Commentary

The reduction in disability among the elderly

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As the population lives longer, is it living in more or less healthy states? Manton and Gu (1) tackled this question in a recent issue of PNAS. Understanding whether the population is healthier or not is vitally important to individuals and to society as a whole. People value longevity improvements more when the quality of life of the additional years is high. Living longer but with severe disability is nowhere near as enjoyable as living longer with good health. The social consequences of an aging population also depend on average health. Disabled people use significantly more medical resources than do nondisabled people. If the elderly population is increasingly healthy, the impact of overall population aging on medical care needs will be smaller than if the surviving population is increasingly frail. Further, policies to encourage additional work effort among the elderly will only be successful if the elderly have the physical capacity to perform the work. Reduced disability will not solve the aging problem for the public sector—medical spending is increasing too rapidly for that—but it can ameliorate the magnitude of the problem.

There has been a longstanding debate concerning whether the elderly are more or less healthy over time. Demographers examining the issue in the 1970s concluded that the elderly were increasingly less healthy (2). The data used were not of high quality, however, and they afforded multiple interpretations (3). The National Long-Term Care Survey (NLTCS), first conducted in 1982, was designed in part to rectify this difficulty. The NLTCS asks detailed questions about disability in a consistent manner over time. It samples from all of the elderly population, not just community dwellers. And it now has nearly 20 years of data from a consistent questionnaire, asked in 1982, 1984, 1989, 1994, and 1999. In a recent issue of PNAS, Manton and Gu (1) reported the findings from the 1999 wave of the NLTCS.

Manton and Gu (1) present clear, overwhelming evidence that the average health of the elderly population is improving. Between 1982 and 1999, the share of the elderly with severe disabilities, measured roughly as the ability to function independently with ease, declined from 26.2% to 19.7%. The cumulative reduction in disability is 25%, or 1.7% per year. The importance of this finding is hard to overstate. The NLTCS data are designed ideally to look at disability changes, so these results have particular credence. They are a major advance in our knowledge.

Although initially greeted skeptically (4), the NLTCS results are increasingly being replicated in other studies, including the National Health Interview Survey, the Medicare Current Beneficiary Survey, and the Survey of Income and Program Participation (5). The one partial outlier is the Supplement on Aging to the Health Interview Survey, which showed a constant disability rate by one measure over the 1984 to 1994 period and a decline in disability by another. Overall, the weight of the evidence suggests large disability reductions, as shown in the NLTCS. This is very welcome news.

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Manton and Gu (1) have several other important findings. First, they show that the reduction in disability is occurring increasingly more rapidly over time. Between 1982 and 1989, disability rates declined by 1.0% per year. The rate of decline increased to 1.7% per year between 1989 and 1994, and to 2.7% per year between 1994 and 1999. Second, Manton and Gu (1) show that disability is falling for blacks as well as whites. Over the entire 1982 to 1999 time period, the annual decline in disability for blacks roughly equals that for whites, despite the fact that black disability was increasing in the 1980s and white disability was falling. Blacks made up for the lost ground in the 1990s.

The important question raised by these results is why disability is falling so rapidly. Manton and Gu (1) provide tantalizing evidence on this question, but do not tackle it head on. Understanding the cause of reduced disability is vital, because it indicates whether the decline in disability can be expected to continue into the future or not. Disability reductions resulting from improved public health measures at the turn of the 20th century, for example, will not be as important over the next few decades, when the elderly population will have been born substantially after those improvements, whereas disability reductions resulting from shifts away from manual labor would be expected to continue.

The cause of disability decline is multifactorial. One clear contributing factor is improved medical treatments. Many elderly are disabled by arthritis, which can be treated with pharmaceuticals (NSAIDs and, increasingly, COX-2 inhibitors) or, in the extreme, joint replacement surgery. Use of these technologies has expanded over time. Cataract surgery is also increasingly common and reduces disability associated with visual impairment. Manton and Gu (1) provide indirect evidence for the importance of technological improvements for disability reduction. They note the coincidence between reduced cardiovascular disease mortality and the implementation of Medicare. Heart disease is a leading cause of chronic disability, so this is an important link. More direct evidence comes from studies showing the role of specific medications in reduced hypertension (6), a leading risk factor for strokes, and from studies showing the spread of cataract surgery to people with increasingly less severe visual impairment (7). Because the NLTCS has data on Medicare records that are linked to the survey participants, estimates of the role of medical technology in improved health can be conducted.

Behavioral changes are also important in reduced disability. The one-third decline in cigarettes smoked between 1960 and the late 1990s reduces chronic respiratory damage, heart disease, and strokes. Reduced fat intake over the same time period (8) has had similar effects. The impact of improved diets and reduced smoking for emphysema, heart disease, and stroke are likely key contributors in reduced disability in the past two decades.

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A third explanation is the spread of assistive devices for people with health troubles. Canes and walkers help infirm elderly stay out of nursing homes; walk-in showers and grab bars prevent hip fractures and allow those who have had a fracture to live independently; microwave ovens make it easier for the frail elderly to cook; and telephones with larger keypads enable the visually impaired to communicate. Manton and colleagues (9), in earlier work with the NLTCS, documented a large change in use of assistive devices over time. Increased use of assistive devices has been found in other surveys as well (10).

Such assistive devices may be particularly important in reduced nursing home utilization. Manton and Gu (1) document the enormous decline in nursing home residence between 1982 and 1999, particularly in the last few years. Although some of this decline reflects reduced disability overall, another part reflects the growth of assisted living facilities that provide many of these assistive technologies in a more pleasant environment than a nursing home.

The impact of assistive devices on disability in the community is more difficult to ascertain. In the NLTCS, as in other surveys of disability, people using assistive devices specifically designed to provide help with daily functions are counted as disabled. Thus, providing canes to people with arthritis would increase disability, even if walking longer distances had become easier. As a result, the true decline in disability may be even greater than Manton and Gu (1) report. The net impact of assistive device use on disability has yet to be sorted out.

An additional factor in reduced disability is improved socioeconomic status. Manton and Gu (1) highlight a key aspect of this, the increasing education of the elderly. Manton and Gu (1) show that more educated individuals have a disability rate of only about half as much as less educated people. Coupled with the large increase in the share of elderly with high school and college degrees, this finding helps to explain the decline in disability in recent decades. Indeed, this trend will continue for many decades into the future as education among the elderly continues to increase.

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The important question is why education is related to disability. Education can influence disability in many ways: by allowing greater access to medical care resources, by increasing knowledge about appropriate health behaviors, and by the direct impact of mental stimulation on cognitive functioning. For example, Stern *et al*. (11) speculate that educational attainment imparts a reserve that delays the onset of Alzheimer's disease.

Occupation is closely related to education and is a further dimension of socioeconomic status. The current elderly who worked in blue-collar jobs over their lifetime were exposed to substantially more dust and fumes than were the elderly who worked in white-collar jobs. The same is true for elderly who lived on farms, which was much more common decades ago than it is today. Costa (12) shows that the change in occupational composition explains a significant part of the long-term decline in disability in the United States. Estimates of the impact of occupation change in recent decades are lacking.

Finally, disability reduction may reflect a change in the disease environment over time. Increasing evidence documents that infectious diseases encountered early in life influence health later in life. The link between rheumatic fever and rheumatic heart disease is particularly clear (13). Associations also have been shown between heart disease and typhoid (14), measles (15), and malaria (16). Even prenatal factors such as maternal malnutrition and lack of adequate weight gain may influence late life disease (17). Older generations of elderly were more exposed to these diseases and conditions as children than were younger generations, which may partly explain the change in disability over time.

Little research has tested and compared these different theories. With the report on disability decline in the Manton and Gu (1) paper, the basic facts about disability change are now complete. The next few years should turn to research considering why disability has changed, testing these and other explanations. Our knowledge of chronic disability, advanced so clearly by Manton and Gu (1), should grow even more rapidly in the years ahead.

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