



# Wrong Direction: Troubling Trends in the Rate of U.S. Cardiovascular Disease Deaths

A Report from the National Forum for Heart Disease & Stroke Prevention

---

## AUTHOR

**Stephen Sidney, MD, MPH, FAHA**  
*Director of Research Clinics  
Kaiser Permanente Northern California  
Division of Research*

---

## EDITORS

**Darwin Labarthe, MD, MPH, PhD, FAHA**  
*Professor of Preventive Medicine, Feinberg School of Medicine,  
Northwestern University  
Emeritus Founder, National Forum for Heart Disease & Stroke Prevention*

**John M. Clymer**  
*Executive Director, National Forum for Heart Disease & Stroke Prevention*

**Laura Gordon**  
*General Manager, Edelman*

Cardiovascular diseases account for more than 30% of all deaths in the United States. But for 22 years – thanks to significant advances in treatment and prevention – the **rate** of death from these diseases has steadily declined.

Recent data, however, show that this downward trend has slowed considerably. After the long-term decline, the annual number of deaths from cardiovascular diseases has increased by 53,000 since 2011 – to more than 836,000 deaths in 2015.

In 2015, the death rate from heart disease in particular increased for the first time in 22 years, and the rate of people dying from stroke rose for the second time in two years.\*

Heart disease and stroke are the 1st- and 5th- leading causes of death in the United States, and reversal of the positive historical trends in these rates is reason for serious concern. What is both disturbing and inspiring: the U.S. Centers for Disease Control and Prevention estimates that at least 200,000 deaths from heart disease and stroke each year are preventable.

Slowing or even reversal of the previous year-to-year declines in rates may be due to growing rates of obesity and diabetes, offsetting gains in other contributing factors. Contributing to increasing numbers of cardiovascular deaths are the additional factors of continued aging of the population as well as a newer phenomenon: increasing occurrence of heart failure,<sup>1</sup> some aspects of which remain difficult to treat effectively.

Regardless of the cause, it is clearly more critical than ever that all health system stakeholders – from patients to providers to payers to government – work together to re-establish the strong declines in rates for heart disease and stroke death that were present before 2011.

*\* Death **rates** as presented here are compared from year to year as though the age pattern of the US population remained as it was in 2000. But population growth at older ages, where rates are highest, causes increases in the actual **numbers** of deaths overall, even when the rates (proportion of people dying) at those ages have improved.*

FOR MORE INFORMATION  
VISIT US AT [WWW.NATIONALFORUM.ORG](http://WWW.NATIONALFORUM.ORG)

## Trends in types of heart disease

From 2000 to 2015, the death rate from heart disease dropped nearly 35%. But starting in 2011, the rate of decline slowed substantially, from an annual rate of decline of 3.7% between 2000 and 2011 to less than 1% annually since then.<sup>2,3</sup> The total number of heart-disease deaths in 2015 was 6% higher than in 2011 – its highest level in 10 years (**Figure 1**).

- The death rate from the most common form of heart disease – ischemic heart disease – dropped by nearly 50% from 2000 to 2015. But as with heart disease overall, **that rate of decline has slowed** since 2011, from 5% between 2009 and 2011 to 2.7% between 2011 and 2015. The **number** of deaths from ischemic heart disease declined steadily from 2000 through 2014, but increased slightly in 2015.

The death rate from the second most-common form of heart disease – **heart failure** – generally declined from 2000 to 2009, but increased steadily between 2009 and 2015 (**Figure 2**). The number of deaths from heart failure **increased by 33%** during that time, from about 56,000 to more than 75,000.

- The death rate from **all other forms of heart disease** generally declined modestly from 2000 to 2011, but has increased by 10% since then. The majority of deaths in this category are due to hypertensive heart disease, atrial fibrillation/flutter, cardiomyopathy, rheumatic aortic valve disorders, and sudden death.
- The number of deaths for all other forms of heart disease has increased steadily by a total of 37% since 2000, from about 140,000 in 2000 to nearly 192,000 in 2015.

## A sobering trend for strokes

The death rate from stroke dropped 38% from 2000 to 2015 (**Figure 3**). But like heart disease, the rate of decline has slowed considerably since 2011, and the stroke death rate actually increased between 2013 and 2015.

The number of stroke deaths declined steadily from 2000 to 2009 by 23%, from about 168,000 to 129,000, remained stable until 2013, then increased by nearly 9% to about 140,000 during the next two years.

Importantly, some studies show that stroke rates have increased among younger adults in recent years.<sup>4,5</sup>

## Similar patterns seen in men and women

Cardiovascular diseases are the leading cause of death for both men and women. Men have a substantially higher age-adjusted death rate from cardiovascular diseases than women, but women live to older ages on average than men, and experience a much higher number of cardiovascular deaths in the oldest age group. The net effect: similar numbers of cardiovascular disease deaths for women as for men. And the slowed rate of decline is happening similarly among both sexes.

## Trends hold true across races, ethnicities

In the major race-ethnicity groups (Hispanics as well as non-Hispanic whites, African Americans/blacks, Asian Americans/Pacific Islanders

FIGURE 1:

Age-adjusted heart-disease death rates in U.S.

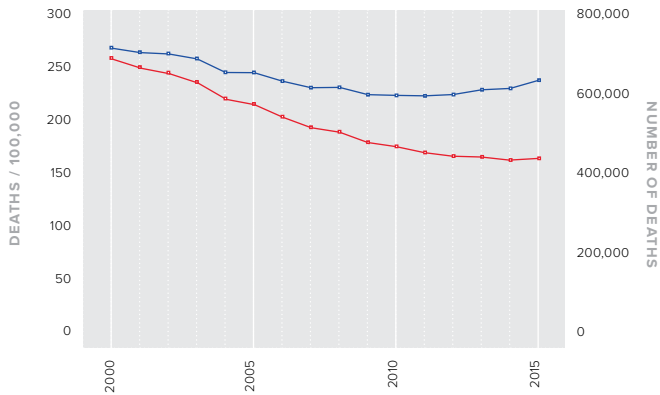


FIGURE 2:

Age-adjusted heart failure death rates in U.S.

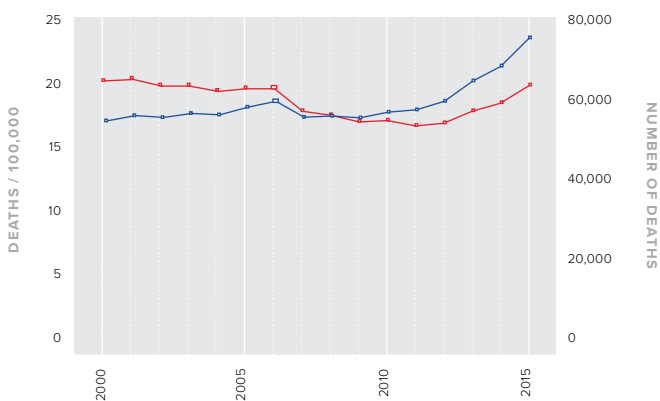
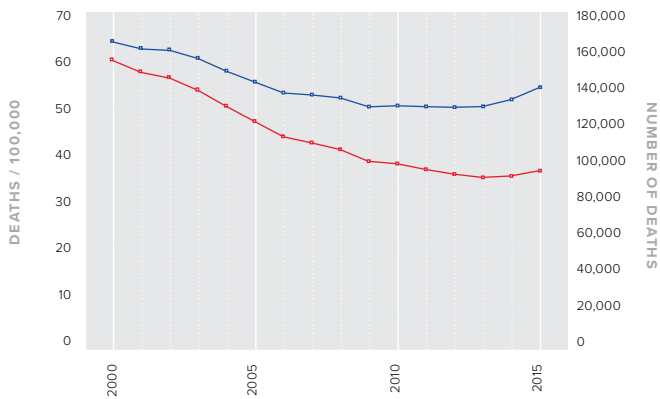


FIGURE 3:

Age-adjusted stroke death rates in U.S.



■ Number of Deaths      ■ Age-adjusted Mortality (or Death) Rate

and American Indians), the trend patterns were similar for overall heart disease, ischemic heart disease, and stroke, but the **levels** differ importantly between groups.

The death rate for all cardiovascular diseases among African Americans/blacks is 30% higher than for the overall population (**Figure 4**). There are significant differences by race-ethnicity in the 2015 death rates for ischemic heart disease, heart failure, other causes of heart disease and stroke. In nearly all instances, death rates were ranked the same by race-ethnicity for the entire time period of 2000-2015, with substantially higher rates in African Americans/blacks.

Regional & global trends

Regionally in the United States, the highest rates of cardiovascular disease death tend to be in southeastern states. Interestingly, geographic differences can also be seen at the very local levels. For example, the rate of heart-disease deaths is 331/100,000 people in Greene County, Ohio, but 537/100,000 in neighboring Fayette County.<sup>6</sup>

While many health disparities follow socioeconomic differences, affluence has not prevented the slowing of decline in heart-disease deaths on a global scale. It's true that major declines in cardiovascular disease have occurred in regions with high socioeconomic status, with lesser degrees of change or no change in other regions.<sup>7</sup> However, even countries with the highest socioeconomic status show similar trends as the United States, in that the rate of decline has slowed – and in some cases numbers of deaths have increased – in recent years.

What's working and what's not

Concerted public health efforts have contributed substantially to the long-term decline in cardiovascular disease, including restrictions on smoking and an enhanced focus on lowering cholesterol and blood pressure.<sup>8,9</sup> The use of aspirin and statins to protect heart health has increased,<sup>10</sup> enhanced by efforts such as the Million Hearts® initiative, which is sponsored by the CDC and the Centers for Medicare and Medicaid Services, with the National Forum as a partner organization.<sup>11</sup>

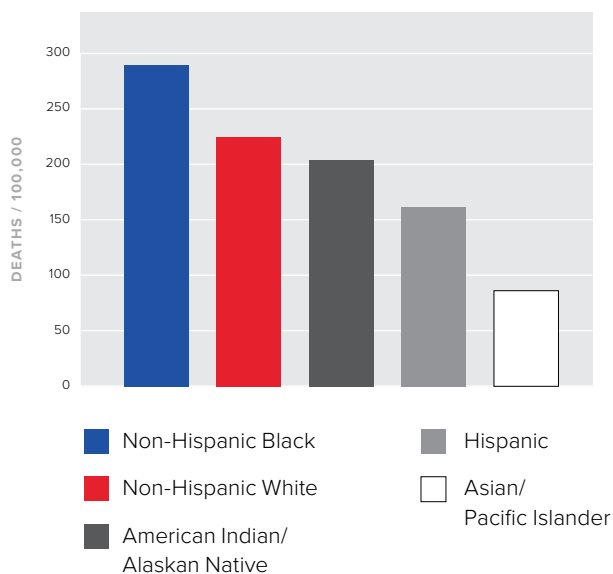
But despite these important efforts, the prevalence of obesity and diabetes have increased considerably over the past three decades, with more than one-third of U.S. adults estimated to be obese<sup>12</sup> and 30 million adults believed to have diabetes.<sup>13</sup> It is likely that this epidemic of obesity and diabetes is a significant contributor to the recent negative trends in heart-disease deaths.

Fighting these troubling trends: What can we do?

The National Forum for Heart Disease & Stroke Prevention, as a unique convener of organizations whose common purpose is to advance the nation's cardiovascular health and prevent heart disease and stroke, advocates for and promotes efforts to reduce the burden of heart disease and stroke to achieve the vision of a world that is heart healthy and stroke free. The current troubling trends in cardiovascular disease death mean that we must re-double our support for public health efforts and promote educational programs and interventions to reduce cardiovascular risk and improve cardiovascular health.

FIGURE 4:

Age-adjusted cardiovascular disease death rates by race/ethnicity, 2015



Summary

While the United States has enjoyed major declines in death rates from heart disease and stroke since 2000, there is troubling evidence of a major deceleration in these declines since 2011. Issues of special concern include the rising prominence of heart failure, the continuing disadvantage of African Americans/blacks and the persistently high numbers of cardiovascular deaths, even when death rates are declining.

There is a glimpse of good news: Preliminary data suggest that the increase in the heart disease death rate that occurred in 2015 may be reversed by a dip in 2016 with a 2% decrease in the heart-disease death rate, from 168/100,000 people in 2015 to 165/100,000 in 2016.<sup>14</sup> Preliminary data available for 2016 also suggest that there will be a decrease in the death rate from stroke from 2015, although it will remain higher than in 2012-14.<sup>14</sup>

But the recent slowing of positive trends in cardiovascular disease and stroke deaths has sounded an alarm to which the National Forum and others are responding. Even if the slowing or reversal of these favorable trends in rates is only temporary, the message is clear: Trends in the wrong direction must be reversed, and favorable trends accelerated, if the massive burden of cardiovascular disease in the United States is to be overcome.

REFERENCES

- Benjamin EJ, Blaha MJ, Chiuve SE, Cushman M, Das SR, Deo R, et al. American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Heart Disease and Stroke Statistics-2017 Update: A Report From the American Heart Association*. *Circulation*. 2017 Mar 7;135(10):e146-e603.
- Sidney S, Quesenberry CP Jr, Jaffe MG, Sorel M, Nguyen-Huynh MN, Kushi LH. *Recent Trends in Cardiovascular Mortality in the United States and Public Health Goals*. *JAMA Cardiol*. 2016 Aug 1;1(5):594-9.
- Sidney S, Quesenberry CP Jr, Jaffe MG, Sorel M, Go AS, Rana JS. *Heterogeneity in national U.S. mortality trends within heart disease subgroups, 2000-2015*. *BMC Cardiovasc Disord*. 2017 Jul 18;17(1):192.
- Kissela BM, Khoury JC, Alwell K, Moomaw CJ, Woo D, Adeoye O, et al. *Age at stroke: Temporal trends in stroke incidence in a large, biracial population*. *Neurology*. 2012 Oct 23;79(17):1781-7.
- George MG, Tong X, Bowman BA. *Prevalence of Cardiovascular Risk Factors and Strokes in Younger Adults*. *JAMA Neurol*. 2017 Jun 1;74(6):695-703.
- Centers for Disease Control and Prevention, *Interactive Atlas of Heart Disease and Stroke*. Accessed at: <https://www.cdc.gov/dhdsdp/maps/atlas/index.htm>, Oct. 8, 2017.
- Roth GA, Johnson C, Abajobir A, Abd-Allah F, Abera SF, Abyu G. *Global, Regional, and National Burden of Cardiovascular Diseases for 10 Causes, 1990 to 2015*. *J Am Coll Cardiol*. 2017 Jul 4;70(1):1-25.
- Mann D, Reynolds K, Smith D, Muntner P. *Trends in statin use and low-density lipoprotein cholesterol levels among US adults: Impact of the 2001 National Cholesterol Education Program guidelines*. *Ann Pharmacother*. 2008 Sep;42(9):1208-15.
- Steinberg BA, Bhatt DL, Mehta S, Poole-Wilson PA, O'Hagan P, Montalescot G. *Nine-year trends in achievement of risk factor goals in the US and European outpatients with cardiovascular disease*. *Am Heart J*. 2008 Oct;156(4):719-27.
- Gu Q, Paulose-Ram R, Burt VL, Kit BK. *Prescription Cholesterol-Lowering Medication Use in Adults 40 and Over: United States, 2003-2012*. Hyattsville, MD: National Center for Health Statistics; 2014. NCHS Data Brief, No. 177.
- Frieden TR, Berwick DM. *The "Million Hearts" initiative – preventing heart attacks and strokes*. *N Engl J Med*. 2011 Sep 29;365(13):e27
- Ogden CL, Carroll MD, Kit BK, Flegal KM. *Prevalence of childhood and adult obesity in the United States, 2011-2012*. *JAMA*. 2014 Feb 26;311(8):806-14.
- Centers for Disease Control and Prevention. *National Diabetes Statistics Report, 2017*. Atlanta, GA: US Dept of Health & Human Services; 2017. Accessed at: <https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf>, October 8, 2017.
- Ahmad FB, Bastian B. *Quarterly provisional estimates for selected indicators of mortality, 2015-Quarter 1, 2017*. National Center for Health Statistics. National Vital Statistics System, Vital Statistics Rapid Release Program. 2017. Accessed at: [www.cdc.gov/nchs/products/vsrr/mortality-dashboard.htm](http://www.cdc.gov/nchs/products/vsrr/mortality-dashboard.htm), September 30, 2017.