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WILL PEOPLE BE HEALTHY ENOUGH TO WORK LONGER?

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Introduction

As recently as the mid-1960s, the median retirement age for men — the age at which half of all men are no longer in the labor force — was 66. Today, it is 63. But given the scheduled decline in Social Security replacement rates, increased longevity, and the relatively low balances in 401(k) accounts, Americans risk serious income shortfalls, especially at older ages, if they continue to retire at age 63. A rational response is to move the average retirement age back to 66 or even older. A key consideration is whether people will be healthy enough to work longer. This *brief* compares the health status of older people today with those forty years ago and explores what happens to people's health as they age.

The bottom line is that the health of older people (those 65 and older), as opposed to older workers (those 50 to 64), showed little improvement in the 1970s, mixed results in the 1980s, and marked improvement since the 1990s. The marked improvement for older workers most likely began earlier, in the 1980s. Today, the health of older workers appears to be at least as good as it was forty years ago. Thus, if half of the male population were then healthy enough to work until age 66, the same percentage should be able to do so today. Two important issues not addressed in this *brief* are whether the jobs will be there for older workers and the challenge presented by the 15 to 20 percent of the older population for whom work will be impossible.

Health and Work

Intuitively, people's health affects their ability and desire to work. Poor health can make work difficult and unpleasant, leading people to withdraw from the labor force. Poor health can reduce people's productivity, leading to lower wages, and lower wages reduce the incentive to work. Poor health can make people less attractive to employers and therefore less likely to be hired. In 1969, intuition carried the day, as shown by the following observation by the day's leading experts:

"... that the labor force status of an individual will be affected by his health is an unassailable proposition [because] a priori reasoning and casual observation tell us it must be so, not because there is a mass of supporting evidence."[1]

Today, we have the evidence. In the last 35 years, research into the impact of health on labor force activity has become a major industry, and virtually all studies show that poor health reduces the likelihood of being in the labor force and the expected retirement age, as well as hours worked and wages.[2]

The size of the effect of health on work, however, is sensitive to the measurement of health status. Most studies use a measure of self-assessed health (very good, good, fair, bad, or very bad) or whether respondents report health limitations that affect their ability to work. Researchers have also used objective measures such as whether the person has a problem with activities of daily living or the presence of a chronic or acute condition.

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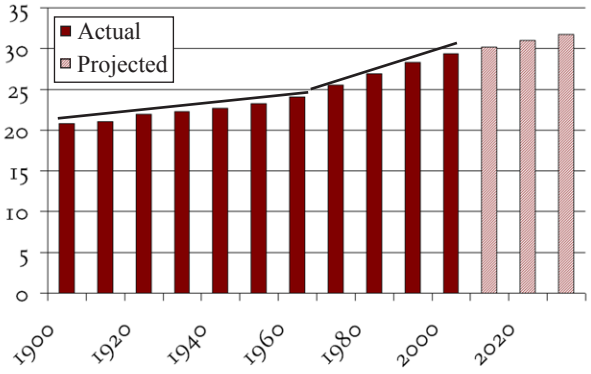
It turns out that self-reported health status is actually a pretty good indicator of a person's medically determined health status. These self reports, however, are sensitive to other parts of the employment picture, which create problems for researchers attempting to establish relationships between health and work. For example, people who like their work downplay their health problems and work longer, while those who dislike their work emphasize health issues and retire sooner. Similarly, people who have cut back on their work are more likely to report a health problem, either because they want to justify their decision or because they may be eligible for government benefits if they are unhealthy.[3] Despite these possible biases, using self-reported health information may be the best approach to determining how health affects work. While the "justification" phenomenon tends to bias the estimated effect of health on work upward, measurement error biases the results downward, and the two biases may well cancel each other out. In contrast, objective measures of health are often not very good indicators of whether people can work or not — for example, difficulty walking up stairs may have little effect on a person's ability to work as a computer programmer — and simply bias the effect toward zero.

A huge body of literature has confirmed that health affects work. Originally, researchers simply added some measure of poor health to an equation explaining labor force participation and found negative effects. Increasingly, the studies have become more sophisticated to address the biases discussed above. Regardless of the approach and the measurement of health and work activity, the studies provide overwhelming evidence that poor health reduces the likelihood of work.[4] Therefore, it is important to determine whether older people will be healthy enough to work.

Life Expectancies at Age 50

One starting point for exploring the health of older workers is to look at trends in life expectancy at age 50. Figure 1 shows life expectancy at age 50 for males over the 20th century. Interestingly, life expectancy at older ages rose very slowly at the beginning of the century and then accelerated sharply toward the end of the century. In fact, life expectancy at 50 was not very different in 1960 than in 1900 — 24 years versus 21 years. After 1960, however, life expectancy at 50 took off, rising to 29 years in 2000 and is projected to increase to 32 years by 2030.[5]

Figure 1. Life Expectancy in Years at Age 50 for Men, 1900-2030



Source: U.S. Social Security Administration, *Life Tables for Males*, 1900-2030.

Although longer life spans generally imply improvements in health, keeping less healthy people alive could actually increase the percent of the population with disabilities. Thus, for a time, researchers referred to the "failure of success."[6] Therefore, it is important to check on the health of the surviving population and determine the extent to which disabilities may prevent them from working.

What is a Disability?

Disablement is generally defined as a process. It begins with a "pathology," a change in a person's body caused by disease, infection, or some other factor.[7] An example is hypertension, whereby high blood pressure stretches the walls of the arteries. A pathology can then lead to an impairment, which makes it difficult for a person to function. For example, hypertension can lead to angina, which causes chest pains upon exertion, or to heart attack or stroke. The impairment can then lead to an inability to perform work or household tasks. Finally, the functional limitations can lead to dependence.

For older people, dependence usually means the person has difficulty with basic activities of daily living (ADLs), such as eating, bathing, or dressing, or difficulty with instrumental activities of daily living (IADLs), such as doing light housework, shopping, or preparing meals. ADL disability is generally considered the most severe because it is generally associated with long-term care needs.[8]

With a focus on work, the key question is the extent to which older people have disabilities that might limit their labor force activity. Our primary concern is with older workers, people age 50 to 65. But we first look at trends in disability among the population 65 and over, because substantial research has been conducted for this age group and presumably a healthier group of retirees would imply a healthier cohort of older workers. The following section then reports the more limited survey results for those 50 to 65.

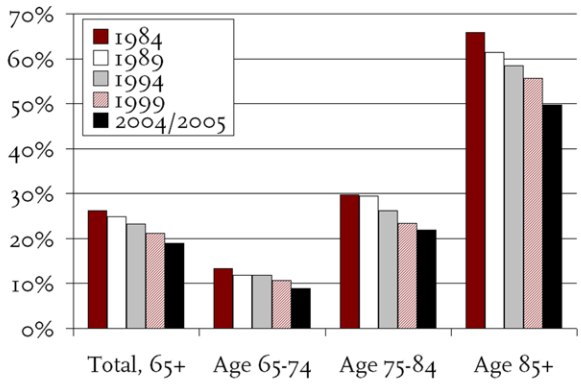
Trends in Disabilities among Those 65 and over

As noted above, the relationship between improvement in mortality and the health of the older population is theoretically ambiguous. For example, if the reduction in mortality were due to keeping more stroke victims alive, the health of the surviving population could decline since stroke survivors are often quite disabled. On the other hand, if the improvement in mortality came from better treatment for hypertension, the overall health of the population would improve since many would not develop an impairment. Indeed, trends during the 1970s led a number of researchers to conclude that increased longevity had led to increased frailty among the surviving population, but since the early 1990s it seems irrefutable that the health of the older population has been improving.

In 2002, a technical working group examined trends in disability for older Americans across five major national surveys.[9] The group concluded that, when standardizing for the definition of disability, time period, and consistent inclusion or exclusion of the nursing home population, all five surveys showed consistent downward trends for two common disability measures — difficulty with daily activities and help with daily activities — beginning in the early to mid-1990s. The evidence for change in the 1980s and for a third measure of disability (the use of help or equipment with daily activities) remained mixed.

The most consistently positive findings regarding the health of those 65 and over come from the *National Long-Term Care Survey* (NLTCS). The NLTCS, a longitudinal survey of the Medicare-enrolled population aged 65 and over, has been conducted in 1982, 1984, 1989, 1994, 1999, and 2004. In each survey, approximately 20,000 people are screened for chronic limitations in activities of daily living and instrumental activities of daily living.[10] Researchers put a lot of weight on this survey because the questions have remained virtually unchanged since the beginning.

Figure 2. Percent of Older Americans with Any Kind of Disability, by Age, Selected Years 1984-2004/2005



Source: Manton, Gu and Lamb (2006) from Duke University, *National Long-Term Care Survey* (NLTCS), 1984-2004/2005.

Figure 2 shows the percent of the total 65-and-over population that was dependent, where dependent is defined as having an ADL or IADL difficulty or residing in a nursing home. Between 1984 and 2004, the share of the elderly that lacked the ability to function independently with ease declined from 26.2 percent to 19.0 percent.[11] The figure also shows the prevalence of dependency by age. Although dependency rises sharply as people get older, the pattern of decreasing dependency was evident for all age groups.[12] (See Box for a discussion of the decline in the nursing home population).

Experts have cited a number of reasons for this improvement in the health of those 65 and over. Since the change has occurred so recently and so rapidly, environmental factors — as opposed to genetic or evolutionary developments — must clearly play a major role.[13] The usual suspects include better medical care, reduced exposure to childhood diseases, improved lifestyles, fewer occupational hazards, and increased education and income. Understanding the source of the improvements for those 65 and over should shed light on whether and when older workers would also be expected to enjoy better health. For example, to the extent that most of the improvements for those 65 and over was the result of Medicare-driven improved medical care, those under 65 would be less likely to benefit. But to the extent that it was the result of other factors such as reduced exposure to early childhood disease, improved working conditions, etc., the improvement should be evident in those under 65, but show up roughly a decade earlier.

Better medical treatments. Twenty years ago, one of the major reasons that older people had problems with walking and shopping was arthritis.[14] The major developments that required nursing home care were cognitive impairment, followed by heart disease and stroke. The medical profession has been able to alleviate many of these health problems. The debilitating effects of arthritis have been substantially controlled by the use of anti-inflammatory drugs.[15] Joint replacements, which roughly doubled from the 1980s to the 1990s, have also been a major innovation. In terms of heart disease and stroke, the use of hypertension medication also rose in the late 1970s and early 1980s, which may explain the decline in incidence of stroke in recent years. It appears that much of the improvement has come from earlier diagnosis and improved treatment of those who develop the condition rather than from a reduced onset of conditions in the first place, although the age of onset remains an unsettled question.[16]

Reduced exposure to infectious disease in childhood. The current elderly were also less exposed to disease in childhood. The medical and epidemiological literature provides many examples of the possible linkage between early life infectious disease and chronic disease and cognitive disorders late in life.[17] For example, individuals who had acute rheumatic fever as a child were likely to experience a recurrence of attacks following a streptococcal infection. Other infectious diseases, such as measles, syphilis, typhoid fever and malaria, can also cause heart problems in later life.[18] The decline of infectious diseases likely contributed to the reduced disability of today's 65 and over population.

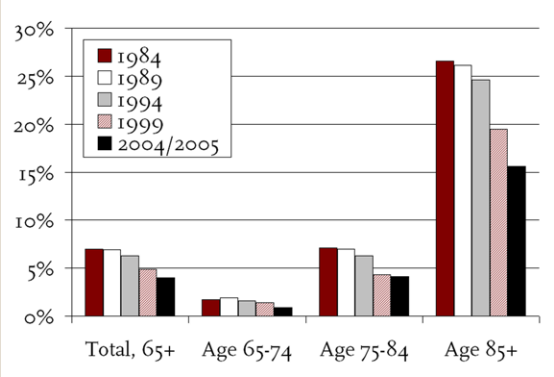
Improved lifestyles. In addition to having healthier childhoods, the current elderly also evidenced better behavior as adults. In 1960 about 40 percent of adults were regular smokers; today only about 25 percent of the population smokes. Smoking is the leading risk factor for heart disease, stroke, and respiratory diseases — all precursors to a disability.[19] People have also reduced the intake of salt and fats in their diets, which may have reduced the incidence of atherosclerosis and hypertension. Diabetics are taking better care of themselves relative to earlier cohorts in terms of consumption of alcohol and foods with sugar.[20] On the other hand, the growing trend toward obesity and rising incidence of diabetes are examples of unfavorable developments.[21]

Reduced occupational hazards. The nature of work has also become less physically demanding and less hazardous. First, employment has shifted from manual jobs to white-collar work. This is an important development because economists have documented that, even controlling carefully for education and income, those in manual occupations have worse self-reported health and experience more rapid declines in their health with age than their white-collar counterparts.[22] Manual workers also have less control over their work schedules, face repetitive tasks, and hold jobs with low prestige, which can cause psychological problems. Second, within manual jobs, regulations have substantially reduced occupational hazards by limiting workers' exposure to dust, fumes, and gases that can cause lung diseases.

THE DECLINE IN THE NURSING HOME POPULATION

Over the past twenty years, the percentage of the population over age 65 in nursing homes has also declined dramatically for all age groups (see Figure 3). Some of the decline may reflect a shift to home-based care and assisted living facilities. The number of residential care and assisted living beds increased by 97 percent from 1990 to 2002.[23] Changes in Medicare, specifically a clarification of eligibility criteria for home health care, also increased the percentage of the elderly population receiving care at home.[24] Some of the decline, however, probably reflects a generally healthier older population.

Figure 3. Percent of Population Age 65 and over in Nursing Homes, Selected Years 1984-2004/2005



Source: Manton, Gu and Lamb (2006) from the 1984-2004 NLTCS.

Higher educational attainment. The improvement in educational attainment among those 65 and over could also have led to improved health. More educated people have a 50 percent lower disability rate than the less educated.[25] The share of the elderly with a college degree more than doubled from 1980 to 2005.[26] Some contend that education inevitably stands for more than years in the classroom. That is, it is a broad measure that reflects access to medical care, patterns of medical care use, as well as exercise, diet, and smoking patterns, and access to devices when disability does occur.[27] A recent study, however, attempts to disentangle education from these other factors, and finds that even controlling for income and wealth as well as other reasons why education might matter — past health behaviors such as smoking and drinking, job-related hazards, early life economic environment, and parental education and health — education remains an important explanatory variable.[28] One possible reason is that more educated people will follow what can be complicated regimens and better manage their diseases.[29] This discipline may reflect an improved understanding of how current actions can affect future events that comes with more education. In short, now that we have eliminated the huge disparities between rich and poor in terms of exposure to infectious diseases and even in terms of food and shelter, the impact of education on health has become increasingly important.[30]

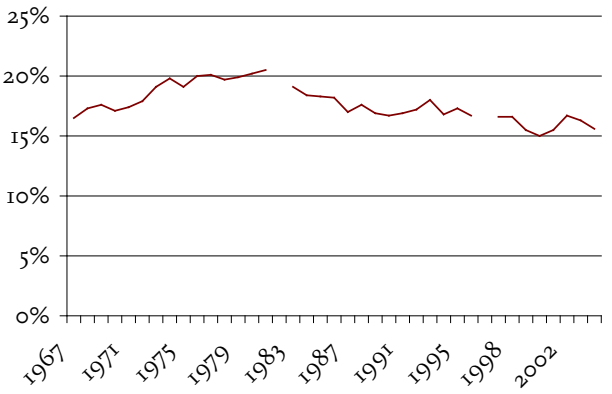
The improvement of the condition of older Americans has been both recent and dramatic. The explanation for the timing may be two-fold. First, improvements in medical care, reductions in occupational stress, changes in lifestyles, and increases in education and income all occurred in a short period of time. On the medical side, Medicare, which was enacted in 1965, may well have encouraged treatment innovations for the elderly through teaching hospitals and clinical research.[31] Second, the life experiences of different population groups differed significantly. As described by Costa (2005):

"Those who were 70 in 1980 were born in 1910 when infectious disease rates were still high and when incomes were low and spent their prime years in relatively dangerous jobs. In contrast, those who were 70 in 2000 were born in 1930 when infectious disease rates, while still high by today's standards, had fallen. They enjoyed higher incomes, ate a more balanced diet, acquired more education, worked in less dangerous jobs and had access to improved medical care."

Trends in Disabilities among the Working-Age Population

The fact that the health of older Americans has improved would lead one to conclude that the health of the older *working-age* population was also getting better. But for a long time, such a conclusion was not obvious. The major survey that tracked disabilities among the working-age population — the *National Health Interview Survey* (NHIS) — showed the percent of this population with disabilities increasing from the mid-1960s through the early 1980s (see Figure 4).

Figure 4. Percent of Men Age 45 to 64 with Activity Limitation, 1967-2004



Note: From 2002-2004, the figure shows work limitation for all persons instead of males only.
Source: Authors' calculations from the National Center for Health Statistics (1967-2004).

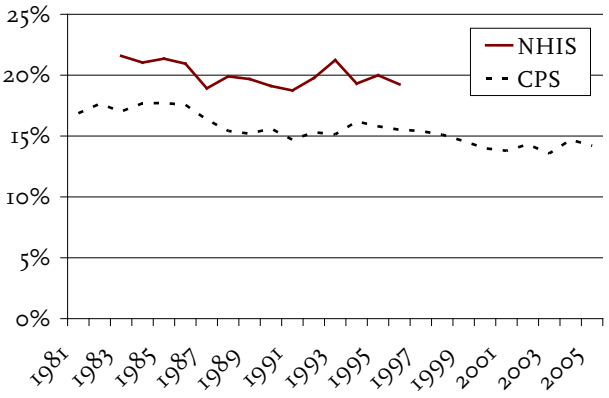
Decennial census data also showed an increase in the fraction of both men and women unable to work during the 1970s. Skeptics of the increasing disability story contend that the trend during the 1970s may, at least in part, reflect social factors such as earlier detection and diagnosis of chronic diseases and greater availability of disability insurance.[32] Thus, the trend in the prevalence of disabilities during the 1970s remains controversial. Since the early to mid-1980s, however, it is clear that the percent of men with an activity limitation has declined.[33]

The NHIS is an annual cross-sectional survey of 100,000 non-institutionalized civilians conducted by the National Center for Health Statistics. Unfortunately, the survey questions have been revised every

10 to 15 years, making it impossible to construct a series over a long period of time.[34] Nevertheless, consistent data are available from 1967-1982, 1983-1996, and 1997-2004. For the period 1983-1996, the survey asked "Does any impairment or health problem now keep [person] from working at a job or business? Is [person] limited in the kind or amount of work [person] can do because of any impairment?" A person who answers yes to either question is considered to have a work limitation.[35] As Figure 4 shows, the percent of those 45 to 64 with a disability declined from the early 1980s and through the mid-1990s. Between 1997 and 2004, a similar question produced a more stable trend. But the general conclusion emerging from the NHIS data is one of declining disability among older working-age individuals to a level at least comparable to that in the mid-1960s.

Another source of data on work limitations is the *Current Population Survey* (CPS). The CPS is also a large annual cross-sectional survey (about 150,000 non-institutionalized civilians). Unlike the NHIS, the CPS was not designed to track health trends but rather to gather employment and income data for the U.S. population. Nevertheless, beginning in 1981 the March Supplement asks a question about work limitations: "Does anyone in this household have a health problem or disability which prevents them from working or which limits the kind of work they can do? [If so,] who is that? Anyone else?" And unlike the NHIS, the survey question has remained unchanged for the last 25 years. The percent of men with a work-limitation-based disability is shown in Figure 5. The trend since the early 1980s is one of declining disabilities.

Figure 5. Percent of Men Age 50 to 64 with a Work Limitation-Based Disability, NHIS and CPS, 1981-2005



Sources: Authors' calculations from the U.S. Census Bureau, *Current Population Survey* (CPS), 1981-2005 and the National Center for Health Statistics, *National Health Interveiw Survey*, 1983-1996.

Figure 5 also includes data from the NHIS for purposes of comparison. The average level of work-based disability was higher in the NHIS than in the CPS. The NHIS might elicit a higher rate of reported disability because it is a health-based survey.[36] But both surveys show a downward trend in the 1980s and early 1990s. It makes sense that improved disability trends would show up earlier among those 50 to 64 than for those 65 and over, since the younger cohort was less exposed to infectious diseases in childhood, worked in less hazardous jobs, and enjoyed higher education and incomes.

One note of caution may be in order. Some researchers have recently raised concerns about increased disability among younger people, most likely due to the increases in obesity.[37] Obesity often results in diabetes, and rates of diabetes are on the rise. If these trends hold, the story of improving health for older workers could reverse for the younger generation.

Conclusion

Numerous studies have shown that health and work are related. Those reporting poor health are less likely to work than those in good health. Although the trends in the 1970s remain controversial, the NHIS data indicate a rise in work limitations among men age 45 to 64 from the mid-1960s to the mid-1980s. This period was when the average retirement age for men fell from 66 to 63. The expansion of the nation's retirement income system — Social Security, Medicare, and employer pensions — clearly contributed to this decline in the average retirement age. But declining health could be part of the explanation.

Now that the retirement income system is contracting, workers need to remain employed longer to gain the same level of retirement income security. The evidence suggests that the health of older workers is at least as good today as it was forty years ago. Moreover, jobs are much less physically demanding than they were in the past. Thus, physical limitations should not inhibit the ability of the bulk of older Americans to work at least until their mid-sixties.

Important questions still remain concerning whether the jobs will be there for older workers. And the data also make clear that, despite a positive trend, 15 to 20 percent of people in their late fifties and sixties will find work virtually impossible. Moreover, many of those who need to work longer — particularly low-wage workers dependent on Social Security — are precisely the individuals who have onerous jobs that stress their health and who lack the education to manage their care. Thus, the working longer prescription must be administered with care.

Endnotes

1 Bowen and Finnegan (1969).

2 For a survey of the literature, see Currie and Madrian (1999); an update can be found in Deschryvere (2005).

3 Also, people are more likely to report a health problem if they have sought treatment. Since people with higher incomes and more education use more medical care, they may be more likely to report certain conditions.

4 Health alone may not be the sole determinant of whether someone is able to work. Nagi (1976) views disability as the interaction between the individual's disability and the demands presented by the social and physical enviornments. Consequently, as Jette and Badley (2000) lay out, varying levels of accomodation as well as an individual's own personality and characteristics can affect the likelihood of working with a disability. Burkhauser, Butler, Kim, and Weathers (1999) and Burkhauser, Butler, and Gummus (2004) find that following the onset of a work-limiting condition, employer accomodation delays the time between onset and claiming Social Security Disability Insurance benefits.

5 The same pattern is evident in the probability of 50-year-olds surviving to 65 — very little change until 1970 and then a surge thereafter.

6 See Waidmann, Bound, and Schoenbaum (1995).

7 The following discussion is based on a process described by Nagi (1976) and also presented in Cutler (2001).

8 See Freedman, Martin, and Schoeni (2002).

9 See Freedman et al. (2004). The five surveys included the *Health and Retirement Study* (HRS), the *Medicare Current Beneficiary Survey* (MCBS), the *National Health Interview Survey* (NHIS), the *National Long Term Care Survey* (NLTCS), and the *Supplements on Aging* (SOAs).

10 The sample consists of 15,000 who were surveyed on previous surveys and 5,000 who passed age 65 since the previous survey. See Manton and Gu (2001).

11 Manton, Gu, and Lamb (2006).

12 Wolf, de Leon, and Glass (2007) explore the dynamics of the declining population level disability prevalence and find that, on the positive side, disabilities are occurring later but, on the negative side, people are taking longer to recover.

13 For an extensive discussion of this issue, see Fogel and Costa (1997).

14 See Cutler (2001).

15 See Fries et al. (1996).

16 Cutler (2001) argues that the onset of conditions has not receded, while Fogel (2003) asserts that the average age of onset of chronic disease occurred more than a decade later at the end of the 20th century than at the beginning.

17 For a review of the literature, see Cutler, Deaton, and Lleras-Muney (2006).

18 See Costa (2005) and Cutler (2001).

19 Cutler (2001).

20 See Costa (2005).

21 See Lakdawalla, Bhattacharya, and Goldman (2004).

22 See Case and Deaton (2003).

23 See Harrington et al. (2005).

24 See Bishop (1999).

25 See Manton and Gu (2001).

26 The percent of the elderly with a college degree increased from 5 percent in 1980 to 12 percent in 2005 (U.S. Census Bureau, *Current Population Survey,* 1980 and 2005).

27 See Schoeni, Freedman, and Wallace (2001).

28 See Smith (2004).

29 Goldman and Smith (2002) found that in a randomized trial in which one group of diabetics was placed in a group with enforced treatment, the biggest beneficiaries were those with the least education.

30 Insight from correspondence with Dora Costa.

31 See Cutler and Meara (2001).

32 Waidmann, Bound, and Schoenbaum (1995). From the mid-1960s until the mid-1970s, Social Security Disability Insurance benefits rose while eligibility requirements became less strict. Until the Social Security Administration and Congress started to tighten these requirements in 1976, the availability of disability insurance may have influenced workers' view of their health and ability to work.

33 Cutler, Liebman, and Smyth (2006) recently compared the health status in the 1960s/1970s with today and found significant improvement. They used two measures that are consistent over time: 1) the share of people in the last two years of their life (a period when disability is high); and 2) the share of people who report themselves in fair or poor health. The reported data, however, did not provide a clear indication of what happened during the 1970s.

34 The National Center for Health Statistics redesigned the NHIS questionnaire format in 1982 and again in 1997. The NHIS asks all adult respondents whether they are unable to perform their major activity because of health problems; limited in their ability to perform their major activity; and limited in any activity. Prior to 1982, men were asked these questions in regards to paid work, while women who identified their major activity as "keeping house" were asked about their ability to perform housework. Starting in 1982, the question which asked respondents to identify their "major activity" changed to give men and women the same set of choices (working, keeping house, going to school, or something else). Additionally, regardless of what respondents identified as their major activity, all those under age 70 were asked about their ability to work. Those who did not report their major activity as working were asked a set of follow-up questions from which a work limitation response could be constructed. Changes to the survey in 1997 include changes to the wording, structure, and context of questions as well as a shift from paper to laptop computers for the collection process.

35 The NHIS also asks directly about certain impairments (deaf in both ears, blind in both eyes, etc.) of a subset of survey respondents. This practice has allowed researchers to explore the people who have similar impairments but report no work limitations.

36 See Burkhauser, Daly, Houtenville, and Nargis (2002) for an assessment of the limitations of the CPS for measuring the portion of the population with disabilities. In fact, both surveys may understate the percent of the population with impairments, because having an impairment, even a serious one, does not necessarily mean the individual will not work. For example, according to the 1996 NHIS, 31 percent of those blind in both eyes reported no work limitation; 26 percent of those with cerebral palsy reported no work limitation. Therefore, both estimates exclude those sufficiently integrated into the workforce that they do not report a work limitation. For any given person, the likelihood of employment depends on the interaction of state of health, functional capacity, the nature of the work, and the possibilities for work accommodation (see Chan, Tan, and Koh (2000)).

37 Lakdawalla, Bhattacharya, and Goldman (2004).

References

Bishop, Christine E. 1999. "Where Are the Missing Elders? The Decline in Nursing Home Use, 1985 and 1995." *Health Affairs* 18(4): 146-155.

Bowen, William and T. Finnegan. 1969. *The Economics of Labor Force Participation*. Princeton, NJ: Princeton University Press.

Burkhauser, Richard V., John S. Butler, and Gulcin Gumus. 2004. "Dynamic Programming Model Estimates of Social Security Disabililty Insurance Application Timing." *Journal of Applied Econometrics* 19: 671-685.

Burkhauser, Richard V., John S. Butler, Yang-Woo Kim, and Robert R. Weathers II. 1999. "The Importance of Accommodation on the Timing of Disability Insurance Applications: Results from the Survey of Disability and Work and the Health and Retirement Study." *The Journal of Human Resources* 34(3): 589-611.

Burkhauser, Richard V., Mary C. Daly, Andrew J. Houtenville, and Nigar Nargis. 2002. "Self-Reported Work-Limitation Data: What They Can and Cannot Tell Us." *Demography* 39(3): 541-555.

Case, Anne C. and Angus Deaton. 2003. "Broken Down By Work and Sex: How Our Health Declines." Working Paper 9821. Cambridge, MA: National Bureau of Economic Research.

Chan, Gregory, V. Tan, and David Koh. 2000. "Ageing and Fitness to Work." *Occupational Medicine-Oxford* 50 (7): 483-491.

Costa, Dora L. 2005. "Causes of Improving Health and Longevity at Older Ages: A Review of the Explanations." *Genus* 61(1): 21-38.

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

Cutler, David. 2001. "Declining Disability among the Elderly." *Health Affairs* 20 (6): 11-27.

Cutler, David, Angus Deaton, and Adriana Lleras-Muney. 2006. "The Determinants of Mortality." Working Paper 11963. Cambridge, MA: National Bureau of Economic Research.

Cutler, David, Jeffrey B. Liebman, and Seamus Smyth. 2006. "How Fast Should the Social Security Eligibility Age Rise?" NBER Retirement Research Center Working Paper NB04-05. Cambridge, MA: National Bureau of Economic Research.

Cutler, David and Ellen Meara. 2001. "Changes in the Age Distribution of Mortality Over the 20th Century." Working Paper 8556. Cambridge, MA: National Bureau of Economic Research.

Deschryvere, Matthias. 2005. "Health and Retirement Decisions: An Update of the Literature." *ENEPRI Research Report* No. 6. Belgium: European Network of Economic Policy Research Institutes.

Duke University. *National Long-Term Care Survey*, 1984-2004/2005. Durham, NC.

Fogel, Robert. 2003. "Changes in the Process of Aging During the Twentieth Century: Findings and Procedures of the Early Indicators Project." Working Paper 9941. Cambridge, MA: National Bureau of Economic Research.

Fogel, Robert and Dora L. Costa. 1997. "A Theory of Technophysio Evolution with Some Implications for Forecasting Population, Health Care, and Pension Costs." *Demography* 31(1): 49-66.

Freedman, Vicki, Eileen Crimmins, Robert Schoeni, Brenda Spillman, Hakan Aykan, Ellen Kramarow, Kenneth Land, James Lubitz, Kenneth Manton, Linda Martin, Diane Shinberg, and Timothy Waidmann. 2004. "Resolving Inconsistencies in Trends in Old-Age Disability: Report from a Technical Working Group." *Demography* 41 (3): 417-441.

Freedman, Vicki, Linda Martin, and Robert Schoeni. 2002. "Recent Trends in Disability and Functioning Among Older Adults in the United States — A Systematic Review." *JAMA — Journal of the American Medical Association* 288 (24): 3137-3146.

Fries, James F., Catherine A. Williams, Dianne Morfeld, Gurkirpal Singh, and John Sibley. 1996. "Reduction in Long-Term Disability in Patients With Rheumatoid Arthritis by Disease-Modifying Antirheumatic Drug-Based Treatment Strategies." *Arthritis and Rheumatism* 39(4):616-622.

Goldman, Dana and James P. Smith. 2002. "Can Patient Self-Management Help Explain the SES Health Gradient?" *Proceedings of the National Academy of Sciences USA* 99(16): 10929-10934.

Harrington, Charlene, Susan Chapman, Elaine Miller, Nancy Miller, and Robert Newcomer. 2005. "Trends in the Supply of Long-Term-Care Facilities and Beds in the United States." *The Journal of Applied Gerontology* 24(4):265-282.

Jette, Alan M. and Elizabeth Badley. 2000. "Conceptual Issues in the Measurement of Work Disability." In Nancy Mathiowetz and Gooloo S. Wunderlich, eds. *Survey Measurement of Work Disability: Summary of a Workshop*. Washington, DC: National Academy Press.

Lakdawalla, Darius, Jayanta Bhattacharya, and Dana Goldman. 2004. "Are the Young Becoming More Disabled?" *Health Affairs* 23(1): 168-176.

Manton, Kenneth and XiLiang Gu. 2001. "Changes in the Prevalence of Chronic Disability in the United States Black and Non-Black Population Above Age 65 from 1982 to 1999." *Proceedings of the National Academy of Sciences USA* 98(11): 6354-6359.

Manton, Kenneth, XiLiang Gu, and Vicki Lamb. 2006. "Change in Chronic Disability from 1982 to 2004/2005 as Measured By Long-Term Changes in Function and Health in the U.S. Elderly Population." *Proceedings of the National Academy of Sciences USA* 103(48): 18374-18379.

Nagi, Saad. 1976. "An Epidemiology of Disability Among Adults in the United States." *Milbank Memorial Fund Quarterly: Health and Society* 54(4): 439-467.

National Center for Health Statistics. 1967-2004. *Current Estimates from the National Health Interview Survey*. Washington, DC: U.S. Centers for Disease Control and Prevention.

National Center for Health Statistics. *National Health Interview Survey, 1981-1996*. Public Use Sample, Documentation, and Codebook. Washington, DC: U.S. Centers for Disease Control and Prevention.

Schoeni, Robert F., Vicki A. Freedman, and Robert B. Wallace. 2001. "Persistent, Consistent, Widespread, and Robust? Another Look at the Trends in Old-Age Disability." *Journal of Gerontology: Social Sciences* 56B (4):S206-S218.

Smith, James P. 2004. "Unraveling the SES Health Connection." In *Aging, Health, and Public Policy: Demographic and Economic Perspectives,"* Supplement to *Population and Development Review* 30: 108-132.

U.S. Census Bureau. *Current Population Survey,* 1980-2005. Washington, DC.

U.S. Social Security Administration. *Life Tables for Males*, 1900-1930. Unpublished data.

Waidmann, Timothy A., John Bound, and Michael Schoenbaum. 1995. "The Illusion of Failure: Trends in the Self-Reported Health of the U.S. Elderly." *Milbank Quarterly* 73(2): 253-287.

Wolf, Douglas A., Carlos F. Mendes de Leon, and Thomas A. Glass. 2007. "Trends in Rates of Oneset of and Recovery from Disability at Older Ages: 1982-1994." *Journal of Gerontology* 62B(1): S3-S10.

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