

HEALTH

Stanford Center on Poverty and Inequality

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Here's a grim fact: U.S. life expectancy has plateaued. It might have reasonably been assumed that, at least for the foreseeable future, life expectancy would continuously increase as the economy grew, medical innovations accumulated, healthy behaviors diffused, and health care improved. Up until 2010, each new decade indeed brought substantially longer life spans, just as this logic implies. Parents could expect their newborns to live 78.7 years in 2010, exceeding the life expectancy for 1970 births by almost eight years. Life spans were averaging 10 weeks longer *each year*.

Then something dramatically changed. The prior trend predicted that life expectancy should have increased by more than a year since 2010. Instead, in an especially sharp break, there's been no observable increase at all.

In this article, we discuss the causes of this change and its implications for health and well-being in the United States, with a special focus on the changing gap in life expectancy for men and women. Although most of the many "gender gaps" examined in this issue favor men, the gap in life expectancy favors women, thus making it an idiosyncratic case of some interest.

We will examine trends in life expectancy at birth, defined as the average life span expected for newborns given prevailing death rates.¹ Why focus on life expectancy? Of course, average life span doesn't correlate perfectly with health. For example, each deadly car accident reduces the average life span, but accidents happen to healthy and unhealthy individuals alike. Suicide rates, on the other hand, are more closely linked with underlying mental health problems or societal conditions that reduce well-being.² In short, life expectancy is certainly not the only measure of population health, but it is one of the important summary measures.

KEY FINDINGS

- The male-female life expectancy gap, which favors females, fell from 7.6 years in 1970 to 4.8 years in 2010, a reduction of more than one-third.
- Most of this convergence was caused by a substantial decline from 1990 to 2000 in HIV-AIDS mortality and in the homicide rate. Because HIV-AIDS and homicide affect men more than women, a decline in these underlying rates had the effect of reducing the male-female life expectancy gap.
- Life expectancy has stagnated for the last several years for men and women, primarily due to increases in drug poisoning deaths and in the suicide rate.

Trends in U.S. Life Expectancy

U.S. life expectancy trends for males and females have been qualitatively similar. However, as shown in Figure 1, the rate of increase was much less rapid for females. From 1970 to 2010, life expectancy for an infant girl increased 6.3 years, from 74.7 to 81.0. The corresponding increase for an infant boy (9.1 years) was nearly three years greater, rising from 67.1 to 76.2. Because of these differences, the male-female life expectancy gap fell by more than one-third, from 7.6 to 4.8 years.³

Most of this convergence occurred in the 1990s, when life expectancy increased by 2.3 years for males versus just 0.5 year for females. This more rapid improvement among males was to a significant extent caused by a substantial decline in HIV-AIDS mortality and in the homicide rate, both of which disproportionately affect younger adult men.

Causes of the Recent Stall in U.S. Life Expectancy

Both male and female life expectancies have been essentially flat since 2010.⁴ What are the predominant causes of this stagnation? Table 1 lists age-adjusted death rates in 2010 and 2016 for the top 10 causes of death. Despite reductions in mortality from cancer and heart disease, there have been substantial increases from unintentional injuries, Alzheimer's disease, and suicide. Of these, injury deaths and suicides have greater effects on life expectancy, since they are more prevalent at younger ages.⁵ This helps explain why, even though overall death rates fell, life expectancy was unchanged from 2010 to 2016.

Within the category of unintentional injury, the two most common causes of death are motor vehicle incidents and poisonings, which include drug overdoses. The death rate from poisoning increased by 37.7 percent from 2010 to 2015 (from 10.6 to 14.6 per 100,000).⁶ This increase continues a trend that started in the 1990s. The poisoning death rate doubled from 1990 to 2000 (2.3 to 4.5) and more than doubled again from 2000 to 2010 (4.5 to 10.6). However, these earlier increases were mostly offset by contemporaneous reductions in the motor vehicle death rate, which fell from 18.5 in 1990 to 11.3 in 2010. In contrast, since 2010 the motor vehicle death rate has been relatively unchanged, while poisoning deaths have continued to rise.

The next two causes of death that have increased most in recent years are Alzheimer's disease and suicide. The Alzheimer's death rate increased 20.7 percent. The 11.6 percent increase in the suicide rate continues a trend that started around 2000, when the national suicide rate stood at 10.4 per

100,000. Suicides have steadily risen since, reaching 13.5 per 100,000 in 2016.

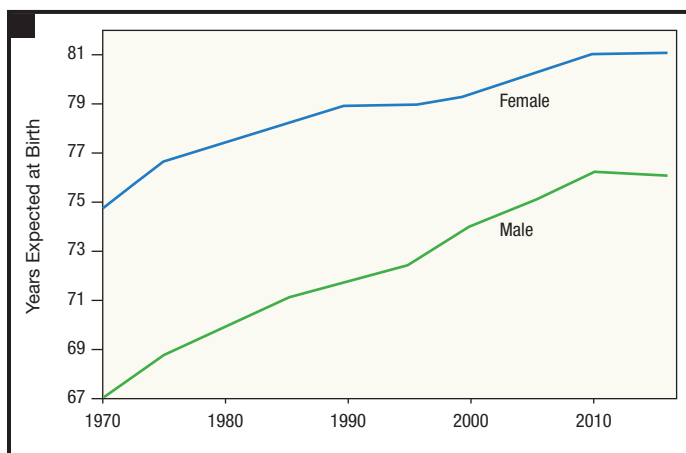
This analysis suggests that life expectancy has stalled in large part due to the increasing prevalence of death from unintentional injury (including drug poisoning) and suicide. While both began to increase before 2010, the decrease in motor vehicle deaths had previously offset their effect on overall life expectancy. With motor vehicle deaths now having reached at least a temporary low point, the effects of drug deaths and suicides are directly observable in the recent life expectancy plateau. Deaths from Alzheimer's disease have also increased markedly since 2010, but since the disease affects older individuals, it has less impact on average life expectancy.

Implications for Health Disparities

As shown in Figure 1, the life expectancy gap declined in size by one-third from 1970 to 2010. How has the gap fared since? Since 2010, there has been a slight 0.2 year increase in this gap. This is because life expectancy for males turned very slightly downward, whereas it continued to grow for women, albeit at a slower rate than had before been the case.

It is useful to examine the changing causes of death standing behind this aggregate trend. The final two columns of Table 1 show the ratio of male-to-female mortality rates for each cause of death in 2010 and 2015.⁸ With the exception of Alzheimer's disease, death rates for men are higher than (or equal to) the corresponding rates for women for all of the conditions listed.⁹ Notably, men are more than twice as likely as women to die from unintentional injuries. This ratio has recently increased, which contributes to the 0.2 year increase since 2010 in the female-male life expectancy gap.

FIGURE 1. Life Expectancy by Sex



Source: 1970–2010 data from Arias et al., 2017, Table 19; 2016 data from Kochanek, Kenneth D., Sherry L. Murphy, Jiaquan Xu, and Elizabeth Arias. 2017. "Mortality in the United States, 2016." *National Center for Health Statistics Data Brief*, Figure 1.

Although the overall gap increased slightly, Table 1 reveals that some of the forces in play are serving to reduce the gap. Suicide is a case in point. Men are much more likely to commit suicide than women, but the recent increase in suicide has had a larger effect on women, leading to some convergence in the life expectancy gap. As Table 2 shows, the overall suicide rate for women increased 50 percent (from 4.0 to 6.0 per 100,000) from 2000 to 2015 versus 19 percent for men (17.7 to 21.1). Men aged 75 and up were the only age-sex group whose suicide rate fell, and in every age group, women's suicide rates increased relative to men's. The most striking differences occurred under age 25, where increases of around 10 percent for men were dwarfed by increases of around 80 percent for women. These death rate increases at young ages have important effects on the trends in life expectancy by sex.

TABLE 1. Age-Adjusted Rates for the Top 10 Causes of Death

Cause of Death	2010	2016	Percent Change	2010	2015
				Male/Female Ratio	Male/Female Ratio
Heart Disease	179.1	168.5	-7.6%	1.6	1.6
Cancer	172.8	155.8	-9.8%	1.4	1.4
Chronic Lower Respiratory Diseases	42.2	40.6	-3.8%	1.3	1.2
Unintentional Injuries	38.0	47.4	+24.7%	2.0	2.1
Stroke	39.1	37.3	-4.6%	1.0	1.0
Alzheimer's Disease	25.1	30.3	+20.7%	0.8	0.7
Diabetes	20.8	21.0	+1.0%	1.4	1.5
Influenza and Pneumonia	15.1	13.5	-10.6%	1.4	1.3
Kidney Disease	15.3	13.1	-14.4%	1.4	1.4
Suicide	12.1	13.5	+11.6%	4.0	3.5
All Other Causes	187.4	191.1	+1.8%	1.3	1.3
Overall	747.0	733.1	-2.4%	1.4	1.4

Source: 2010 and 2015 data from Table 17. "Age-Adjusted Death Rates for Selected Causes of Death, by Sex, Race, and Hispanic Origin: United States, Selected Years 1950–2015." National Center for Health Statistics; 2016 data from Kochanek et al., 2017. Rates are per 100,000 population.

TABLE 2. Suicide Rate by Sex and Age in 2000 and 2015

Age Group	Male Suicide Rate			Female Suicide Rate			Male/Female Ratio	
	2000	2015	Percent Change	2000	2015	Percent Change	2000	2015
15–19	13.0	14.2	+9%	2.7	5.1	+89%	4.8	2.8
20–24	21.4	24.2	+13%	3.2	5.5	+72%	6.7	4.4
25–34	19.6	24.7	+26%	4.3	6.6	+54%	4.6	3.7
35–44	22.8	25.9	+14%	6.4	8.4	+31%	3.6	3.1
45–54	22.4	30.1	+34%	6.7	10.7	+60%	3.3	2.8
55–64	19.4	28.9	+49%	5.4	9.7	+80%	3.6	3.0
65–74	22.7	26.2	+15%	4.0	5.7	+43%	5.7	4.6
75–84	38.6	35.2	-9%	4.0	4.6	+15%	9.7	7.7
85+	57.5	48.2	-16%	4.2	4.2	0%	13.7	11.5
Overall	17.7	21.1	+19%	4.0	6.0	+50%	4.4	3.5

Note: Overall death rate is age-adjusted.

Source: Table 30. "Death Rates for Suicide, by Sex, Race, Hispanic Origin, and Age: United States, Selected Years 1950–2015." National Center for Health Statistics.

Conclusions

In short, average health in the United States as measured by life expectancy has not improved during the last several years for men or women. The increases in drug poisoning deaths and in the suicide rate are a primary reason for this disturbing trend. While drug deaths have hit men and women about equally hard, the recent increase in the suicide rate has disproportionately affected women. American women still live

longer than men, though women's life expectancy advantage has narrowed to 5 years (down from 7.6 years in 1970).

While life expectancy provides an overall snapshot of health in the United States by sex, there are disparities in well-being and quality of life that it captures less well. For example, depression occurs much more frequently in women than in men,¹⁰ but its effects on well-being are represented in the life

expectancy gap only to the extent that depression increases the death rate. It is beyond our scope here to explain all gender differences in well-being. However, recent large increases in women's suicide rates suggest that newly emerging public health conditions may be relatively more detrimental to women than our summary life expectancy measure shows.

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NOTES

1. To calculate life expectancy for a specific year, the National Center for Health Statistics uses all of the age-specific mortality rates for that year. It then “assumes a hypothetical cohort that is subject throughout its lifetime to the age-specific death rates prevailing for the actual population in that year.” See Arias, Elizabeth, Melonie Heron, and Jiaquan Xu. 2017. “United States Life Tables, 2014.” *National Vital Statistics Reports* 66(4).

2. Conditions like diabetes fall in the middle of this continuum. Diabetes may reduce life expectancy, but it can be associated with a reasonably high quality of life if well managed.

3. During this same period, there was a similar convergence in life expectancy by race. For example, the black-white gap in male life expectancy fell from 8.0 years to 4.7 years, while for females this narrowed from 7.3 to 3.3 years.

4. For females, life expectancy inched up from 81.0 to 81.1 years; for males, it fell slightly from 76.2 to 76.1 years.

5. The median ages among those dying from accidental deaths and from suicides in 2015 were 54 and 48, respectively. In contrast, the median age of death from heart disease and cancer was 81 and 72, respectively. See Murphy, Sherry L., Jiaquan Xu, Kenneth D. Kochanek, Sally C. Curtin, and Elizabeth Arias. 2017. “Deaths: Final Data for 2015.” *National Vital Statistics Reports* 66(6), Table 6.

6. The 2016 data have not yet been published for more specific causes of death (e.g., poisoning).

7. The Alzheimer's increase partly reflects individuals living to older ages than previously. Ninety-three percent of decedents in this group were 75 or older in 2010 and 2015.

8. The 2016 data are not yet published by sex.

9. Women accounted for 70 percent of deaths with Alzheimer's as the primary cause in both 2010 and 2015.

10. Albert, Paul R. 2015. “Why Is Depression More Prevalent in Women?” *Journal of Psychiatry & Neuroscience* 40(4), 219–221.