ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Wise, David A.

Article

The economics of aging

NBER Reporter Online

Provided in Cooperation with:
National Bureau of Economic Research (NBER), Cambridge, Mass.

Suggested Citation: Wise, David A. (2003) : The economics of aging, NBER Reporter Online, National Bureau of Economic Research (NBER), Cambridge, MA, Iss. Summer 2003, pp. 1-10

This Version is available at:
https://hdl.handle.net/10419/61842

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH

Reporter OnLine at: www.nber.org/reporter

SUMMER 2003

IN THIS ISSUE

Program Report: The Economics of Aging 1

Research Summaries: Randomized Trials and Quasi-Experiments in Education Research 11
Inflation Dynamics: Combining Measurement with Theory 15
The New Economics of Smoking 19
Venture Capitalists As Economic Principals 22

NBER Profiles 25
Conferences 28
Bureau News 39
Bureau Books 49
Current Working Papers 50

NBER Service Brings You New Data for Free

A new, **free** NBER email service gives you daily email links to all U.S. government data releases, including unemployment, trade, interest rates, GDP, etc. We keep track of your preferences and email you the requested links when they are released. To sign up for any or all of the government releases, visit www.nber.org/releases and register your choices. **IT'S FREE!!**

Program Report

The Economics of Aging

David A. Wise*

Population aging, early retirement, limited but increasing retirement saving, more expensive medical practice patterns, and an established national entitlement to income and health care support after age 65 — all of these factors largely define the economic environment of the United States (and much of the world) at the beginning of the 21st century. Over the past 30 years, life expectancy has increased from age 71 to age 77, while the most common age of retirement has decreased from age 65 to age 62. Retiring at age 62, the typical American retiree today faces another 20 years of living, consuming and, at one time or another, and in many cases regularly, needing expensive health care services. These trends already have placed significant financial pressure on the public and employer-sponsored programs that provide income and health care support to older Americans.

Meanwhile, the massive demographic bulge in the population — the baby boom generation — begins turning age 62 in 2008. Going forward, the number of Americans age 62 and older is projected to double from 40 million today to 80 million 30 years from now, while the working age population is projected to grow by just 12 percent over the same period. Compounding the demographic situation is the continuing rise in medical costs. National health care expenditures have grown from $250 billion annually in 1980 to $1.4 trillion today, and show little sign of slowing down. The combination of economic, labor market, health and demographic trends points to any number of social and economic challenges in the decades ahead. Understanding the complexities of this situation, and the relationships between demographics, policy, behavior, economics, and health — this is the substantive aim of the NBER Program on the Economics of Aging.

Begun in 1986, the Aging Program has developed primarily around large, coordinated research projects that simultaneously address several interrelated issues in the economics of aging. Extensive funding for the program has been provided by the National Institute on Aging (NIA), both through multiple research grants and through a Center grant, which provides centralized infrastructure support to the program effort. NIA also has supported our efforts to engage new investigators in studying

* *Wise is Director of the NBER's Program on the Economics of Aging and the Stambaugh Professor of Political Economy at Harvard University's Kennedy School of Government.* *The numbers in brackets throughout this report refer to NBER Working Papers. This report has been prepared with the intensive help of Richard Woodbury.*

NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH

The National Bureau of Economic Research is a private, nonprofit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers and board of directors are:

President and Chief Executive Officer — *Martin Feldstein*
Vice President for Administration and Budget — *Susan Colligan*
Controller — *Kelly Horak*

BOARD OF DIRECTORS

Chairman — *Michael H. Moskow*
Vice Chairman — *Elizabeth E. Bailey*
Treasurer — *Robert Mednick*

DIRECTORS AT LARGE

Peter Aldrich
Elizabeth E. Bailey
John Herron Biggs
Andrew Brimmer
John S. Clarkeson
Don R. Conlan
George Eads
Martin Feldstein
Jacob A. Frenkel
Judith M. Gueron
Robert S. Hamada
George Hatsopoulos
Karen N. Horn
Judy C. Lewent
John Lipsky
Laurence H. Meyer
Michael H. Moskow
Alicia Munnell
Rudolph A. Oswald
Robert T. Parry
Richard N. Rosett
Marina V. N. Whitman
Martin B. Zimmerman

DIRECTORS BY UNIVERSITY APPOINTMENT

George Akerlof, *California, Berkeley*
Jagdish W. Bhagwati, *Columbia*
William C. Brainard, *Yale*
Michael J. Brennan, *California, Los Angeles*
Glen G. Cain, *Wisconsin*
Franklin Fisher, *MIT*
Saul H. Hymans, *Michigan*
Marjorie B. McElroy, *Duke*
Joel Mokyr, *Northwestern*
Andrew Postlewaite, *Pennsylvania*
Uwe Reinhardt, *Princeton*
Nathan Rosenberg, *Stanford*
Craig Swan, *Minnesota*
David B. Yoffie, *Harvard*
Arnold Zellner, *Chicago*

DIRECTORS BY APPOINTMENT OF OTHER ORGANIZATIONS

Mark Drabenstott, *American Agricultural Economics Association*
Gail Fosler, *The Conference Board*
A. Ronald Gallant, *American Statistical Association*
Richard C. Green, *American Finance Association*
Robert Mednick, *American Institute of Certified Public Accountants*
Angelo Melino, *Canadian Economics Association*
Richard D. Rippe, *National Association for Business Economics*
John J. Siegfried, *American Economic Association*
David A. Smith, *American Federation of Labor and Congress of Industrial Organizations*
Josh S. Weston, *Committee for Economic Development*
Gavin Wright, *Economic History Association*

The NBER depends on funding from individuals, corporations, and private foundations to maintain its independence and its flexibility in choosing its research activities. Inquiries concerning contributions may be addressed to Martin Feldstein, President & CEO, NBER 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. All contributions to the NBER are tax deductible.

The *Reporter* is issued for informational purposes and has not been reviewed by the Board of Directors of the NBER. It is not copyrighted and can be freely reproduced with appropriate attribution of source. Please provide the NBER's Public Information Department with copies of anything reproduced.

Preparation of the NBER *Reporter* is under the editorial supervision of Donna Zerwitz.

Requests for subscriptions, changes of address, and cancellations should be sent to *Reporter*, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. Please include the current mailing label.

issues in aging, and at least a dozen graduate students and post-doctoral research fellows become engaged in the program each year through NIA fellowships. Many more become engaged as research assistants on project grants. A number of smaller "exploratory" projects on issues in aging are supported through the Center, as well as projects that integrate related components of the overall research effort. More than 100 papers are completed annually by participants in the NBER program. Some of these also appear in a series of books published by the University of Chicago Press.[1]

The Economic Circumstances of Older Americans

Personal Retirement Accounts

A major theme of the Aging Program since its inception has been to better understand the economic circumstances of older Americans. A key fact from early project work was the very small amount of financial assets of most retirees in the United States in the early 1980s and the overwhelming reliance on Social Security, and in some cases firm pension plans, for financial support in retirement. But over the last two decades, there has been a dramatic transformation in the magnitude of saving that is taking place in personal retirement accounts, such as IRAs and 401(k) plans. Now about 85 percent of contributions to retirement plans are to personal accounts. In decomposing trends in plan eligibility, participation given eligibility, participant contributions, and aggregate wealth accumulation in personal retirement accounts, and in projecting the future of these trends, James M. Poterba, Steven F. Venti and I have confirmed the potential of 401(k) plans to significantly alter the financial circumstances of individuals retiring in the future [W8610, W6295, W5762]. Because more individuals will have had more years of participation in 401(k)-type savings plans, they will reach retirement with increasing accumulations of financial assets. For many, their personal retirement accounts will contribute as much or more in retirement than Social Security. The most recent in a long series of studies on this topic shows that the ratio of retirement plan assets to wage and salary earnings has grown more than five fold since 1975. This represents a fundamental transition in the composition of post-retirement financial support in the United States.

Despite these aggregate trends, it's clear that there is wide variation in saving behavior across the population. For example, Venti and I have found that saving rates vary substantially at all income levels, and that these variations lead to vastly different levels of asset accumulation over a working career [W7521]. What explains this variation in behavior? Part of the answer is simply choice: some people choose to save a lot, and others do not. But that choice is made in the context of one's social and economic environment, as well as the public and employer policies that relate to individual saving decisions. In a series of studies, James Choi, David Laibson, Brigitte Madrian, Andrew Metrick, and Dennis G. Shea find that the "default" provisions of 401(k) plans make a huge difference in whether and how much people save in their 401(k) plans [W8655, W8651, W7682]. Many more employees participate when there is automatic enrollment; and they contribute more to their plans, on average, when the default contribution rate of the program is higher. Recent research by Esther Duflo and Emmanuel Saez provides complementary evidence of increased participation in retirement plans by individuals who received a financial incentive to attend a program information session, as well as by individuals who did not receive the incentive, but who worked in departments where others received the incentive [W8885, W7735]. Thus the influence of peer behavior was found to be a significant factor in plan participation decisions.

Related studies from the Aging Program have considered more specific aspects of retirement saving. Studies of pre-retirement withdrawals from 401(k) plans find little effect on the total dollar accumulations in these plans, as a large fraction of job changers don't withdraw assets from their personal accounts and a large fraction of assets that are withdrawn are "rolled over" into other personal retirement accounts [W7314]. Studies of whether the assets in retirement accounts have replaced saving that would have otherwise taken place in other forms conclude that the large majority of personal retirement saving is new saving that would not have occurred without these plans [W5599]. Studies of the potential offsetting decline in defined benefit pension plan coverage conclude that the growth of personal retirement accounts dwarfs any displacement of assets in traditional plans [W8610]. And, studies of alternative measures of saving emphasize the implications of not counting capital gains as part of saving in the NIPA personal saving rate, while the expenditure of money that has accumulated in the form of capital gains is still counted as dis-saving (or spending) [W8237, W8610]. As a result, the NIPA-measured saving rate can be very low — about 2 percent now — while the retirement plan contribution rate (as a percentage of wage and salary earnings) has been over 8 percent.

Looking ahead, our research agenda has evolved to focus on the risks associated with different forms of retirement saving, and how recent trends may have changed the risk exposure of individuals in providing for their retirement. The different risk characteristics of fixed assets (like 401(k) accounts), as compared with annuitized assets (like Social Security and traditional pension plans) is one piece of this work. Another is the increased exposure to market fluctuations that is associated with personal retirement accounts. The extreme case of company stock as a retirement investment has been explored recently by Olivia S. Mitchell and Stephen P. Utkus; they confirm the risk of such investments, and identify policy tools that might encourage greater diversification [W9250]. Poterba, with various coauthors, also has looked at the allocation of investments in personal retirement accounts, focusing particularly on the mix between debt and equity holdings [W9268, W7991, W7392]. Among other findings, his research shows that the aggregate allocation between stocks and bonds in individual accounts is broadly similar to the allocation one finds in defined benefit plans, which are managed by financial professionals. But there is much more variation across individual retirement accounts. For instance, just over 45 percent of households with tax-deferred accounts appear to hold only equities, and 22 percent hold only debt. These results provide a starting point from which to consider the market risk of personal accounts.

Social Security, Housing, Annuities, and Bequests

As the primary source of retirement income support in the United States, Social Security defines the economic circumstances of many older Americans. Many members of the Aging Program are engaged in analyses of Social Security, as well as on the potential design and implications of various Social Security reform possibilities. In this report, I have focused on projects supported by the National Institute on Aging as part of NIA research grants. One such project, directed by Jeffrey B. Liebman, looks at how alternative Social Security reforms would be likely to affect lower-income households. Social Security is widely recognized as a redistributive program, replacing a greater fraction of earnings for those at lower income levels. Liebman's research, however, points to many other redistributive aspects of Social Security — from people with shorter life expectancies to people with longer life expectancies, from single workers and dual-earning couples to one-earner couples, and from long-career workers to short-career workers. Because of these other factors, about 20 percent of Social Security participants in the top income quintile receive a larger net transfer from Social Security than the average transfer for people in the lowest income quintile [W8625].

Liebman also finds that Social Security reforms that blend the current system with an investment-based component could give most Social Security beneficiaries higher expected benefits than the current system, and lower the percentage of widowed, divorced, and never married women with benefits below the poverty line from 26 percent to 9 percent [W7492]. Kathleen McGarry has also looked at poverty among the elderly, noting that reforms to the Supplemental Security Income Program could have a significant effect in reducing elderly poverty [W7574]. She also finds that a surprising number

of potential SSI recipients do not apply for benefits.

Aside from Social Security (and for some, an employer-provided pension), housing equity is the major asset of a large fraction of current retirees. Despite the value of these housing assets, Venti and I find that housing equity is rarely used to support general non-housing consumption during retirement [W8608, W7882]. We find that in the absence of a precipitating event (such as divorce, the death of a spouse, or the entry of a family member into a nursing home), families are unlikely to sell their homes, downsize, or remortgage. And even among those experiencing major life changes, discontinuing ownership is the exception rather than the rule. A related study by Gary V. Engelhardt, Jonathan Gruber, and Cynthia Perry finds that the living arrangements of widows and divorcees are more sensitive to economic circumstances than the living arrangements of couples [W8911]. They estimate that a 10 percent cut in Social Security benefits would lead more than 600,000 single-resident elderly households to move into shared living arrangements.

The role of bequests in the financial circumstances of older Americans also has been considered in a number of recent studies. One study by Michael D. Hurd and James Smith finds that the distribution of bequests is highly skewed, so that the typical baby-boom person will receive a very modest inheritance [W9142]. This is partly because of the skewed distribution of wealth and partly because of the tendency of the wealthy to have fewer children. But it is also attributable to anticipated dis-saving: it is estimated that households aged 70-74 will bequeath just 39 percent of their wealth, consuming the rest before they die. Jeffrey Brown and Scott Weisbenner also have explored the magnitude of assets that are passed from one generation to another through bequests and other intergenerational transfers [W8753]. They find that about one-fifth of current household wealth (on average) was obtained as a result of transfers and bequests, while four-fifths resulted from individual decisions about how much income to save. But, as in the Hurd and Smith study, they find a heavy concentration of transfer wealth among a relative smaller number of households. Focusing on the allocation of bequests among siblings, McGarry and Audrey Light find that 80 percent of older parents plan to make equal bequests. Among those planning to divide their estates unequally, about half point to the inequality as compensation for a child taking care of them in their old age, and half point to differences in the needs of different children.

Aging Program research is also exploring how assets are used at older ages, and how consumption changes at retirement. Recent work by Hurd and Susann Rohwedder, for example, finds a reduction in both anticipated and actual spending at retirement [W9586]. Brown, Amy Finkelstein, Poterba, Mitchell, and others are studying issues in annuity pricing, the differences in mortality experience between annuitants and the population at large, the potential for good inflation-adjusted annuity products, the differing characteristics of individual and joint-life annuity products, the differences in pricing between mandatory and voluntary annuity products, and the redistributive effects of annuities from those with shorter to those with longer life expectancies [W9256, W8567, W8064, W8045, W7812, W7560, W7268, W7199, W7193, W7191, W7168, W7005, W6918]. As more assets are being accumulated in personal retirement accounts, the question of whether, under what circumstances, and how much those assets might be annuitized is an increasingly important one. An important finding of this work is the higher longevity of those who purchase annuities, relative to the population as a whole, and the need to price annuities higher because of this differential.

Finally, a broad view of the financial circumstances of older Americans is presented in a recent study by Victor R. Fuchs [W8236]. Fuchs takes what he calls "a holistic approach" to the financial problems of the elderly, focusing simultaneously on expenditures that are self-financed and those financed by transfers from the young (under age 65). He finds that about 35 percent of the elderly's full income was devoted to health care; 65 percent to other goods and services. He also finds that 56 percent of full income was supported by transfers from the young; compared with 44 percent from the elderly themselves. He also points to future trends which may stimulate the need for more saving and more work prior to retirement.

Retirement Policies and Labor Market Behavior

Retirement Policy in the United States

A second major theme of the Aging Program is the relationship between retirement policies and labor market behavior, as well as the determinants of work and retirement decisions more generally. Over the years, the strong relationship between the economic incentives of retirement policies and the ages at which individuals retire from the labor force has been confirmed in multiple studies, using multiple data sources, and applying multiple research methodologies. The most recent have been conducted by Courtney Coile and Gruber [W7830, W7651, W7318], Alan L. Gustman and Thomas L. Steinmeier [W9183, W8229, W7588], and Andrew A. Samwick and me.[2] These studies point to the younger retirement that occurs, when younger retirement is encouraged by the economic structure of the benefit programs. Recent work by Courtney Coile has extended this line of analysis to the joint retirement decisions of couples, finding for example that the economic incentives in a wife's retirement plan can have a significant effect on the retirement decisions of both husband and wife [W9496]. Gustman and Steinmeier also have explored joint retirement decisions, and find much stronger interdependence when the spouses say they value spending time together [W8772].

Many other studies have looked at other determinants of retirement. A recent study by McGarry finds that changes in retirement expectations are driven to a much greater degree by changes in health than by changes in income or wealth [W9317]. Gustman and Steinmeier find that the dramatic

stock market rise in the 1990s had an effect in increasing retirement, while it lasted, but any continuing effects since the decline in the market are much more modest [W9404]. A study by Hurd, James Smith, and Julie M. Zissimopoulos finds that those who have worse survival expectations retire sooner, and collect retirement benefits sooner, although the majority of workers claim Social Security benefits as soon as they are eligible, regardless of their survival expectations [W9140]. Leora Friedberg finds that computer users retire later than non-users [W8297]. And a review of the literature by Gruber and Madrian (including a number of their own studies) concludes that health insurance availability is another important determinant of retirement [W8817]. This collection of studies makes clear the complexity of interrelated health, economic, social, and job circumstances that contribute to individual retirement decisions.

Social Security and Retirement Around the World

Beyond the analyses of retirement behavior in the United States, we also have been engaged in a major cross-national project on social security systems and retirement around the world. This project, now in its third phase, has brought together a team of investigators from Belgium, Canada, Denmark, Italy, France, Germany, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States. For each phase of the project, a set of parallel studies has been conducted in each country; and these studies are then integrated together to allow comparisons across countries. Both the individual studies [such as W9494, W9455, W8658] and the integrated analyses are published in a series of volumes by the University of Chicago Press.[3] These volumes have been supplemented by publications that describe the overall results [W9407, W8103].[4]

The first phase of the project mapped out the detailed provision of social security programs into measures of retirement incentives comparable across countries. The studies demonstrated a very strong correspondence across countries between the social security incentives to retire and the age at which older workers withdraw from the labor force. The second phase of the project applied micro-data from each country to estimate more formally the relationship between social security provisions and retirement in each country. The models emphasized the effect on retirement of the age of eligibility for retirement programs, and measures of the incentive to leave the labor force once a person is eligible. The model simulations confirmed very large effects of program provisions on retirement decisions in every country.

The third phase of the project (just finished) has used the retirement model estimates from phase two to describe the fiscal implications of various illustrative social security reforms. The first simulation predicts the effect of delaying all program benefit eligibility ages by three years. The second reform is a common social security system in all countries. The third reform is an adjustment of each country's program to an actuarially fair level with benefit payment rates adjusted on an actuarial basis for earlier or later retirement. While the simulations were conducted for each of the countries in the project, the character of the findings can be illustrated by looking at the case of Germany, which has not (until recently) reduced retirement benefit rates for those qualifying for early retirement. The findings suggest that implementing actuarially fair adjustments to retirement benefits in Germany would lead to an increase in the average retirement age of about 3 years, for both men and women. Combining the impact of such a reform on retirement behavior, benefit payments, contributions to the social security system, and other taxes paid as a result of retention in the labor force — there is an estimated fiscal benefit to the illustrative policy change of over 80,000 Euros per worker, or about 1.2 percent of GDP in Germany.

Continuing work on the project will consider the relationship between social security system provisions and the well-being of the elderly, as well as the young; the more complicated relationships between health, functional disability, social security provisions, and retirement; and the relationship between social security system provisions and the employment of the young. All of the new work is being done in the context of an evolving retirement policy environment worldwide, a policy evolution driven in large part by a growing awareness that social security programs are not sustainable under demographic trends which are compounded by program inducements for older workers to leave the labor force at younger and younger ages.

Socioeconomic Circumstances, Health, and Health Disparities

There is a dramatic and well documented correlation between socioeconomic measures, such as education, income, and wealth, on the one hand, and health measures, such as self-reported health status and mortality, on the other. What leads those with more income, education, wealth, and other measures of social status to be in better health, on average; and what leads those in better health to have more economic resources? Many potential causal links have been explored in NBER research, and the subject is a key aspect of our research agenda going forward.

In a series of studies, Angus S. Deaton and Christina Paxson have explored the multiple facets of the relationship between health and economic circumstances, using data from a number of countries, and making clear that there is no simple causal relationship [W8534, W8370, W8318, W8099, W7141, W7140]. Indeed the nature of the relationship may be quite different across geographic regions with different living standards, health conditions, racial composition, population density, inequality, and other factors. Most recently, the focus of this work has been on economic inequality, independent from economic status, as a potential determinant of inequalities in health. One approach of this investigation has focused on long-term historical trends in income inequality in the United States and United Kingdom, finding that the long-term decline in

mortality rates over the last half century occurred most rapidly when income inequality was rising — just the opposite of what one might expect if income inequality were an important causal factor of poorer health. The project also has looked at relative deprivation (low income relative to a reference group) as a potential influence on health, developing a relative deprivation model of health determination, along with empirical analyses to test the model. In the empirical work, relative deprivation as a measure of inequality also appears to have little effect on health outcomes. The general conclusion of this line of research is that while the direction of the causal relationship between health and wealth may be in doubt, the relationship is not determined by economic inequality.

Studies by Anne C. Case and Duflo have looked at the relationship between socioeconomic status and health from a somewhat different angle, focusing on the health effects of the expanded pension program in South Africa. This program dramatically elevated the economic resources of many extended families in South Africa, and not just the individuals directly eligible for the pension. Case finds a large causal effect of income on health status in poorer populations — an effect that works at least in part through sanitation and living standards, in part through nutritional status, and in part through the reduction of depression and psychosocial stress [W8495]. Duflo finds larger effects on the health of family members when a woman is the recipient of the pension than when a man is the recipient, suggesting differences in how income is allocated within households [W8061].

Research by Case, Darren Lubotsky, and Paxson has focused on the childhood origins of the relationship between socioeconomic status and health [W8344]. Using numerous data sources, they find that health is positively related to household income even in childhood. The relationship between household income and children's health status becomes more pronounced as children grow older, as the adverse health effects of lower income accumulate over children's lives. Thus, part of the intergenerational transmission of socio-economic status may work through the impact of parents' long-run average income on children's health.

Fuchs, Mark B. McClellan, Jonathan S. Skinner, and others have studied the geographic, income, and racial distribution of medical utilization [W8628, W6910, W6013]. One study explores the flow of Medicare benefits to high-income and low-income neighborhoods in 1990 and 1995. The authors find that Medicare spending per capita for the lowest income groups grew much more rapidly than Medicare spending in either high income or middle income neighborhoods. Thus, disparities in health care access and health care utilization may be decreasing over time.

Another set of studies looks at the potential impact of insurance coverage as a determining factor in health care utilization and access to care. For example, a question addressed in several studies is whether managed care has limited access to care. Paul Heidenreich, McClellan, Craig Frances, and Laurence C. Baker find that patients in geographic settings with a high share of managed care patients, following a heart attack, are more likely to received appropriate treatment with beta-blockers and aspirin, but less likely to undergo coronary angiography [W8065]. In a similar study, Daniel Altman, David M. Cutler, and Richard Zeckhauser find almost no difference between treatment intensity among individuals enrolled in HMO plans and those enrolled in indemnity insurance plans in the same health care markets [W7832].[5] The reason HMOs cost less, they conclude, is not because HMOs provide less care. Instead, about half of HMO cost savings is attributable to lower incidence of disease among HMO enrollees; and about half results from HMOs paying lower prices for the same treatments.

Where managed care may make a difference, however, is in the medical practice patterns used in geographical regions that have more or less managed care penetration, and in the spillover effects of cost containment on the provision of unreimbursed care. According to Cutler, one implication of the expansion of managed care — and indeed the cost containment strategies in all health insurance plans — is increased financial pressure on hospitals and associated limitations on "charity" care. This has led to more division of patients across hospitals according to their ability to pay. Low or non-paying patients increasingly are directed toward safety net hospitals, and fewer resources are available to these hospitals to provide un-reimbursed care. In other words, hospitals that have traditionally provided more care to uninsured patients are being doubly affected: first by having responsibility for an even larger portion of uninsured care; and second by getting less reimbursement from insured patients.

Many other components of NBER research in the Aging Program relate to the theme of socioeconomic status, health and health disparities. Robert T. Jensen has been engaged in a project on the effects of the macro economy on health circumstances in Russia and Eastern Europe. McClellan has looked at the effects of adverse health events on work and earnings. Daniel L. McFadden has developed a new research project on the dynamics of health and wealth, building on methodological work done in cooperation with Peter Adams, Hurd, Angela Merrill, and Tiago Ribeiro.[6] With Hurd and Merrill, McFadden also has looked at the quantitative importance of various predictors of mortality, including income, wealth and education [W7440]. All of these investigations relate to the causal links between socioeconomic circumstances and health; the Aging Program plays a significant role in integrating them in a coordinated programmatic way.

Health, Health Care, and Health Policy

Health, Disability and Mortality

Many have worried that increasing longevity would create a new burden of health and long-term care needs for an increasingly sick and disabled elderly population. While population aging has created additional health and long-term care needs, the

potential cost has been moderated — at least in the short run — by a significant long-term decline over time in the functional limitations of older people. This trend has been documented in numerous data sources. However, much less is known about the rate, acceleration, character, causes, and consequences of the decline. Thus the study of disability has become a new high priority area of research in the Aging Program.

In some initial work on this topic, Cutler has conducted an overview of the evidence on disability decline, and potential causal explanations.[7] He quantifies the rate of disability decline at 1 percent or more per year for the past several decades. Among the potential explanations of disability decline that Cutler cites are medical care improvements, improved health behaviors, increasing use of assistive devices and improvements in living conditions that increase independence with functional limitations, higher levels of education and improved socioeconomic status, reductions in disease exposure, and social supports. He and I are engaged in an ongoing research effort to better understand disability decline, its causes, the potential of interventions to extend it, and the cost implications of the decline for Medicare expenditures. A related project deals with the role of health behaviors as a determining factor of health and functional ability.

Dora L. Costa also has been studying trends in chronic illness, functional disability, and mortality. Her focus has been on longer-term historical trends, and the historical underpinnings of more recent health trends. For example, Costa finds that functional disability (disability in walking, difficulty in bending, paralysis, blindness, and deafness) in the United States has fallen at an average annual rate of 0.6 percent among men age 50 to 74 from the early twentieth century to the early 1990s [W7605]. Another recent study by Costa looks at the socioeconomic and demographic determinants of frame size using a data set of Civil War soldiers [W8843]. Costa finds that changes in frame size explain about three-fifths of the mortality decline among white men between 1915 and 1988 and predict even sharper declines in older age mortality between 1988 and 2022. Another study finds that the immediate effects of reduced infectious disease rates and reduced mortality from acute disease account for 62 percent of the 20th century increase in survival rates, and the long-term effects account for another 12 percent of the increase [W8000]. This line of research has provided a valuable historical perspective on more recent health and disability trends.

Alan M. Garber, Jay Bhattacharya, and Thomas E. MaCurdy also have initiated a new project on disability decline, focusing on medical care for the disabled elderly. This work will explore the individual patterns of disability decline (and improvement), the persistence of disability status of individuals over time, the inter-temporal links between disabilities and chronic diseases, and the medical utilization and expenses of individuals before and after the development of disability, and as individual functional ability evolves over time.

Trends in Treatment, Utilization, and Costs

A diversity of health care and health policy issues have been studied as part of the Aging Program in recent years. These include studies of trends in utilization, the composition of medical care costs in different health insurance programs, the persistence of individual health care expenditures over time, the role of technology change in medical practices as a key factor in medical expenditure growth, the increasingly disproportionate spending on medical care at older ages, the effectiveness of medical technology in treating various health conditions, the effects of different policy provisions in containing health care costs, and the differences in access to medical care across the population.

One line of research, involving Garber, MaCurdy, McClellan, and others, has focused on the one-third of Medicare expenditures that are spent on patients near the end of life.[8] In recent years, hospice care and other out-of-hospital treatment has decreased the proportion of the population that dies in the hospital, a trend that might have been expected to reduce costs. Instead, while there has been a decline in hospitalization rates over the 1988-95 period, the use of intensive care and intensive inpatient procedures has continued to increase, offsetting any potential cost savings.

Another set of studies has looked at trends in the treatment of specific health conditions, such as acute myocardial infarction or liver disease or ventricular arrhythmia.[9] Illustrative of the findings, a study of implantable cardioverter-defibrillators finds that their use, at a cost of up to $50,000 for the procedure and treatment of complications, grew more than 10-fold among Medicare beneficiaries between 1987 and 1995. Increasing use of bypass surgery and angioplasty, the more intensive approaches to heart attack treatment, also have increased rapidly, raising overall expenditure on heart attack treatment, despite a drop in the cost of any particular approach to treatment. The increasing technological intensity of medicine dominates almost all other sources of health care cost growth, including demographics, decreasing mortality, decreasing hospitalization rates, decreasing chronic illness rates, and other factors.

Complementing these studies of treatment trends are a collection of studies on the incremental benefits of intensive treatment, and the changing productivity of medical care.[10] A recent study of angioplasty by Cutler and Robert S. Huckman is representative of this work [W9311]. The use of angioplasty has spread dramatically over the 20 years since its introduction. It has raised the cost of treatment for coronary artery disease. However, because it now sometimes substitutes for bypass surgery, a more expensive procedure, there is some offset in costs with the same or better health outcomes as bypass surgery. And where angioplasty has replaced non-intensive medical management, the value of the technology is likely enough to justify the cost. Indeed many of the analyses of medical productivity by NBER investigators find that the increasing use of intensive procedures has done a lot to improve health, on average,

although the procedures may be less effective in marginal patients.

Health Insurance, Hospital Organization, and Health Policy Reform

In large part as a response to rising costs, the health insurance and health policy environment in the United States has continued to evolve. Cutler has explored the decline in health insurance coverage among working families in the United States in the 1990s, finding that coverage declined primarily because fewer workers took up coverage when offered it, not because fewer workers were offered insurance or were eligible for it [W9036].[11] Project estimates suggest that increased costs to employees can explain the entire decline in take-up rates in the 1990s.

Kessler and McClellan have been engaged in a project on the effects of hospital organizational form on medical productivity. A recent study from this project finds that areas with a for-profit hospital have about 2.4 percent lower hospital expenditures, but virtually the same patient health outcomes [W8537]. Kessler and McClellan attribute this to the likely spillover effects of for-profit hospitals on their nonprofit and public counterparts: the competition from for-profit hospitals may limit the ability of non-profits to behave inefficiently. In another study, Kessler, McClellan, and Henry Hansmann compare the responsiveness of hospitals to reductions in demand, finding that for-profit hospitals respond most rapidly, followed in turn by public and religiously affiliated non-profit hospitals, while secular non-profits are distinctly the least responsive ownership form [W8989].

Matthew Eichner, McClellan, and I have considered the incentives, characteristics, and potential limitations of medical savings accounts (MSAs) as an alternative approach to firm health insurance provision.[12] Under these plans, a specified amount of money is deposited each year in an employee MSA, and these funds are available to support non-catastrophic medical care expenses as needed. Unused assets in the MSA account are treated as long-term retirement saving. A catastrophic insurance plan covers any expenditures above this deductible. Such schemes are designed to provide consumers — and their health care providers — incentives not to spend money on care which offers only low marginal benefit. Our research has considered both the desirable incentive features of MSA plans and the potential limitations that might result for individuals with long-term continuing health care expenditures. We find that only a small fraction of households have continuing medical expenditures year after year at a level that would overwhelm their MSA balances. Indeed our most recent work on the project shows how MSA plans might work in conjunction with other personal retirement accounts as a means of financial preparation for retirement. Based on actual medical histories, our simulations suggest that more than half of plan enrollees participating in an equity-invested MSA program over a working career would accumulate MSA balances of over three times the amount contributed to the plans. And very few would accumulate less than 100 percent of their contributions, even after paying for non-catastrophic health care costs. Thus a key finding from the project is that MSA plans may not only be effective in containing health care costs; they may also work in conjunction with other programs to increase pre-retirement saving.

Cutler also has considered the dynamics of international health policy reform.[13] One study finds that as new and expensive medical technologies have developed over time, the policy commitment to equal access to care has become ever more expensive. Historically, countries have dealt with rising costs by maintaining equal access and restricting total spending. Today, many countries are considering a move away from spending controls and toward incentive-based medical care reform — possibly inducing more cost-effective health care decisions, but also greater reductions in care among those less able to afford the incentive-based cost-sharing provisions of the plans.

Database Development in Aging

Many NBER investigators have been involved in the development of data on older people in the United States and abroad. The Health and Retirement Survey (HRS) began about a decade ago and now provides longitudinal information on the health and economic circumstances of about 25,000 older Americans from 1992 to the present. NBER affiliates Charles Brown, Gustman, Hurd, and Mitchell are members of the HRS management team; David O. Meltzer, John Rust, and Skinner are on the HRS Steering Committee; and Cutler, David I. Laibson, and I are on the NIA Data Monitoring Committee for the HRS. The HRS project has developed and applied numerous survey innovations, including the use of bracketing questions to minimize non-response, the use of experimental modules for continuous database development, the inclusion of data on expectations, the linkage of survey data to administrative records from the Social Security Administration and the Centers for Medicaid and Medicare Services, and the inclusion and coding of pension and health plan data obtained directly from firms. Many participants in the Aging Program have assisted in developing, analyzing, and improving these innovative components.

McFadden has been a leader in the study of survey response bias and in the development of internet survey methodologies. A major accomplishment of this work has been to implement an experimental internet survey method for data collection, administered through an internet virtual laboratory, or IVLab, developed explicitly for the project. The IVLab has confirmed the value of internet-based questioning as a low-cost survey methodology that enables cost-effective experimentation with questionnaire formatting and survey content — experimentation that is generally cost-prohibitive using other survey approaches. McFadden's work also has been at the cutting edge in exploring how the format, sequencing, and context of questioning affects responses, and how to

effectively correct (or at least correctly interpret) biases that result from these survey limitations. In addition to the methodological advances made through the IVLab, McFadden and colleagues have completed both a pilot and a larger-scale version of an internet-based survey of older Americans, called the Retirement Perspectives Survey (RPS). The content of the RPS survey draws heavily on the asset and health components of HRS, but with substantially more variation in questionnaire format, sequencing, cues and context. These experimental treatments have enabled the research team to test order effects and other framing effects on subject responses. The larger-scale RPS survey also includes both mail-out and internet versions of the survey, so investigators can begin to assess how both sample selection and response biases differ between them, as well as between these experimental surveys and the HRS itself.

The analysis of survey response bias has continued to be a key element of this work. For example, a recent study by Li Gan, Hurd, and McFadden looks at people's mortality expectations, which are very close to actual mortality risks on average, but which have problematic characteristics, such as unrealistic focal point responses [W9480]. The methodological research being done by Hurd, McFadden, and others is helping to explain these anomalies, correct for them whenever possible, and appropriately interpret research that uses these data.

Yet another exciting area of database development has been in the development of international data on aging. Axel Börsch-Supan is the coordinator of the Survey of Health, Aging, and Retirement in Europe (SHARE). SHARE is a coordinated data collection effort in Denmark, France, Germany, Greece, Italy, the Nether-lands, Spain, and Sweden. It evolved in part from the HRS, and from the NBER project on social security systems and retirement around the world, and a number of NBER investigators (in addition to Börsch-Supan) are advisors to the SHARE project. In other parts of the world, Case, Deaton, and others have been involved in designing surveys and conducting research on the effects of the pension system in South Africa. Aging Program investigators also have been involved, peripherally at this point, in discussions with a larger consortium of research and data sites in developing regions throughout Africa and parts of Asia (the INDEPTH network). Duflo is involved in database development in areas of poor health in various regions of India. And Jensen has extended his research and database development work on health and economic circumstances in Russia and Eastern Europe to developing countries in Asia, including India and Pakistan.

For almost two decades, the NBER Aging Program has focused widespread attention on population aging, and the health and economic circumstances of individuals as they age. It has also worked well in integrating a wide range of related research projects into a cohesive program, including regular interaction among members of the research team, extensive dissemination of re-search findings in both academic publications and non-technical reports, external involvement in promoting aging-related research and data resource development in aging, organizing international collaborations and cross national comparisons of aging issues, sponsoring regular workshops and conferences on the economics of aging, and inspiring the collaborative engagement of both senior scholars and new investigators in the study of aging issues.

---

[1] *These volumes include* The Economics of Aging *(1989)*, Issues in the Economics of Aging *(1990)*, Topics in the Economics of Aging *(1992)*, Studies in the Economics of Aging *(1994)*, Advances in the Economics of Aging *(1996)*, Inquiries in the Economics of Aging *(1998)*, Frontiers in the Economics of Aging *(1998)*, Themes in the Economics of Aging (2001), *and* Perspectives on the Economics of Aging *(forthcoming)*.

[2] *A. Samwick and D.A. Wise, "Option Value Estimation with Health and Retirement Survey Data," in S. Ogura, T. Tachibanaki, and D.A. Wise, eds.,* Labor Markets and Firm Benefit Policies in Japan and the United States*, Chicago: University of Chicago Press, forthcoming.*

[3] *J. Gruber and D.A. Wise, eds.,* Social Security and Retirement Around the World*, University of Chicago Press, 1999; J. Gruber and D.A. Wise, eds.,* Social Security Programs and Retirement around the World: Micro-Estimation*, Chicago: University of Chicago Press, forthcoming.*

[4] *J. Gruber and D.A. Wise, "Social Security and Retirement Around the World: Introduction and Summary," in S. Polacheck and J. Robst, eds.,* Research in Labor Economics*, Vol 18, JAI Press Inc., 1999; J. Gruber and D.A. Wise, "Social Security, Retirement Incentives, and Retirement Behavior: An International Perspective," in A.J.Auerbach and R.D. Lee, eds.,* Demographic Change and Fiscal Policy*, Cambridge: Cambridge University Press, 2001; J. Gruber and D.A. Wise, "An International Perspective on Policies for an Aging Society," in S. Altman and D. Schactman, eds.,* Policies for an Aging Society: Confronting the Economic and Political Challenges*, Baltimore: Johns Hopkins Press, 2002; J. Gruber and D.A. Wise, "Different Approaches to Pension Reform from an Economic Point of View," in M. Feldstein and H. Siebert, eds.,* Social Security Pension Reform in Europe*, Chicago: University of Chicago Press, 2002.*

[5] *See also D.M. Cutler and J. Seinfeld, "Managed Care Enrollment and Care for the Poor," working paper, 2003.*

[6] *P. Adams, M.D. Hurd, D.L. McFadden, A. Merrill, and T. Ribeiro. "Healthy, Wealthy, and Wise? Tests for Direct Causal Paths between Health and Socioeconomic Status,"* Journal of Econometrics*, Vol. 112, (1) (January 2003), pp. 3-56.*

[7] *D.M. Cutler, "Declining Disability Among the Elderly," Health Affairs, 20 (6) (November/December 2001), pp. 11-27.*

[8] *A.E. Barnato, A.M. Garber, C.R. Kagay, and M.B. McClellan, "Trends in the Use of Intensive Procedures at the End of Life," in A. M. Garber, ed.,* Frontiers in Health Policy Research*, Vol. 4, Cambridge, MA: MIT Press, 2001; J. Geppert and M. B. McClellan, "Trends in Medicare Spending near the End of Life," in D. A. Wise, ed.,* Themes in the Economics of Aging*, Chicago: University of Chicago Press, 2001; A.M. Garber, T.E. MaCurdy and M.B. McClellan, "Medical Care at the End of Life: Diseases, Treatment Patterns, and Costs," in A.M. Garber, ed.,* Frontiers in Health Policy Research*, Vol. 2, Cambridge, MA: MIT Press, 1999.*

[9] *J.H. Best, J. Geppert and D. L. Veenstra,*

"Trends in Expenditures for Medicare Liver Transplant Recipients," Liver Transplantation, *2001; N. Every, A.M. Garber, P. Heidenreich, M. Hlatky, D. P. Kessler, M.B. McClellan, J.P. Newhouse and O. Saynina, "Technological Change in Heart Attack Care in the United States: Causes and Consequences," in M.B. McClellan and D.P. Kessler, eds.,* Technological Change in Health Care: A Global Analysis of Heart Attack, *Ann Arbor, MI: University of Michigan Press, 2002; P. Heidenreich and M.B. McClellan, "Trends in Heart Attack Treatment and Outcomes, 1975-95: Literature Review and Synthesis," in D.M. Cutler and E.R. Berndt, eds.,* Medical Care Output and Productivity, *Chicago: University of Chicago Press, 2001; P. Heidenreich and M.B. McClellan, "Trends in Treatment and Outcomes for Acute Myocardial Infarction: 1975-1995,* American Journal of Medicine, *2001; D. P. Kessler and M.B. McClellan, "A Global Analysis of Technological Change in Health Care: The Case of Heart Attacks,"* Health Affairs, *1999; M.B. McClellan, "Biomedical Research and Then Some: the Causes of Technological Change in Heart Attack Care," in K. Murphy and R.H. Topel, eds.,* The Value of Biomedical Research, *Chicago: University of Chicago Press, forthcoming; A.M. Garber, M. Hlatky, M.B. McClellan, K. McDonald, and O. Saynina, "Utilization and Outcomes of the Implantable Cardioverter Defribrillators: 1987-1995",* American Heart Journal, *2001.*

[10.] *D.M. Cutler and M.B. McClellan, "Productivity Change in Health Care,"* Amercian Economic Review, *2001; D.M. Cutler and M.B. McClellan, "Is Technological Change in Medicine Worth It?"* Health Affairs, *2001; J.M. Brooks, M.B. McClellan, and H.S. Wong, "The Marginal Benefits of Invasive Treatments for Acute Myocardial Infarction: Does Insurance Coverage Matter?"* Inquiry, *2000; A. Brown and A.M. Garber, "A Concise Review of the Cost-Effectiveness of Coronary Heart Disease Prevention," Medical Clinics of North America, 2000; W. Browner, C. Frances, B. Massie, M.B. McClellan, H. Noguchi, and M.G. Shlipak, "Comparison of the Effects of Angiotensin Converting-enzyme Inhibitors and Beta Blockers on Survival in Elderly Patients with Reduced Left Ventricular Function after Myocardial Infarction,"* American Journal of Medicine, *2001; C. Frances, M.G. Shlipak, H. Noguchi, P.Heidenreich, and M.B. McClellan, "Does Physician Specialty Affect Survival of Elderly Patients with Myocardial Infarction?"* Health Services Research, *2000; A.M. Garber, "Advances in Cost-Effectiveness Analysis of Health Interventions," in A. Culyer and J.P. Newhouse, eds.,* Handbook of Health Economics, *North-Holland, 2000.*

[11.] *See also M. Chernew, D.M. Cutler and P. Keenan, "Rising Medical Costs and the Decline in Insurance Coverage," working paper, 2003.*

[12.] *M. Eichner, M.B. McClellan and D.A. Wise, "Individual Expenditures and Medical Savings Accounts: Can They Work?" in S. Ogura, T. Tachibanaki, and D.A. Wise, eds.,* Labor Markets and Firm Benefit Policies in Japan and the United States, *Chicago: University of Chicago Press, forthcoming; M. Eichner and D.A. Wise, "Little Saving and Too Much Medical Insurance: Medical Savings Accounts Could Help," in D. A. Wise, ed.,* Personal Saving, Personal Choice, Stanford: Hoover Institution Press, *1999.*

[13.] *D. M. Cutler, "Equality, Efficiency, and Market Fundamentals: The Dynamics of International Medical Care Reform,"* Journal of Economic Literature, *2002; D.M. Cutler, "The Third Wave in Health Care Reform," in S. Ogura, T. Tachibanaki and D.A. Wise, eds.,* Aging Issues in the United States and Japan, *Chicago: University of Chicago Press, 2001; D.M. Cutler, "Supplementing Public Insurance Coverage with Private Coverage: Implications for Medical Care Systems," in S. Ogura, T. Tachibanaki, and D.A. Wise, eds.,* Labor Markets and Firm Benefit Policies in Japan and the United States, *Chicago: University of Chicago Press, forthcoming.*

*