

# Changes in Mortality in Top 10 Causes of Death from 2011 to 2018



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## INTRODUCTION

Trends in mortality rates due to leading causes of death reflect the medical, psychosocial, and economic well-being of a society, and a historical snapshot of such trends can help inform policies of the future. Therefore, we examined changes in the number of deaths and age-adjusted mortality rates (AAMR) attributed to the top 10 causes of death between 2011 and 2018, the last year we have data available from the Centers for Disease Control and Prevention. We chose 2011 as the start date because of earlier work showing a transition in 2011 in 2 of the top 10 causes of death (heart disease and stroke) from a long-term decline to increasing numbers of deaths since then.<sup>1</sup>

## METHODS

The Centers for Disease Control and Prevention Wide-Ranging Online Data for Epidemiologic Research (CDC WONDER) dataset was used to identify national changes in the number of deaths and AAMR due to the top 10 underlying causes of death from January 1, 2011, to December 31, 2018.<sup>2</sup> The population projection was obtained from U.S. Census data.<sup>3</sup>

## RESULTS

As of 2018, the top 3 causes of death were heart disease, cancer, and accidents (Table 1). The largest percentage decline for AAMR occurred for cancer deaths (–11.8%), and the greatest increase in AAMR occurred for deaths due to Alzheimer disease (+23.5%). AAMR for influenza and pneumonia (–5.1%) and chronic lower respiratory diseases (–6.6%) declined. Increases in AAMR due to accidental deaths (+22.8%) and intentional self-harm (suicide) (+15.4%) were observed.

Even though the AAMR declined for 7 of the 10 top causes of death, the number of deaths increased for all 10 of the leading causes. This is because the older (age  $\geq 65$  years) age group grew at a much more rapid rate than that of the younger (age  $< 65$  years) (26.7% vs. 1.7%), while 70% or more of the deaths from 8 of these causes were concentrated in older (age  $\geq 65$  years) adults (Table 2).

## DISCUSSION

Important patterns of change in AAMR in the past decade have been previously noted, from stalling of the decline in mortality due to heart disease<sup>1</sup> to decrease in life expectancy attributed to drug overdoses and suicides among young and middle-aged adults.<sup>4</sup> While interventions to prevent and treat coronary heart disease (CHD) have been successful, with age-adjusted mortality rate decrease 14.9% in last decade, the worrisome plateau in the decline in heart disease mortality seems to be driven by an increase in mortality for heart failure (20.7%), with majority of deaths due to heart disease happening in the increasing aging population.<sup>5</sup>

The largest percent decline during this time period of the study was noted for cancers. According to a recent report, this progress is driven by long-term declines in death rates for the 4 leading cancers, namely lung, colorectal, breast, and prostate cancers. That report also noted that over 2008–2017, reductions slowed for female breast and colorectal cancers and stopped for prostate cancer; in contrast, declines accelerated for lung cancer, which remains the biggest contributor of mortality among cancers.<sup>6</sup>

It remains to be seen what the final death toll will be due to COVID-19 in 2020. With more than 90,000 deaths by May, it has already surpassed the number of deaths attributed to all but the 6 of the leading causes of deaths in 2018 including influenza and pneumonia, the 8th highest cause of mortality in 2018. Due to the direct and myriad of indirect consequences of this pandemic, mortality rankings due to top 10 causes noted in the current report may look very different in 2020.

As noted, almost three-quarters of the deaths from 8 of these causes were concentrated in older (age  $\geq 65$  years) adults. Further, the  $\geq 65$  years population is projected to increase by 39% from 52.4 million in 2018 to 73.1 million in 2030<sup>3</sup> so that the number of deaths from most of the 10 leading causes can be expected to increase unless more effective preventive and therapeutic interventions can be implemented.

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Table 1 Changes in Mortality Attributed to the Top 10 Causes of Death in the USA, 2011–2018

	Total deaths				Age-adjusted mortality rate (per 100,000 population)			
	2011	2018	Absolute change, N	Percent change (%)	2011	2018	Absolute change in AAMR	Percent change in AAMR (%)
1. Heart disease (I00–I09, I11, I13, I20–I51)	596,577	655,381	+ 58,804	+ 9.9	173.7	163.6	– 10.1	– 5.8
2. Cancer (C00–C97)	576,691	599,274	+ 22,583	+ 3.9	169.0	149.1	– 19.9	– 11.8
3. Accidents (V01–X59, Y85–Y86)	126,438	167,127	+ 40,689	+ 32.2	39.1	48.0	+ 8.9	+ 22.8
4. Chronic lower respiratory diseases (J40–J47)	142,943	159,486	+ 16,543	+ 11.6	42.5	39.7	– 2.8	– 6.6
5. Cerebrovascular diseases (I60–I69)	128,932	147,810	+ 18,878	+ 14.6	37.9	37.1	– 0.8	– 2.1
6. Alzheimer disease (G30)	84,974	122,019	+ 37,045	43.6	24.7	30.5	+ 5.8	+ 23.5
7. Diabetes mellitus (E10–E14)	73,831	84,946	+ 11,115	+ 15.1	21.6	21.4	– 0.2	– 0.9
8. Influenza and pneumonia (J09–J18)	53,826	59,120	+ 5294	+ 9.8	15.7	14.9	– 0.8	– 5.1
9. Nephritis, nephrotic syndrome and nephrosis (N00–N07, N17–N19, N25–27)	45,591	51,386	+ 5795	+ 12.7	13.4	12.9	– 0.5	– 3.7
10. Intentional self-harm (suicide) (U03, X60–X84, Y87.0)	39,518	48,344	+ 8826	+ 22.3	12.3	14.2	+ 1.9	+ 15.4

Table 2 Number of Deaths, Age ≥ 65 Years, and Percentage of All Deaths, 2018

	Number of deaths	% of all deaths
Heart disease	526,509	80.3
Cancer	431,102	71.9
Accidents	57,213	34.2
Chronic lower respiratory disease	135,560	85.0
Cerebrovascular disease	127,244	86.1
Alzheimer's disease	120,658	98.9
Diabetes mellitus	60,182	70.8
Influenza and pneumonia	48,888	82.7
Nephritis, nephrotic syndrome, and nephrosis	42,232	82.2
Intentional self-harm (suicide)	9147	18.9

With approximately 600,000 and more annual deaths due to each, cancer and heart disease, they are likely to remain the top 2 causes respectively, and a sobering reminder that long-term societal challenge of these non-communicable diseases remains.

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**Compliance with Ethical Standards:**

**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

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