caregiving on caregiver depressive symptoms.

Respondents to the National Longitudinal Caregiver Survey were used to identify data on 1,580 spousal caregivers of veterans with dementia. The mean number of depressive symptoms was measured using the Center for Epidemiologic Studies Depression Scale (CES–D, 20-item scale). Although the overall mean depressive symptoms of wife caregivers (6.2 of 20) was below the minimum value (8 or 9 of 20) associated with clinical depression, approximately one in three caregivers, throughout the study period, had a number of depressive symptoms that were consistent with true clinical depression.

Excellence: What makes this project exceptional?

Although there is a significant body of research on the relationship between caregiver burden and depressive symptoms, little is understood about how these depressive symptoms change over time for the caregiver population as well as for specific subgroups of caregivers. In this study the researchers utilized an innovative statistical analysis method (LCTA) to examine and uncover key trends

in depressive symptoms experienced by spousal caregivers of men with dementia.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As the U.S. population ages and there are fewer younger persons to care for the elderly, spousal caregiving is likely to become more prevalent. More work is needed to determine the need for and feasibility of screening for depressive symptoms in these caregivers.

Effectiveness: What is the impact and/or application of this research to older persons?

Methods such as LCTA may help improve the understanding of caregiver symptoms over time, as well as identify caregivers at risk for depression.

Innovativeness: Why is this research exciting or newsworthy?

Through their use of an innovative statistical method for studying trajectories in longitudinal data ('Latent Class Trajectory Analysis' or LCTA), the researchers have successfully identified important depressive symptom subgroups of spousal caregivers.

OFFICE OF PORTFOLIO ANALYSIS AND STRATEGIC INITIATIVES: PATIENT-REPORTED OUTCOMES MEASUREMENT INFORMATION SYSTEM

Through the Patient-Reported Outcomes Measurement Information System (PROMIS), NIH-supported investigators are developing a short and accurate computer-based questionnaire for patients to report their symptoms and responses to therapies. The answers will more accurately reflect the patient's perspective than previously possible.

Lead Agency: Office of Portfolio Analysis and Strategic Initiatives (OPASI)/Common Fund, NIH Office of the Director.

Agency Mission:

• Strategic planning and implementation of trans-NIH initiatives that seek to transform the way health research is conducted.

• Development and distribution of tools and methodologies to NIH Institutes and Centers for analysis and evaluation of NIH programs.

Principal Investigator: James F. Fries, M.D., Professor, Stanford University, School of Medicine, 1000 Welch Rd, Suite 203, Division of Immunology & Rheumatology, Stanford, CA 94305.

General Description: The NIH Roadmap funds research that has the potential to transform biomedicine. The Patient-Reported Outcomes Measurement Information System (PROMIS) is designed to revolutionize the way patient-reported outcomes are used for clinical research and evaluation of medical practice. PROMIS is improving the precision of patient-reported outcome assessment while reducing the burden on respondents. A problem with many patient-reported assessment approaches is that they are either too broad to capture precise symptoms or too labor intensive for patients to complete. One major goal of PROMIS is to develop measures that can be used for many different conditions so that responses from patients with different conditions can be compared. PROMIS will shorten the assessment that each patient answers by using a computer program to ask only questions most relevant to the previous response of the patient.

The project led by NIH-supported investigators is defining the measures to be used to assess physical function, pain, and cognitive

functioning, three critical concerns of seniors. These investigators will contribute their work on two of these measures, physical functioning and pain, to a larger project that includes teams working on other aspects of outcomes measures to generate the full PROMIS assessment tool. Because PROMIS will be used for many conditions, NIH-supported investigators have assessed many previously used measures for their ability to give insights into different conditions. They have tested their new collection of measures and are now developing a computer-based tool to select from those measures the ones that are relevant to the patient answering the questionnaire. The outcome from this work will be a computer-based questionnaire that adapts to the condition of the patients to obtain the most useful information without burdening the patient with unnecessary questions.

Excellence: What makes this project exceptional?

The PROMIS initiative funds six groups of investigators to work together to develop a new, scientifically rigorous and validated method of measuring patient-reported outcomes. Each group will work in its area of expertise to contribute to the main goal. The work by 2 of the NIH-supported investigators focuses on two areas of deep concern to elders: pain and physical function. These investigators are experts in the assessment of measures of arthritis, making their contribution to the PROMIS especially relevant to seniors. Incorporated into the PROMIS assessment tool, measures in pain and physical function will allow precise measurement of these critical aspects of senior health.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Physical function, pain and cognitive functioning are very important for older people, yet historically difficult to measure.

Effectiveness: What is the impact and/or application of this research to older persons?

PROMIS will allow health care professionals to more accurately assess the conditions of older persons and to develop strategies to improve their lives while reducing the burden on patients to report their outcomes.

Innovativeness: Why is this research exciting or newsworthy?

Patient-reported assessment approaches are either too broad to capture precise symptoms or too labor intensive for patients to complete. Moreover, it is difficult to compare results between different assessment tools. PROMIS is expected to profoundly improve clinical research by making more accurate diagnoses of patient conditions and response to therapies while reducing the burden on respondents. PROMIS has the potential to revolutionize the way patient-reported outcomes are used for clinical research and evaluation of medical practice.

NATIONAL HUMAN GENOME RESEARCH INSTITUTE (NHGRI)/NATIONAL INSTITUTES OF HEALTH (NIH) RISK EVALUATION AND EDUCATION FOR ALZHEIMER'S DISEASE (REVEAL) STUDY

The Risk Evaluation and Education for Alzheimer's Disease (REVEAL) study is a clinical trial funded by the National Human Genome Research Institute (NHGRI) and the National Institute on Aging (NIA). The goal of REVEAL is to provide healthy adults with genetic susceptibility testing and information about their chances of

developing Alzheimer's disease. Participants in REVEAL were prescreened for psychological problems and early signs of Alzheimer's disease.

Lead Agency: National Human Genome Research Institute (NHGRI)/National Institutes of Health (NIH).

Agency Mission: The National Human Genome Research Institute (NHGRI) led the National Institutes of Health's (NIH) contribution to the International Human Genome Project, which had as its primary goal the sequencing of the human genome. This project was successfully completed in April 2003. Now, the NHGRI's mission has expanded to encompass a broad range of studies aimed at understanding the structure and function of the human genome and its role in health and disease.

To that end NHGRI supports the development of resources and technology that will accelerate genome research and its application to human health. A critical part of the NHGRI mission continues to be the study of the ethical, legal and social implications (ELSI) of genome research. NHGRI also supports the training of investigators and the dissemination of genome information to the public and to health professionals.

Principal Investigator: Green, Robert C., Professor, Boston University Medical Campus, 715 Albany Street, M–921, Boston, MA 02118–2394.

Partner Agency: Boston University, Cornell University, Case Western University, Howard University.

General Description:

RISK EVALUATION AND EDUCATION FOR ALZHEIMER'S DISEASE (REVEAL) STUDY

Genes and other biological markers are rapidly being identified that can provide presymptomatic estimates of risk for the eventual development of late-onset diseases. There is widespread public interest in obtaining risk information, particularly as treatments are developed to slow or prevent the onset of degenerative diseases. Many of the recently discovered gene markers are not deterministic genes, but rather susceptibility genes that interact with other, as yet unidentified genes, and with factors such as age, gender, race, family history and environmental exposures. Therefore genotyping individuals for susceptibility genes will require different protocols for providing risk assessment and counseling than those that have been used with deterministic genes. With few restrictions on the marketing and utilization of such tests, their usage may soon increase. Yet, there are almost no data available to understand who (e.g. age, gender, race) would seek susceptibility risk information once it is available; and why they would do so (e.g. to alleviate anxiety, to prepare financially). Nor is there information on the benefits or negative consequences of providing susceptibility risk information that could guide rational clinical decisions or public policy.

In its first finding period, the REVEAL (Risk Evaluation and Education for Alzheimer's Disease) Study created original educational and counseling protocols, and enrolled over 150 adult children of patients with Alzheimer's disease (AD) into a randomized clinical trial to examine (1) the characteristics of those persons who sought risk assessment with genetic susceptibility testing, including APOE genotype disclosure, and (2) the impact of this disclo-

sure. The next funding period of the Study (REVEAL II) will include siblings of patients with AD in the study, and will randomize adult children or siblings to the current Extended Protocol or to a new Condensed Protocol that will more closely monitor clinical interactions that could be implemented on a large scale. It will also explore how the impact of genetic susceptibility testing with APOE disclosure varies between younger and older relatives, and between relatives of African American and European American patients with AD. REVEAL II will take place at four clinical centers of care (Boston University, Cornell University, Case Western University and Howard University). Risk assessment using genetic susceptibility testing with APOE genotyping and disclosure, because of its inherent uncertainties, is an ideal model to develop new guidelines for whether and how best to use susceptibility gene markers in this and other diseases where such markers are, or will be, available in the near future.

Excellence: What makes this project exceptional?

REVEAL is the first multi-center trial designed to evaluate the impact of Alzheimer's genetic risk testing on healthy adults. Previously there was no data on this important issue.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Alzheimer's, the most common form of dementia, is most common in those over 65 with an estimated 26 million people afflicted worldwide, and is expected to increase.

Effectiveness: What is the impact and/or application of this research to older persons?

It was crucial to gauge the public's reaction to genetic information on Alzheimer's. Understanding the reactions can help healthcare professionals better inform their senior patients and encourage healthy behaviors.

Innovativeness: Why is this research exciting or newsworthy?

REVEAL found that disclosing APOE status and its association with Alzheimer's risk to participants did not result in a significant increase in distress or depression. In fact, participants who discovered they had the high risk APOE e4 allele proved more likely to be proactive in changing their lifestyles and planning for long term care.

NATIONAL INSTITUTE ON AGING: SOCIAL NETWORKS INFLUENCE SMOKING BEHAVIOR AND OBESITY

NIH-supported researchers demonstrated that an individual's social network can have a strong influence on his or her behavior change. Changes in smoking behavior and obesity spread quickly through networks of people defined by adult respondents as close friends. These network influences proved much stronger than previously suspected and stronger even than those of spouses, siblings, co-workers, and neighbors.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.

• Foster the development of research and clinician scientists in aging.

• Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Nicholas A. Christakis, PhD, Harvard Medical School, 180 Longwood Avenue, Boston, MA 02115.

General Description:

SOCIAL NETWORKS INFLUENCE SMOKING BEHAVIOR AND OBESITY

NIH-supported investigators conducted analyses on a densely interconnected social network of 12,067 people assessed longitudinally from 1971 to 2003 as part of the Framingham Heart Study. Researchers conducted two projects to examine the influence of social networks on individual behavior, one related to obesity and the other to smoking. The results of both studies demonstrated that social networks are important in behavior change and decision making—with effects beyond those between spouses, siblings, and neighbors. The first study demonstrated that obesity "spreads" in social networks in measurable ways and is related to the nature of the social tie. Findings showed that the chance of becoming obese over time increased by 171 percent for an individual who had a friend of the same sex who became obese. Among pairs of adult siblings, if one sibling became obese the chance that the other would become obese increased by 40 percent. Similarly, among married couples, if one spouse became obese, the likelihood that the other spouse would become obese increased by 37 percent. A "neighbor" becoming obese had no effect on an individual's change in weight.

The second study by the same NIH-supported investigators analyzed changes in smoking behavior and found that smokers quit in groups and not in isolation and that those who continued to smoke formed clusters that shifted their social connections over time to those who also smoked. For example, when a spouse quit, it decreased the chance of his or her spouse smoking by 67 percent. When a sibling quit, it reduced the chance of smoking by 25 percent among his or her brothers and sisters. In the work setting, size of the organization was a factor. In small firms, a co-worker quitting could decrease smoking among peers by 34 percent, but in larger firms, the influence was insignificant. The findings indicate that the closeness of the relationship in the network, regardless of geographic location, was key to spreading behaviors.

UNDERSTANDING, PREVENTING, DIAGNOSING, AND TREATING ALZHEIMER'S DISEASE: A MULTIDIMENSIONAL ALZHEIMER'S DISEASE BRAIN ATLAS

This project developed a digital atlas of Alzheimer's disease using a framework to correlate disease observations from diverse images in a single probabilistic brain model. The research led to landmark papers and novel methods to characterize and track Alzheimer's disease that are used at imaging centers nationally and overseas.

Lead Agency: National Library of Medicine (NLM), National Institutes of Health (NIH).

Agency Mission: The mission of NLM is to acquire, organize, disseminate, and preserve the biomedical knowledge of the world for

the benefit of the public health. Toward this mission, NLM offers extramural grants for research in biomedical informatics and information sciences, bioinformatics and public health informatics, and supports informatics research training at twenty universities.

Principal Investigator: Arthur W. Toga, Professor, Laboratory of Neuro Imaging, Department of Neurology, UCLA School of Medicine, 635 Charles E. Young Drive South, Suite 225, Los Angeles, CA 90095–7334.

Partner Agencies: National Institute on Aging (NIA), National Institutes of Health (NIH).

General Description: This project created an atlas of Alzheimer's disease by developing a framework to correlate disease-specific observations from different types of images (such as MRI scans, PET scans, and frozen sections of brain tissue) into a probabilistic brain model presented as a digital atlas. The developed tool set and product are applicable not only to the basic and clinical science of Alzheimer's disease, but to the general problem of mapping the structure and function of any dynamic process in health or disease in whole populations of subjects. This work led to hundreds of publications on new measures to track Alzheimer's disease progression and novel methods for creating digital image atlases. The work combines data from post mortem tissue with images from the various modalities to create a probabilistic model of the brain that provides which regions are most likely to be affected by Alzheimer's. This in turn allows a scientist to compare new images to the atlas and assess the probability that what they are comparing has the disease. The project also developed 4D visualization tools that incorporate spatial and temporal data into profiling how the brain regions degenerate with Alzheimers. The researchers published landmark papers, now very highly cited, in 3 areas: (1) The first time lapse maps of the trajectory of Alzheimer's disease in the living brain; (2) the first reports tracking the spread of plaque and tangle pathology in the living brain; and (3) registration and analysis of unique brain tissue scans of Alzheimer's disease, which they incorporated into the probabilistic brain atlas. This body of work is now widely cited in the Alzheimer's field. Their methods for tracking Alzheimer's disease are now used at imaging centers nationally and overseas.

Excellence: What makes this project exceptional?

In developing a brain atlas of Alzheimer's disease, the researchers developed the first time lapse maps of the trajectory of Alzheimer's disease in the living brain; published the first reports tracking the spread of plaque and tangle pathology in the living brain; and perfected methods of registration and analysis of unique brain tissue scans into a probabilistic brain model. Their methods for tracking Alzheimer's disease are now used at imaging centers nationally and overseas.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Alzheimer's disease looms as the greatest threat to public health in the first half of the 21st century. Dementia doubles in frequency every five years after age 60, afflicting 1 percent of those aged 60–64 but rising to 30–40 percent of those 85 years or older. The marked growth in the elderly population and the dramatic rise in the frequency of dementia are warnings of an approaching socio-

economic disaster with no cure. The annual cost (direct and indirect) of Alzheimer's disease in the United States alone is over $113 billion.

Effectiveness: What is the impact and/or application of this research to older persons?

This tool set and product are highly applicable to the basic and clinical science of Alzheimer's disease, which remains a significant public health threat for older persons. Future large-scale studies of neuroanatomy in Alzheimer's disease will greatly benefit from this new atlas-based framework for analysis. The time savings for an automated assessment of multiple brain regions over manual brain region delineation methods are enormous.

Innovativeness: Why is this research exciting or newsworthy?

The manual generation of brain region information for the 20 datasets used to construct the probabilistic atlas took over 3000 man-hours to generate. Using the tools and techniques developed in this project, a researcher now needs roughly 15 hours of processing time and 1 hour of visualization of registration accuracy to achieve similar results. Thus, this automated assessment allows a profound time savings. The computational atlas imaging tool accommodates growth in its population data. The population distribution data is made available to the users of this assessment method contingent upon their sharing of their data with other users, which is now the goal of the Alzheimer's Disease Neuroimaging Initiative (ADNI). Through open sharing of similar assessment tools and longitudinal populations, researchers achieve sufficient statistical power to evaluate individual patients against the population. Studies using the ADNI database are now testing the predictive power of this and other assessment tools in identifying incipient Alzheimer's disease within the elderly population.

UNDERSTANDING, PREVENTING, DIAGNOSING, AND TREATING ALZHEIMER'S DISEASE: ALZHEIMER'S DISEASE NEUROIMAGING INITIATIVE (ADNI)

Neuroimaging Initiative is a major public-private partnership to determine whether sophisticated imaging technologies, other biological markers, and other assessments can improve our understanding of the progression of mild cognitive impairment and Alzheimer's disease and in turn facilitate the efficiency of clinical trials.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Michael W. Weiner, M.D., MRS Unit, 114M, VA Medical Center, 4150 Clement St., San Francisco, CA 94121.

Partner Agencies: National Institute of Biomedical Imaging and Bioengineering (NIBIB), Food and Drug Administration, Foundation for the National Institutes of Health, Pfizer Inc., Wyeth Research, Eli Lilly and Company, Merck & Co. Inc., GlaxoSmithKline, AstraZeneca AB, Novartis Pharmaceuticals Corporation, Eisai Global Clinical Development, Elan Corporation plc, Institute for the Study of Aging (ISOA), Alzheimer's Association.

General Description:

ALZHEIMER'S DISEASE NEUROIMAGING INITIATIVE (ADNI)

In October 2004, the National Institute on Aging, in conjunction with several other federal agencies, private companies, and organizations, launched the Alzheimer's Disease Neuroimaging Initiative (ADNI) to test whether serial magnetic resonance imaging (MRI), positron emission tomography (PET), other biological markers, and clinical and neuropsychological assessment can be combined to measure with greater sensitivity the progression of mild cognitive impairment (MCI) and early Alzheimer's disease (AD). The study could help researchers and clinicians develop new treatments and monitor their effectiveness as well as lessen the time and cost of clinical trials. The project is the most comprehensive effort to date to find neuroimaging and other biomarkers for the cognitive changes associated with MCI and AD. The study, which is taking place at 57 sites across the United States and Canada, began recruitment in April 2005. Approximately 800 individuals ages 55 to 90 are participating over the five years of the study.

Nearly three years into the study, ADNI continues to be a major venue for facilitating neuroimaging research relevant to AD. Early results from ADNI show that, in addition to aiding early diagnosis, researchers may be able to reduce the time and expense associated with clinical trials by improving methods and developing uniform standards for imaging and biomarker analysis. For example, one ADNI study found that a standard physical model can be used successfully to monitor performance of MRI scanners at many different clinical sites. This will help ensure accuracy of the MRI images produced from ADNI volunteers. Investigators on another ADNI study compared changes over time in PET scans of brain glucose metabolism in people with normal cognition, mild cognitive impairment, and AD and found that scans correlated with symptoms of each condition and that images from different clinical locations were consistent across sites, suggesting the validity of PET scans for use in future clinical trials.

An important achievement of ADNI is the creation of a publicly accessible database available to qualified researchers worldwide. The database contains thousands of MRI and PET scan brain images and clinical data and will include biomarker data obtained through blood and cerebrospinal fluid analyses. ADNI includes samples and brain scans from 200 people with Alzheimer's, 400 people with mild cognitive impairment, and 200 healthy people. All volunteers are between ages 55 and 90. Confidentiality of the participants is rigorously protected. To date, over 200 researchers have signed up for database access.

Excellence: What makes this project exceptional?

This five-year study is the most comprehensive to date to identify brain and other changes associated with cognitive decline in mild

cognitive impairment and Alzheimer's disease. In addition, the Alzheimer's Disease Neuroimaging Initiative is the largest public-private partnership on brain research at NIH and represents an innovative model for other such efforts in the sciences.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As many as 4.5 million Americans currently suffer from AD. Many more suffer from MCI, a precursor condition. Results from the Alzheimer's Disease Neuroimaging Initiative could help researchers and clinicians develop new treatments and monitor their effectiveness as well as decrease the time and cost of clinical trials.

Effectiveness: What is the impact and/or application of this research to older persons?

Early work through the Alzheimer's Disease Neuroimaging Initiative has addressed the "nuts-and-bolts" of clinical imaging research technologies that have the potential to improve methods and decrease time and expense related to clinical trials. Final results are not yet available from the ongoing ADNI clinical study, but we anticipate that the results will have a tremendous impact on our understanding of AD and the best ways to monitor and treat it.

Innovativeness: Why is this research exciting or newsworthy?

The Alzheimer's Disease Neuroimaging Initiative is the largest, most comprehensive study to date to identify brain and other changes associated with cognitive decline in MCI and AD. The study has already begun to identify ways to reduce the time and expense associated with clinical trials and is expected to provide a wealth of information about cognitive impairment and AD.

UNDERSTANDING, PREVENTING, DIAGNOSING, AND TREATING ALZHEIMER'S DISEASE: DELAYING PROGRESSION FROM MILD COGNITIVE IMPAIRMENT TO ALZHEIMER'S IN A CLINICAL TRIAL

Among people with mild cognitive impairment, an NIH-supported study of donepezil therapy was associated with a lower rate of progression to Alzheimer's disease during the first year of treatment, although the apparent benefit disappeared after the first year.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Ronald C. Petersen, Ph.D., M.D., Alzheimer's Disease Research Center, Mayo Clinic College of Medicine, 200 First St., SW., Rochester, MN 55905.

Partner Agencies: Pfizer, Inc., Esai, Inc.

General Description:

DELAYING PROGRESSION FROM MILD COGNITIVE IMPAIRMENT TO ALZHEIMER'S IN A CLINICAL TRIAL

Amnestic mild cognitive impairment (MCI), characterized by memory problems not severe enough to be classified as dementia, is considered to be a transitional state that occurs between the cognitive changes of normal aging and the very early stages of Alzheimer's disease (AD). Previous studies have shown that approximately 8 in 10 people who meet criteria for MCI progress to AD within 6 years of diagnosis and that people with the apolipoprotein E–ε4 (APOE–ε4) gene, the only known genetic risk factor for late-onset AD, progress to AD more rapidly.

The first NIH secondary AD prevention trial, comparing the effects of vitamin E and donepezil (Aricept®) in preventing AD in people diagnosed with amnestic MCI, was conducted at 69 sites across the United States and Canada. The investigators found that individuals who took donepezil were at reduced risk of progressing to a diagnosis of AD during the first year of the trial, but by the end of the three-year study there was no benefit from the drug. Vitamin E was found to have no effect on AD risk when compared with placebo. As part of the trial, the researchers examined the effect of donepezil and vitamin E on delaying diagnosis of AD among a subset of people with APOE–ε4. While the overall rate of progression to AD was greater in this group, use of donepezil in the APOE–ε4 subset was beneficial for up to three years in reducing the risk of an AD diagnosis.

These findings are the first to suggest that an agent can delay the clinical diagnosis of AD in people with MCI. However, because too little is known about the effects of taking donepezil so early in the disease course on subsequent progression, the results, although promising, do not support a recommendation for the generalized use of donepezil to forestall the diagnosis of AD in people with MCI. Further studies are needed of donepezil and other therapies that may benefit patients at risk of developing AD.

Excellence: What makes this project exceptional?

This is the first study to demonstrate a benefit for any chemopreventive agent in the treatment of AD.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As many as 4.5 million Americans ages 65 or over suffer from Alzheimer's disease (AD) and many more have mild cognitive impairment (MCI), AD's precursor condition. Approximately 80 percent of those who meet the criteria for amnestic mild cognitive impairment will have Alzheimer's disease within six years, and the presence of one or more apolipoprotein (APOE) ε4 alleles is associated with a more rapid rate of progression. Therefore, the ability to prevent or delay the development of AD among people with MCI is of tremendous public health importance.

Effectiveness: What is the impact and/or application of this research to older persons?

Although too little is known at present about donepezil's long-term effects to support a recommendation for its routine use to forestall the diagnosis of AD in people with mild cognitive impairment, these findings suggest that chemoprevention of AD is pos-

sible and provide hope that future clinical studies will lead to the development of effective drug interventions.

Innovativeness: Why is this research exciting or newsworthy?

These findings are the first to suggest that an agent such as donepezil can delay a diagnosis of AD among people with MCI, and they indicate that chemoprevention of AD is possible.

UNDERSTANDING, PREVENTING, DIAGNOSING, AND TREATING ALZHEIMER'S DISEASE: TWO ADDITIONAL LATE-ONSET ALZHEIMER'S DISEASE RISK FACTOR GENES IDENTIFIED

Two new risk factor genes, SORL1 and GAB2, for late-onset Alzheimer's disease have been discovered. Their discovery was made possible through the use of new technology, large databases, and collaboration involving scientists around the world.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator:

SORL1

Richard Mayeux, MD, MSc., Gertrude H. Sergievsky Center, Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York, NY 10032.

GAB2

Eric M. Reiman.

Partner Agencies: National Human Genome Research Institute.

GAB2

Kronos Life Sciences Laboratories.

SORL1

Alzheimer Association, Blanchett Hooker Rockefeller Foundation, Charles S. Robertson Gift from the Banbury Fund, Canadian Institutes of Health Research, Howard Hughes Medical Institute, Canadian Institutes of Health Research, Japan Science and Technology Trust, Alzheimer Society of Ontario, Canada Foundation for Innovation, Ontario Research and Development Challenge Fund, Ontario Mental Health Foundation; Genome Canada, Alzheimer Society of Canada, Fonds de la Recherche en Santé Assessorato Regionale alla Sanità-Regione Calabria, Finalized Project of the Ministry of Health (2003–2005), Fondation pour la Recherche Médical, Robert and Clarice Smith, Abigail Van Buren, Alzheimer Disease Research Program, W. Garfield Weston Fellowship.

General Description:

TWO ADDITIONAL LATE-ONSET ALZHEIMER'S DISEASE RISK FACTOR GENES IDENTIFIED

The etiology of Alzheimer's disease (AD) is complex, likely involving both genetic and environmental components. Until recently, only one gene, APOE–ε4, had been linked with late-onset AD, the more common form of the disease. In the past year, multinational research teams using state-of-the-art genome-wide association study (GWAS) technology, which involves rapidly scanning for markers across the complete set of DNA of many people to find genetic variations related to a particular disease, have identified two new genes that may influence risk of late-onset AD, the more common form of the disease.

SORL1: Researchers found evidence suggesting that faulty versions of the SORL1 gene contribute to formation of amyloid plaques, a hallmark sign of Alzheimer's in the brains of people with the disease. They identified 29 variants that mark relatively short segments of DNA where disease-causing changes could lie. The study did not, however, identify specific genetic changes that result in Alzheimer's.

GAB2: Investigators found that the GAB2 gene modifies late onset AD risk in APOE–ε4 carriers and influences AD neuropathology.

Excellence: What makes this project exceptional?

A particularly compelling aspect of these findings is the use of publicly available data from a genome-wide association study to confirm the identification of a risk factor gene. These findings demonstrate the tremendous benefit of highly collaborative interaction, sample sharing, and rapid analysis which greatly increase the likelihood of finding new risk factor genes more quickly and inexpensively.

Significance: How is this research relevant to older persons, populations and/or an aging society?

As many as 4.5 million Americans currently have Alzheimer's disease. A better understanding of its underlying causes may ultimately lead to preventive interventions.

Effectiveness: What is the impact and/or application of this research to older persons?

Further research is needed to determine the specific mutations and pathways through which genes for late-onset AD influence risk.

Innovativeness: Why is this research exciting or newsworthy?

Previously, only one gene for late-onset AD had been identified. These discoveries provide new clues as to AD's pathogenesis.

UNDERSTANDING THE BIOLOGICAL PROCESSES OF AGING: QUANTITATIVE STUDIES OF PROTEIN AGGREGATION AND AGING

The NIH Director's Pioneer Award Program is intended to support creative, innovative investigators who bring their ideas to bear on significant research challenges. The Ismagilov project is a multidisciplinary research program that aims to develop, validate, and disseminate microfluidic technologies for quantitative studies of protein aggregation and aging.

Lead Agency: Office of Portfolio Analysis and Strategic Initiatives (OPASI)/Common Fund, NIH Office of the Director.

Agency Mission:

- Strategic planning and implementation of trans-NIH initiatives that seek to transform the way health research is conducted
- Development and distribution of tools and methodologies to NIH Institutes and Centers for analysis and evaluation of NIH programs

Principal Investigator: Rustem F. Ismagilov, Ph.D., University of Chicago, Dept of Chemistry, 929 E. 57th Street GCIS E 305, Chicago, IL 60637.

Partner Agencies: All NIH Institutes and Centers participate in the planning and implementation of NIH Common Fund/Roadmap Programs. The NIGMS plays a lead role in implementing the NIH Director's Pioneer Awards. The Ismagilov Pioneer Award is jointly funded by the Common Fund and the NIA.

General Description: The NIH Director's Pioneer Award Program is intended to support creative, innovative investigators who bring their ideas to bear on significant research challenges. The program includes multiple awards focused on problems of aging; the Ismagilov project is an example. This is a multi-disciplinary research program that aims to develop, validate, and disseminate microfluidic technologies for quantitative studies of protein aggregation and aging. Protein aggregation is associated with aging and with a number of human diseases that affect both quality and duration of life. Many fundamental aspects of protein aggregation remain elusive, including connections between protein aggregation and toxicity, and the connection between protein aggregation and initiation and progression of diseases. Microfluidic platforms will be developed to understand these complex processes from both bottom-up and top-down perspectives. Bottom-up, new droplet-based microfluidic systems will be developed to characterize quantitatively the connection between protein aggregation and toxicity *in vitro*.

This system will allow the reproducible real-time generation, manipulation, and characterization of aggregates for *in vitro* and *in vivo* toxicity screens. Multidimensional statistical analysis of toxicity patterns obtained in these devices may elucidate the connection between protein aggregation and toxicity, clarify the mechanism of action of existing drug candidates that target aggregation, and accelerate development of new drugs and drug cocktails. Top-down, microfluidic technologies will be developed to induce and monitor aggregation *in vivo* with high spatiotemporal resolution, and to observe the effects of aging, physiological state, neuronal activity, and presence of drug candidates on the initiation and progression of protein aggregation diseases. These two technologies will be used together to understand protein aggregation and aging, and may lead to new hypothesis and molecules for controlling these processes.

Excellence: What makes this project exceptional?

The NIH Director's Pioneer Award Program is a highly competitive program that seeks the most creative, innovative investigators through a combined process of written application and interviews. The combination of excellence, innovation, and creativity on the part of the investigator and significance on the part of the research project determine success in the competition. Dr. Ismagilov was

chosen as a Pioneer Awardee because of his history of innovation and the fundamental challenges of studying mechanisms of protein aggregation associated with aging.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The approaches Dr. Ismagilov has proposed offer the potential for fundamentally new ways of understanding how protein aggregation occurs during aging, how it exerts its pathological effects, and how it may be reversed. Microfluidic technologies will be developed to induce and monitor aggregation *in vivo* with high spatiotemporal resolution, and to observe the effects of aging, physiological state, neuronal activity, and presence of drug candidates on the initiation and progression of protein aggregation diseases.

Effectiveness: What is the impact and/or application of this research to older persons?

These technologies will be used to understand protein aggregation and aging, and may lead to new hypothesis and molecules for controlling these processes.

Innovativeness: Why is this research exciting or newsworthy?

Dr. Ismagilov combines elements of chemistry, physics, engineering, and biology to understand the protein aggregation and misfolding that occurs during aging and which underlies the pathology of diseases such as Alzheimer's Disease and Parkinson's Disease. The application of engineering and physical sciences to the understanding of the aging process and the ability to use the new technologies to be developed as an early indicator of therapeutic efficacy represents a pioneering approach with potential for very high payoff.

UNDERSTANDING THE SOCIAL AND BEHAVIORAL PROCESSES OF AGING: NATIVE ELDER RESEARCH CENTER/RESOURCE CENTERS FOR MINORITY AGING RESEARCH (RCMAR)

The Native Elder Research Center (NERC) is focused on increasing capacity, improving networks, and expanding active partnerships among Native American and Alaska-Native researcher focused on studying issues pertinent to Native elder health.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Spero Manson, Ph.D., American Indian & Native Alaskan Programs, Nighthorse Campbell Native Health Building, Mail Stop F800, P.O. Box 6508, Aurora, CO 80045.

Partner Agencies: National Center for Minority Health and Health Disparities (NCMHD).

General Description: This Resource Center for Minority Aging Research (RCMAR) is coordinated through the University of Colo-

rado and has the following programmatic aims: (1) To enhance the administrative structure, supported by a large, comprehensive array of relevant AI/AN programs, required to direct and coordinate a culturally relevant, scientifically meritorious effort of this nature; (2) to expand active partnerships with AI/AN communities that insure continuous access to and involvement of Native elders, their families, and local systems of care in the aging research process; (3) to expand an extensive network of collaborative links to identify, recruit, and to promote a cadre of AI/AN investigators willing to commit themselves to developing their potential as scientists specializing in aging research; (4) to improve a carefully crafted set of mechanisms, informed by nearly two decades of experience, to equip AI/AN investigators for successful research careers at the interface of aging, health, and culture; (5) to enlarge an existing group of investigators to include even more diverse disciplinary expertise of an exceptionally qualified nature that can address a broad range of high-priority questions related to the aging of Native elders, and (6) to promote a program of research that holds promise for reducing the differentials in health status and care which now plague this special population.

Excellence: What makes this project exceptional?

This is one of the few sustained projects in Indian County that focuses upon training native investigators for careers in research on AI/AN older populations. They have been extremely successful in attracting and keeping outstanding native investigators.

Significance: How is this research relevant to older persons, populations and/or an aging society?

In comparison to their counterparts in the general population, Native elders are at greater risk for numerous acute as well as chronic illnesses, suffer more frequent comorbidities, have less access to high quality and needed services, and are slower to seek care which often leads to more serious and complicated presentations. the NERC RCMAR has contributed significantly to closing these gaps and to increasing the participation of Native people in related research.

Innovativeness: Why is this research exciting or newsworthy?

Several significant findings have been published in peer-reviewed journals.

UNDERSTANDING THE SOCIAL AND BEHAVIORAL PROCESSES OF AGING: EXPLORING THE MISTREATMENT OF NATIVE ELDERS

Exploring the Mistreatment of Native Elders is a project focused on exploring the issues of mistreatment among rural and urban Native elders in order to evaluate measurement methodologies and develop recommendations for future research.

Lead Agency: National Institute on Aging (NIA)/National Institutes of Health (NIH).

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.

• Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigator: Lori Jervis, Ph.D., Department of Psychiatry, University of Colorado Health Sciences Center, MS F800, P.O. Box 6508, Nighthorse Campbell-NH Building, Denver, CO 80045–0508.

General Description: Little is known about the prevalence/incidence of elder mistreatment in any U.S. population, let alone American Indian/Alaska Natives (AI/ANs). The few available studies on elder mistreatment among this group suggest that the phenomenon is likely common, but rigorous studies on its prevalence/incidence are sorely needed. Further, there is a dearth of knowledge about cultural understandings of elder mistreatment in AI/AN.

Excellence: What makes this project exceptional?

Although this is the first year of the two year grant, Dr. Jervis is undertaking a project with generic implications for measuring elder mistreatment in any diverse population group. Further, she has been highly successful in gaining access to a typically difficult to reach population group.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The three specific aims of this project are: (1) To explore the feasibility of conducting a study of the prevalence/incidence of mistreatment among rural and urban Native elders, and to identify measurement approaches that can be employed; (2) to conduct a pilot study of the prevalence/incidence of mistreatment among Native elders in order to evaluate the usefulness and effectiveness of several methods of measuring mistreatment in this population; and (3) to use the information generated by the project to develop recommendations for future research that estimates the prevalence/incidence of elder mistreatment in AI/AN and other minority and diverse communities. The collaboration between researchers and Community Experts will ensure that scientific approaches to conducting a prevalence/incidence study of Native elder mistreatment will be grounded in local realities.

Effectiveness: What is the impact and/or application of this research to older persons?

By understanding the extent of elder mistreatment among AI/ANs, we may gain insights into interventions to prevent these events.

Innovativeness: Why is this research exciting or newsworthy?

There is a dearth of knowledge about cultural understandings of elder mistreatment in AI/AN or other minority communities. Since what constitutes mistreatment is culturally defined, this lack of knowledge likely hinders researchers' ability to detect and evaluate mistreatment.

NATIONAL CANCER INSTITUTE: CANCER AND AGING PLANNING GRANTS

The goal of this program is to expand the capacity of the NCI-designated Cancer Centers to carry out research that concentrates on aging and age-related aspects of human cancer through support of new investigators, pilot projects, and shared resources focused on

aging and cancer. Grantees are expected to develop a formal research program that would become a stable component of the cancer center dedicated to collaborative research in aging and cancer and translation of findings into the clinical and population settings.

Lead Agency: National Cancer Institute/National Institutes of Health.

Agency Mission: The National Cancer Institute coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients.

Principal Investigator: Linda K. Weiss, Ph.D., Chief, Cancer Centers Branch, Office of the Director, National Cancer Institute, Suite 700, 6116 Executive Boulevard, Bethesda, MD 20892.

Partner Agency: National Institute on Aging/National Institutes of Health.

General Description:

PLANNING AND DEVELOPMENT (P20) GRANTS INTEGRATING AGING AND CANCER RESEARCH IN NVI-DESIGNATED CANCER CENTERS

The goal of this program is to expand the capacity of Cancer Centers to engage in pioneering research that concentrates on aging- and age-related aspects of human cancer through support of new investigators, pilot projects, and shared resources focused on aging and cancer. Grantees are expected to design and coordinate a research effort in a five-year project period that will result in a formal aging/cancer "Program" or an equally effective integrated research activity that becomes a component of the NCI-funded Cancer Center. A solid, focused infrastructure for the conduct and continued development of an aging/cancer research program, allowing for incorporation of multiple disciplines and creative exploration of new approaches to cancer, is also expected. A broad range of cancer research falls under this scientific initiative, based on seven thematic areas defined in a 2001 NIA/NCI Workshop Report: Treatment Efficacy and Tolerance; Effects of Comorbidity; The Biology of Aging and Cancer; Patterns of Care; Prevention, Risk Assessment and Screening; Psychosocial and Medical Effects; and Palliative, End-of-Life Care, and Pain Relief.

Excellence: What makes this project exceptional?

It was specifically designed to build research capability in aging- and age-related aspects of human cancer through the NCI-designated Cancer Centers, building upon their abilities to work across organizational boundaries, foster transdisciplinary research, create long-term stability for scientists and research programs, provide extensive core resources to investigators, and link to their communities.

Significance: How is this research relevant to older persons, populations and/or an aging society?

There is a clear need to encourage research which draws from expertise in many disciplines to focus on the problems of cancer in older persons. This initiative is an effort to mobilize expertise through a planning and implementation effort that accelerates research at the aging/cancer interface. The research initiative provides the initial resources to develop and create an integrated,

interactive research capability with a significant base of externally funded, peer reviewed research projects in NCI-designated Cancer Centers that focuses on problems of cancer in the elderly. The unique cancer center infrastructure and its critical mass of multidisciplinary expertise provide an ideal research setting for meeting the challenges inherent in integrating aging and cancer research. Cancer Centers have well-established interactive research environments, and they have the leadership, space, equipment, structure and resources available to take advantage of new research directions as opportunities arise.

Effectiveness: What is the impact and/or application of this research to older persons?

Persons 65 and older are at highest risk for cancer and have a higher mortality rate than younger persons. This initiative is still under way and it will be some time before the true and long-term impact can be assessed; however, it should accelerate research specifically focused on in cancer and aging research.

Innovativeness: Why is this research exciting or newsworthy?

This program is the culmination of several years of effort by NIA and NCI and extramural scientists with expertise in many areas relevant to cancer and aging. It should stimulate research capability in this area in the funded institutions and visibility for aging/cancer issues, build a cadre of future investigators at the cancer/aging research interface, and identify important focal areas for further research and infrastructure support, thus serving as a platform for additional efforts in the future.

NATIONAL CANCER INSTITUTE: EFFECTIVENESS OF PROSTATE RADIATION THERAPY

Prostate-specific antigen screening has led to an increase in the diagnosis and treatment of localized prostate cancer. However, the role of active treatment of low- and intermediate-risk disease in elderly men is controversial. This study estimates the association between treatment (with radiation therapy or radical prostatectomy) compared with observation and overall survival in men with low- and intermediate-risk prostate cancer. This study suggests a survival advantage is associated with active treatment for low- and intermediate-risk prostate cancer in elderly men aged 65 to 80 years.

Lead Agency: National Cancer Institute/National Institutes of Health.

Agency Mission: The National Cancer Institute coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients.

Principal Investigator: Stacey Vandor, Planning Officer, National Cancer Institute.

General Description: Prostate-specific antigen screening has led to an increase in the diagnosis and treatment of localized prostate cancer. However, the role of active treatment of low- and intermediate-risk disease in elderly men is controversial. This study estimates the association between treatment (with radiation therapy or radical prostatectomy) compared with observation and overall survival in men with low- and intermediate-risk prostate cancer

using the U.S. cohort from Surveillance, Epidemiology, and End Results Medicare data. A total of 44,630 men aged 65 to 80 years who were diagnosed between 1991 and 1999 with organ-confined, well- or moderately differentiated prostate cancer and who had survived more than a year past diagnosis. Patients were followed up until death or study end and were classified as having received treatment if they had claims for radical prostatectomy or radiation therapy during the first 6 months after diagnosis. They were classified as having received observation if they did not have claims for radical prostatectomy, radiation, or hormonal therapy. Patients who received only hormonal therapy were excluded. At the end of the 12-year study period, 37% of men in the observational group and 23.8% in the treatment group had died. The treatment group had longer 5- and 10-year survival than the observation group. After using propensity scores to adjust for potential confounders (tumor characteristics, demographics, and comorbidities), there was a statistically significant survival advantage associated with treatment. A benefit associated with treatment was seen in all subgroups examined, including older men (aged 75–80 years at diagnosis), black men, and men with low-risk disease. This study suggests a survival advantage is associated with active treatment for low- and intermediate-risk prostate cancer in elderly men aged 65 to 80 years. Because observational data cannot completely adjust for potential selection bias and confounding, these results must be validated in randomized controlled trials of alternative management strategies in elderly men with localized prostate cancer.

Excellence: What makes this project exceptional?

This observational study suggests a reduced risk of mortality associated with active treatment for low- and intermediate-risk prostate cancer in the elderly Medicare population examined. Although a randomized controlled trial design is needed to confirm these findings, they help begin to answer the long-standing questions regarding treatment decisions for older men.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This study is relevant to older populations because prostate cancer primarily affects older men. In fact, from 2001–2005, the median age at diagnosis for cancer of the prostate was 68 years of age, with over 62% of all persons diagnosed over 65. This study supports the use of treatment to prolong life for these older men.

Effectiveness: What is the impact and/or application of this research to older persons?

This research is especially applicable to older men because of the large percentage of prostate cancer cases in this population. Upon further study, confirmation of these results will lead to more effective treatment of older men.

Innovativeness: Why is this research exciting or newsworthy?

This study suggests a survival advantage is associated with active treatment for low- and intermediate-risk prostate cancer in elderly men aged 65 to 80 years. By helping to answer long-standing questions about appropriate types of treatment for prostate cancer, especially for older men, these findings propel researchers to begin to confirm these findings. Through future randomized studies, the finding that treatment is effective for older men can be confirmed

and put into practice, holding the promise to affect countless older men diagnosed with this disease.

NATIONAL SCIENCE FOUNDATION: HOME MONITORING WHILE MAINTAINING ELDER PRIVACY

This research will enable elders to maintain their privacy, while taking full advantage of home-based computing for their health and personal safety.

Lead Agency: National Science Foundation, Directorate for Computer and Information Science and Engineering, Division of Information and Intelligent Systems.

Agency Mission: NSF's mission is to promote the progress of science: to advance the national health, prosperity and welfare; to secure the national defense (NSF Act of 1950).

Principal Investigators: Dr. L. Jean Camp, University of Indiana, School of Informatics, 901 E. 10th St., Bloomington, IN 47405; Dr. Katherine Connelly, University of Indiana, School of Informatics, 901 E. 10th St., Bloomington, IN 47405; Dr. Lesa Lorenz-Huber, University of Indiana, School of Informatics, 901 E. 10th St., Bloomington, IN 47405; Dr. Kalpana Shankar, University of Indiana, School of Informatics, 901 E. 10th St., Bloomington, IN 47405.

Partner Agencies: N/A.

General Description: This project addresses the acute privacy challenge of home-based health care based on ubiquitous computing, or ubicomp, where vulnerable populations risk enforced technological intimacy. It will employ the well-defined "design for values" method to create an innovative toolkit that can be used by our aging population, their caregivers, and designers to ensure privacy and autonomy in home-based ubicomp.

Ubiquitous computing integrates technology into our everyday environments, fundamentally altering privacy by creating continuous, detailed data flows. Ubicomp will result in an environment that is aware, active and responsive. It creates an aware environment through the pervasive distribution of sensors. It is active because sensor data are processed and examined. It is responsive in that the technology acts on the environment based on processed data. As the ubiquitous computing devices are networked, the data and decisions have the potential to be observed from any connected locale on the planet. Thus privacy becomes a major concern.

Design for privacy is complicated by the fact that privacy is a socially constructed value that differs significantly across environments and individuals. Currently, design for privacy requires a user who understands the social implications of ubicomp technology, demands a design that respects privacy, and articulates specific technical design requirements. Design for privacy also requires a ubicomp designer with mastery of privacy enhancing technologies, security mechanisms, and a profound understanding of privacy. Neither of these is a reasonable burden. This research will decrease the burdens for both parties.

This project will create a system for designing highly customized privacy-enhancing ubicomp. The privacy framework consists of three integrated, complementary components. The first component is a participant tool for eliciting individual elder privacy concerns, making it easy for non-technical people to express privacy concerns. The second is a designer tool that translates elder concerns into

technical choices or suggestions. The third is a privacy-enhancing code library for ubicomp sensors that vastly simplifies privacy-sensitive design, including data filtering, access control list creation, and integration of cryptographic privacy enhancing technologies.

The broader impacts of the project include: (1) Development of a multidisciplinary curriculum that will engage over 40 students in the research project; (2) a living laboratory to enable research and curricular activities in business, nursing, health and other disciplines; (3) expansion of the potential for privacy-enhanced home-based healthcare; (4) the development of tools to ensure that older people make their own choices about home monitoring and protection of their privacy and autonomy; and (5) a design tool and computer code library that enable ubicomp designers to easily embed appropriate privacy-enhancing and strong security-protecting mechanisms in home-based ubicomp without requiring expertise in privacy or security.

This project examines the role of information technology in the homes of elders with an emphasis on design and evaluation for privacy. The interdisciplinary team of computer scientists, clinical researchers on geronotology, and information scientists and their students are creating a digital toolkit that enables elders to maintain their privacy, while taking full advantage of home-based computing for their health and personal safety. Elders have been shown to systematically underestimate their electronic privacy risk.

The tools will serve two functions. They will help elder make appropriate decisions about home-based computing and guide designers in creating privacy-respecting technologies. Three current prototypes are being evaluated by a set of volunteers from a local retirement center. These tools facilitate social networks, encourage healthy behaviors, decrease isolation and support independence.

One prototype mimics a wall mirror and provides reminders and encourages social interaction. There is a motion sensor device so that when the person moves away from the mirror, the screen disappears. This Mirror Motive provides an interface that provides a way to arrange events with other individuals. The messages disappear when the person makes a waving hand gesture at the mirror. This exposure to events outside the home provides an opportunity to be more involved. The level of interaction by the user is shown to the user as a growing plant.

A second prototype encourages elders to increase their levels of physical activity while staying more tightly connected to a community of their peers. Older adults can seamlessly track the indicators of well-being of community members by looking at the e equivalent of a wristwatch. The elder can choose to share personal information with peers without concern that the data will show up in an internet search.

The team is also constructing a "living Lab", in which elders from the local community will interact with the previous prototypes and others embedded in the home, which preserves the look and feel of a historic house near campus. These volunteers will provide critical feedback about the technology's usability, appropriateness and privacy implications.

NATIONAL SCIENCE FOUNDATION: STROKE VICTIM REHABILITATION AND SOCIALLY ASSISTIVE ROBOTICS

This research project will develop principles for human-robot interaction to benefit victims of strokes, both as part of rehabilitation and to assist stroke victims in coping with their disabilities.

Lead Agency: National Science Foundation, Directorate for Computer and Information Science and Engineering, Division of Information and Intelligent Systems.

Agency Mission: NSF's mission is to promote the progress of science: to advance the national health, prosperity and welfare; to secure the national defense (NSF Act of 1950).

Principal Investigator:

Maja J Mataric, Computer Science Department, University of Southern California, Ronald Tutor Hall (RTH) 407, 3650 McClintock Avenue, OHE 200, Los Angeles, CA 90089–1450 USA.

Partner Agencies: N/A.

General Description: This research project focuses on the development and understanding of human-robot interaction (HRI) systems to benefit victims of strokes—disturbances in the blood supply to the brain resulting in some degree of loss of brain function. Robotics has the potential of positively impacting quality of life, especially for people with special needs, like those coping with the effects of strokes. If we are to meet the demand for personalized one-on-one care for the growing populations of elderly individuals and those with special cognitive and social needs throughout life, great strides must be made in human-robot interaction in order to bring robotics into everyday application domains.

This interdisciplinary project identifies a specific set of human-robot interaction research questions in the study of robotic systems capable of providing help through social rather than physical interaction. The research foci of the study are: embodiment, personality, empathy, and adaptivity toward the development of an assistive human-robot interaction model for customized time-extended assistive interaction. The research will be grounded in the stroke rehabilitation domain, where personalized and dedicated care is needed to provide supervision, motivation, and training during the critical post-stroke period and beyond, and where assistive human-robot interaction can play a key role. A novel assistive human-robot interaction model will be developed based on personality matching between the user and the robot, in order to optimize the user's task performance on rehabilitation exercises.

Excellence: What makes this project exceptional?

The work is the first to study the role of personality and empathy in assistive human-robot interaction with human subjects, as well as to engage in longitudinal assistive human-robot interaction research to assess time-extended human-machine interaction in the assistive context.

Most novel is the use of a socially assistive robotic agent as a rehabilitation coach. The researcher has built a bio-mimetic humanoid robot capable of expressing emotion and making human-like gestures plus software for the robot that allows it to behave in an empathetic manner. This empathetic behavior will allow the robot to endear itself to the user during rehabilitation.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Strokes are far more common among elderly people, and they may face greater challenges coping with life after their strokes than do younger people.

Effectiveness: What is the impact and/or application of this research to older persons?

Project outcomes will provide pilot data necessary for translating the methodologies developed toward clinical applications.

Innovativeness: Why is this research exciting and newsworthy?

Currently there are about 750,000 new strokes per year in the United States, and some expect the number to double in the next twenty years with the growing elderly population.

NATIONAL SCIENCE FOUNDATION: "SMART HOMES" RESEARCH FOR INDEPENDENT LIVING OF SENIORS

This research on "smart homes" will make it possible to develop systems that monitor the elderly in their homes, in order to assess their changing needs and capabilities, in a noninvasive manner that balances the needs of health, safety and privacy.

Lead Agency: National Science Foundation (NSF), Directorate for Computer and Information Science and Engineering, Division of Information and Intelligent Systems.

Agency Mission: NSF's mission is to promote the progress of science: to advance the national health, prosperity and welfare; to secure the national defense (NSF Act of 1950).

Principal Investigators: Dr. Marjorie Skubic, Associate Professor, Electrical and Computer Engineering Dept. and Computer Science Dept., Director, Center for Eldercare and Rehabilitation Technology, College of Engineering, University of Missouri-Columbia, Columbia, MO 65211–2060, 221 Engineering Building West.

Partner Agencies: N/A.

General Description: This long-term research effort is developing "smart home" technologies to help older adults remain independent at home while controlling costs. Smart homes enhance residents' safety and monitor health conditions using sensors and other devices. Such technology can help keep older adults independent while controlling costs. The technologies must be aligned with the needs and capabilities of the elderly users, in order to be most beneficial, but those needs and capabilities change over time, as the aging process progresses. The key is early identification of changing conditions that indicate impairments. The continuous assessment of physical function is a key indicator of initial decline in health and functional ability. Identifying and assessing problems while they are still small can provide a window of opportunity for interventions that will alleviate the problem areas before they become catastrophic.

Objectives of the first phase of the project included: development of an integrated monitoring system that reliably captures data about the elder residents and their environment in a noninvasive manner and balances the needs of health, safety and privacy; collection of data in typical independent living, elder settings, using an integrated monitoring system; development of algorithms to extract patterns of activity from the collected sensor data; and evaluation of the usability of the technology and investigation of funda-

mental issues in human-computer interaction for the population of older adults. Project objectives in the second phase included: To collect video data of staged scenarios in realistic multi-person settings using older adult participants, thereby producing a body of labeled data; to utilize the collected labeled data, develop and evaluate algorithms for analyzing video in a way that preserves privacy, extracts the pose sequences of multiple persons, tracks the movement of inanimate objects, and generates assessments and summarizations of the observed activities and physical function; to evaluate the effectiveness of the summarization and assessments by showing the video and extracted information to gerontology experts and obtaining feedback; and to assess the perceptions and attitudes of older adults towards video monitoring by showing them the processed ("anonymized") video and extracted information.

This research will impact technology, health care, policy, quality of life for older adults, and peace of mind for their families. Advances in technology have implications for other areas, including fitness and physical rehabilitation. These strides will assist health care providers to identify potential health problems and keep older adults independent longer. This, of course, means happier lives for the older adults and their families. Offering a model for eldercare technology may also provide policy makers with information to guide decisions about services for older people.

Excellence: What makes this project exceptional?

The knowledge and technical capabilities achieved by this long-term project will be valuable for several fields of research concerning the elderly, and ultimately for the development and deployment of "smart home" monitoring systems that ensure the safety and support the independence of aging citizens. As a research tool, a smart home can greatly increase our understanding of how elderly people at various levels of impairment handle the tasks of life, thereby providing the knowledge required to design more appropriate products and services for them. As a diagnostic tool, it can assess how well individuals handle their daily challenges over time, providing advice about actions to improve their well being and actually using functions of the smart home to compensate directly for some kinds of increasing disability. As smart home technology is deployed, it will improve the safety of elderly individuals living at home, for example by warning family members or emergency services when something has gone wrong the elderly person cannot cope with, covering a much wider range of dangerous or potentially costly situations than current devices that may merely monitor when a person falls down.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The central focus of this research is monitoring elderly individuals in their home environments, to have the timely information needed to provide assistance and to compensate for changing levels of disability.

Effectiveness: What is the impact and/or application of this research to older persons?

Smart home technologies will be developed on the basis of this research for direct use by elderly persons in their homes, at the same time that the research provides excellent data for improved professional understanding of the aging process. Fundamental to

this research project is respect for the privacy and self-respect of elderly people, using automatic monitoring in a manner designed to maximize their independence and autonomy.

Innovativeness: Why is this research exciting and newsworthy?

The big challenge in this work is how to maximize the independence of elderly people in a way that also maximizes their safety and privacy. Success in this difficult balancing act will benefit them with better quality of life, while reducing costs such as the personnel expenses in assisted living facilities and nursing homes.

NATIONAL SCIENCE FOUNDATION: COLLABORATIVE RESEARCH AND INTELLIGENT SYSTEMS & COGNITIVE ROBOTICS USED FOR ASSISTANCE

Quality of Life Technology Engineering Research (QoLT) Center will develop intelligent systems and assistive technologies in concert with a person to enable aging and disabled population to perform daily living activities more independently and to participate in society more fully.

Lead Agency: National Science Foundation (NSF).

Agency Mission: NSF's mission is to promote the progress of science: to advance the national health, prosperity and welfare; to secure the national defense (NSF Act of 1950).

Pricipal Investigators: Prof. Takeo Kanade, Carnegie-Mellon University, 500 Forbes Avenue, WH 405, Pittsburgh, PA 15213–3890; Prof. Rory Cooper, University of Pittsburgh, 5042 Forbes Tower, Room 5042, Atwood & Sennott Streets, Pittsburgh, PA 15260.

Partner Agencies: University of Pittsburgh, Bosch Research, Honeywell Life Systems, Sanyo North America Corp., Sony Corp., Blueroof Technologies, Etovia Systems Inc.

General Description: The Quality of Life Technology Engineering Research (QoLT) Center will transform lives in a large and growing segment of the population—people with reduced functional capabilities due to aging or disability. Future compassionate intelligent QoLT systems will monitor and communicate with a person, understand her daily needs and tasks, and provide reliable and happily-accepted assistance by compensating and substituting for diminished capabilities.

Many previous attempts to use sophisticated assistive technology failed due to lack of basic understanding of human functions (psychological, physiological, physical, and cognitive) and how to relate them to the design of intelligent devices and systems that aid, interact, and work in symbiosis with a person of diminished capacity. Traditional robotic advances have been made without cognitive human component. the goal of QoLT is to develop assistive technologies in concert with a person. That fundamental difference defines the QoLT research. QoLT systems are person-aware as well as environment-aware. The focus will be on four areas of research: *Perception and Awareness*—performs research on sensing and perception technology that not only reliably detects, tracks and recognizes objects in cluttered real-life environments, but also understands the person's motion, activities, emotions, and intentions; *Mobility and Manipulation* seeks hardware and software that are not only capable of dealing with everyday life objects, but also are inherently safe for physical interaction of machines and people, so that robotic effectors touch people gently, even while moving them;

Human System Interaction addresses the challenge of dynamically adjusting interfaces on the fly to account for changes in an individual over time. It also seeks methods for support providers to modulate the level of compensation that QoLT systems provide in order to achieve desired clinical outcomes; *Person and Society* research brings socioeconomic considerations to the forefront of advanced technology research and into the system design from the beginning. QoLT systems respond to the population with the largest variety of functional support needs—older people and people with disabilities, and for the most diverse needs—everyday life. Testing the systems in *Natural Environment Testbeds*, the research is not only integrating components and subsystems, but is integrating systems with people's lives.

The technologies developed will enable older adults and people with disabilities to more independently perform activities of daily living and give them opportunity to participate in society longer and more fully. QoLT will augment the capabilities and extend the reach of professional and informal caregivers, increasing their cost effectiveness and improving their own quality of life. Having more people gainfully employed and reducing the need for or delaying the onset of institutionalization will have an even more profound impact on the national economy. QoLT will transform and eventually subsume the present assistive technology industry, one that is fragmented and composed primarily of very small companies serving a small market, into a space with a large consumer base including the soon-to-retire Baby Boomers. In terms of clinical impact, QoLT will accelerate the trend of engineers and clinicians collaborating for better treatment and will add computer and robotics specialists to patient care teams.

Excellence: What makes this project exceptional?

The exceptional nature of this project lies in the fact that it will not only assist the older adults and people with disabilities but will also augment the capabilities of professional and informal caregivers thus increasing their cost effectiveness. QoLT will also transform the current assistive technology industry. Other point of importance is that it will accelerate the trend of research collaboration between engineers and clinicians to provide better treatment of patients that includes computer and robotics specialists.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The research is very relevant to aging population as it is expected to increase substantially every year. We are facing an unprecedented shift in age demographics that has the potential to disrupt every business, industry, and economy. Modern medical and agricultural technologies have extended human life-spans into the 80s and 90s, but most countries will soon face an enormous care giving crisis. Perceptual, cognitive and musculoskeletal diseases that impair motor skills dramatically increase with age. Presently there are about 35 million people—one in eight—over the age of 65 in the United States. By 2030, those numbers will double to 70 million with older Americans accounting for 20% of the U.S. population. By then, one in two working adults will serve as informal caregivers. The aging U.S. Baby Boomers, those born between 1945 and 1964 and accounting for 39% of adult Americans, will find severe physician shortages in the specialties they most need. Of all

of the challenges faced by older individuals, dementia—a chronic condition characterized by cognitive decline sufficient to affect functioning—is often most feared and has the largest negative impact on both older persons and their family members. Whereas due to longer life-expectancy the probability of a 65 year old woman living to age 85 is 65%, and correspondingly 53% for a man, nearly half of persons over age 85 suffer Alzheimer's disease (AD). In addition to AD, there are many other pathologies that affect cognitive function as well as movement ability—strength, coordination, and balance—such as stroke (2.5 million) and traumatic brain injury (5.3 million). In the United States disability affects 48.9 million people who have limitation in a functional activity or social role, whereas 24.1 million report having a severe disability and are unable to perform one or more activities of daily living. Their unemployment rates are notably high: 37.5% overall disability; 47.3% sensory disability; 31.8% physical disability; and 28.5% mental disability.

Effectiveness: What is the impact and/or application of this research to older persons?

The technologies developed will assist the older population and people with disabilities directly in performance of their daily activities. Specifically this will be achieved through intelligent systems.

Innovativeness: Why is this research exciting and newsworthy?

The research is transformative and innovative because this is the first time that assistive technologies will be developed in concert with human cognition.

NATIONAL SCIENCE FOUNDATION: DATA OF ECONOMICAL AND SOCIAL WELL-BEING OF OLDER AMERICANS

The Panel Study of Income Dynamics (PSID) has collected data on a representative group of American families since 1968. Researchers use the PSID's unique data to study the economic and social well-being of older Americans.

Lead Agency: National Science Foundation (NSF).

Agency Mission: NSF's mission is to promote the progress of science: to advance the national health, prosperity and welfare; to secure the national defense (NSF Act of 1950).

Principal Investigator: Frank P. Stafford, Ph.D., Institute for Social Research, P.O. Box 1248, Ann Arbor, MI 48109–1248.

Partner Agencies: Panel Study of Income Dynamics (PSID), National Institute on Aging, National Institute of Child Health and Human Development, United States Department of Agriculture—Economic Research Service.

General Description: The Panel Study of Income Dynamics (PSID) is a nationally representative long-term study of nearly 8,000 U.S. families and the individual men, women, and children who make up these families. It emphasizes the dynamic aspects of economic and demographic behavior, but its content is broad. It gathers information from participants about their income, wealth, employment, pensions, time use, health status, spending patterns, psychological well-being, health insurance, demographic and sociological outcomes, and more.

The PSID began to follow the first group of 4,800 families in 1968. As of 2008, the PSID has collected information about more than 40,000 individuals spanning as much as 40 years of their lives. Because the PSID follows entire families, it is a "telescope"

that allows us to see how individuals and their families evolve and change through the entire life cycle. Over the past 10 years, the PSID has been redesigned to track mid- to long-term U.S. household-socioeconomic dynamics while remaining nationally representative. In addition, content was expanded in six major areas; intergenerational studies, savings and consumption, technology and capital formation, health and aging, child development, and immigration.

It is one of the most widely used social science data sets in the world; thousands of articles, books and papers have been based on the data. These data are available freely via the Internet to researchers, including economists, demographers, sociologists, developmental psychologists, geographers, social psychologists, and others. The web-based data center is itself a valuable educational resource and has been used by colleges and high schools to illustrate how data analysis and statistical methods are used to analyze human behavior.

Using the PSID, researchers study the effects of aging on both individuals and families. They examine the economic well-being of older Americans, including research on pensions, retirement savings, and decisions about whether or not to work part-time after retirement. They conduct research on the extent of poverty among the elderly. They study how families cope with the needs of aging individuals. Researchers can study people as they move from independent living to living with their children or to institutional care, and they can also measure the time and money children allocate to their aging parents. Researchers can also study elderly Americans who are the primary guardians of their grandchildren; how does child-rearing affect their lives? Geographical and demographic information allows researchers to study how all these things vary with race and location. For example, we can study how older people respond to deteriorating neighborhoods; are they 'trapped' if their neighborhood changes while younger families move to safer places?

Excellence: What makes this project exceptional?

The PSID is unique. It is the world's longest running nationally representative panel survey of families. The survey has now gathered forty years of data on the same families and their descendents. These data are available to the entire scientific and educational community, and hundreds of researchers from disciplines ranging from economics to medicine have used the PSID as a 'telescope' that allows them to see how American families have fared and changed. The PSID is truly a cornerstone of empirically-based social science research in the U.S. and the world. Through its long term measures of economic and social behavior and well-being, the study has compelled both researchers and policy makers to confront and learn from the dynamism inherent in social and behavioral processes. Using the PSID, researchers have been able to study American families throughout the life cycle. People who joined the sample as grandparents are now deceased; people who joined as young parents are now at or past retirement age and their children are now parents themselves.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Research using the PSID is directly relevant to older persons and to our aging society. Using PSID data, researchers have been able

to measure whether or not aging baby boomers are financially prepared for retirement. They have been able to reconcile the apparent puzzle of a low saving rate but high wealth in some families. The data have been used to test the life-cycle consumption theory in economics, which predicts how people will make financial decisions in their working adult years that determine their retirement income. The PSID has also allowed researchers to see how wealth and health status vary across older Americans from different socio-economic and demographic groups.

Effectiveness: What is the impact and/or application of this research to older persons?

Most importantly, by using the PSID researchers are able to study older people not as isolated individuals but as members of families. They can examine how families meet care-giving responsibilities, both in how they care for their elderly and how older members of the family care for their children and grandchildren. Researchers can consider not just how money and wealth are shared across generations, but also how family members contribute time and effort to each others' care.

Innovativeness: Why is this research exciting and newsworthy?

The PSID has been used to show that a large group of senior Baby Boomers are unprepared for retirement, with little in the way of household wealth accumulation. This research result has spurred the development of educational programs designed to encourage retirement savings. PSID data on health expenditures helped us forecast the eventual cost of the Medicare prescription drug benefit. The PSID allows us to study whether or not a wide variety of government programs designed to assist older Americans have the desired effects. This research is key for evidence-based public policy.

SMITHSONIAN INSTITUTION: THE BRACERO HISTORY PROJECT

The Bracero History Project collects, preserves, and shares the experience of a "greatest generation" of American workers. By recognizing the contributions of the elderly we do much to raise their self esteem and improve their mental health. Through intergenerational learning the general public gains an appreciation of elderly Americans.

Lead Agency: Smithsonian Institution, National Museum of American History, Division of Work and Industry.

Agency Mission: The National Museum of American History dedicates its collections and scholarship to inspiring a broader understanding of our nation and its many peoples. We create learning opportunities, stimulate imaginations, and present challenging ideas about our country's past.

Principal Investigator: Peter Liebhold, Chair, Division of Work and Industry, NMAH, MRC 629 P.O. Box 37012, Smithsonian Institution, Washington, DC 20013–7012.

Partner Agency: Smithsonian Latino Center, University of Texas, El Paso, Brown University, George Mason University.

General Description: The Bracero History Project collects, preserves, and shares the experience of a "greatest generation" of American workers. In place between 1942 and 1964 the bracero program allowed millions of Mexican men to come to work in the US on short term labor contracts. Many of these workers eventu-

ally settled and brought families to the US or married locals. The Bracero History Project sends historians into communities across the country to interview these now elderly men and women and record their stories of hard work and hope for the future.

The Bracero History Project is important for both the nation and the individuals involved. By recognizing the contributions of the elderly we do much to raise their self esteem and improve their mental health. By then preserving and making the stories available to all through a website (braceroarchive.org) and a traveling exhibition (*Bittersweet Harvest: The Bracero History Program 1942–1964*) the general public gains a growing appreciation of an often overlooked cohort of the American population. Intergenerational learning projects like this are one of the most important ways that we as a nation come to value the lives of the elderly.

Excellence: What makes this project exceptional?

This project is exceptional on many levels—in organization, in execution, and in accessibility.

Organizationally the Bracero History Project is unusual for being a consortium of museums, universities, and cultural institutions. While the Smithsonian has taken a leadership role the project is in fact truly collaborative and owned by all.

In execution the Bracero History Project is also exceptional. Members of the team go out into the field to conduct interviews, often in remote rural locations. With over 600 recorded oral histories (the majority in Spanish) this is the largest Latino oral history project to date.

Finally in execution the Project is quite unusual. All the materials are being made available through the web so interested parties can access them from home or school. The traveling exhibition has been carefully designed to be both inexpensive and low security meaning that this important show will be able to travel to communities that rarely see museum exhibitions.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The project research is extremely relevant to older people because it values their experiences. Braceros and their families have been overlooked by historians for years. This project will help put their sacrifices back into the central story of American history where they belong.

Effectiveness: What is the impact and/or application of this research to older persons?

There are many ways in which the Bracero History Project is impacting those involved but perhaps the most interesting is the development of intergenerational learning. In the Town Hall Meetings and Collection Days held around the country we are struck by the number of older braceros and wives coming to tell their stories at the behest of a child or grandchild. The project helps send a strong message of family importance and worth.

Innovativeness: Why is this research exciting or newsworthy?

The project is helping document and preserve an important chapter of American history. Known by only a few historians the Bracero History Project is recording the details of an important piece of work and immigration history. Additionally the Project is groundbreaking in its open source use of the web to share collected materials with all.

SMITHSONIAN INSTITUTION: AMERICA'S POST WWII FAMILY LIFE

Strengthen the museum's representation of the thematic area of aging in America. Document how major demographic changes since World War II impacted how Americans create and maintain family and home life with a focus on the elderly and their families. Begin to form a material record of America's aging population.

Lead Agency: Smithsonian Institution, National Museum of American History, Division of Home and Community Life.

Agency Mission: The National Museum of American History dedicates its collections and scholarship to inspiring a broader understanding of our nation and its many peoples. We create learning opportunities, stimulate imaginations, and present challenging ideas about our country's past.

Principal Investigator: William H. Yeingst, Chair, Division of Home and Community Life, Smithsonian Institution, P.O. Box 37012, NMAH, Room 4127, MRC 615, Washington, DC 20560–7012.

General Description: The National Museum of American History collects artifacts to preserve for the American people an enduring record of their past. As part of the museum's effort to document the major historical developments in home and family life from 1945 to the present, the Division of Home and Community Life is conducting a case study titled, "The Population Ages: Remaking Home and Family Life." The aging of the American population is a demographic fact that reveals the intersection between home and family life, public policy, cultural and material change, science and other aspects of American life. Aging in America has differed according to gender, class, race, and ethnicity. Increasingly senior citizens have created an identity as a group that has been reflected both in policy and in the market for housing and consumer products for the home. This was reflected in the establishment of AARP that helped define an identity and influence policy in 1958, and the founding of the activist Gray Panthers in 1970. The project takes the following avenues for implementation:

—Documentation through Collaboration. This is an opportunity to go beyond artifacts to collect stories through oral history and photography by seeking a partnership with a group such as AARP and a university or other ethnographic project.

—Iconic Household Artifacts. Identify the significant artifacts that represent the stories of aging and their distinctive impact on American society. Although much research on the material culture of aging remains to be done, some iconic artifacts developed for an aging population may be identified. OXO good grips kitchen utensils reflect an important mainstream product that will be collected. Other objects designed for the health, safety and mobility of the aging in their homes have provided alternatives for the larger population.

—Retirement communities. The aging of the population has had a major impact on housing and housing types. The concept of retirement communities as a national phenomenon is a post-1945 development. The development of retirement communities should be documented with a collecting effort related to early residents of the first retirement communities in Sun City, Arizona and Leisure World. Recreation objects prevalent in these retirement facilities

such as the Wii video game would serve as a lens for documenting social life, exercise, and the role of technology in our aging population.

—Public policy: Public policy decisions related to social security, employment opportunities and health care have increasingly reacted to the aging population's needs. How families cope with aging members in response to these policies, in the redesign of their homes, the accommodation of multigenerational families within one household, and long term care is an important area for oral history activity.

Excellence: What makes this project exceptional?

The project gives representation to how older Americans shaped history and were shaped by history in the course of their everyday lives.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The project acknowledges the role of the elderly in American society and gives representation to their stories and actions.

Effectiveness: What is the impact and/or application of this research to older persons?

This project encourages a reinforcement of memory and recall with its emphasis on oral history and a response to objects. It encourages engagement and connection to the larger world.

Innovativeness: Why is this research exciting or newsworthy?

The research is accomplished while this generation's stories can be collected on tape and video. It is the first generation whose stories and points of view about home life and objects can be documented in this way.

SMITHSONIAN INSTITUTION DIVISION OF PHYSICAL ANTHROPOLOGY: HISTORIC CAUSES OF OSTEOPOROSIS

This research pertains to bone density in 17th and 18th century human skeletons from Maryland and Virginia. The study will help determine whether osteopenia, or low bone mass, is present in Colonial period remains. Preliminary results show that low bone density was present in remains from various archaeological sites dating to these periods.

Lead Agency: Smithsonian Institution's National Museum of Natural History Department of Anthropology (Division of Physical Anthropology).

Agency Mission: The Smithsonian Institution's Department of Anthropology is dedicated to advancing and sharing knowledge about humanity in all its dimensions, from the evolution and biological variation of the human species to the diversity of the world's cultures and languages, both past and present.

Principal Investigator: Douglas W. Owsley, Ph.D., Curator, Physical Anthropology Div. Head, Department of Anthropology, 10th and Constitution Avenue, NW., MRC 112 P.O. Box 37012, Washington DC 20013–7012.

Partner Agency: Institute for Technology in Health Care and Dr. James S. Jelinek, Chair of Radiology of the Washington Hospital Center.

General Description: Osteoporosis is a disease characterized by low bone density, or "porous bones," placing an individual at high risk for fractures by weakening the structural matrix of bones and

diminishing their ability to withstand the day to day stresses and strains we place on them. The intermediate stage between normal bone and osteoporosis is classified as "osteopenia," which refers simply to low bone density.

Dual Energy X-ray Absorptiometry (DXA) scanning equipment was developed for clinical use and is currently the most widely used method for measuring bone density in patients at risk for osteoporosis. The scanner directs x-ray energy from two different sources towards the bone being examined. The mineral density weakens or prolongs the transmission of the x-ray energy through a filter onto a photon counter in a degree related to the amount of bone mass present. The greater the bone mineral density, the greater the signal picked up by the counter.

A DXA scan report compares the bone mineral density values with those of a young normal individual (T-score) and with an age-matched normal individual (Z-score). According to the World Health Organization standards, an individual with a T-score at or above -1.0 has normal bone density, while a T-score between -1.0 and -2.5 is osteopenic. Osteoporosis is clinically diagnosed when the T-score is at or below -2.5.

Various factors are linked to low bone density including a diet low in vitamin D, insufficient calcium, smoking, moderate alcohol consumption, sedentary lifestyle, genetics (sex, race, and family history), hormones, and pregnancy.

Nearly 150 historic and modern forensic specimens from various institutions and locations including the Smithsonian Institution, Jamestown, and Maryland Historical Trust collections have been included in this survey. Of the femora DXA scanned thus far, over twenty meet the World Health Organization's definition of osteopenia, and four classify as osteoporotic

DXA scanning has recently been used in a number of studies involving archaeological material (Lees et al, 1993; Ekenman et al, 1995; Mays et al, 1998; Poulson et al, 2001; Gonzlez-Reimers et al, 2002) as it offers a precise and non-destructive method of quantitatively measuring bone mineral density.

Excellence: What makes this project exceptional?

This study provides temporal information on the frequency of low bone density in eastern North America.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This is basic research designed to investigate the causes of osteopenia and osteoporosis in historic populations from Maryland and Virginia over the last four hundred years. It is one component of a multifaceted study of health and diet with emphasis on the transition from European and African diets following colonization of the New World.

Effectiveness: What is the impact and/or application of this research to older persons?

This basic research provides a new long-term view of the implications of how we understand health and diet. As basic research it will articulate with other studies from areas of medical research.

Innovativeness: Why is this research exciting or newsworthy?

This research makes use of museum collections to provide answers to health issues of concern to millions of Americans.

SOCIAL SECURITY ADMINISTRATION: EFFECT OF INSTITUTIONS AND POLICIES ON RETIREMENT CHOICES

This project offers an explanation for the continuing effect of institutions and policies on retirement choices. The largest effects of the policies examined are from increasing the early entitlement age from 62 to 64 and reducing benefits to 75 percent of their promised levels.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Alan Gustman, Professor of Economics, Dartmouth College, Hanover, NH 03755.

General Description: This paper is based on a structural model of retirement and saving, estimated with data for a sample of married men in the Health and Retirement Study. It explains the relation of specific features of Social Security—the benefit amount, the early entitlement age, the normal retirement age, earnings test parameters, and the delayed retirement credit—to work and retirement decisions. A full range of work and retirement outcomes are considered, including continued work on the main job, full-time work outside the main job, and partial or full retirement. The authors consider not only the effect of Social Security on movement from States of greater to lesser work, but also the reverse flows from States of lesser work to States of greater work.

The largest effects of the policies examined are from increasing the early entitlement age from 62 to 64 and reducing benefits to 75 percent of their promised levels, the approximate amount benefits would have to be reduced when the trust fund runs out if there are no changes in funding. With the increase in the early entitlement age, about 5 percent more of the population continues to work full time at their main job at age 62 and 63 than would otherwise. In addition, another 4.5 percent of the male population works full time after having retired, as does another 4 percent at age 63. Partial retirement is reduced at ages 62 and 63 by about 3 percentage points when the early entitlement age is 64. Overall, complete retirements are about 6 percentage points lower at age 62 and 63 when the early retirement age is higher. From age 64 on, the percent completely retired is about two percentage points lower in each year when the early entitlement age is 64 rather than 62.

The effects of reducing promised Social Security benefits by about a quarter are also large. The probability of remaining on the main job is higher for those in their sixties, with the difference ranging from 3 to 5 percentage points for those ages 62 and older. At each year of age, an additional 1 percentage point will be in full-time work after having retired. There is little difference in the fraction partially retired, so the probability of being fully retired is reduced by 4 to 6 percentage points when benefits are reduced by a quarter.

Decisions of when to retire will have an important bearing on overall labor supply in the future and are increasingly important given declining birth rates and increasing longevity. This project studies the effect of the changing landscape of retirement incentives on retirement behavior. The results are based on a careful calibration of a structural model of retirement and saving. The re-

search is significant, because it relates the effects of specific features of the Social Security program on work and retirement decisions. It is innovative in that several levels of work are examined, including moving from less work to more work.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

Decisions of when to retire will have an important bearing on overall labor supply in the future and are increasingly important given declining birth rates and increasing longevity. This project studies the effect of the changing landscape of retirement incentives on retirement behavior. The results are based on a careful calibration of a structural model of retirement and saving. The research is significant, because it relates the effects of specific features of the Social Security program on work and retirement decisions. It is innovative in that several levels of work are examined, including moving from less work to more work.

SOCIAL SECURITY ADMINISTRATION: FINANCIAL ELIGIBILITY MODEL (FEM)

The FEM is a flexible tool of evidence-based decision-making in SSI program policy that has also been used to analyze Medicare buy-in programs and the Medicare Part D Low Income Subsidy.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Paul S. Davies, Director, Division of Policy Evaluation, Office of Research, Evaluation, and Statistics, 500 E Street, SW., 9th Floor, Washington, DC 20254–0001.

General Description: The Financial Eligibility Model (FEM) was developed by researchers at the Social Security Administration (SSA) as a flexible tool of evidence-based decision-making in Supplemental Security Income (SSI) program policy. SSI provides a minimum income guarantee for elderly and disabled persons with limited resources. SSI helps many older people to escape poverty and to gain access to public health insurance coverage. In December 2006, roughly 2 million people aged 65 and over received SSI payments. For some elderly individuals, SSI is the main source of cash benefits. For others it supplements Social Security benefits. In most cases SSI beneficiaries are categorically eligible to receive Medicaid.

The FEM was designed to assist policy makers in evaluating whether SSI is reaching the target population and whether the program can be improved by changing program rules. The FEM uses a representative sample of older persons in the United States from the Survey of Income and Program Participation matched to SSA administrative records. An innovative aspect of the FEM is its ability to analyze tradeoffs between program cost and program outcomes, such as poverty reduction. For example, it allows for the comparison of the poverty-reducing effects of alternative policy modifications on the basis of a given budget scenario.

One analysis using the FEM found that changing the Federal benefit rate, the general income exclusion, and the asset threshold appear to be roughly equally effective in reducing poverty among the elderly on a cost-equivalent basis, whereas relaxing the earned income exclusion would be less effective (Davies, Rupp, and Strand, 2004). Another analysis assessing Social Security minimum benefit proposals found that simplified administrative procedures to establish eligibility for minimum benefits may result in poor targeting and substantial additional program costs (Rupp, Davies, and Strand, 2007). In a third analysis, Strand and Rupp (2007) found that the relationship between Social Security and SSI needs to be explicitly considered in assessing the potential effects of alternative reform scenarios. Analysts also use the FEM to study eligibility for Medicare buy-in programs and the Low Income Subsidy (LIS) under the Medicare Part D prescription drug benefit program.

Excellence: What makes this project exceptional?

This project is exceptional, because it provides a versatile tool for assessing various policy options to improve an important program, SSI, for older people with limited income and resources. It supports the analysis of program design options in a manner that provides a credible, unbiased, and nonpartisan foundation for evidence-based decision-making. It is adaptable to various budget realities, such as budget-neutral approaches to improving the target-effectiveness of the program. The project also is exceptional because it has demonstrated adaptability to newly emerging policy issues with potentially large effects on the economic well-being of older people, such as the introduction of the LIS program under Medicare Part D or Social Security reform options.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This project is of major significance for developing policy options to reduce poverty and improve various aspects of economic well-being in an era of limited resources and demographic pressures on the safety net for older people. The FEM allows for identifying low-cost or budget-neutral approaches to reduce poverty among the elderly. It also allows policy makers to assess the pros and cons of alternative approaches regardless of their political orientation in an objective manner. The FEM is significant for elderly people, because about 2 million elderly individuals with low income and resources currently benefit from the SSI program. Ignoring SSI in discussing policy options for related programs such as Social Security, Medicaid, and Medicare could lead to adverse effects on the well-being of the elderly. SSI reform options also are relevant because of changing realities, such as increased reliance on individual retirement accounts and other defined contribution plans in retirement security. Without attention to the equitable treatment of defined contribution pension assets, access to the SSI program among older people with low income and assets might be adversely affected in the future. The FEM provides an opportunity to address issues of this kind in a budget-neutral or low-cost manner.

Effectiveness: What is the impact and/or application of this research to older persons?

The project is highly effective in that it provides an opportunity for policy makers to explore budget-neutral or low-cost options to improve targeting in SSI and related programs. Policy makers need

to reassess program policies continuously as our economy and society go through rapid changes. They need to have tools to assess policy options in an objective and balanced manner. The FEM provides an important tool for considering the role of SSI in assessing various Social Security options, an important area for the economic well-being of the elderly in the future that previously has been neglected in Social Security reform discussions and assessments.

Innovativeness: Why is this research exciting or newsworthy?

This research is innovative, exciting, and newsworthy for several reasons. It provides an excellent example of a unified framework for assessing important aspects of program design, such as outreach, targeting, distributional effects on the economic well-being of the elderly, administrative complexity, and program cost. The researchers developed an innovative metric of "cost-equivalent" comparisons that facilitates the fair comparison of policy and program design options. The project provides a tool for assessing complex program interactions between critical public programs for the elderly, such as SSI, Social Security, Medicaid and Medicare. It also provides an innovative tool for assessing the interactions between program design and broader trends in the economy and society, such as changing marital patterns and shifts in pension systems from defined benefit to defined contribution plans. Using evidence from the FEM is useful for developing consensus among policy makers of differing political persuasion about cost-effective ways of improving the effectiveness of SSI and other programs, and debunking—positive or negative—myths and exaggerations about potential effects of program reform that do not hold up under the closer scrutiny provided by FEM-based policy evaluation applications.

SOCIAL SECURITY ADMINISTRATION: HEALTH AND MORTALITY OF RETIREMENT-AGED WORKERS

This research project investigates mortality and health of male Social Security covered workers who claim benefits at different retirement ages, and life expectancy of male Social Security covered workers aged 60 and older by socioeconomic status.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Hilary Waldron, 500 E Street, SW., 9th Floor, Washington, DC 20254–0001.

General Description: This research project investigates mortality and health differences among Social Security covered workers. Past work studied how mortality and health differed between men claiming Social Security benefits at different Social Security entitlement (retirement) ages. The most recent work analyzed trends in male life expectancy by socioeconomic status for male Social Security covered workers aged 60 and older. Mortality and health differences among Social Security covered workers can impact the Social Security program in many ways, including possible effects on disability applications, mortality projections, and possible behavioral responses to any hypothetical future increases in Social Security's Early Entitlement Age (EEA) or Full Retirement Age (FRA).

Mortality and health differences among Social Security covered workers can impact the Social Security program in many ways, including effects on disability applications, mortality projections, and behavioral responses to possible future increases in Social Security's EEA or FRA.

The retirement policy community is currently debating the advisability of raising Social Security's EEA as a means of encouraging greater work participation at older ages in the U.S. Knowledge of differences in health and mortality risk among older persons is crucial when analyzing such proposals. Many studies have found health to be a powerful factor in retirement decisions, leading to conjectures that improving health levels should make retirement later than age 62 more desirable and more feasible for workers. Most studies of health trends, however, have looked only at *average* health levels among workers nearing retirement, concluding that average health is improving and that only a minority of individuals are in poor health as they reach age 62.

The studies in this project delve beneath the population averages. The earlier work looked at the health and mortality of workers retiring at 62 compared to those who retired later, finding there was substantial evidence that the early retirees tended to be less healthy and to die earlier than those who retired later. The most recent work looked at trends in life expectancy. Although average life expectancies have been increasing, the study found significant evidence that life expectancies at lower socioeconomic status have not been increasing as fast as those at higher socioeconomic status.

The life expectancy trends have wider implications than the determination of early entitlement policy. The U.S. currently lags in life expectancy behind most wealthy developed nations, while simultaneously spending more on health care than these other nations. This project compared U.S. life expectancy to that of other countries. Other relevant work under way in this area includes a National Academy of Sciences panel of prominent researchers investigating "Divergent Trends in Longevity in High-Income Countries."

In addition, trends in life expectancy by socioeconomic status may have implications for future Social Security expenditures. This project's study of life expectancy trends was cited in this regard in the April 2008 CBO issue brief, "Growing Disparities in Life Expectancy."

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

Mortality and health differences among Social Security covered workers can impact the Social Security program in many ways, including effects on disability applications, mortality projections, and behavioral responses to possible future increases in Social Security's EEA or FRA.

The retirement policy community is currently debating the advisability of raising Social Security's EEA as a means of encouraging greater work participation at older ages in the U.S. Knowledge of differences in health and mortality risk among older persons is cru-

cial when analyzing such proposals. Many studies have found health to be a powerful factor in retirement decisions, leading to conjectures that improving health levels should make retirement later than age 62 more desirable and more feasible for workers. Most studies of health trends, however, have looked only at *average* health levels among workers nearing retirement, concluding that average health is improving and that only a minority of individuals are in poor health as they reach age 62.

The studies in this project delve beneath the population averages. The earlier work looked at the health and mortality of workers retiring at 62 compared to those who retired later, finding there was substantial evidence that the early retirees tended to be less healthy and to die earlier than those who retired later. The most recent work looked at trends in life expectancy. Although average life expectancies have been increasing, the study found significant evidence that life expectancies at lower socioeconomic status have not been increasing as fast as those at higher socioeconomic status.

The life expectancy trends have wider implications than the determination of early entitlement policy. The U.S. currently lags in life expectancy behind most wealthy developed nations, while simultaneously spending more on health care than these other nations. This project compared U.S. life expectancy to that of other countries. Other relevant work under way in this area includes a National Academy of Sciences panel of prominent researchers investigating "Divergent Trends in Longevity in High-Income Countries."

In addition, trends in life expectancy by socioeconomic status may have implications for future Social Security expenditures. This project's study of life expectancy trends was cited in this regard in the April 2008 CBO issue brief, "Growing Disparities in Life Expectancy."

SOCIAL SECURITY ADMINISTRATION CONTRIBUTION TO THE HEALTH AND RETIREMENT STUDY (HRS)

The HRS provides an ongoing source of longitudinal data for research on retirement and aging. SSA provides substantial funds through interagency agreements with the National Institute on Aging.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Irena Dushi, Project Officer, 500 E Street, SW., 9th Floor, Washington, DC 20254–0001.

Partner Agency: National Institute on Aging.

General Description: The Health and Retirement Study (HRS) provides an ongoing source of longitudinal data for research on retirement and aging. HRS is an outgrowth of a prior longitudinal study undertaken by the Social Security Administration (SSA) in the late 1960s that interviewed respondents biennially between 1969 and 1979. At that time, SSA's Retirement History Study was a unique source of data to understand retirement decisions and retirement behavior in a period when a growing number of individuals were taking Social Security benefits before reaching age 65. The HRS has made many improvements to the design of the Social

Security study, learning from the strengths and limitations of the prior study. HRS is now the premier data set in this area.

Through interagency agreements with the National Institute on Aging, SSA provides substantial support for the HRS. SSA supports several areas: (1) Basic support to maintain sample size, improve data quality, assure the confidentiality of the data, and develop restricted access administrative data on benefits and earnings, (2) production of a user-friendly public-use file that requires substantially less time and effort to use than the underlying HRS data releases, especially for longitudinal analysis, (3) collection of longitudinal information on consumption to understand how consumption changes through retirement and whether people have adequate retirement income to meet their consumption needs, (4) efforts to improve the linking of survey information to SSA administrative records on benefits and earnings that is crucial for many analyses of effects of specific policy reforms, and (5) development of longitudinal weights and improved imputations of earnings and pensions that improve the quality of the resulting data.

Excellence: What makes this project exceptional?

The HRS is exceptional in numerous ways. The survey collects a wealth of data across a wide range of subjects, follows people from age 50 until death allowing for the study of the retirement and aging processes, and adds new cohorts every 6 years so that demographic and societal changes can be tracked. Government experts and academic researchers from a diverse set of disciplines, including economics, demography, sociology, psychology, medicine, epidemiology, health services, and survey methodology, collaborate on the design of the survey. The questionnaire employs innovative design features and experimental modules to improve the quality of the data and cover an extensive set of narrowly focused topics. The survey data are linkable to important administrative data files on earnings histories and benefits from SSA for respondents who have provided their consent, and to information on health costs from the Centers for Medicare and Medicaid Services, and pension plan provisions from employers. SSA also supports production of user-friendly public-use data files that greatly simplifies analysis of data across interviews. And the HRS has become a model for similar data collections in other countries, allowing for the study of trends in aging and retirement worldwide.

Significance: How is this research relevant to older persons, populations and/or an aging society?

This survey has been expressly designed to provide the data needed to understand the dynamics of retirement and the aging of the population. HRS data are helping SSA assess a wide range of issues: preretirement savings, health status, health insurance and pension coverage, retirement transitions, and retirement income, including benefits and projected benefits of retired workers, their dependents and auxiliary beneficiaries. Of particular interest among the older cohorts are questions of the economic impact of health problems or age-related declines in health, the impact of widowhood on economic well-being, and the extent of dissaving and Medicaid spend down as people age.

Effectiveness: What is the impact and/or application of this research to older persons?

SSA supports a great deal of research on program issues using the HRS. Recent work using the HRS has addressed such topics as changing consumption at retirement, planning for retirement and financial literacy, managing risks in retirement, assessing the effects of the changing pension environment, adequacy of saving for retirement, effects of Social Security reform options, and differences in the distribution of wealth holdings, pension participation and plan characteristics, and long term care preparations across cohorts of near retirees. The HRS is also an important database for estimating some of the relationships underlying SSA microsimulation models. For example, labor force retirement, financial wealth, and housing equity in Modeling Income in the Near Term are based on relationships estimated from HRS.

Innovativeness: Why is this research exciting or newsworthy?

The U.S. is one of many countries worldwide that is facing an aging population and, in particular, the challenge of a baby boom generation that is on the brink of retirement. Major programs, such as Social Security and Medicare, must make changes in order to remain solvent. The HRS is exciting and newsworthy, because it is a powerful tool for assessing the programs and policies of the present and future.

SOCIAL SECURITY ADMINISTRATION: MODELING INCOME IN THE NEAR TERM (MINT)

MINT is a microsimulation model that projects the economic and demographic circumstances of older Americans through the year 2099 based on data developed by SSA and the Census Bureau to study their economic well-being and to assess the effects of Social Security reform proposals.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Howard M. Iams, Ph.D., 500 E Street, SW., RM 914, Washington, DC 20254–0001.

General Description: MINT (Modeling Income in the Near Term) is a microsimulation model that allows researchers and analysts to examine the economic and demographic circumstances of current retirees and the projected circumstances of future retiree populations. It began initially as a model to document the probable experience of baby boomers in their retirement years, but has recently been expanded to include projections over a longer time horizon. Depending on the analysis year and the group under study, MINT uses actual data, projections, or a combination of the two. Special, detailed databases developed jointly by the Social Security Administration (SSA) and the Census Bureau underlie the model. To create these databases, the two agencies exactly match household survey information from the Survey of Income and Program Participation (SIPP) to administrative records maintained by SSA.

MINT is updated and improved on a continual basis:

• In 2004, the large 1996 SIPP panel was added to the base of MINT data which allows for examination of even relatively small subgroups.

• In 2008, projection techniques were developed that allow MINT to simulate retirement income for older Americans through calendar year 2099.

• In 2008, a beta version of a detailed tax module was created for analysis of benefit taxation issues.

• In 2008, fertility histories were added that allow for the addition of some Social Security child beneficiaries to the model.

• In 2008, the pension model was refined to take account of trends with regard to defined benefit pensions.

• SSA administrative records through 2005 are now available in the underlying database.

MINT is used to study the economic well-being of older Americans. For example, it is used to estimate the poverty rate, or more generally the level of income, of older Americans in future years. It is also used to estimate the characteristics of subgroups. For example, it is used to estimate the percentage of women in various marital status groups in future years (married, widowed, divorced, and never married). Because of the detailed underlying data and its long time horizon, MINT is used extensively to measure the impact of large-scale, complicated Social Security reform proposals. This type of analysis provides policymakers information that complements the standard cost analysis conducted for reform proposals. It allows for an assessment of how subgroups would fare under different reform plans.

Excellence: What makes this project exceptional?

MINT is exceptional because of the level of detail and the quality of the projections. It projects several sources of income, including Social Security benefits, Supplemental Security Income payments, defined contribution and defined benefit pensions, earnings, and income from accumulated assets. MINT provides the most comprehensive measures of retirement income and the most complete characterization of economic well-being for future populations of older Americans. MINT also captures complete lifetime earnings and marital history information, allowing for the analysis of large-scale and complex reform plans that would change retirement and auxiliary benefits under the Social Security program.

Significance: How is this research relevant to older persons, populations and/or an aging society?

MINT provides a comprehensive assessment of the economic well-being of older Americans well into the future. It is a flexible and well-developed tool that policymakers can use as they craft policies designed to deal with the consequences of an aging society. Any number of Social Security reform proposals can be evaluated using MINT.

Effectiveness: What is the impact and/or application of this research to older persons?

SSA has used MINT to provide analysis for the National Economic Council, the Office of Management and Budget, the House Ways and Means Committee, the Senate Finance Committee, and the Government Accountability Office, as well as the Social Security Administration and the Social Security Advisory Board. Several papers using MINT appear in the Social Security Bulletin, edited book volumes, and professional peer-reviewed journals. MINT information has influenced discussions of Social Security reform topics.

Innovativeness: Why is this research exciting or newsworthy?

MINT has influenced the development of other microsimulation models. Research teams studying MINT created other important policy simulation models, such as the Congressional Budget Office's long-term model (CBOLT). The influence continues today because of ongoing improvements to the model. For example, MINT's focus on measuring the detailed components of income will force other models to seek improvements (other current simulation models have only limited measures of income). MINT is also innovative in that it combines actual data on households with sophisticated projection techniques. The incorporation of rich underlying data improves the quality of the projections.

The continuing series of papers and analysis based on MINT are innovative. They reveal the changing landscape of retirement for older Americans. For example, policymakers concerned with the economic well-being of older women have focused on the widowed population. Research from MINT reveals that another segment of the population—never married women—is growing in number and is projected to experience relatively high levels of poverty. This type of research allows policymakers to craft policies designed to deal with newly developing demographic and economic trends.

SOCIAL SECURITY ADMINISTRATION: HEALTH CARE COSTS, TAXES, AND THE RETIREMENT DECISION

This research simulates how much longer the typical worker aged 65 in the year 2030 would have to work to have the same financial resources in a high tax burden and health cost scenario as in a low tax and health cost scenario.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigators: Richard Johnson, Senior Research Associate, Urban Institute, Washington, 2100 M Street, NW., Washington, DC 20037.

General Description: This research estimates the effects of rising taxes and health care costs on the timing of retirement. Higher tax burdens or health costs may delay retirement, as older people have to work longer to save enough money for retirement. On the other hand, if people anticipate these higher costs, they may work and save more while younger and retire when planned. To answer this question, the researchers consider two possible scenarios—one with high taxes and health costs, and one with low taxes and health costs. The low-cost scenario assumes that the tax burden in 2030 is roughly the same as in 2000 by adjusting exemption amounts and the standard deduction by the change in the average wage index. It also assumes health care costs increase at the same rate as inflation. In the high-cost scenario, there is no change in thresholds used for the alternative minimum tax or for taxing Social Security benefits, so more people would be subject to these taxes, and health costs increase by 3.2 percent each year between 2000 and 2030. Using representative cases for low, moderate, and high earners and single and married individuals, they simulate how much longer the typical worker would have to work to have the same financial resources at age 65 in the high-cost scenario as in the low-

cost scenario. In most cases, workers will have to delay retirement by 2.4 to 2.8 years in the high-cost scenario to receive as much annual retirement income as in the low-cost scenario. The only group that would not be affected is low-income single adults, because they would not pay Federal income taxes in either case, and most of their health costs are paid for by Medicaid.

Private individuals face large and growing health care costs. Despite near-universal Medicare coverage, these costs can be particularly burdensome for older Americans, who face out-of-pocket expenses for Medicare premiums, private supplemental premiums, and direct payments to health care providers for deductibles and copayments. Additionally, increasing public costs are likely to boost future tax burdens. Some of this increase will probably fall on older Americans, subjecting them to a double burden. This study is important, because it considers how rising tax burdens and out-of-pocket health care costs will affect the timing of retirement. How well people anticipate future increases in taxes and health care costs, and how they react at younger ages, will crucially affect retirement income. If households are farseeing rational planners, higher health costs and tax burdens will likely induce more saving and harder work while young, muting effects on retirement decisions.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

Private individuals face large and growing health care costs. Despite near-universal Medicare coverage, these costs can be particularly burdensome for older Americans, who face out-of-pocket expenses for Medicare premiums, private supplemental premiums, and direct payments to health care providers for deductibles and copayments. Additionally, increasing public costs are likely to boost future tax burdens. Some of this increase will probably fall on older Americans, subjecting them to a double burden. This study is important, because it considers how rising tax burdens and out-of-pocket health care costs will affect the timing of retirement. How well people anticipate future increases in taxes and health care costs, and how they react at younger ages, will crucially affect retirement income. If households are farseeing rational planners, higher health costs and tax burdens will likely induce more saving and harder work while young, muting effects on retirement decisions.

SOCIAL SECURITY ADMINISTRATION: MEASUREMENT OF RELIANCE ON SOCIAL SECURITY BENEFITS

This project evaluates how different data sources and methodologies affect estimates of the relative importance of Social Security benefits to the elderly.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Lynn Fisher, Economist, 500 E St., SW., 9th Floor, Washington, DC 20254–0001.

General Description: This research project establishes the extent to which statistics on the economic well-being of the elderly, in particular the importance of Social Security benefits relative to other sources of income received by the elderly, are affected by the choice of data source and the methodology employed.

Official statistics on income and poverty come from the March Supplement to the Current Population Survey (CPS) conducted by the U.S. Census Bureau. This project compares the Social Security Administration's (SSA) published statistics on the relative importance of Social Security for the elderly derived from the CPS with statistics produced using the U.S. Census Bureau's Survey of Income and Program Participation (SIPP) and the Federal Reserve Board's Survey of Consumer Finances. This project also uses administrative data on Social Security and Supplemental Security Income benefits linked to the CPS and SIPP to compare survey responses with administrative records for the same individuals. Comparison of estimates across surveys and the use of administrative data aid in evaluating the effect of variations in survey reporting on the perceived economic well-being of the elderly. Future research includes examination of survey reporting of asset income and pensions using Internal Revenue Service (IRS) administrative data linked to the CPS.

This project also examines how methodological choices, such as the unit of observation, influence estimates of the relative importance of Social Security. SSA traditionally has analyzed aged units when estimating the proportion of the elderly population receiving 50, 90, or 100 percent of its income from Social Security. An aged unit may be a married couple or a nonmarried person; resources from non-spouse family or other members of the household are excluded. In contrast, estimates of the relative importance of Social Security produced by the Congressional Research Service use only the income received by a person. Other measures of well-being, such as the official poverty measure, take into account all family income of a person.

Another methodological decision is the determination of which resources count as income. Many assume that those elderly who receive all of their income from Social Security have no other resources. Current measures, however, do not reflect lump sum withdrawals from individual retirement accounts and defined-contribution pensions (e.g., 401ks) or spending from savings—both of which are important elements of a financially secure retirement. SSA funded an experimental battery of questions to the Census Bureau's 2007 CPS on irregular sums paid out of such accounts. SSA is analyzing these data to evaluate the prevalence of lump-sum withdrawals. This research project is also examining the importance of noncash benefits (food, energy, and housing assistance) that provide a safety net for the elderly. Future research will analyze the relative importance of Social Security on an after-tax basis.

The results of this project, based on income data for 1996, indicate that the percentage of the elderly receiving all of their income from Social Security varies from under 5 percent to over 19 percent, depending on the data source and methodology.

Excellence: What makes this project exceptional?

This project is exceptional, because it brings together multiple sources of survey and administrative data, including new survey questions on irregular income from pension accounts and linkages of IRS data on pension and asset income, to explore what is actually measured by a frequently reported statistic—the relative importance of Social Security for the elderly. Using a number of accepted methodologies and data sources, estimates of the proportion of the elderly who are "completely reliant on Social Security" in 1996 vary from less than 1 in 20 to nearly 1 in 5. Because this statistic is so often reported by the press, researchers, and policymakers, it is important to understand how the estimates can differ to such a large degree.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Research into the financial resources available to the elderly is vitally important to policymakers and the public. Providing assistance to the elderly who are economically vulnerable requires an accurate understanding of the size of the vulnerable population and the resources that are available to them. One popular measure requested by the media and policymakers is the proportion of the elderly receiving all of their income from Social Security.

Effectiveness: What is the impact and/or application of this research to older persons?

Better understanding of how estimates of the economic vulnerability of the elderly are constructed is necessary to make fully informed decisions for public policy. Wide discrepancies between estimates based on different data sources also indicate that further improvements in data collection are necessary to better assess the economic vulnerability of the elderly.

Innovativeness: Why is this research exciting or newsworthy?

The proportion of the elderly receiving all of their income from Social Security is frequently reported in the media, usually as the elderly completely reliant/dependent on Social Security. Over the 1990s and early 2000s, the published proportion of aged units (married couples and nonmarried persons) 65 or older receiving all of their income from Social Security grew from 12 percent to 21 percent. Many interpret this rise as growing economic vulnerability of the elderly population. Results from this research project thus far indicate that this rise is most likely due to growing underreporting of the receipt of asset income in the March Supplement of the CPS. The estimate of the proportion of the elderly receiving all of their income from Social Security is highly sensitive to the data source and methodology used. In 1996, 19.4 percent of elderly individuals surveyed in the CPS received all of their income from Social Security compared to 9.4 percent in the SIPP. If the resources under consideration for the relative importance of Social Security were the same as for poverty estimates (the family income of the person), then 11.3 percent of the elderly in the CPS would have been considered completely reliant on Social Security; the same methodology in SIPP would have yielded 4.9 percent of the elderly completely reliant on Social Security.

SOCIAL SECURITY ADMINISTRATION: BENEFIT CLAIMING BEHAVIOR

This project investigates how changes in Social Security program rules affect benefit claiming behavior and labor force activity of older workers by examining the retirement earnings test rule change in 2000 and the gradual increase in the full retirement age.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Jae Song, Economist, 500 E Street, SW., 9th Floor, Washington, DC 20254–0001.

General Description: The challenge of an aging population is likely to require changes in policy rules in both Social Security and Medicare going forward, but how people will respond to policy changes is largely unknown. An increasing number of analysts advocate working longer to balance the needs of retirees with the tax burdens placed on younger workers. But, will people choose to work longer and continue to be productive members of society, or will they choose to spend some of the rewards of growing prosperity by retiring at younger ages? Evidence on behavioral responses to policy changes to the Social Security program became available in the last few years when two changes designed to encourage people to delay retirement came into effect.

This multi-year project analyzes responses to two recent changes in rules governing the Social Security program: the retirement earnings test was eliminated in 2000 for people aged 65–69, and the full retirement age (FRA) for people born in 1938 or later is gradually increasing in 2-month increments until reaching age 67. We examine changes in the age at which people claim Social Security retirement benefits in response to those changes. Data come from a 1 percent sample of administrative data from the Social Security Administration (SSA) for 1997 to 2007.

Descriptive and statistical analyses show that the largest effect of eliminating the earnings test in 2000 occurs at age 65. At that age, the proportion of people who claim retirement benefits increases by 4.6 percentage points among men and 2.4 percentage points among women. In addition, eliminating the earnings test significantly increases—by more than 20 percent—the probability that people who have not yet claimed Social Security benefits when they turn the full retirement age will claim those benefits.

Responses to the increase in the full retirement age are quite dramatic and show the power of policy changes. Among people born in 1937, about 18 percent of men and 12 percent of women claimed benefits at age 65, the FRA for that cohort. As the FRA increased by 2 months per year for the 1938, 1939, 1940, and 1941 cohorts, the bulge of people who claimed benefits at the FRA moved out as well. About 16 percent of men and 10 percent of women claimed benefits at age 65 and 8 months, the FRA for the 1941 cohort. People who previously would have claimed benefits at age 65 but waited until their new, higher FRA are most likely responding to both the benefit reduction and the signaling aspect of the Social Security retirement age. Moreover, the response to the gradual increase in the FRA occurs not only among those who are close to the FRA but also among those who are aged 62, 63 or 64.

In the future we plan to examine how the earnings of older workers have changed in response to the rule changes. We also want to explain why the work behavior of high-income older workers moves in the opposite direction from other workers.

Excellence: What makes this project exceptional?

This project uses unique data and topnotch empirical methods to examine responses to policy changes that affect every American who will receive Social Security retirement benefits. Changes in the full retirement age and the retirement earnings test were made for two reasons: to improve solvency of the Social Security system and to encourage older people to work longer so that their earnings can supplement Social Security benefits. We examine changes in the age at which people claim Social Security retirement benefits as well as long-term and short-term effects on labor supply in response to the two Social Security rule changes. Findings from the project are essential not only for examining the effectiveness of the two rule changes, but also for designing future program rules to further improve solvency of entitlement programs.

The project relies on highly accurate administrative data maintained by SSA. The administrative files include annual earnings for each individual over his/her lifetime, the month and year of birth, month and year of benefit entitlement, and the type of beneficiary status (primary or auxiliary), which are typically not available in survey data. Innovative implementation of a simple regression model paired with historical data reflecting responses to the policy changes produces highly reliable and convincing results, and allows us to estimate the uneven impact of the rule changes across different earnings groups.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The gradual increase in the full retirement age affects everyone born in 1938 or later who will claim retirement benefits from Social Security. For example, everyone born in 1943 has to wait until age 66 to receive full Social Security benefits. If they choose to claim benefits at age 65, they would receive only about 93 percent of their full benefit for the rest of their life. If they choose to claim their benefits at age 62, they would receive just 75 percent of their full benefit. The reductions affect spousal benefits and widow benefits as well.

The change in the retirement earnings test had widespread effects also. In 2000, approximately 10 million older workers aged 65–69 were affected by the elimination of the retirement earning test.

Effectiveness: What is the impact and/or application of this research to older persons?

Results of the project are essential to understanding likely outcomes following reforms of the earnings test and full retirement age, and designing effective reforms in the future. Outcomes of interest include actual changes in retirement ages, additional hours or years in the labor force, and consequent effects on the economic welfare of older workers.

The retirement earnings test continues to affect those who claim Social Security benefits before they reach the full retirement age. Because early claimants constitute more than 80 percent of all those who ever claim retirement benefits, most individuals are po-

tentially subject to the earnings test for a few years after claiming benefits. More individuals are likely to be affected in the future as the full retirement age gradually rises to 67, increasing the breadth of the age range where the earnings test applies.

Innovativeness: Why is this research exciting or newsworthy?

Unlike other studies, this study uses highly representative and accurate data generated from program administration that covers periods of time both before and after the earnings test and FRA rule changes. Such an extended period can help us understand dynamic responses by older workers, some of whom face substantial constraints on remaining in or reentering the labor force because of deteriorating health and outdated skills.

In addition, most past studies of the earnings test rely on a simple regression with a focus on likely effects on average individuals. Such studies have failed to detect the uneven impact of removing the earnings test across the earnings distribution predicted by the structure of the earnings test. Our innovative implementation of regression techniques allows us to examine the uneven impact of the earnings test removal across the distribution of earnings and consequently identifies strong effects at particular regions of the earnings distribution.

SOCIAL SECURITY ADMINISTRATION: 401(k) AUTOMATIC ENROLLMENT

This paper summarizes the empirical evidence on automatic enrollment in 401(k) plans. The evidence strongly suggests that automatic enrollment affects savings outcomes at every step along the way.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Brigitte Madrian, Professor of Public Policy, Harvard University, Cambridge, MA 02138.

General Description: This project assesses the impact on savings behavior of several different 401(k) plan features, including automatic enrollment, automatic cash distributions, employer matching provisions, eligibility requirements, investment options, and financial education. The author presents new survey evidence on individual savings adequacy, basing many of the conclusions on an analysis of micro-level administrative data on the 401(k) savings behavior of employees in several large corporations that implemented changes in their 401(k) plan design. The analysis identifies a key behavioral principle that should partially guide the design of 401(k) plans: Employees often follow "the path of least resistance." For better or for worse, plan administrators can manipulate the path of least resistance to powerfully influence the savings and investment choices of their employees.

The paper presents empirical evidence on how automatic enrollment affects retirement savings outcomes at all stages of the saving lifecycle, including savings plan participation, savings rates, asset allocation, and post-retirement savings distributions. The paper is significant, because it is able to show why defaults have such a tremendous impact on savings outcomes. The paper concludes with a discussion of the role of public policy towards retirement saving when defaults matter. This research has had a direct

effect on policy. The Pension Protection Act of 2006 provides statutory authority for employers to automatically enroll workers in defined contribution plans.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The paper presents empirical evidence on how automatic enrollment affects retirement savings outcomes at all stages of the savings lifecycle, including savings plan participation, savings rates, asset allocation, and post-retirement savings distributions. The paper is significant, because it is able to show why defaults have such a tremendous impact on savings outcomes. The paper concludes with a discussion of the role of public policy towards retirement saving when defaults matter. This research has had a direct effect on policy. The Pension Protection Act of 2006 provides statutory authority for employers to automatically enroll workers in defined contribution plans.

SOCIAL SECURITY ADMINISTRATION: ALTERNATIVE POVERTY RATES

This research creates a consumption-based poverty measure. This is relevant to the elderly population, who are likely to receive income-in-kind, such as Medicare, and have savings or home equity to draw from.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Michael Hurd, Senior Economist and Director, RAND Center for the Study of Aging, RAND Corporation, 1776 Main Street, Santa Monica, CA 90407.

General Description: This research uses income and consumption data from the Consumption and Activities Mail Survey (CAMS) and Health and Retirement Study (HRS) to calculate alternative poverty rates. These are compared to the poverty rates computed using pre-tax income from the Current Population Survey (CPS). The consumption-based measure is the sum of expenditures on non-durable goods and consumption flows from durable goods, such as cars and housing. It is related to income since consumption cannot exceed after-tax income. For groups such as the elderly, a consumption-based measure of poverty may be more reliable since it takes into account income-in-kind, such as Medicare, spending out of wealth, and consumption flows from durable goods. The authors check the validity of the CAMS data and find very high response rates for questions on different types of expenditures. In addition, the patterns of consumption are consistent with younger households saving more while the oldest spend more.

The authors find that poverty rates computed from pre-tax and after-tax incomes are similar for most age ranges. However, the consumption-based poverty rate is much lower than an income-based rate. Overall, 6.16 percent of households fall below the poverty threshold based on income, but when consumption is used, only 2.85 percent would fall below the poverty line. The consump-

tion-based poverty measure accounts for differences in wealth. Of those in poverty based on income, those also in poverty based on consumption have, on average, $187 of non-housing wealth. This is much lower than the average non-housing wealth of $158,202 for those who are not in poverty according to consumption.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

Policy makers have long relied on income-based measures of poverty. Consumption is arguably a much more accurate measure of material well-being than income. For example, households can consume more than their income if they have savings. In this case, if we looked at income, we would form a different impression of the well-being of the household than if we looked at consumption. This project finds that consumption-based poverty rates are considerably lower than income-based rates, especially for single people. A consumption-based measure of poverty would actually decrease the percentage of people categorized as poor, and this is especially true in advanced old age as people spend increasingly out of savings.

SOCIAL SECURITY ADMINISTRATION: FINANCIAL LITERACY

Financial literacy in the older than 50 population is lacking. Most respondents are able to calculate a percentage, but only 55 percent can divide and less than 20 percent can computer compound interest. Solutions to remedy this situation and encourage retirement planning are still needed.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Annamaria Lusardi, Professor, Dartmouth College, Department of Economics, Hanover, NH 03755–3514.

General Description: Using survey data from the Health and Retirement Study, the authors find that financial literacy in the older than 50 population is lacking. Their results are based on several simple questions that ask respondents to calculate a percentage, divide two numbers, and compute compound interest. Most respondents are able to correctly calculate a percentage, while about 55 percent can divide, and less than 20 percent can compute compound interest correctly. These findings are consistent with other financial literacy surveys, both in the U.S. and in other developed countries, that find that many people do not understand interest rates or the terms of their investments. These results are not promising, since this age group should have financial experience and retirement planning is relevant for this group. Respondents who are financially literate are more likely to have planned for retirement. Furthermore, it is unclear how to remedy this situation. Other researchers have found that the effectiveness of financial education seminars is low and since they are voluntary, may not reach those who are most in need of retirement planning.

This project studies workers' levels of financial literacy and finds that strikingly many respondents display particularly low levels of

financial knowledge. Moreover, people who plan for retirement and execute their plans successfully are those who are more financially literate. Other countries have undertaken initiatives to enhance financial literacy, with the goal of enhancing retirement security. The information that this research produces on the level of financial literacy in different subgroups in the population will be useful for efforts aimed at providing financial education and improving financial literacy.

Annamaria Lusardi and Olivia Mitchell were awarded the 2007 Fidelity Research Institute Pyramid Prize for their work on advancing understanding of the importance of financial literacy and planning in helping Americans reach their financial goals. The prize is presented to authors of published applied research that the Institute believes best helps address the goal of improving lifelong financial well-being for Americans. The award-winning paper "Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth" first appeared as a working paper and was subsequently published in the Journal of Monetary Economics.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

This project studies workers' levels of financial literacy and finds that strikingly many respondents display particularly low levels of financial knowledge. Moreover, people who plan for retirement and execute their plans successfully are those who are more financially literate. Other countries have undertaken initiatives to enhance financial literacy, with the goal of enhancing retirement security. The information that this research produces on the level of financial literacy in different subgroups in the population will be useful for efforts aimed at providing financial education and improving financial literacy.

Annamaria Lusardi and Olivia Mitchell were awarded the 2007 Fidelity Research Institute Pyramid Prize for their work on advancing understanding of the importance of financial literacy and planning in helping Americans reach their financial goals. The prize is presented to authors of published applied research that the Institute believes best helps address the goal of improving lifelong financial well-being for Americans. The award-winning paper "Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth" first appeared as a working paper and was subsequently published in the Journal of Monetary Economics.

SOCIAL SECURITY ADMINISTRATION: SOCIAL SECURITY TAX PAYMENTS AND BENEFIT RECEIPTS

This project identifies how much each cohort of workers and retirees, past and projected, has paid or will pay in Social Security taxes, and how much each cohort has received or will receive in benefits under present law and alternative reform proposals.

Lead Agency: Social Security Administration.

Agency Mission: To advance the economic security of the Nation's people through compassionate and vigilant leadership in shaping and managing America's Social Security programs.

Principal Investigator: Dean Leimer, Economist, 500 E Street, SW., 9th Floor, Washington, DC 20254–0001.

General Description: This project develops a comprehensive accounting of Social Security tax payments and benefit receipts across and within birth cohorts and identifies the implications of these payments for Social Security reform. The first part of the project developed all historical tax payments and benefit receipts by race, gender, and year of birth under the Old-Age and Survivors Insurance (OASI) program, under the Disability Insurance (DI) program, and under these combined programs (OASDI). These estimates allow the identification of historical redistribution under these programs across these race, gender, and generation groups, and the extent to which each of these groups received their "money's worth" from the programs. Although aggregate tax and benefit payments by year are readily available, the breakdown into payments by year, age, race, and gender—requirements for cohort, money's worth, and redistributional accounting—is not. This project draws on a variety of administrative data sources, some readily available in electronic format but others available only in hard copy publications, and develops techniques to allocate the taxes and benefits to the appropriate race, gender, and age group each year from these disparate data sources.

The second part of the project develops cohort accounting estimates of lifetime money's worth and redistributional outcomes under the OASI program for all past, present, and future birth cohorts affected by the program through the cohort born in 2100. These estimates combine, (1) the comprehensive and authoritative accounting of historical OASI taxes and benefits developed in the first part of the project with (2) projected taxes and benefits by birth cohort that are consistent with recent Trustees Reports. Cohort accounting estimates are also developed under alternative tax increase and benefit award reduction policies that bring the program into long-run financial balance over the Trustees Report projection period and beyond. Cohort accounting estimates are developed both from the perspective of cohort members, indicating the extent to which each birth cohort has received or can expect to receive their "money's worth" from the program, and from the perspective of the Social Security program, indicating the extent of redistribution across these cohorts under present law and alternative reform proposals.

Excellence: What makes this project exceptional?

Significance: How is this research relevant to older persons, populations and/or an aging society?

Effectiveness: What is the impact and/or application of this research to older persons?

Innovativeness: Why is this research exciting or newsworthy?

The data developed for this project represent more comprehensive and authoritative measures of historical taxes and benefits under the Social Security program than previously had been available. Previous analyses were based on less definitive estimates, resulting in less accurate and often misleading descriptions of Social Security program outcomes for specific race, gender, and birth co-

hort groups. An accurate accounting of such outcomes is crucial to understanding how the program has worked, its effects on groups of policy interest, and how various reform proposals could affect those outcomes. The projection of lifetime outcomes by birth cohort developed in the second phase of the project extend these results for past, present, and future cohorts consistent with recent Trustees Report projections under present law and alternative reform proposals.

Such authoritative projections are central to informing the current policy debate. The historical and projected data, and the associated money's worth and redistributional estimates developed under this project, have been cited frequently by the policy and research communities, as well as the popular press, as part of the current debate, and have made significant contributions to informing policy and advancing research by: (1) Identifying the money's worth and redistributional effects of Social Security programs in the past, (2) illustrating the OASI program's potential effects in the future under alternative reform proposals, and (3) developing empirical and analytical approaches relevant to redistributional and money's worth analyses.

Social Security is one of the most wide-reaching government programs and is obviously crucial to the well-being of the aged and to many economically vulnerable population groups. Consequently, an accurate understanding of the past effects of the program on groups of policy interest and projections of how those effects could change under alternative reform proposals is of utmost importance to the aged and to the economically vulnerable groups affected by Social Security programs. This project has made significant contributions in understanding and projecting those effects and, more generally, helping advance related research.

SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION: INTEGRATED PRIMARY HEALTH CARE

PRISM–E was a federally funded multi-site randomized behavioral health services research study that compared effectiveness of an integrated primary health care approach to an enhanced version of specialty behavioral health services accessed through referral for older adults.

Lead Agency: Substance Abuse and Mental Health Services Administration (SAMHSA).

Agency Mission: SAMHSA's mission is to build resilience and facilitate recovery for people with or at risk for mental or substance use disorders.

Principal Investigator: Sue E. Levkoff, Sc.D., Harvard Medical School, Brigham and Women's Hospital, Department of Psychiatry, 1249 Boylston Street, 3rd Floor, Boston, MA 02215.

Partner Agency: Department of Veterans Affairs (DVA) was a key co-partner, Health Resources and Services Administration (HRSA), Centers for Medicare and Medicaid Services (CMS).

General Description: Although prevalence rates vary in epidemiological studies, elderly individuals experience high rates of depression, anxiety disorders, and alcohol use disorders. Older adults are high utilizers of health care services who seek and receive mental health and substance abuse services more often from their primary care providers than from specialty providers. At that time there

was great interest in whether integrating behavioral health care into primary health care settings might provide better access to care and/or better outcomes. To examine this issue, SAMHSA developed and funded a large randomized multisite study to add critical knowledge about how to best organize and deliver mental health and substance abuse services for older adults. The study was titled *Primary Care Research in Substance Abuse and Mental Health for the Elderly (PRISM–E).* PRISM–E was developed to compare the effectiveness of two common service delivery models to treat behavioral health care problems. The first model, Integrated Care, was set within generalist primary health care settings. The comparison model was an enhanced form of care provided in behavioral health specialist settings through referral from primary health care providers. The study aimed to identify differences in clinical and cost outcomes between these two models for targeted conditions common in older adults, depression, anxiety, and problem or at-risk alcohol use. This 6-year study included clinical screenings on 25,000 persons age 65 years and older; random assignment of 2,300 persons identified with mental health or substance abuse issues to either Integrated Care or Enhanced Specialty Referral treatment models; and, assessments at baseline, 3 and 6 months, to determine changes in clinical symptoms and functioning over the course of treatment.

Key findings of the study:

• Many older adults in primary care settings have behavioral health problems that can be easily identified by screening.

• Both treatment approaches succeeded in improving participant's mental health and resulted in participants' report of high satisfaction. An advantage of the Enhanced Specialty Referral model was found for persons with the most severe forms of depression.

• Integrated Care led to greater access to behavioral health services.

Policy implications of the study:

• Both Integrated Care and Enhanced Specialty Referral provide good options or choices for older adult consumers. Many consumers prefer Integrated Care because of concerns about stigma, transportation or coordination with other providers. The Enhanced Specialty Referral model better meets needs of consumers with more serious illnesses. Consumers demand choices and PRISM–E demonstrates two good choices for mental health and alcohol treatment services.

• Funding issues identified during the study included need for training opportunities for providers on integrated care, current prohibition of billing for both a primary care and psychiatry visit on the same day, and no funding options for administrative case management which is critical for Enhanced Specialty Referral.

Future plans include dissemination of findings through a SAMHSA-sponsored evidence-based practice KIT (Knowledge Informing Transformation) specific for the treatment of depression in older adults, brochures and web material for providers and older adult consumers.

Excellence: What makes this project exceptional?

PRISM–E was a large-scale behavioral health services study conducted with high standards of scientific rigor to enhance credibility

and generalizability. The study was conducted as a randomized trial; all sites underwent rigorous independent peer review; and the large number of study participants provided statistical power to address the study questions. A Coordinating Center provided oversight of the entire study and a Steering Committee, composed of Federal representatives, the Coordinating Center, all study sites and older adult consumers, provided ongoing collaborative planning for the study. A common research protocol and assessment battery was used with well-validated measures including culturally sensitive research instrument. A comprehensive cost study was included in the research. The primary findings of the study were published quickly after study completion in high-quality peer-reviewed journals.

Significance: How is this research relevant to older persons, populations and/or an aging society?

The study made significant contributions to the fields of aging, mental health, and substance abuse because it was:

- Largest study of depression in the elderly.
- Largest study of at-risk drinking and alcohol use in the elderly.
- First study of behavioral health integration vs. referral specialty care in the elderly.
- Past studies look at usual specialty care vs. collaborative care.
- First effectiveness study of behavioral health care integration for older adults.
- Other major studies focus on compliance to complex clinical guidelines.
- PRISM–E focused on behavioral health care services enhancements that were easily adoptable across diverse real-world clinical sites.
- Large sample of ethnic minority elderly (42 percent of total sample).

Effectiveness: What is the impact and/or application of this research to older persons?

Detailed findings from the study will contribute to better identification and treatment of older persons with behavioral health needs. Lessons learned include the following:

- Nearly 20 percent of the 25,000 persons screened presented significant levels of psychological distress and about 5 percent endorsed suicidal thoughts. Only 11 percent of those who screened positive for psychological distress and 14 percent of those with suicidal thoughts reported receiving care from a mental health professional during the past three months prior to the time of screening.
- Over 8 percent of older primary care patients consumed seven or more drinks per week or had more than four drinks in a day more than two times in the past 3 months, a level above the NIAAA guidelines for persons over the age of 65. Heavy drinkers or binge drinkers were more likely to become depressed or have poorer health status.
- Overall, patients in the Integrated Care group averaged more visits over the 6-month follow-up period than the Enhanced Specialty Referral group and initial engagement (making the first visit) was greater for Integrated Care than Enhanced Specialty Referral care.

• The comparison of two system intervention models of care (i.e., Integrated Care vs. Enhanced Specialty Referral) for older adults found comparable clinical rates of meaningful depression remission and decreases in depression severity over 6 months. However, for major or more severe forms of depression, the Enhanced Specialty Referral resulted in greater reduction in depressive symptoms than Integrated Care.

• The average quantity and frequency of drinking declined significantly over 6 months for consumers in both treatment groups. Similarly, binge drinking also declined over time with no differences in drinking between Integrated Care and Enhanced Specialty Referral.

• This study surveyed provider preference for the Integrated Care or the Enhanced Specialty Referral models. Almost all primary care providers stated that Integrated Care led to better communication between primary care and mental health providers, less stigma for patients, and better coordination of mental/physical care. Fewer thought that Integrated Care led to better management of depression, anxiety, or alcohol problems.

Innovativeness: Why is this research exciting or newsworthy?

The study demonstrated innovativeness in the following ways:

• Development and implementation of Consumer Advisory Councils at local and national levels; Active participation of consumers in many aspects of study.

• Study addressed multiple behavioral health conditions in context of one study and its two comparison models.

• Study had input from many constituencies including policymakers, providers, funders, consumers, advocates, cultural competence experts, and a variety of research specialties.

• Randomized trial conducted in real world settings typically not the focus of large scale funded research projects.

• In addition to primary Federal leadership from SAMHSA Project Officer, study included an array of additional expertise and participation of Federal staff from all three of SAMHSA's Centers and from participating Federal agencies.

• Study databases are publicly available and detailed manuals are available for understanding their organization. This will foster analysis by additional outside investigators for years to come.

VI. Appendix II: List of Agencies Contacted for Submissions

Department of Agriculture
Department of Commerce
    Census Bureau
Department of Defense
Department of Education
Department of Energy
Department of Health and Human Services
    Administration on Aging
    Administration for Children and Families
    Agency for Healthcare Research and Quality
    Agency for Toxic Substances and Disease Registry
    Centers for Disease Control and Prevention
        National Center for Environmental Health/Agency for Toxic Substances and Disease Registry
        National Center for Health Statistics

Centers for Medicare and Medicaid Services
Food and Drug Administration
Health Resources and Services Administration
Indian Health Service
National Institutes of Health
National Institute on Aging
Office of the Assistant Secretary for Planning and Evaluation
Substance Abuse and Mental Health Services Administration
Department of Homeland Security
Department of Housing and Urban Development
Department of the Interior
Department of Justice
Department of Labor
Bureau of Labor Statistics
Employee Benefits Security Administration
Department of State
Department of Transportation
Department of the Treasury
Department of Veterans Affairs

INDEPENDENT AGENCIES

Agency for International Development
Appalachian Regional Commission
U.S. Arctic Research Commission
Commission on Civil Rights
Congressional Budget Office
Consumer Product Safety Commission
Corporation for National Service
Environmental Protection Agency
Equal Employment Opportunity Commission
Federal Communications Commission
Federal Reserve System
Federal Trade Commission
General Accounting Office
Interagency Council on Homelessness
Legal Services Corporation
Library of Congress
National Aeronautics and Space Administration
National Archives and Records Administration
National Council on Disability
National Endowments for the Arts
National Endowment for the Humanities
National Science Foundation
Pension Benefits Guaranty Corporation
Postal Service
Railroad Retirement Board
Small Business Administration
Smithsonian Institution
Social Security Administration

○