CENTER FOR
RETIREMENT
RESEARCH
AT BOSTON COLLEGE

October 2008, Number 8-17

ARE OLDER MEN HEALTHY ENOUGH TO WORK?

By Alicia H. Munnell, Mauricio Soto, and Alex Golub-Sass*

Introduction

Since the mid-1960s, the median retirement age for men has declined from 66 to 63. If Americans continue to retire at age 63, a great many will risk income shortfalls, especially at older ages. This risk is even greater for those currently nearing retirement who have recently seen a large portion of their nest eggs evaporate.

Work directly increases current income, Social Security benefits, and retirement saving, and decreases the length of retirement. But are Americans healthy enough to work longer? Life expectancy has been steadily increasing, but disparities in health and mortality outcomes have widened and the improvement in health outcomes for the population in general may have slowed or even reversed.

In determining whether people will be able to work longer, it is not simply measuring how long they will live, but rather how much longer they will be capable of working. Life expectancy may be increasing, but can the same be said for healthy, disability-free life expectancy?

This *brief* uses the *National Health Interview Survey* to estimate trends in disability-free life expectancy for men at age 50. The first section calculates trends in disability-free life expectancy for the population as a whole, revealing an increase between 1970 and 2000 of almost three years. The second section estimates the trends in disability-free life expectancy by race and educational attainment, showing that the three-year increase is attributable primarily to movement up the education ladder, with minimal increases within educational groups. Moreover, major disparities remain between those in the bottom and top quartiles of the population. The third section looks to the future, suggesting that the improvement in health outcomes for the population in general may have slowed or even reversed and that increases in educational attainment may have ceased. The final section concludes that the level and dispersion in disability-free life expectancy that we have today may be with us for a long time and that a vulnerable portion of the population – perhaps those who most need to work longer – might not be able to extend their work lives.

* Alicia H. Munnell is the Peter F. Drucker Professor of Management Sciences in Boston College's Carroll School of Management and Director of the Center for Retirement Research at Boston College (CRR). Mauricio Soto is a research associate at the Urban Institute. Alex Golub-Sass is a research associate at the CRR. This *brief* is based on a longer paper (Munnell, Soto, and Golub-Sass 2008).

Recent Trends in Disability-Free Life Expectancy

In the last 35 years, virtually all studies show that poor health has a negative effect on the likelihood of being in the labor force and on the expected retirement age, as well as hours worked and wages earned.[1] Therefore, the health of the older working-age population is a key prerequisite to extending the retirement age.

Survival expectancies

Death is the end point, so a natural starting place for exploring the ability of older people to work is life expectancy. An increase in life expectancy raises the possibility of a longer worklife with the potential of some period of retirement at the end. Thus, it is the first step for establishing that people are able to work longer. Between 1970 and 2000, life expectancy for a 50-year-old man increased from 23.2 years to 27.5 years, suggesting that men are capable of working longer.[2]

Disability-free life expectancy

Death is not the only relevant end point for how long people can work. Many non-fatal conditions may make it difficult for people to stay in the labor force. Increases in total expected years of life are not necessarily accompanied by increases in expected disability-free life.[3] Thus, it is important to examine how disability-free life has changed over recent decades. The calculation of disability-free life combines data on life expectancy with data on disability from the *National Health Interview Survey* (NHIS).[4] This survey of about 100,000 people has been conducted annually since 1959 by the U.S. National Center for Health Statistics to monitor the population's health and health care utilization. The NHIS asks a series of questions to identify individuals who have a "limitation of activities." Based on the response to those questions, Table 1 shows that the percent of men age 50-54 and 55-59 with an activity limitation was higher in 2000 than in 1970.

Table 1. Percent of the Non-Institutionalized Male Population with Limitation of Activity, 1970-2000

Age	1970	1980	1990	2000
50-54	18.7 %	20.9%	21.4%	21.2%
55-59	23.3	28.1	23.4	24.3
60-64	30.8	36.1	31.8	29.3

Note: Figures for 1990 and 2000 are adjusted to account for survey redesign. See Munnell, Soto, and Golub-Sass (2008) for details.
Source: Authors' calculations using U.S. Department of Health and Human Services, *National Health Interview Survey* (NHIS), 1969-2001.

The data on activity limitations can be combined with period life tables to determine the number of years individuals are expected to be alive in the community with no activity limitations, or the disability-free life expectancy at age 50. Between 1970 and 2000, while life expectancy at age 50 increased by 4.2 years, disability-free life expectancy increased by only 2.7 years (see Table 2). The pattern was one of virtu-

Table 2. Expectations at Age 50 of Years Spent in Various States of Health, 1970-2000

Expectation of life	Years				Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Total	23.2	24.8	26.3	27.5	1.6	1.4	1.2	4.2
Free of disability	15.2	15.2	16.7	17.9	0.1	1.4	1.2	2.7
With disability	7.6	9.1	9.2	9.1	1.5	0.1	0.0	1.5
Institutionalized	0.5	0.5	0.5	0.5	0.0	-0.1	0.0	0.0

Sources: Authors' calculations using Bell and Miller (2005); U.S. Bureau of the Census (1973a, 1973b, 1983, 1984, 1991, and 2001); and 1969-2001 NHIS.

ally no gains in disability-free years in the 1970s, and roughly equivalent gains in the 1980s and 1990s.

The overall conclusion is that men, on average, can expect more disability-free years than they could in the 1960s when the average retirement age was 66. But averages may not tell the whole story because health status and life expectancy both vary by socio-economic status.

Recent Trends in Disability-Free Life Expectancy by Education and Race

Numerous studies have documented a strong link between health and mortality and socioeconomic status. Education, occupation, and income are the most widely used measures. The relationship between education and mortality and health appears to be particularly strong, even after accounting for other factors.[5] Studies have also shown that health status varies by race. Thus, it is not enough to assert that because life expectancy and even years of disability-free life have increased on average since the 1960s that everyone can work longer. The following calculations document the trends in disability-free life expectancy by education and race.

This exercise is more complicated than that for the entire population because it requires life tables for each education and race group. Data are available on the ratios of the mortality of each education-race group relative to the general population mortality for the period around 1990. As shown in Table 3, the discrepancies are enormous, implying life expectancy at age 50 varying from 28.7 years for a college-educated white male to 20.9 years for a black male with less than high school. It is not possible to use these same relative mortality ratios for all years, however, because the literature shows that the relationship between mortality and education has increased over time.[6] Therefore, the relative mortality tables for 1990 are adjusted using the changes in the 10-year death rates by education and race from the decennial censuses.[7] The result is a set of relative mortality ratios for 1970, 1980, 1990, and 2000 for each available education-race group. These ratios are applied to the period life tables to obtain life tables by education and race group.

Table 3. Relative Mortality Rates and Life Expectancy for Males At Age 50 by Race and Education, 1979-1989

Race and education*	Relative mortality rates	Implied life expectancy
White		
<High school (HS)	1.33	24.2
HS +	0.95	26.3
College +	0.57	28.7
Black		
<HS	2.55	20.9
HS +	1.75	22.0

* <HS is for individuals without a high school diploma. HS + is for those with a high school diploma and perhaps some college. College + is for those with a college degree and perhaps an advanced degree.
Sources: Brown, Liebman, and Pollet (2002) and authors' calculations using Bell and Miller (2005).

The next step is to use the NHIS to document the percent of the population by education and race with activity limitations. These percentages are shown in Table 4 for each subgroup. With the exception of white college-educated men, the prevalence of disability has increased over time.

Table 4. Percent of the Non-Institutionalized Male Population Age 50-64 with Limitation of Activity, 1970-2000

Year	White			Black	
	<HS	HS +	College +	<HS	HS +
1970	22.5%	16.7%	13.2 %	28.1%	17.5%
1980	27.3	18.7	13.2	32.3	19.6
1990	28.8	18.7	14.0	33.1	19.0
2000	34.0	20.0	11.4	36.7	25.0

Note: Figures for 1990 and 2000 are adjusted to account for survey redesign, based on methodology in Crimmins, Saito, and Ingegneri (1997). Figures for blacks with high school or more are adjusted for 1970.[8] See Munnell, Soto, and Golub-Sass (2008) for further details.
Source: Authors' calculations using the 1969-2001 NHIS.

The final step is to estimate years of disability-free life for each group.[9] The results show that, with the exception of college-educated whites, disability-free life expectancy has remained virtually unchanged or worsened for each group (see Table 5).

Table 5. Total Life Expectancy and Disability-Free Life Expectancy for Males at Age 50, by Education and Race, 1970-2000

Year	White			Black	
	<HS	HS +	College +	<HS	HS +
	Total life expectancy				
1970	21.3	23.6	25.4	17.3	17.7
1980	22.8	24.9	29.7	19.2	22.9
1990	24.2	26.3	28.7	20.9	22.0
2000	25.2	27.2	30.1	22.3	23.4
	Disability-free life expectancy				
1970	13.3	16.7	19.2	10.3	15.4
1980	12.7	16.5	21.5	9.6	15.2
1990	13.0	17.7	21.3	10.7	14.5
2000	13.3	17.9	22.8	11.4	14.8

Note: Figures for blacks with high school or more are adjusted for 1970. See endnote 8.
Source: Authors' calculations using the 1969-2001 NHIS.

Of course, educational attainment has increased over the last 30 years, so information by sub-group does not give a comprehensive picture of what has happened to disability-free life expectancy for the population as a whole and for different quartiles of the population. Table 6 shows the disability-free life expectancy for the population as a whole and for each quartile of the population. This table results from combining information on the distribution of the population by educational attainment and race at each point in time with the data on disability-free life expectancy. The numbers for the total population are very similar to those reported in Table 2, but the estimates by quartile vary enormously.

Two important points emerge from this analysis. First, since relatively little improvement has occurred in disability-free life expectancy within individual race and educational groups, most of the overall improvement has occurred because people have moved up the educational ladder. Second, enormous disparities exist in disability-free life expectancy between those in the bottom and the top quartiles of the population. Thus, people vary enormously in terms of their ability to continue working.

Table 6. Disability-Free Life Expectancy for Males at Age 50, by Quartile, 1970-2000

Quartile of disability-free life expectancy	1970	1980	1990	2000
Bottom quartile	12.5	12.0	12.8	14.1
2nd quartile	13.7	14.8	17.3	17.9
3rd quartile	16.7	16.5	17.7	19.1
Top quartile	17.8	20.3	21.0	22.8
Total	15.2	15.9	17.2	18.4

Note: This table combines the disability-free life expectancy at age 50 by race-education with the race-education distribution of men aged 50-54 for each year.
Source: Authors' calculations using the 1969-2001 NHIS.

A Look to the Future

An important question is how disability-free life expectancy will change over time. The outcome depends on two factors – the general health of the population and changing patterns of educational attainment. Recent developments suggest some concern on both fronts.

Recent health trends

A number of recent studies suggest that continued improvement in the health of the older working-age population may not continue. For example, one study reported data from the *Health and Retirement Study* (HRS) on the health status of those age 51-56 from three different cohorts: the original HRS cohort born 1936-41; the so-called War Babies born 1942-47; and the Early Baby Boomers born 1948-53.[10] Despite enormous advances in diagnosis and treatment, Early Baby Boomers and War Babies are much less likely to assess their overall health as "excellent or very good." These cohorts also suffer more than the original HRS sample from pain, chronic diseases, psychiatric problems, and alcohol issues.[11] And the deterioration appears to be increasing with each cohort (see Table 7 on the next page).[12]

In addition, the reductions in risk factors that have contributed to the decline in mortality (and presumably improved health) over the last 30 years may well be offset by the increase in obesity going forward. One study estimated that the population age-adjusted probability of dying in ten years declined from 9.8 percent to 8.4 percent between the 1970s and the 2000s.[13] The largest contributors to this reduction

Table 7. Self-Reported Health Status of Males in the *Health and Retirement Study*, Ages 51-56 by Birth Cohort

Health status	Original cohort 1992	War Babies 1998	Early Boomers 2004
Excellent/ very good	57%	54%	50%
Problem reported:			
Pain	17	23	29
Chronic	53	54	60
Psychiatric	8	17	21
Alcohol	21	23	28

Source: Soldo et al. (2006).

were the decline in smoking and better control of blood pressure. But by the early 2020s, rising Body Mass Index (BMI) could more than offset any continued reduction in smoking. With two-thirds of the population overweight or obese, continued improvements in health may be an unrealistic expectation.[14]

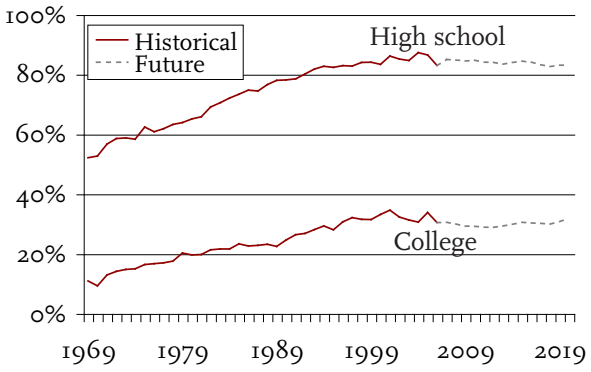
In short, health and mortality trends may not be improving.

Trends in educational attainment

Increases in disability-free life expectancy over 1970-2000 coincided with large increases in educational attainment. Between 1970 and 2000, the percent of men 50-54 with a high school degree went from 55 percent to about 84 percent and the percent with a college degree increased from 13 percent to about 32 percent.

Improvements in educational attainment, however, have recently plateaued. Men in their 30s and 40s today have similar levels of education as those 50-54. These trends imply that the education achievement of men 50-54 in the future will not be better than it is today. In fact, for the next 20 years, the percent of men 50-54 with high school and college degrees will remain around 85 percent and 30 percent respectively (see Figure 1).[15] Thus, looking forward, the lack of continued increases in educational attainment might slow down improvements in health.

Figure 1. Percent of Men Age 50-54 with a High School Diploma or a College Degree, 1969–2020



Source: Authors' calculations using the 1969-2006 NHIS.

Conclusion

A series of conclusions emerge from this *brief*. First, on average, a 50-year-old man could expect almost three more years of healthy life in 2000 than in 1970. Second, disability-free life expectancy varies significantly by race and education. Third, with the exception of college graduates, little improvement has occurred within each race-education group. Fourth, when collapsing the race and educational groups into quartiles of the population, disability-free life expectancy averages 14 years for the lowest quartile, 18 to 19 years for quartiles two and three, and 23 years for the highest quartile. Finally, given the leveling of male educational attainment and the idea that obesity may slow or reverse health gains, disability-free life expectancy may not continue to improve in the future.

These conclusions have implications for policymakers who may be seeking ways to encourage longer worklives, particularly in light of the current financial crisis. Physical limitations should not inhibit the bulk of older Americans from working at least until their mid-sixties. However, at least a quarter of the population may find continued employment extremely difficult. And employment prospects are unlikely to improve given the plateauing of educational achievement and the growing incidence of obesity.

Endnotes

1 For a survey of the literature, see Currie and Madrian (1999) and Deschryvere (2005).

2 The calculations in this *brief* are based on "period" life expectancy, a measure that assumes age-specific mortality rates for a specific year remain constant in the future. An alternative measure is "cohort" life expectancy, which includes expected future mortality improvements that generally produce higher estimates than period life expectancy. Ideally, we would like to use cohort life tables jointly with cohort disability rates to estimate the changes in disability-free life expectancy for different cohorts. The decision to use period life tables is based on two practical considerations. First, previous literature uses period life tables, and we wanted to make our figures comparable with the existing literature. And second, constructing cohort disability rates requires assumptions about the potential changes in disability rates of the elderly that might obscure the analysis. We conducted alternative analyses using cohort life tables and cohort disability rates (assuming the improvement in disability rates by age group for each cohort equals the average improvements in disability rates for similar age groups in the last 40 years), and the results from this alternative scenario are qualitatively comparable to the results presented in this *brief*.

3 See Crimmins, Saito, and Ingegneri (1997) and Fries (1983).

4 The following analysis builds on the work of Crimmins, Saito, and Ingegneri (1989 and 1997).

5 For a discussion of the theories on why education plays such an important role, see Cutler and Lleras-Muney (2006). Education has also become the favorite measure because it can be determined for all individuals, and education generally avoids the possibility of reverse causation – for example, poor health may lead to low income. In contrast, most people complete their education by their early adult years, so educational attainment is unlikely to be affected by the health impairments that occur later in life.

6 See Crimmins and Saito (2001).

7 We calculated the 10-year death rates for men 50 and over from the IPUMS-Census data for each education group and estimated the ratio of these death rates to the death rate of the general population. The ratio of the 10-year death rate to the general population goes from 1.02 in 1960 to 1.06 in 1990 and 1.09 in 2000 for those with less than high school and from 0.71 in 1960 to 0.67 in 1990 and 0.64 in 2000 for those with college or more. We apply the changes in these ratios over time to the 1990 relative mortality tables. For example, in 1990, the mortality rate for a white male with less than high school at age 50 is 1.33 times the mortality of the general population (Brown, Liebman, and Pollet 2002). The adjustment means that this ratio decreases to 1.27 (1.33*1.02/1.06) in 1960 and increases to 1.36 (1.33*1.09/1.06) in 2000. We used the Census calculations as a conservative measure of the growing disparities in mortality. An alternative specification using the data on self-reported health instead of the 10-year death rates from the Census generates qualitatively equivalent results, although the implied speed of growth of the disparities in health across education groups is much larger.

8 Figures for blacks with high school or more are adjusted for 1970 because of the small number of observations in this category. The adjustment assumes that the ratio of the percent of black males with high school or more to white males with high school or some college in 1970 is the same as the ratio observed for 1980. This imputation does not affect the overall results because blacks with high school or more were only about 2.5 percent of the population in 1970 for the age groups analyzed in this *brief*.

9 As before, the period life tables are used to estimate the number of years individuals age 50 in each race-education group are expected to be alive in five age ranges: 50-54, 55-59, 60-64, 65-69, and 70 and older. The sum of these values is the life expectancy at age 50. The values for each age category are multiplied by the percent non-institutionalized to get the years individuals age 50 are expected to be alive in the community. These figures are multiplied by one minus the disability rates in Table 4 for each race-education-age category to determine the number of years individuals age 50 are expected to be alive in the community with no disabilities. The sum of these values is the years of disability-free life expectancy at age 50.

10 See Soldo et al. (2006).

11 Respondents were coded as having a potential drinking problem if they responded positively to more than 1 out of the 4 items: ever felt should cut down on drinking, ever criticized for drinking, felt bad or guilty about drinking, or ever taken a drink first thing in the morning. This measure is used clinically to screen for alcoholism.

12 See Cutler, Glaeser, and Rosen (2007). Another suggestion that middle-aged people in the United States are facing serious health problems comes from a study that compares the self-reported rates of several chronic diseases related to diabetes and heart disease, adjusted for age and health behavior risk factors, of non-Hispanic white individuals 55-64 in the United States and the United Kingdom (Banks et al., 2006). The results showed that the U.S. population in late middle age is less healthy than the equivalent U.K. population for diabetes, hypertension, heart disease, myocardial infarction, stroke, lung disease, and cancer. These results hold even controlling for behavioral risk, including smoking, overweight, obesity, and alcohol drinking, which explain very little of these health differences. These differences are not due to biases in self-reporting disease, because biological markers of disease exhibit exactly the same patterns. And they are not solely driven by the bottom of the socioeconomic distribution; in many diseases, the top of the distribution is less healthy in the United States as well.

13 Cutler, Glaeser, and Rosen (2007) use the 1971-75 and 1999-2002 *National Health and Nutrition Examination Survey*.

14 If everyone took medication for hypertension and high cholesterol, the impact of rising obesity as measured by BMI could be almost eliminated, but it is not clear that will happen.

15 The figure shows the three-year moving average of the percent with a high school diploma and percent with a college degree. Men with a GED are classified as not having a diploma. The graduation rates after 2006 are constructed from the graduation rates for men 35-39, 40-44, and 45-49 between 2001-2006.

References

Banks, James, Michael Marmot, Zoe Oldfield, and James P. Smith. 2006. "Disease and Disadvantage in the United States and in England." *Journal of the American Medical Association* 295(17): 2037-45.

Brown, Jeffrey R., Jeffrey B. Liebman, and Joshua Pollet. 2002. "Estimating Life Tables that Reflect Socioeconomic Differences in Mortality." In *The Distributional Effects of Social Security Reform*, eds. M. Feldstein and J. Liebman. University of Chicago Press: Chicago, IL.

Bell, Felicitie C. and Michael L. Miller. 2005. *Life Tables for the United States Social Security Area 1900-2100*. Actuarial Study No. 116. Office of the Chief Actuary. U.S. Social Security Administration.

Crimmins, Eileen M., Yasuhiko Saito, and Dominique Ingegneri. 1989. "Changes in Life Expectancy and Disability-Free Life Expectancy in the United States." *Population and Development Review* 15(2): 235-267.

Crimmins, Eileen M., Yasuhiko Saito, and Dominique Ingegneri. 1997. "Trends in Disability-Free Life Expectancy in the United States, 1970-90." *Population and Development Review* 23(3): 555-572.

Crimmins, Eileen M. and Yasuhiko Saito. 2001. "Trends in Healthy Life Expectancy in the United States, 1970-90: Gender, Racial, and Educational Differences." *Social Science and Medicine* 52: 1629-1641.

Currie, Janet, and Brigitte C. Madrian. 1999. "Health, Health Insurance, and the Labor Market." In *Handbook of Labor Economics*, eds. Orley C. Ashenfelter and David Card. Volume 3C. Amsterdam: Elsevier Science Publishers BV.

Cutler, David and Edward Glaeser and Allison Rosen. 2007. "Is the US Population Behaving Healthier?" Working Paper 13013. Cambridge, MA: National Bureau of Economic Research.

Cutler, David, and Adriana Lleras-Muney. 2006. "Education and Health: Evaluating the Theories and Evidence." Working Paper 12352. Cambridge, MA: National Bureau of Economic Research.

Deschryvere, Matthias. 2005. "Health and Retirement Decisions: An Update of the Literature." Research Report. European Network of Economic Policy Research Institutes.

Fries, James F. 1983. "The Compression of Morbidity." *Milbank Memorial Fund/Quarterly/Health and Society* 61(3): 397-419.

Munnell, Alicia H., Mauricio Soto, and Alex Golub-Sass. 2008. "Will People Be Healthy Enough to Work Longer?" Working Paper 2008-11. Chestnut Hill, MA: Boston College Center for Retirement Research.

Soldo, Beth, Olivia S. Mitchell, Rania Tfaily, and John F. McCabe. 2006. "Cross-Cohort Differences in Health on the Verge of Retirement." Working Paper 12762. Cambridge, MA: National Bureau of Economic Research.

U.S. Bureau of the Census. 1973a. *Census of Population: 1970*. Vol. I. Washington, DC: Government Printing Office.

U.S. Bureau of the Census. 1973b. *Census of Population: 1970*. Vol. II. Washington, DC: Government Printing Office.

U.S. Bureau of the Census. 1983. *Census of Population: 1980, Vol. I. Characteristics of the Population*. Washington, DC: Government Printing Office.

U.S. Bureau of the Census. 1984. *Census of Population: 1980. Vol. II. Subject Reports*. Washington, DC: Government Printing Office.

U.S. Bureau of the Census. 1991. *Census of Population and Housing, 1990: Summary Tape File 1*. Washington, DC: Government Printing Office.

U.S. Bureau of the Census. 2001. *Census 2000 Summary File 1*. Washington, DC: Government Printing Office.

U.S. Department of Health and Human Services. *National Health Interview Survey, 1969-2006*. Public Use Sample, Documentation, and Codebook. Hyattsville, MD: National Center for Health Statistics.

CENTER FOR
RETIREMENT
RESEARCH
AT BOSTON COLLEGE

About the Center

The Center for Retirement Research at Boston College was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

Affiliated Institutions

The Brookings Institution
Massachusetts Institute of Technology
Syracuse University
Urban Institute

Contact Information

Center for Retirement Research
Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467-3808
Phone: (617) 552-1762
Fax: (617) 552-0191
E-mail: crr@bc.edu
Website: http://www.bc.edu/crr

The research reported herein was performed pursuant to a grant from the U.S. Social Security Administration (SSA) funded as part of the Retirement Research Consortium. The opinions and conclusions expressed are solely those of the authors and do not represent the opinions or policy of SSA, any agency of the Federal Government, or the Center for Retirement Research at Boston College.