# Has Society Gotten Older or Younger?

## Why Conventional Wisdom Is Largely Wrong

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**Two powerful demographic processes—falling birth rates and increasing life expectancy—have been shaping the age profile of the US population. By traditional measures of population aging, such as the share of the population over age 65, both processes make the US population older. But longer life expectancy is correlated with better health, greater capacity to work, and a more active lifestyle. Compared with alternative measures of aging that account for these improvements, traditional measures dramatically overstate aging problems. Old-age programs like Social Security then provide ever-larger shares of government resources to support more years of retirement rather than needs of the truly old.**

The answer to the question in this brief's title, though it may at first seem nonsensical, is "yes." Two demographic factors dominate aging trends; one makes us younger, and another makes us older. Combining these trends reveals that, until very recently, we may not have aged at all relative to previous decades. And although American society will get older by almost any definition over the next couple decades, the increase in the share of the population reaching old age will be much smaller than has been anticipated.

Why does this matter? Perceptions about how much society is aging have huge implications for how we organize ourselves to meet needs in old age, whether that be through government programs like Social Security, private retirement plans, or individual efforts to work and save. The challenge involves providing the necessary resources for old age and distributing those resources efficiently and fairly.

Traditional measures of population aging, such as the share of the population above a certain chronological age, are often uninformative (if not misleading), and are mostly useful for approximating the share of the population eligible for some private or public program, such as Medicare or discounted movie tickets. When the birth rate falls, the share of the population in their later years, such as the last 10 or 15 years or last one-quarter of life, will increase, just as the share that is younger will decrease. In the United States and some other developed countries, this phenomenon is reflected acutely in the "baby boom" problem (technically, the "baby bust," or decrease in birth rate following the postwar baby boom, will lead to the long-term, and likely more permanent, increase in the old-to-young ratio).

But when people live longer, particularly because of improved health, the population in many ways becomes more youthful: mortality rates decrease, and people's capacity to engage in work or recreational activities increases.[1] Groups such as Encore and the Stanford Center on Longevity, for instance, stress the new opportunities available to current generations that were not available in the past.[2]

If people live longer but don't work longer, however, the story becomes more complex. Larger shares of nonworkers in an economy create budgetary problems within and around old-age programs such as Social Security and Medicare, but this is because the retiree-to worker ratio rises and not, at least by this definition, because the population is getting "older."

Of course, other factors come into play when measuring whether a population is aging. Increased immigration usually makes societies younger at first, but it can eventually raise the share of the older population if immigration levels subsequently fall.

In this brief, we will examine three different measures of population aging and demonstrate how, relative to measures based on remaining life expectancy, a measure based on the share of the population over a given chronological age exaggerates the extent of population aging.

# Why Chronological Age Is Misleading

The most commonly used measure of society's age is the share of population over some chronological age, often 65. Age 65 was first defined as the retirement age in Germany in 1916;[3] the US Congress followed suit in 1935 when it enacted Social Security and created "old age insurance" for people age 65 and older. The share of the population above a fixed chronological age (whether 65, 70, or 75) shows significant growth from 1900 to 2010.

But the share of population over a certain age rises not only when the birth rate falls but also when life expectancy increases. Life expectancy at birth today is about 50 percent higher than it was in 1935. A change in fertility and a change in mortality have very different implications for how much people's capabilities or needs in society are changing.

Consider a very simple example of improved mortality in a society where the size of the population at every age is the same and everyone lives to exactly 75. Then, through progress over the decades,

everyone starts living to 85. If we define the "aged" population as the share over age 65, the aged population share will have grown from 10/75 to 20/85, or from about 13.3 percent to 23.5 percent.

We can instead measure the aged share as those with 10 years or less of life expectancy—that is, the share age 65 or over with the initial mortality and the share age 75 or over after the decline in mortality. Now the share of the aged population falls from 10/75 initially to 10/85, or from 13.3 percent to 11.8 percent.

Before the increase in longevity, the share over age 65 and the share in their expected last 10 years of life are by definition the same: 13.3 percent. After people start living longer, the traditional, chronological-age measure of the aged population rises to about double the share in the last 10 years of life (23.5 percent versus 11.8 percent).

Of course, this raises further questions about what we mean by "aged." Health researchers studying aging investigate ages at which impairments and diseases become prevalent. Some examine "damage-related" factors or programmed factors, such as what happens to our DNA, which can be related to normal biological change but can also be related to societal factors, such as prevalence of smoking.

Although these various strands of research help us understand differences in health conditions across a population, they don't translate easily to a measure of societal aging over time. By contrast, mortality rates can be measured fairly accurately. Thus, much health literature essentially measures aging using mortality rates and then examines the correlation between various health factors and mortality.

A reasonable assumption, therefore, is that as people's average life expectancy increases by a year, their capacity at older ages to achieve a certain level of work and perform various activities of daily living also increases by a year. And that assumption may understate gains in capability. For instance, hearing aids and cataract surgery restore functioning even if a health measure may show limited or no delay in the onset of damage to the ear or eye. Health care can not only decrease age-specific prevalence of impairment, it can also make that impairment less disabling.

## Measures of the Aged Share of the US Population

How have these factors played out in the United States over the past few decades? That depends on the many nuanced changes in fertility and mortality trends within and across cohorts and time. We examine the evolution of three measures of population aging from 1940 to 2090. Historic numbers are based on census data; future estimates derive from population projections using DYNASIM, Urban Institute's microsimulation model, and the Social Security actuaries' life tables, which assume that the combined birth and immigration rate will continue at just about replacement and that mortality will improve (though at a slower rate than in the past).

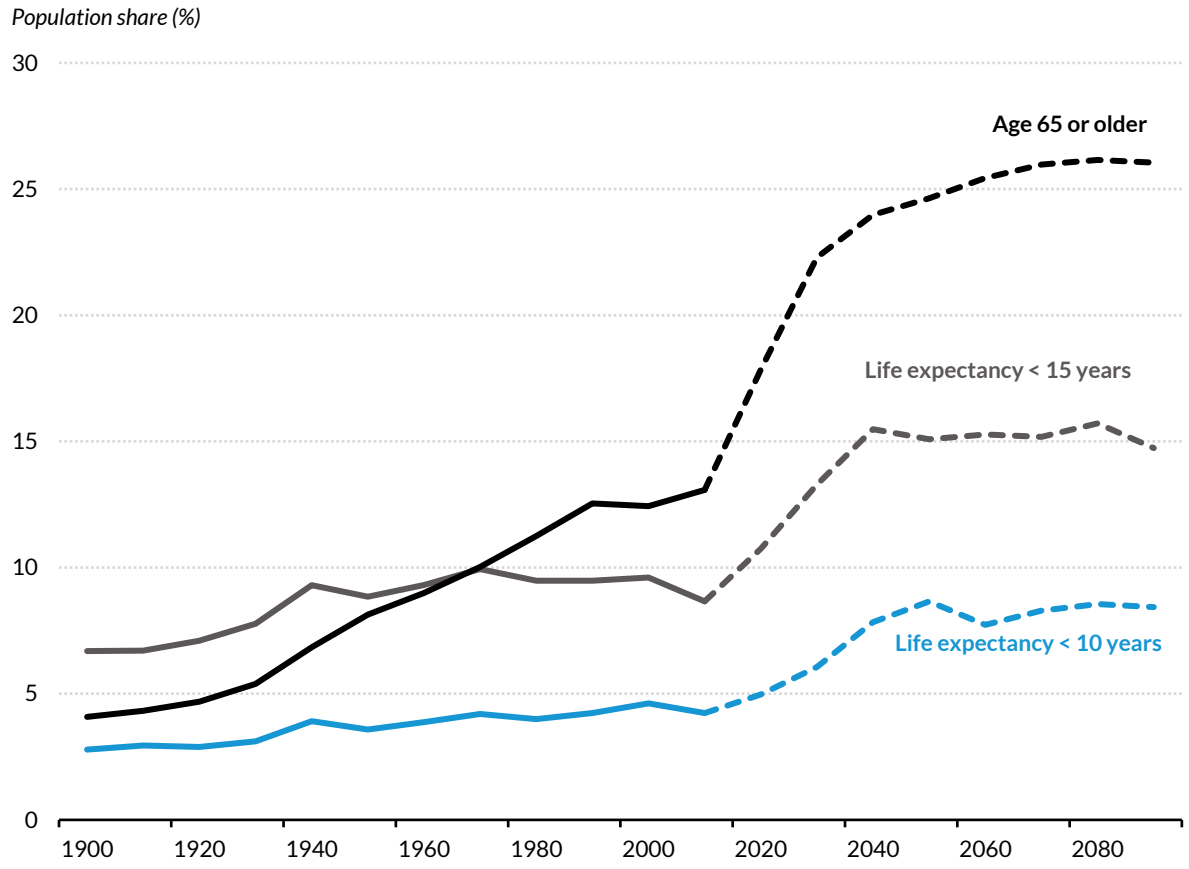
The three measures of the share of the population that is "old" are: (1) those over age 65, (2) those with an average life expectancy of 15 years or less, and (3) those with a life expectancy of 10 years or

less. In 1940, when Social Security benefits were first paid, the average life expectancy at age 65 was less than 15 years. Between 1940 and 2010, the share of the population over age 65 almost doubled, from 6.8 to 13.1 percent. Over that same period, the share with 15 years or less of life expectancy fell from 9.3 to 8.7 percent, and the share with 10 years or less of life expectancy increased slightly, from 3.9 to 4.2 percent.

The first of the baby boomers (born in 1946) did not reach age 65 until 2011. Since then, by any of our measures, we have begun a period of aging. Between 2010 and 2050, each measure shows a significant rise relative to its base (e.g., more than doubling, from 4.2 to 8.7 percent of the population, for those with 10 or less years of life expectancy). For programs geared toward meeting long-term care needs in the last years of life, that growth portends a significant rise in the demand for services.

FIGURE 1

**Three Measures of the Aged US Population**




**Source:** US Decennial Census (1900 to 2000), American Community Survey (2010), Social Security Administration life tables, and DYNASIM ID963. US Census and ACS data obtained from Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek, IPUMS USA: Version 8.0 [dataset] (Minneapolis: IPUMS, 2018). https://doi.org/10.18128/D010.V8.0.

**Notes:** Solid lines represent historic data, and dashed lines represent projections from DYNASIM.

However, if we are concerned about the extent to which the population as a whole will age over that 2010 to 2050 period, the share with 10 years or less of life expectancy is projected to rise by only 4.5 percentage points, and the share with 15 years or less of life expectancy is projected to rise by 6.4 percentage points. By contrast, that increase is 11.5 percentage points with the chronological age measure.

From 2050 to 2090, only the share of the population age 65 and older continues to rise; the other measures show no further aging.

A further drop (or rise) in fertility would show more (or less) aging under all definitions; further improvements in mortality typically show more aging with the chronological age measure and show less aging with the other two measures (though this gets more complicated because changes in disease and addiction prevalence often affect mortality at much younger ages).

# Conclusion

Only recently have we begun a period when the net amount of aging is increasing by almost any measure. A quick drop-off in fertility often identified with the end of the post–World War II baby boom will affect the share of the population that is aged as those baby boomers retire between 2010 and 2040, but improvements in mortality likely will mitigate some of that rapid increase. Looking back to periods before 2010, improvements in mortality may have more than offset declines in fertility, creating a population in 2010 as youthful as that of 1940.

For periods after 2040, the pre-2010 phenomenon may repeat itself, with the population no longer aging or becoming younger if measured using our alternative life expectancy metrics.

Note the contrast between this analysis and one that asserts that all increases in share of the population over some age creates problems for society, including the affordability of its retirement and health care systems. If people don't work longer when they live longer, then of course the share of the population receiving government benefits will rise and the share paying taxes will fall. The consequences of such a decrease in the ratio of workers to beneficiaries extend well beyond Social Security by reducing GDP, personal income, income tax revenues, and, unless tax rates are raised, the amount of government services that can be provided to the entire population.

If the retirement age in programs such as Social Security had been adjusted for longevity or improvements in life expectancy, Social Security would be running surpluses at existing tax rates not only today but even after the effects of baby boomers' retirement had played out. Such surpluses could have been used to maintain higher benefits for those in need, those near poverty, and those with the chronic and long-term care needs that come in the last years of life. Parallel gains could also have been sustained for parts of the government's budget going to children, workers, and the nonelderly. The ongoing question is the extent to which using a chronological measure of old age similar to ones developed over a century ago leads government to target its resources poorly toward meeting the needs of old and young alike.

# Notes

[1] See Coile. Milligan, and Wise (2016).

[2] See https://encore.org/ and http://longevity.stanford.edu/.

[3] "Social Security History - Otto von Bismarck," Social Security Administration, accessed February 11, 2019, https://www.ssa.gov/history/ottob.html.

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