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Trends in Life Expectancy in the United States, Denmark, and the Netherlands: Rapid Increase, Stagnation, and Resumption

Life expectancy has improved steadily and substantially in most high-income countries over the last century. In recent decades, however, the United States, Denmark, and the Netherlands have seen gains in life expectancy stagnate (NRC 2010: Glei, Meslé, and Vallin). U.S. life expectancy has been rising at a slower pace than other high-income countries over the last 25 years, particularly for women. Denmark experienced virtually no growth in life expectancy from 1980 to 1995. The Netherlands experienced stagnation in the rate of growth in life expectancy starting in the early 1980s and continuing until 2002. While increases in life expectancy in Denmark and the Netherlands have resumed, the growth rate of U.S. life expectancy remains exceptionally slow.

Troubled by the widening gap between life expectancy in the United States and many other industrialized countries, the Division on Behavioral and Social Sciences and Education at the National Institute on Aging supported a National Research Council (NRC) expert panel to investigate the causes of stagnation in U.S. life expectancy at age 50 and above. The goal is to understand the factors contributing to stagnating life expectancy gains and identify ways to improve health in order to narrow the gap between the United States and countries with improving life expectancy. This newsletter discusses life expectancy trends in the United States, Denmark, and the Netherlands, highlighting some of the key findings from the resulting publications (NRC 2010 and NRC 2011).

Examining Recent Trends in Life Expectancy in High-Income Countries

The panel focused on life expectancy after age 50 because most of the variation in life expectancy among high-income countries is determined by survival beyond age 50. They noted that "among countries that have recorded reductions in adult mortality at advanced ages, the United States, the Netherlands, and Denmark are frequently cited as three [countries] that have recently underachieved" (NRC 2011).

Table 1 shows gains in life expectancy at age 50 for women for select high-income countries between 1950 and 2007. While all countries experienced substantial growth in female life expectancy at age 50 over the six decades, there was considerable variation in the level of growth in more recent decades. Between 1950 and 1980, Japanese women,

In This Issue

This review summarizes research related to the objectives of the National Institute on Aging, with emphasis on work conducted at the NIA demography centers. Our objective is to provide decisionmakers in government, business, and nongovernmental organizations with up-to-date scientific evidence relevant to policy debates and program design. These newsletters can be accessed at www.prb.org/TodaysResearch.aspx.

Table 1
Gains in female life expectancy at age 50 varied widely among high-income countries.

	1950	1980	2007
United States	27	31	33
Denmark	26	30	32
Netherlands	27	31	34
France	26	31	36
Italy	26	30	35
Japan	24	31	37

Source: Human Mortality Database, accessed at www.mortality.org, on June 28, 2011.

the world's leader in life expectancy today, gained 7 years of life at age 50. The corresponding gains were 5 years for French women and 4 years for women in all other countries: United States, Denmark, the Netherlands, and Italy. Gains since the 1980s were 6 years in Japan and 5 years in France and Italy, as opposed to 3 years in the Netherlands and 2 years in the United States and Denmark.

These different rates of increase also changed the ranking of countries with respect to life expectancy. Life expectancies at age 50 for women in the United States, Denmark, and the Netherlands were on par with other countries (and led Japan by several years) in 1950, yet these three countries were at the bottom by 2007.

There is less variation in life expectancy for men at age 50 among high-income countries, although U.S. men have consistently ranked among the lowest (see Table 2). While increases in life expectancy slowed dramatically for women in the United States, Denmark, and the Netherlands around 1980, they stalled entirely for Danish and Dutch men and slowed somewhat for U.S. men in the period prior to 1980. Between 1950 and 1980, Japanese men gained 6 years of life at age 50. The corresponding gains were 3 years for French men, 2 years for American men and 1 year or less for men in Denmark, the Netherlands, and Italy. Gains for men since the 1980s were 6 years in Italy, 5 years in the Netherlands and France, 4 years in Japan and the United States, and 3 years in Denmark.

Exploring the Causes of Stagnation in the Rates of Increase

The panel investigated a range of potential explanations for the stagnation in the rate of increase in U.S. life expectancy, including smoking, obesity, access to health care, social inequality, levels of physical activity, social integration and social interaction, and hormone replacement therapy. Writing in the final report, the panel concluded that a "history of heavy smoking combined with current levels of obesity are playing a substantial role in the relative poor longevity performance in the United States" (NRC 2011).

Evidence suggests that smoking is the main culprit in the slower growth of U.S. life expectancy. Five decades ago, more Americans smoked, and those who smoked did so more intensively, compared to their counterparts in Europe and Japan (NRC 2010: Pampel). After a time lag, the mortality related to smoking is reflected in the lower rate of growth in U.S. life expectancy during the past 25 years compared to other countries. One analysis determined that a large portion (78 percent for women, 41 percent for men) of the gap in life expectancy between the United States and other high-income countries in 2003 was the result of higher mortality related to smoking (NRC 2010: Preston, Glei, and Wilmoth).

Obesity is more prevalent in the United States than in other high-income countries. Given the rapid increase in rates of obesity in the United States, it likely contributed to the stagnation as well (NRC 2010: Alley, Lloyd, and Shardell). The size of the impact is, however, not clear since the extent to which obesity at older ages affects mortality is not fully understood.

Obesity is associated with a lack of physical exercise. Evidence indicates that U.S. adults are somewhat more sedentary than their European counterparts. Levels of physical activity among older adults also likely played some role in U.S. life expectancy trends, but the degree is difficult to quantify (NRC 2010: Steptoe and Wikman).

While smoking had the largest impact on trends in U.S. life expectancy, with obesity likely playing a secondary role, other contributing factors came into play. The panel examined research comparing social networks and social support in the United States with England (where no stagnation occurred) and found little differences between these countries. Despite the well-documented link between social integration and interaction and mortality, these factors do not appear to have played a measurable role in the stagnation (NRC 2010: Banks et al.).

Differences among health care systems also help explain differences in life expectancy. "The lack of universal access to health care in the United States undoubtedly increases mortality and reduces life expectancy," wrote the panel (NRC 2011). While adults age 65 and older in the United States have health coverage through the federal Medicare program, health impairments emerge at earlier ages and carry over. Evidence indicates the U.S. health care system does equally well or better than other countries at prevent-

Table 2
U.S. male life expectancy at age 50 ranked among the lowest compared to other high-income countries.

	1950	1980	2007
United States	23	25	29
Denmark	25	25	28
Netherlands	26	25	30
France	22	25	30
Italy	24	25	31
Japan	21	27	31

Source: Human Mortality Database, accessed at www.mortality.org, on June 28, 2011.

ing death among those treated for some of the major causes of death in old age, such as cancer and cardiovascular disease (NRC 2010: Preston and Ho). This finding suggests that the United States does as well as other high-income countries in preventing death after diseases are diagnosed. But the U.S. health care system may do a poor job preventing disease compared to European health systems; some analysts think the U.S. obesity epidemic reflects a failure of preventive medicine. Available evidence supporting the notion that a lack of preventive medicine in the United States is hampering gains in life expectancy is inconclusive (NRC 2010: Preston and Ho).

Although socioeconomic disparities in mortality in the United States are wide, they are unlikely to explain more than a small percentage of the gap between gains in U.S. life expectancy and those of the highest achieving countries (NRC 2010: Avedano et al.). While Americans with the lowest levels of educations have higher mortality rates than the least educated people in other high-income countries, this difference is largely offset by higher average education levels in the United States than elsewhere. Evidence shows that the life expectancy of residents of "even the most advantaged areas of the United States (at the state and county level) have been falling behind in international comparisons" (NRC 2011). This suggests that despite widening geographic disparity in life expectancy in recent decades in the United States, inequality is unlikely to have contributed very much to the life expectancy stagnation (NRC 2010: Wilmoth, Boe, and Barbieri).

There is also no solid evidence that postmenopausal hormone therapy played a role in the stagnation of life expectancy gains for U.S. women (NRC 2010: Goldman). Use of hormone therapy was not any more widespread among U.S. women than among women in certain other countries where life expectancy continued to rise. When hormone therapy is begun near the onset of menopause, it does not appear to increase the risk of heart disease and may decrease that risk for some women.

Like the United States, Denmark and the Netherlands have higher mortality rates from lung cancer and respiratory diseases than other high-income countries, which points to smoking as a cause of the stagnating life expectancy gains in those two countries (NRC 2010, Christensen et al.; and Mackenbach and Garssen). Higher alcohol consumption and relatively low health care investment also likely played some role in Denmark's life expectancy stagnation; relatively low spending on health care for the elderly may also have been a factor in the Netherlands. Denmark and the Netherlands have much lower obesity rates than the United States, however.

Understanding the Resumption in Rate of Increase

What factors might explain the resumption in the rate of increase in life expectancy in Denmark and the Netherlands? Kaare Christensen and colleagues (NRC 2010) explored this question for Denmark and found that in the mid-1990s around the time Danish life expectancy started to increase again, the Danish population also adopted healthier lifestyles with respect to smoking, alcohol consumption, and physical activity. They also found that, in the mid-1990s, the Danish government implemented the "Heart Plan" and increased funding on treatments of the cardiovascular diseases. They concluded that increases in Danish life expectancy were likely explained by declines in mortality from cardiovascular diseases that resulted from both improvements in the health related behaviors as well as prevention and treatment of cardiovascular diseases.

In an in-depth examination of the renewed gains in life expectancy seen by the Netherlands, Johan Mackenback and Joop Garssen (NRC 2010) found that, unlike Denmark, the Netherlands saw no large changes in smoking, alcohol consumption, or regular exercise among the elderly in the period prior to the resumption of the increase in life expectancy. Rather, they concluded that changes in health care delivery appear to have played a key role. The rapid growth in the provision of health care services, especially increases in health care expenditures and hospital admission rates, occurred roughly about the same time as the resumption in mortality decline in older ages. Between 1999 and 2003, the Dutch experienced a significant growth in annual health care expenditures per capita—more than 40 percent. The researchers found that elderly patients also became increasingly more likely to receive treatments in hospital for diseases that were important causes of death, including cancer and cardiovascular diseases. They concluded that older adults benefited from the expansion of health care services discussed above, which likely explains why mortality in older ages resumed its decline.

While Denmark and the Netherlands saw the long-term upward trend in life expectancy resume, the United States has not. Whereas past smoking rates may explain a large part of the present mortality disadvantage of the United States, more recent trends in smoking suggest U.S. mortality may improve in the future, according to the panel's report. The cohorts of American women who had the highest prevalence of smoking—those born in the 1940s—are now entering advanced

ages. Life expectancy for older women in the United States will continue to be hampered by smoking-related mortality for a decade or two longer (Wang and Preston 2009), but as these cohorts die, younger cohorts have increasingly lower rates of smoking than their European counterparts. The U.S. female life expectancy at older ages may, thus, resume its rapid upward trajectory. Among U.S. men, the impact of smoking on mortality has already started declining.

Some researchers argue, however, that any improvements in life expectancy from declining smoking rates may be offset by the health impact of obesity (Olshansky et al. 2005; Stewart, Cutler, and Rosen 2009). This impact is not certain, however, as recent data suggests a leveling off of the growth in obesity rates in the United States and possibly also reduced risk of death from obesity (Flegal et al. 2010; Mehta and Chang 2010). The NRC panel report emphasizes the importance of obesity in affecting U.S. life expectancy in the future, writing that it bears watching as an "important factor in future longevity trends in the United States" (NRC 2011).

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The NIA Demography Centers

The National Institute on Aging supports 14 research centers on the demography and economics of aging, based at the University of California at Berkeley, the University of Chicago, Duke University, Harvard University, Johns Hopkins University, the University of Michigan, the National Bureau of Economic Research, the University of Pennsylvania, Princeton University, RAND Corporation, Stanford University, Syracuse University, the University of Southern California/ University of California at Los Angeles, and the University of Wisconsin-Madison.

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For More Information

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