

VIEWPOINT

Farida B. Ahmad, MPH
National Center for
Health Statistics,
Centers for Disease
Control and
Prevention, Hyattsville,
Maryland.

**Robert N. Anderson,
PhD**
National Center for
Health Statistics,
Mortality Statistics
Branch, Division of Vital
Statistics, Hyattsville,
Maryland.



Supplemental
content

The Leading Causes of Death in the US for 2020

Vital statistics data provide the most complete assessment of annual mortality burden and contribute key measurements of the direct and indirect mortality burden during a public health pandemic. While mortality statistics have historically been produced annually, the COVID-19 pandemic introduced a pressing need for the National Center for Health Statistics (NCHS) National Vital Statistics System (NVSS) to rapidly release reliable provisional mortality data. Provisional estimates indicate a 17.7% increase in the number of deaths in 2020 (the increase in the age-adjusted rate was 15.9%) compared with 2019, with increases in many leading causes of death.¹ The provisional leading cause-of-death rankings for 2020 indicate that COVID-19 was the third leading cause of death in the US behind heart disease and cancer.¹

Mortality Data From the NVSS

The NVSS collects, processes, tabulates, and disseminates vital statistics based on death certificates filed in the 50 states and the District of Columbia. Causes of death on death certificates are coded according to the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*.^{2,3} Cause-of-death data are based on the underlying cause of death, which is the disease or condition responsible for initiating the chain of events leading to death. Mortality statistics presented here are provisional, based on currently available death certificate data from the states to the NCHS as of March 21, 2021.

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Final mortality data will be available approximately 11 months after the end of the data year.

Shifting Trends in Mortality

The provisional number of deaths occurring in the US among US residents in 2020 was 3 358 814, an increase of 503 976 (17.7%) from 2 854 838 in 2019 (Table). Historic trends in mortality show seasonality in the number of deaths throughout the year, with the number of deaths higher in the winter and lower in the summer. The eFigure in the Supplement shows that death counts by week from 2015 to 2019 followed a normal seasonal pattern, with higher average death counts in weeks 1 through 10 (n = 58 366) and weeks 35 through 52 (n = 52 892) than in weeks 25 through 34 (n = 50 227). In contrast, increased deaths

in 2020 occurred in 3 distinct waves that peaked during weeks 15 (n = 78 917), 30 (n = 64 057), and 52 (n = 80 656), with only the latter wave aligning with historic seasonal patterns.

Trends in Leading Causes of Death

The Table also presents leading causes of death in the US for the years 2015 to 2020.⁴ According to provisional data, in 2020, there were notable changes in the number and ranking of deaths compared with 2019.⁵ COVID-19 was the third leading cause of death in 2020, with an estimated 345 323 deaths, and was largely responsible for the substantial increase in total deaths from 2019 to 2020. Substantial increases from 2019 to 2020 also occurred for several other leading causes. Heart disease deaths increased by 4.8%, the largest increase in heart disease deaths since 2012. Increases in deaths also occurred for unintentional injury (11.1%), Alzheimer disease (9.8%), and diabetes (15.4%). Influenza and pneumonia deaths in 2020 increased by 7.5%, although the number of deaths was lower in 2020 than in 2017 and 2018. From 2019 to 2020, deaths due to chronic lower respiratory disease declined by 3.4% and suicide deaths declined by 5.6%.

Understanding Mortality in the Context of a Pandemic

Trends in mortality for leading causes of death are important indicators of shifting patterns in mortality.

During the COVID-19 pandemic, changes in leading causes provide insight into the direct and indirect effects of the pandemic on mortality burden. Most of the increase in deaths from 2019 to 2020 was directly attributed to COVID-19. However, increases were also noted for several other leading causes of death. These increases

may indicate, to some extent, underreporting of COVID-19, ie, limited testing in the beginning of the pandemic may have resulted in underestimation of COVID-19 mortality.⁶ Increases in other leading causes, especially heart disease, Alzheimer disease, and diabetes, may also reflect disruptions in health care that hampered early detection and disease management. Increases in unintentional injury deaths in 2020 were largely driven by drug overdose deaths. Final mortality data will help determine the effect of the pandemic on concurrent trends in drug overdose deaths.

Provisional, national mortality data show that the COVID-19 pandemic substantially affected mortality in 2020. Early estimates of life expectancy at birth, based on provisional data for January to June 2020, show historic declines not seen since World War II

**Corresponding
Author:** Farida
Ahmad, MPH,
Division of Health Care
Statistics, National
Center for Health
Statistics, Centers for
Disease Control and
Prevention, 3311 Toledo
Rd, Hyattsville, MD
20782 (FBAhmad@
cdc.gov).

Table. Number of Deaths for Leading Causes of Death, US, 2015-2020^a

Cause of death	No. of deaths by year					
	2015	2016	2017	2018	2019	2020
Total deaths	2 712 630	2 744 248	2 813 503	2 839 205	2 854 838	3 358 814
Heart disease	633 842	635 260	647 457	655 381	659 041	690 882
Cancer	595 930	598 038	599 108	599 274	599 601	598 932
COVID-19 ^b						345 323
Unintentional injuries	146 571	161 374	169 936	167 127	173 040	192 176
Stroke	140 323	142 142	146 383	147 810	150 005	159 050
Chronic lower respiratory diseases	155 041	154 596	160 201	159 486	156 979	151 637
Alzheimer disease	110 561	116 103	121 404	122 019	121 499	133 382
Diabetes	79 535	80 058	83 564	84 946	87 647	101 106
Influenza and pneumonia	57 062	51 537	55 672	59 120	49 783	53 495
Kidney disease	49 959	50 046	50 633	51 386	51 565	52 260
Suicide	44 193	44 965	47 173	48 344	47 511	44 834

^a Leading causes are classified according to underlying cause and presented according to the number of deaths among US residents. For more information, see the article by Heron.⁴ Source: National Center for Health Statistics. National Vital Statistics System: mortality statistics (<http://www.cdc.gov/nchs/deaths.htm>). Data for 2015-2019 are final; data for 2020 are provisional.

^b Deaths with confirmed or presumed COVID-19, coded to *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* code U07.1 as the underlying cause of death.

(1942-1943).⁷ The effects of the pandemic are likely to continue through 2021 as well because COVID-19 has already caused more than 100 000 deaths this year. However, the effects of COVID-19

on mortality trends may be mitigated in 2021 given better detection and treatment options as well as increasing natural and vaccine-related immunity.

ARTICLE INFORMATION

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REFERENCES

- Ahmad FB, Cisewski JA, Miniño A, Anderson RN. Provisional Mortality Data—United States, 2020. *MMWR Morb Mortal Wkly Rep*. Published March 31, 2021. https://www.cdc.gov/mmwr/volumes/70/wr/mm7014e1.htm?s_cid=mm7014e1_w
- World Health Organization. *International Statistical Classification of Diseases, Tenth Revision (ICD-10)*. World Health Organization; 1992.
- National Center for Health Statistics, Centers for Disease Control and Prevention. National Vital Statistics System: instructions for classification of underlying and multiple causes of death—2021. Accessed March 26, 2021. <https://www.cdc.gov/nchs/nvss/manuals/2a-2021.htm>
- Heron M. Deaths: leading causes for 2017. *Natl Vital Stat Rep*. 2019;68(6):1-77.
- Kochanek KD, Xu JQ, Arias E. Mortality in the United States, 2019: NCHS data brief, no. 395. National Center for Health Statistics. Accessed March 22, 2021. <https://www.cdc.gov/nchs/products/databriefs/db395.htm>
- Gerberding JL. Measuring pandemic impact: vital signs from vital statistics. *Ann Intern Med*. 2020;173(12):1022-1023. doi:10.7326/M20-6348
- Arias E, Tejada-Vera B, Ahmad F. *Vital Statistics Rapid Release: Provisional Life Expectancy Estimates for January Through June, 2020: Report No. 10*. National Center for Health Statistics; 2021.