



# Research Highlights in the Demography and Economics of Aging

no. 9

september 2007

## Assessing the Fiscal Impact of Aging

Increasing longevity and declining fertility are combining to convert the population age structure worldwide from young to old—a historic demographic transition still in progress. In the United States, the population over age 65 will almost triple by 2070 and the population over 85 will increase fivefold (see table). In addition, the average age at retirement in the United States has decreased from 74 in 1920 to 62 in 2000. Americans now live long and often productive post-retirement lives.

And yet, the combination of decreasing fertility and longer retirements is resulting in a dwindling workforce and a growing old-age dependency ratio (the retired population ages 65 and older divided by the working population ages 20 to 64). In the United States this ratio was 0.19 in 2000 but is projected to climb to 0.36 by 2050, due in part to the imminent retirement of the large baby-boom generation. This means that public revenue from taxable wages under current law will not be sufficient to support promised Social Security and Medicare benefits; indeed, the insolvency of these programs is projected to occur some time in the next 30 years.

The Behavioral and Social Research (BSR) Program of the National Institute on Aging (NIA) has for many years sponsored research that has contributed to our understanding of the impact of aging in the United States. This brief highlights some of this research.

### Forecasting the Future

Evaluating the impact of population aging depends in part on an accurate estimate of the projected size of the elderly population, which, in turn, depends on an accurate projection of life expectancy. Over the past 20 years, Ronald Lee and his colleagues have developed new stochastic forecasting methods that are gaining widespread acceptance. For life expectancy, the Lee-Carter method uses 50 to 100 years of historical data to fit the stochastic

model, which gives forecasts with probability distributions and tells policymakers the likelihood of different potential outcomes.

Combining these stochastic mortality models with similar models for fertility, Ronald Lee and Shripad Tuljapurkar developed probabilistic forecasting methods for the population and its age distribution. These methods have been used by Lee and his colleagues to produce forecasts of government expenditures on Social Security and Medicare that assign probabilities to the range of outcomes, rather than just produce a single point estimate. For example, they find a 50 percent chance that under current law, Social Security will become insolvent by 2040. However, they estimate that there is a 2.5 percent chance it will remain solvent until 2090, and a 2.5 percent chance that it will become insolvent much earlier, by 2027.

In examining the effects of policy changes, Lee and Tuljapurkar have found that a combination of increasing the Social Security payroll tax by 1 percent immediately (to 13.4 percent) while raising the normal retirement age by two more years (from 67 to 69) by 2024, and investing one-quarter of the Trust Fund in equities has a 50 percent chance of keeping Social Security solvent for 95 years, until the end of the century, and an 85 percent chance of keeping it solvent until 2052.

### Projected Increases in Older Population in the U.S.

	2000 (millions)	2025 (millions)	2050 (millions)	2070 (millions)
Total population	275	338	404	464
Ages 65 and older	35	63	82	98
Ages 85 and older	4	7	19	23

Source: U.S. Census Bureau.

*The size of the elderly population is one important demographic variable in evaluating demands on government budgets; health status of the elderly population is another.*

But Medicare is an even more important cause of long-term budgetary pressure. Here, Lee and Miller find that expenditure growth will be partially offset by healthier aging and improved health status of older popula-

tions. Thus, the size of the elderly population is one important demographic variable in evaluating demands on government budgets; health status of the elderly population is another important determinant. Healthier people should cost less because they need less health care and because they are able to work longer. If they live longer, however, they draw pension and health care benefits longer as well. The BSR program has funded a variety of projects that seek to disaggregate the fiscal impact of an aging population into factors associated with the growth in the size of the elderly population versus factors that affect demand for health services and pension benefits.

## Living Longer and Healthier

Until very recently, conventional wisdom in epidemiology held that the dramatic increase in life expectancy in this century has resulted in a more substantial burden of chronic disease at older ages. Nobel laureate Robert Fogel and economist Dora Costa utilized medical records from Civil War veterans to show that chronic diseases began earlier in life and were more severe for people living at the beginning of the 20th century than at the end. In fact, as life expectancy has increased, the age of onset of chronic conditions has advanced as well.

More recent evidence supports this finding. In a series of papers analyzing data from the National Long-Term Care Survey, Burton Singer and Kenneth Manton find indications of an accelerating decline in disability among elderly Americans. Singer and Manton's work suggests that a 1.5 percent annual decline in chronic disability for elderly persons is achievable. This would keep the ratio of younger healthy workers to older disabled retirees at a fairly constant level even as the population of elderly grows.

An older but healthier population should make a big difference in costs. Using the 1992-1998 Medicare Current Beneficiary Survey, James Lubitz of the National Center for Health Statistics found that older healthier adults generate no higher health costs than their unhealthier younger counterparts.

Not everyone agrees with such optimism. Research by Darius Lakdawalla, Dana Goldman, and others suggests that utilization of nursing home services will increase significantly

because of increasing disability rates related to increasing rates of asthma and diabetes among the young. Nursing home costs are a large part of Medicaid expenditures, and their estimate of up to a 25 percent increase in nursing home use above current projections would have a substantial budgetary impact.

## Getting What You Pay For

Despite uncertainty about the future health of the elderly population, some researchers suggest that it makes sense for increasing resources to be allocated to health as our society ages and incomes continue to grow. Harvard health economist David Cutler's research suggests that we get a good return on health spending. He shows that advances in medical technology have yielded significant gains to health status in the latter part of the 20th century. For example, Cutler estimates that 70 percent of the decrease in heart attack mortality rates can be accounted for by improved treatment technology. Cost-benefit analyses demonstrate that the benefits of improved survival greatly outweigh the costs of the improved treatment technology.

Cutler argues that policymakers are interested in designing an affordable health care system based on the current budget. He proposes a more sensible policy approach: Design a health care system that keeps the valuable improvements in medical technology but works to reduce the amount of care provided with low value.

## Regional Variations

The demand for health care by an aging population may not be the only thing driving the increase in costs. Jonathan Skinner and colleagues at Dartmouth examined Medicare expenditure per enrollee around the country and found spending to be as much as three times higher in some regions than others, after accounting for other potential causes. They found that use of specific services, such as visits to medical specialists, varies widely and is not explained by clinical differences in those receiving such care. Elliott Fischer and David Wennberg have demonstrated that regional variation in Medicare spending is not linked to outcomes. Even with appropriate statistical controls, higher-spending regions do not have better health outcomes than lower-spending regions. Indeed, Medicare enrollees in higher-spending regions receive more care but do not have better health outcomes and are not more satisfied with the care they receive than those in lower-spending regions.

The Dartmouth research suggests that if all regions could safely adopt the practice patterns of the lower-spending regions, Medicare spending would fall by about 30 percent.

---

## Financing Longer Retirements

Even as life expectancy increases, most Americans continue to retire before age 65 and begin taking Social Security benefits at 62, when these benefits are first offered. According to a 2004 Congressional Budget Office report, spending under current law for the Social Security program will increase from 4.4 percent of gross domestic product (GDP) now to more than 6 percent in 2030. At the same time, revenues for the program will remain the same, about 5 percent of GDP. Outlays are projected to exceed revenues in 2017 and the Social Security Trust Fund will be exhausted by 2040.

Understanding historical patterns of labor force participation and behavioral responses to policy changes may yield insights for policymakers. In a major international collaboration funded by the BSR, Jonathan Gruber and David Wise lead a team of researchers to summarize provisions of social security systems in 12 countries including Japan, the United States, Canada, and nine European countries. They discovered that provisions of social security systems have significant effects on labor force participation.

Examining provisions across the 12 countries, they found that two features of social security plans have the most important effects on labor force participation incentives: the age at first eligibility (which ranges from age 53 to 63 across countries) and the pattern of benefit accrual. In many countries, until very recently, there was essentially a tax on continued work past the first age at eligibility. In Germany, for example, not only were there no incentives to continue working, there were actually disincentives to continue working, or what they call a tax on work. Countries with provisions that place greater penalties on work at older ages have lower labor force participation than those with smaller penalties.

Gruber and Wise then conducted a policy experiment in which they simulated a three-part common reform, which they applied across all nations under study. They examined:

1. A three-year increase in the age at first eligibility for social security.
2. A policy change that removed the tax to work.
3. A normal retirement age of 65 and an early retirement age of 60.

The simulated policy changes led to a reduction in retirements in all countries in the study. In essence, people take retirement benefits when they are offered.

Demographer Samuel Preston estimates that balance could be restored to the Social Security Trust Fund by raising the retirement age by one-half year for every year of increased life expectancy. He suggests that the logic of this option

would make the most sense to potential beneficiaries: We are living longer, why shouldn't we work longer, too? Since death rates are higher for lower earners, some adjustments in benefits would have to be made in order to offset disproportionate loss of benefits to low-income workers.

In an era of uncertainty regarding the future of Social Security and as traditional company-sponsored defined benefit pension plans wane, efforts to encourage American workers to utilize other methods of preparing for retirement are increasing. James Choi, David Laibson, and Bridgitte Madrian have examined patterns of saving in 401(k) plans. They find that a large percentage of workers who are offered matching contributions to 401(k) plans by employers fail to contribute up to the employer's match threshold. These employees are, in effect, leaving money on the table. Exploring possible reasons for this puzzling behavioral response, the team finds evidence that those who fail to exploit the employer match are less financially literate than those who do and are also more likely to procrastinate. They suggest that matching may be more effective when combined with other interventions that account for employee passivity and also reduce the complexity of the 401(k) participation decision.

*Two features of social security plans have the most important effects on labor force participation incentives: the age at first eligibility and the pattern of benefit accrual.*

## Conclusion

The future size of the elderly population is one determinant of the costs of age-related programs, so demographics projections are needed to assess the long-term fiscal impact of population aging. It is also important to predict the health status of future cohorts of older people since this status relates to both their ability to continue working at older ages as well as their use of health services. Technological advances and the structure of pension systems also affect the rising costs of U.S. entitlement programs. Research on demographic trends, the dynamics of disability and health at older ages, and decisions about work and retirement savings will all be needed to assess the fiscal impacts of population aging.

---

## References

Dora L. Costa, "Understanding the Twentieth-Century Decline in Chronic Conditions Among Older Men," *Demography* 37, no. 1 (2000): 53-72.

James J. Choi et al., "\$100 Bills on the Sidewalk: Suboptimal Saving in 401(k) Plans," *NBER Working Paper* 11554 (August 2005).

David M. Cutler, *Your Money or Your Life: Strong Medicine for America's Health Care System* (New York: Oxford University Press, 2004).

Elliott S. Fisher et al., "The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care," *Annals of Internal Medicine* 138, no. 4 (2003): 273-87.

Elliott S. Fisher et al., "The Implications of Regional Variations in Medicare Spending. Part 2: Health Outcomes and Satisfaction With Care," *Annals of Internal Medicine* 138, no. 4 (2003): 288-98.

Robert W. Fogel, "Changes in the Disparities in Chronic Disease During the Course of the Twentieth Century," *NBER Working Paper* 10311 (February 2004).

Jonathan Gruber and David E. Wise, "Social Security Programs and Retirement Around the World," *NBER Working Paper* 9407 (December 2002).

Robert E. Hall and Charles I. Jones, "The Value of Life and the Rise in Health Spending," *NBER Working Paper* 10737 (August 2004).

Darius Lakdawalla et al., "Forecasting the Nursing Home Population," *Medical Care* 41, no. 1 (2003): 8-20.

James Lubitz et al., "Health, Life Expectancy, and Health Care Spending Among the Elderly," *The New England Journal of Medicine* 349, no. 11 (2003): 1048-55.

Ronald Lee, "Quantifying Our Ignorance: Stochastic Forecasts of Population and Public Budgets," *Population and Development Review* 30, Special Supplement (2004): 153-76.

Ronald Lee and Timothy Miller, "An Approach to Forecasting Health Expenditures, With Application to the U.S. Medicare System," *Health Services Research* 37, no. 5 (2002): 1365-86.

Burton H. Singer and Kenneth G. Manton, "The Effects of Health Changes on Projections of Health Service Needs for the Elderly," *Proceedings of the National Academy of Sciences* 95, no. 26 (1998): 15618-22.

John E. Wennberg and Jonathan Skinner, "Regional Inequality in Medicare Spending: The Key to Medicare Reform," in *Frontiers in Health Economics* 3, ed. Alan Garber (Boston: MIT Press, 2000).

## Centers on Demography and Economics of Aging

The National Institutes of Health/National Institute on Aging supports 13 research centers on the demography and economics of aging, based at the University of California at Berkeley, the University of Chicago, Harvard University, the University of Michigan, the National Bureau of Economic Research, the University of North Carolina, the University of Pennsylvania, Pennsylvania State University, Princeton University, RAND Corporation, Stanford University, the University of Southern California/University of California at Los Angeles, and the University of Wisconsin.

This research brief was produced by the Population Reference Bureau with funding from the Behavioral and Social Research (BSR) Program of the National Institute on Aging. The brief was written by Amanda Sonnega, Ph.D., Associate Director for External Relations, Michigan Retirement Research Center, University of Michigan, and edited by staff at the Population Reference Bureau.

---

**PRB**

POPULATION REFERENCE BUREAU

1875 Connecticut Ave., NW, Suite 520, Washington, DC 20009 USA

Tel.: 202-483-1100 | Fax: 202-328-3937

E-mail: [popref@prb.org](mailto:popref@prb.org) | Website: [www.prb.org](http://www.prb.org)

