

- Why Are Recessions Good for Your Health?
- How Did the Great Recession Affect Near Retirement-Age Households?
- The Draw-Down of Retirement Savings

ALSO: Short Abstracts of Recent NBER Working Papers — see page 4

# NBER NATIONAL BUREAU OF ECONOMIC RESEARCH

## BULLETIN ON AGING AND HEALTH

### Why Are Recessions Good for Your Health?

The recent economic crisis has generated renewed interest in understanding the effects of economic downturns on individuals' well-being. One notable and now well-established fact is that mortality rates rise during periods of economic expansion and fall during recessions. While theories abound, the causes of this association are not yet well understood.

In **"The Best of Times, The Worst of Times: Understanding Pro-Cyclical Mortality"** (NBER Working Paper 17657), researchers **Ann Huff Stevens, Douglas Miller, Marianne Page, and Mateusz Filipski** explore the mechanisms by which economic conditions affect mortality.

One commonly proposed explanation for the finding of pro-cyclical mortality is that working individuals have less leisure time, which may lead them to exercise less and opt for quicker, less healthy foods. A second explanation is that work itself may generate stress or exposure to hazardous conditions. A third theory is that a stronger economy generates more traffic and pollution, resulting in more motor vehicle accidents and pollution-related health problems.

The authors first look at the cyclical sensitivity of mortality rates by age. They find that the mortality rate of young adults is the most sensitive to economic conditions. This would seem to provide support for the idea that work is bad for your health, since the labor supply of young adults is more cyclically sensitive than that of older adults.

Yet several of the paper's findings cast doubt on such a conclusion. First, for those under age 65, the cyclical

mortality is primarily driven by the cyclical nature of motor vehicle accidents. Second, and perhaps more importantly, the overall association of unemployment and mortality is mainly due to changes in the mortality of those over age 65, who are generally out of the labor force. The mortality rate of older women is particularly cyclically sensitive — as the authors note, "women age 65 plus account for 55% of the roughly 6,700 additional deaths (across all ages and genders) that are predicted to result from a 1 percentage point drop in unemployment."

The authors devote the rest of their analysis to exploring why older women face higher mortality risk when the economy strengthens. They suggest that there may be cyclical changes in the quality, quantity, or nature of health care inputs, which may have a greater effect on women over age 65 because they use health care more intensively.

Several basic facts are supportive of such a theory. Employment in the health care sector is lower during periods of expansion than during recessions. Nursing homes often report shortages of skilled workers, shortages that may be particularly severe when the economy is strong. A lack of trained personnel in nursing homes could affect older women more than older men since women are more likely to use nursing home care at the end of their lives.

To test their theory, the authors first explore patterns in deaths by location. They find that deaths in nursing homes are far more prone to cyclical fluctuations than deaths in other locations. In fact, cyclical fluctuations in

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nursing home deaths among those over age 65 are sufficiently large to account for all cyclical mortality, according to the authors' estimates. The authors also show that mortality is more strongly pro-cyclical in states where a greater fraction of the elderly population lives in nursing homes.

Could falling quality of care in nursing homes when labor markets tighten explain these findings? The authors show that employment levels in skilled nursing facilities decline when the unemployment rate falls. The authors also show that the employment of nursing aides, who are used more heavily by nursing homes and other skilled nursing facilities, falls when the economy strengthens, while the employment of more highly-skilled doctors and nurses rises.

As the authors note, their analysis indicates that "pro-cyclical mortal-

ity cannot be explained without focusing on the elderly, particularly elderly persons who reside in nursing homes.” Noting the important role that changes in the employment of less-skilled aides in nursing homes seem to play in explain-

ing pro-cyclical mortality, the authors conclude “our findings provide new evidence that staffing difficulties among relatively low-skilled nursing occupations may be an important focus for efforts to improve the quality of health care.”

*The authors gratefully acknowledge funding from the NIA via the Center on the Economics and Demographics of Aging at UC Berkeley Pilot Project (NIA 5P30AG012839-15) and from the National Science Foundation (SES#09-000231).*

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## How Did the Great Recession Affect Near Retirement-Age Households?

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The Great Recession that began in late 2007 was marked by sharp downturns in U.S. stock, housing, and labor markets. While these events would be expected to negatively affect households in all age groups, households that are approaching retirement age may be particularly vulnerable. Older households who have seen their retirement nest egg diminish in value have little time to increase saving. Postponing retirement may be an option for some who are still working, but will be difficult for those who have lost jobs or are in poor health.

While much has been written in the media about the potential effects of the recession on U.S. households, analysts are just beginning to explore this question empirically. One recent entry in this literature is “**How Did the Recession of 2007–2009 Affect the Wealth and Retirement of the Near Retirement Age Population in the Health and Retirement Study?**” (NBER Working Paper 17547) by **Alan Gustman, Thomas Steinmeier, and Nahid Tabatabai.**

In their analysis, the authors make use of the Health and Retirement Study (HRS)’s long-running and longitudinal nature. Specifically, they calculate changes in outcome measures for the “Early Boomers” (households with a member aged 53 to 58 in 2006) between 2006 and 2010. By comparing the results for Early Boomers to those for earlier cohorts who experienced more favorable economic conditions while in their mid-50s, the authors can provide some sense of the recession’s effects, although they caution “there are many reasons for the differences in retirement behavior [and other outcomes] of members of different cohorts, so a simple comparison may not isolate the effects of the recession.”

Looking first at changes over time in the wealth holdings of Early Boomer households, including pensions, Social Security, housing and other forms of wealth, they find that the total wealth of this population was 2.8 percent lower in 2010 than it had been

in 2006, prior to the onset of the recession. Changes in wealth were not spread evenly throughout the population. While those in the middle ten percent of the wealth distribution experienced a 4.3 percent drop in wealth, there was essentially no drop in total wealth for households in the lowest wealth quartile. One key reason for this is that Social Security wealth (which was unaffected by the recession) makes up a much larger share of total wealth for poorer households.

Turning to the question of how earlier cohorts fared, the authors look at the change in assets from 1994 to 1998 for the “HRS Cohort” (ages 53 to 58 in 1994) and the change from 2000 to 2004 for the “War Babies” (ages 53 to 58 in 2000). Wealth grew by 7.6 percent for the HRS Cohort and 3.2 percent for the War Babies. As the authors note, “with the two earlier cohorts enjoying average gains of 5.4 percentage points, the net wealth at the end of the Great Recession would have been about 8 percentage points higher had the Early Boomers’ wealth grown at that same rate as seen for members of older cohorts.” Yet overall these results “suggest the Early Boomers experienced only a modest decline in total wealth over the period of the recession. They accumulated less wealth over the period of the recession than they would have were they members of cohorts born six or twelve years earlier, but a good part of that difference is due to the fact that members of the War Baby cohort enjoyed a wealth increase from the housing bubble.”

The authors also compare the labor force transitions of the three cohorts. The labor force participation rates of the three cohorts at the beginning of their respective periods are fairly similar—for Early Boomers, 63 percent are classified as not retired (working at least 30 weeks and 1500 hours per year), as compared to 65 percent for War Babies and 61 percent for the HRS Cohort. These figures decline over the next four years, as workers begin to exit the labor force. The declines are fairly similar in

the three groups—14 percentage points for both the Early Boomers and War Babies, 11 points for the HRS Cohort.

The similarity of these figures is perhaps a bit surprisingly given the striking differences in the increase in the overall unemployment rate facing these cohorts. The Early Boomers saw the labor market unemployment rate rise by 5 points over this period, from 4.6 to 9.6 percent, while the rate changed only modestly (staying in the 4 to 6 percent range) in the labor markets facing the other cohorts. Consistent with the overall rates of unemployment, for those who transition out of “not retired” status over the four-year period, there is roughly twice as great a chance that Early Boomers will move to “not working, not retired” status, a category that would include those who are unemployed and still looking for work, than there is for the other groups. Similarly, the share of individuals classified as not working and not retired rose by 5 percentage points over the four years for Early Boomers, vs. rising by 1 point for War Babies and falling by 7 points for the HRS Cohort.

“This is evidence of an adverse effect of the Great Recession on retirement flows,” the authors write. Yet based on a lack of differences in full-time work or partial retirement, they conclude “the bottom line here is that reported unemployment is higher for those experiencing the Great Recession, but other measures of activity or related outcomes do not differ much between those affected by the recession and members of older cohorts when they were the same age. All told, the retirement behavior of the Early Boomer cohort looks similar, at least so far, to the behavior observed for members of older cohorts at comparable ages.”

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*This work was supported by a grant from the Social Security Administration through the Michigan Retirement Research Center (Grant #5 RRC08098401-03-00).*

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## The Draw-Down of Retirement Savings

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The Baby Boomers have begun to reach retirement age. For the oldest boomers in particular, the window to accumulate retirement savings is closing (if not already closed), and attention is now shifting to how boomers are using their savings in retirement. The baby boom generation is of interest not only because of its size, but also because it may be the first for which personal retirement accounts such as IRAs and 401(k)s could play an important role in retirement financial security.

In “**The Composition and Draw-Down of Wealth in Retirement**” (NBER Working Paper 17536) researchers **James Poterba, Steven Venti, and David Wise** present new evidence on what resources are available to households as they enter retirement and how households use those assets in early retirement. The authors make use of data from the Health and Retirement Study (HRS) for their analysis.

The authors first look at the balance sheets of households with a head aged 65 to 69. The typical household has total non-annuitized wealth of about \$220,000. About 80 percent of these households are homeowners, and primary home equity accounts for the largest share—roughly 30 percent—of non-annuitized wealth. Just over half (52 percent) of households have personal retirement accounts (PRAs), which account for roughly 21 percent of non-annuitized wealth; financial assets outside of PRAs account for another 23 percent of wealth and are held by most households (87 percent).

Not surprisingly, there are considerable differences in asset holdings across households, especially for financial assets. While the typical household has total financial assets (both inside and outside PRAs) of just \$52,000, households at the 90th percentile of financial asset holdings have over \$700,000, or more than 13 times as much. For home equity, households at the 90th percentile have about five times as much wealth as the median household (\$585,000 vs. \$120,000), while the equivalent ratio for Social Security wealth is only two (\$643,000 vs. \$315,000).

Next, the authors examine households’ current annuity income—that provided by Social Security and defined benefit (DB) pension plans—and calculate the potential additional annuity income they could obtain by annuitizing their financial (non-housing) wealth. They find that relatively few could purchase an annuity that would generate an additional \$10,000 in annual income—only about one-third of all households could do so, and only 40 percent of those households in the top quartile of current annuity income (those with current annuity income of over \$30,000). Interestingly, while there is a positive correlation between housing equity and annuitizable wealth, there are nonetheless many households with little annuitizable wealth who have substantial home equity.

Turning to the question of how households draw down wealth in retirement, the authors show that there is little use of home equity early in retirement to support consumption or purchase other assets or annuities; rather, households tend to hold home equity until they experience a traumatic event such as one spouse’s death or entry into a nursing home. For non-housing assets, singles and couples who do not experience death or divorce tend to have constant or slightly rising assets from one survey wave to the next, while couples that do experience one of these events see their assets drop sharply.

Exploring linkages between health and wealth, the authors find that there is a strong correlation between these factors, not only at given point in time but also in how they evolve over time. Specifically, the authors find that net worth rises with age for healthier households (those in the top three quintiles of initial health status), but is flat or more slowly increasing for less healthy households (those in the lower two quintiles). While there are many potential explanations that need to be explored more fully, the authors “conclude from these patterns of wealth evolution that if anything, past studies of the cost of poor health in late life underestimate the risks that households face from adverse health shocks.”

These findings have several impor-

tant implications. First, for many households “discussions of whether to purchase an annuity or draw down wealth in another fashion are largely moot; the amount of retirement support that their savings will provide is very limited.” For example, nearly half (43 percent) of households would not be able to make the \$25,000 minimum investment typically required to purchase an annuity even if they liquidated all of their financial assets.

Second, for the minority of households who reach retirement with substantial assets, late-life financial planning is complex and multi-faceted. Households face three main risks: longevity, uninsured medical expenses, and poor asset returns. While most of these households have enough resources (including financial and housing wealth) to meet the expected cost of medical care, the small risk of very high out-of-pocket costs may nonetheless be an important factor in financial planning. Households in the top half of the wealth distribution do not spend down financial assets in the early decades of retirement, suggesting they can meet their regular consumption needs with their current annuity income and interest or dividends on their savings.

Third, home equity “may substitute for other forms of insurance against living longer than expected or facing unanticipated medical costs.” For most households, housing equity exceeds financial assets, and households “appear to treat their houses as a source of reserve wealth that can be tapped in the event of a substantial expense, for example a health care need.” The availability of housing equity may help to explain the limited demand for private annuities.

Finally, the authors note that their findings “underscore the heterogeneity in household circumstances at retirement and suggest the difficulties of applying a ‘one-size-fits-all’ approach to all retirees. A household’s preferences regarding different payout streams may depend on its wealth, its planned future expenditures, and the range of uncertain potential outlays that it faces.” Noting the financial pressures on programs like Social Security and Medicare, the authors conclude that the need to forecast government policies



may be one of the most difficult challenges facing retirement-age households.

The authors are grateful to the National Institute on Aging (grant P01-AG005842),

to the Social Security Administration (grant 5-RRC080984-00-03-00), and to the National Science Foundation (Poterba) for research support. David Wise received support for this research from the National Institution on Aging (grant

P01-AG005842 and P30-AG012810). Poterba is a trustee of the College Retirement Equity Fund, and of the TIAA-CREF mutual funds; TIAA-CREF is a provider of retirement service and annuity products.

## NBER Profile: David Neumark

David Neumark is a Research Associate in the NBER's Programs on Aging, Children, Education, and Labor Studies. He is a Professor of Economics and the Founding Director of the Center for Economics & Public Policy at the University of California at Irvine.

Prior to joining the UC-Irvine faculty, Neumark was a Senior Fellow and Bren Fellow at the Public Policy Institute of California, a faculty member at the Michigan State University and the University of Pennsylvania, and an Economist at the Board of Governors of the Federal Reserve System. He is currently a Visiting Scholar at the Federal Reserve Bank of San Francisco.

Neumark is a Fellow of IZA, the Institute for the Study of Labor, and the Stanford University Center for the Study of Poverty and Inequality. He has served on the editorial board of numerous academic journals, including the *Journal of Urban Economics*, *Industrial Relations*, and *Economics of Education Review* and

is a co-editor of the *Review of Economics of the Household*. He is the recipient of research grants from the National Institute on Aging, National Cancer Institute, and many other government agencies and foundations, and received a National Institute on Aging Special Emphasis Research Career Award.

Neumark's research interests encompass many issues in labor economics, including age discrimination, the effects of health and health insurance on labor supply, the determinants of life-cycle earnings, Social Security reform, and the incentive effects of the Supplemental Security Income (SSI) program. His 2008 co-authored book, *Minimum Wages*, was selected as a Choice Outstanding Academic Title. He has also served as an expert witness on large age discrimination cases.

Neumark received his B.A. in Economics summa cum laude from the University of Pennsylvania and his Ph.D. in Economics from Harvard University.



Neumark splits time between Irvine, California, and San Francisco, where he lives with his wife Donna. He has two children in college, Noam and Eitan. When he is not working or commuting, he enjoys weightlifting, yoga, sailing, and (seasonally) watching the Giants.

## Abstracts of Selected Recent NBER Working Papers

### WP 17451

#### Jeffrey Brown, Amy Finkelstein Insuring Long Term Care in the US

Long-term care expenditures constitute one of the largest uninsured financial risks facing the elderly in the United States. This paper provides an overview of the economic and policy issues surrounding insuring long-term care expenditure risk.

Through this lens we also discuss the likely impact of recent long-term care public policy initiatives at both the state and federal level.

### WP 17467

#### David Neumark, Joanne Song Do Stronger Age Discrimination Laws Make Social Security Reforms More Effective?

Supply-side Social Security reforms to increase employment and delay benefit claiming among older individuals may be frustrated by age discrimination. We test for policy complementarities between supply-side Social Security reforms and demand-side efforts to deter age discrimination, specifically studying whether stronger state-level age discrimination protections enhanced the im-

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part of the increases in the Social Security Full Retirement Age (FRA) that occurred in the past decade. The evidence indicates that, for older individuals who were “caught” by the increase in the FRA, benefit claiming reductions and employment increases were sharper in states with stronger age discrimination protections.

#### **WP 17478**

**Harold E. Cuffe, William T. Harbaugh, Jason M. Lindo, Giancarlo Musto, Glen R. Waddell**

#### **Evidence on the Efficacy of School-Based Incentives for Healthy Living**

We analyze the effects of a school-based incentive program on children’s exercise habits. The program offers children an opportunity to win prizes if they walk or bike to school during prize periods. We use daily child-level data and individual fixed effects models to measure the impact of the prizes by comparing behavior during prize periods with behavior during non-prize periods. Variation in the timing of prize periods across different schools allows us to estimate models with calendar-date fixed effects to control for day-specific attributes, such as weather and proximity to holidays. On average, we find that being in a prize period increases riding behavior by sixteen percent, a large impact given that the prize value is just six cents per participating student. We also find that winning a prize lottery has a positive impact on ridership over subsequent weeks; consider heterogeneity across prize type, gender, age, and calendar month; and explore differential effects on the intensive versus extensive margins.

#### **WP 17535**

**James B. Rebitzer, Mark E. Votruba**  
**Organizational Economics and Physician Practices**

Economists seeking to improve the efficiency of health care delivery frequently emphasize two issues: the fragmented structure of physician practices and poorly designed physician incentives. This paper analyzes these issues from the perspective of organizational economics. We begin with a brief overview of the structure of physician practices and observe that the long anticipated triumph of integrated care delivery has largely gone unrealized. We then analyze the special problems that fragmentation poses for the design of physician incentives. Organizational economics suggests some promising incentive strategies for this setting, but implementing these strategies is complicated by norms of autonomy in the medical profession and by other factors that inhibit effective integration between hospitals and physicians. Compounding these prob-

lems are patterns of medical specialization that complicate coordination among physicians. We conclude by considering the policy implications of our analysis—paying particular attention to proposed Accountable Care Organizations

#### **WP 17581**

**Charles Yuji Horioka, Akiko Terada-Hagiwara**

#### **The Determinants and Long-term Projections of Saving Rates in Developing Asia**

In this paper, we present data on trends over time in domestic saving rates in twelve economies in developing Asia during the 1966–2007 period and analyze the determinants of these trends. We find that domestic saving rates in developing Asia have, in general, been high and rising but that there have been substantial differences from economy to economy and that the main determinants of these trends appear to have been the age structure of the population (especially the aged dependency ratio), income levels, and the level of financial sector development. We then project future trends in domestic saving rates in developing Asia for the 2011–2030 period based on our estimation results and find that the domestic saving rate in developing Asia as a whole will remain roughly constant during the next two decades despite rapid population aging in some economies in developing Asia because population aging will occur much later in other economies and because the negative impact of population aging on the domestic saving rate will be largely offset by the positive impact of higher income levels.

#### **WP 17600**

**John Cawley, Asako S. Moriya, Kosali I. Simon**

#### **The Impact of the Macroeconomy on Health Insurance Coverage: Evidence from the Great Recession**

This paper investigates the impact of the macroeconomy on the health insurance coverage of Americans. We examine panel data from the Survey of Income and Program Participation (SIPP) for 2004–2010, a period that includes the Great Recession of 2007–09. We find that a one percentage point increase in the state unemployment rate is associated with a 1.67 percentage point (2.12%) reduction in the probability that men have health insurance; this effect is strongest among college-educated, white, and older (50–64 year old) men. For women and children, the unemployment rate was not significantly correlated with the probability of health insurance coverage through any source. When one

examines the source of coverage, it becomes apparent that a one percentage point increase in the unemployment rate is associated with a 1.37 percentage point (4.69%) higher probability that a child is covered by public health insurance. Based on the point estimates in this paper, we estimate that 9.3 million adult Americans, the vast majority of whom were men, lost health insurance due to a higher unemployment rate alone during the 2007–09 recession. This is roughly nine times more than lost health insurance during the previous (2001) recession. We conclude with a discussion of how components of recent health care reform may influence these relationships in the future.

#### **WP 17614**

**Gabor Kezdi, Robert Willis**  
**Household Stock Market Beliefs and Learning**

This paper characterizes heterogeneity of the beliefs of American households about future stock market returns, provides an explanation for that heterogeneity and establishes its relationship to stock holding behavior. We find substantial belief heterogeneity that is puzzling since households can observe the same publicly available information about the stock market. We propose a simple learning model where agents can invest in the acquisition of financial knowledge. Differential incentives to learn about the returns process can explain heterogeneity in beliefs. We check this explanation by using data on beliefs elicited as subjective probabilities and a rich set of other variables from the Health and Retirement Study. Both descriptive statistics and estimated relevant heterogeneity of the structural parameters provide support for our explanation. People with higher lifetime earnings, higher education, higher cognitive abilities, defined contribution as opposed to defined benefit pension plans, for example, possess beliefs that are considerably closer to what historical time series would imply. Our results also suggest that a substantial part of the reduced form relationship between stock holding and household characteristics is due to differences in beliefs. Our methodological contribution is estimating relevant heterogeneity of structural belief parameters from noisy survey answers to probability questions.

#### **WP 17629**

**Emily Oster, Ira Shoulson, E. Ray Dorsey**  
**Optimal Expectations and Limited Medical Testing: Evidence from Huntington Disease**

We use novel data to study the decision to undergo genetic testing by individuals at risk

for Huntington disease (HD), a hereditary neurological disorder that reduces healthy life expectancy to about age 50. Although genetic testing is perfectly predictive and carries little financial or time cost, less than 10 percent of at-risk individuals are tested prior to the onset of symptoms. Testing rates are higher for individuals with higher ex ante risk of carrying the genetic expansion for HD. Untested individuals express optimistic beliefs about their probability of having HD and make fertility, savings, labor supply, and other decisions as if they do not have HD, even though individuals with confirmed HD behave quite differently. We show that these facts are qualitatively consistent with a model of optimal expectations (Brunnermeier and Parker, 2005) and can be reconciled quantitatively in this model with reasonable parameter values. This model nests the neoclassical framework and, we argue, provides strong evidence rejecting the assumptions of that framework. Finally, we briefly develop policy implications.

#### WP 17668

**Marianne P. Bitler, Lucie Schmidt**

#### **Utilization of Infertility Treatments: The Effects of Insurance Mandates**

Over the last several decades, both delay of childbearing and fertility problems have become increasingly common among women in developed countries. At the same time, technological changes have made many more options available to individuals experiencing fertility problems. However, these technologies are expensive, and only 25% of health insurance plans in the United States cover infertility treatment. As a result of these high costs, legislation has been passed in 15 states that mandates insurance coverage of infertility treatment in private insurance plans. In this paper, we examine whether mandated insurance coverage for infertility treatment affects utilization. We allow utilization effects

to differ by age and education, since previous research suggests that older, more educated women should be more likely to be directly affected by the mandates than younger women and less educated women, both because they are at higher risk of fertility problems and because they are more likely to have private health insurance which is subject to the mandate. We find robust evidence that the mandates do have a significant effect on utilization for older, more educated women that is larger than the effects found for other groups. These effects are largest for the use of ovulation-inducing drugs and artificial insemination.

#### WP 17689

**Mariacristina De Nardi, Eric French, John Bailey Jones, Angshuman Gooptu**  
**Medicaid and the Elderly**

We describe the Medicaid eligibility rules for the elderly. Medicaid is administered jointly by the Federal and state governments, and each state has significant flexibility on the details of the implementation. We document the features common to all states, but we also highlight the most salient state-level differences.

There are two main pathways to Medicaid eligibility for people over age 65: either having low assets and income, or being impoverished due to large medical expenses. The first group of recipients (the categorically needy) mostly includes life-long poor individuals, while the second group (the medically needy) includes people who might have earned substantial amounts of money during their lifetime but have become impoverished by large medical expenses. The categorically needy program thus only affects the savings decision of people who have been poor throughout most of their lives. In contrast, the medically needy program provides some insurance even to people who have higher income and assets. Thus, this second pathway is to some extent going to

affect the savings of the relatively higher income and assets people.

#### WP 17697

**David H. Autor**

#### **The Unsustainable Rise of the Disability Rolls in the United States: Causes, Consequences, and Policy Options**

Two ailments limit the effectiveness and threaten the long-term viability of the U.S. Social Security Disability Insurance program (SSDI). First, the program is ineffective in assisting the vast majority of workers with less severe disabilities to reach their employment potential or earn their own way. Second, the program's expenditures on cash transfers and medical benefits—exceeding \$1,500 per U.S. household—are extremely high and growing unsustainably. There is no compelling evidence, however, that the incidence of disabling conditions among the U.S. working age population is rising. This paper discusses the challenges facing the SSDI program, explains how its design has led to rapid and unsustainable growth, considers why past efforts to slow program growth have met with minimal and fleeting success, and outlines three recent proposals that would modify the program to slow growth while potentially improving the employment prospects of workers with disabilities. Because these proposals depart substantially from a program design that has seen little change in half a century, their efficacy is unproven. Additionally, even well-meaning efforts to place the SSDI program on a sustainable trajectory run the risk of creating additional hurdles for claimants who are truly unable to work. Nevertheless, the imminent exhaustion of the SSDI Trust Fund provides an impetus and an opportunity to explore innovative solutions to the longstanding policy challenges posed by the SSDI program.

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