



Suicide Rates on the Rise: State Trends and Variation in Suicide Deaths from 2000 to 2017

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SUMMARY

This brief examines state-level data on suicide death rates from 2000 to 2017. Using vital statistics data, it examines how state suicide rates vary and how their trends compare to the U.S. trend of increasing suicide rates, as well as differences across the states in rates of suicide by firearm and non-firearm methods.

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COMPANION BRIEF

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INTRODUCTION

When the U.S. Centers for Disease Control and Prevention (CDC) announced in 2016 that life expectancy in the United States had dropped, the finding made national headlines.^{1,2} Prior to that, U.S. life expectancy hadn't dropped in decades—not since 1993.³ Similar findings of further declines in life expectancy announced in 2017 and 2018 showed this decline wasn't a fluke, as data continued to reveal that Americans were leading increasingly shorter lives.^{4,5} Although death records show there are multiple causes of death contributing to decreased life expectancy (e.g., increased death rates from lung and Alzheimer's disease), two factors have consistently played a role in the trend: suicide and unintentional injuries, including accidental drug overdoses.^{6,7,8}

Around the same time the CDC was documenting declines in U.S. life expectancy, researchers from Princeton University began to study death rates and found that the U.S. was unique among industrialized countries. While death rates were declining in other wealthy nations—such as Canada, Japan and Germany—death rates have been increasing among certain American populations, particularly non-Hispanic whites with lower incomes and lower levels of education.^{9,10} Those same researchers found three main causes of death that accounted for the increased death rates—suicide, drug overdoses and alcohol-related liver disease—which they called “deaths of despair.” They and other researchers have posited that increased deaths of despair may be a response to decades of economic and social changes, leaving many Americans feeling their life situations have not met their expectations and without strong social institutions to help them navigate through the turbulence.¹¹

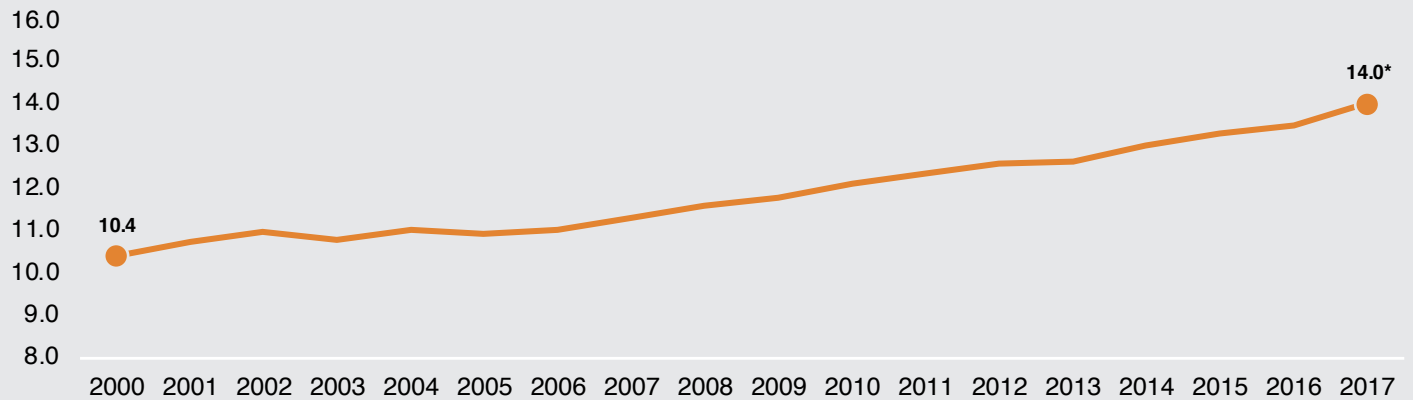
While recent increases in deaths from drug overdoses, especially opioids, have received substantial attention, the toll of other deaths of despair is less widely known.^{12,13} Since 2000, suicide deaths have killed over 650,000 people—more than the number killed by opioids during the same time period. This issue brief examines data on suicide deaths, presenting trends and variation in suicide death rates across the U.S. by subpopulations.

Suicide death rates over time

Over nearly two decades, suicide deaths in the U.S. have increased significantly. From 2000 to 2017, the U.S. suicide death rate increased from 10.4 to 14.0 per 100,000 people, an increase of 35 percent—representing an additional 3.6 deaths per 100,000 people per year (Figure 1).¹⁴

However, the increase in suicide deaths has not followed a consistent trend; instead, the growth in suicide rates has accelerated more recently. During the first half of the time period we examined, from 2000 to 2008, suicide death rates grew from 10.4 to 11.6 deaths per 100,000 people—an increase of 11 percent, or 1.2 additional deaths per 100,000 people.¹⁵ However, from 2009 to 2017, suicide death rates grew from 11.8 to 14.0 deaths per 100,000 people—an increase of 2.3 additional deaths per 100,000 people (a 19 percent increase), which is almost double the earlier increase.

Figure 1. United States Suicide Death Rate per 100,000 People, 2000-2017

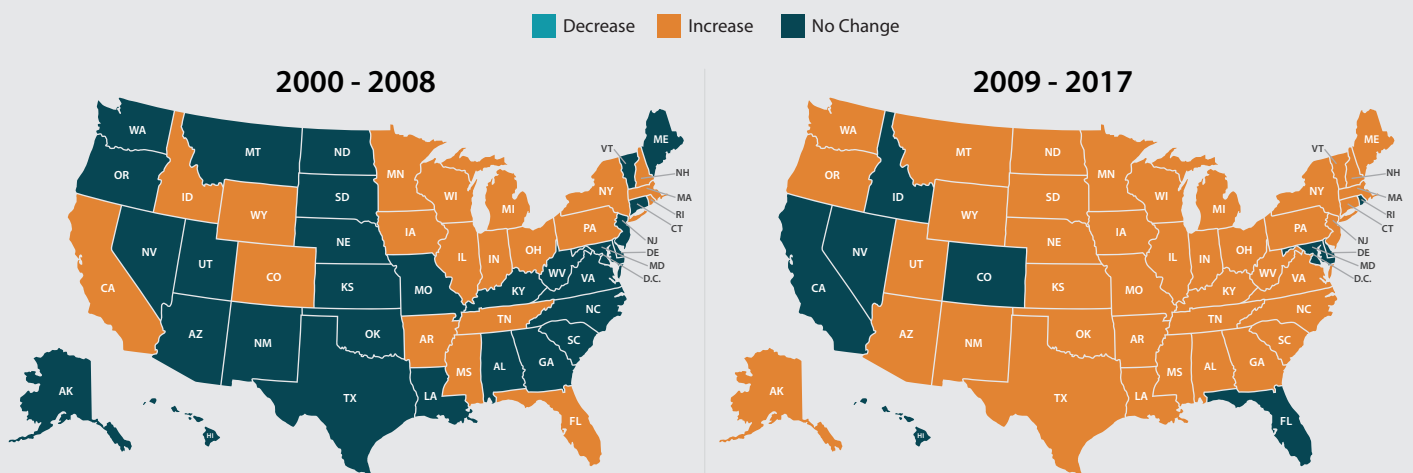


* Statistically significant increase at 95% level.
 Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

Additionally, there were more statistically significant annual increases in suicide death rates from 2009 to 2017 (in 7 of 8 years) compared to 2000 to 2008 (in 5 of 8 years). The later time period also saw larger increases in suicide death rates. From 2000 to 2008, the largest statistically significant annual increase in suicide death rates was 0.3 deaths per 100,000 people, which happened between 2000-2001, 2006-2007, and 2007-2008; however, from 2009 to 2017, there were statistically significant annual increases in suicide rates of 0.4 deaths per 100,000 people (from 2009-2010 and 2013-2014) and of 0.5 deaths per 100,000 people (from 2016-2017).

Consistent with national trends, state-level trends also suggest a pattern of acceleration. From 2000 to 2008, 21 states experienced statistically significant increases in their suicide death rates, led by the District of Columbia's 91 percent increase (Figure 2).¹⁶ From 2009 to 2017, however, 41 states experienced statistically significant increases in their suicide death rates, led by West Virginia's 60 percent increase.

Figure 2. State Changes in Suicide Rates, 2000-2008 and 2009-2017



Notes: Suicide rates in the District of Columbia increased from 2000-2008 and saw no significant change from 2009-2017. Statistically significant change at 95% level.
 Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

Figure 3. Highest and Lowest State Suicide Rates per 100,000 People, 2017

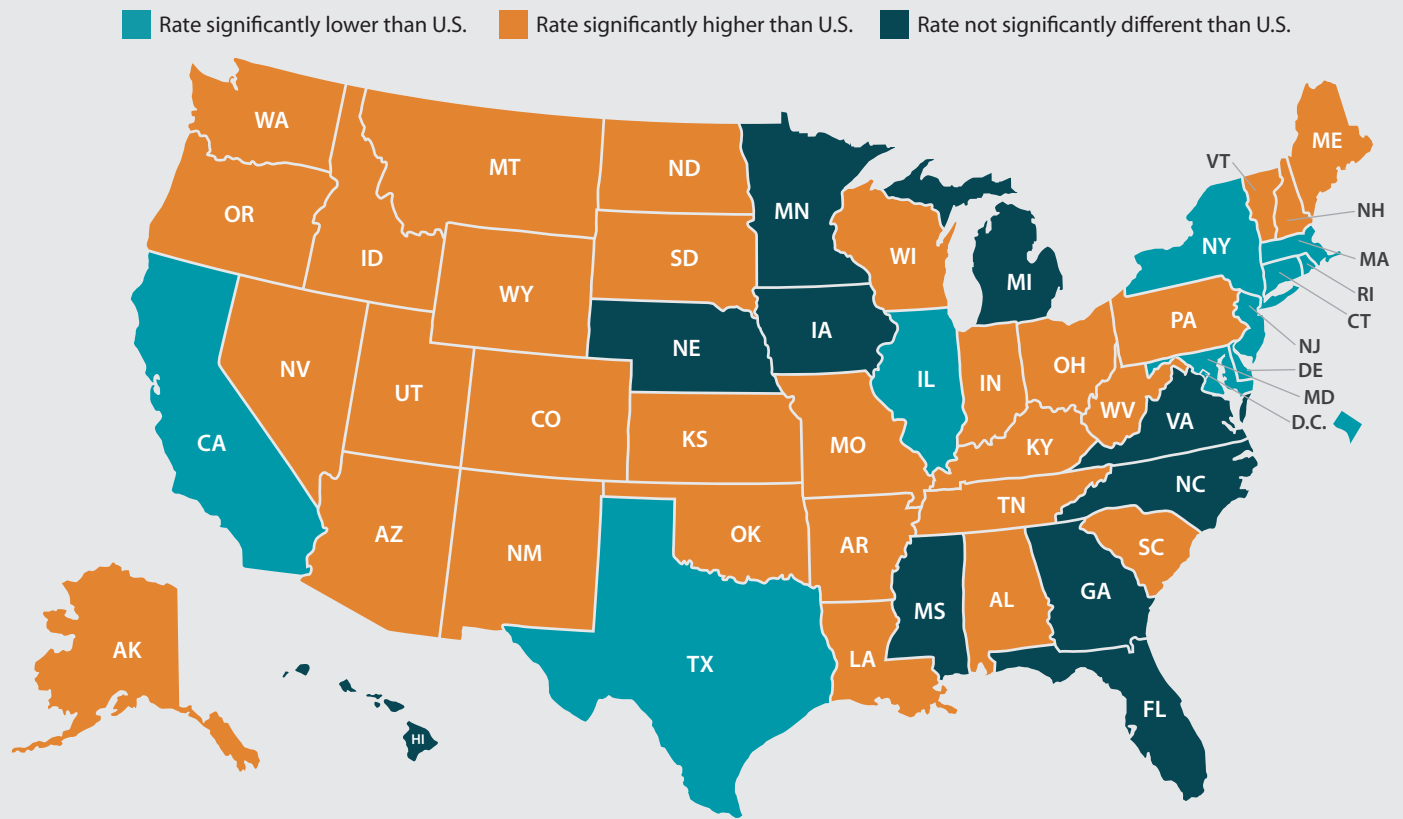
States with the highest suicide rates	
Montana	28.9
Alaska	27.0
Wyoming	26.9
New Mexico	23.3
Idaho	23.2

States with the lowest suicide rates	
District of Columbia	6.6
New York	8.1
New Jersey	8.3
Massachusetts	9.5
Maryland	9.8

State suicide deaths rates

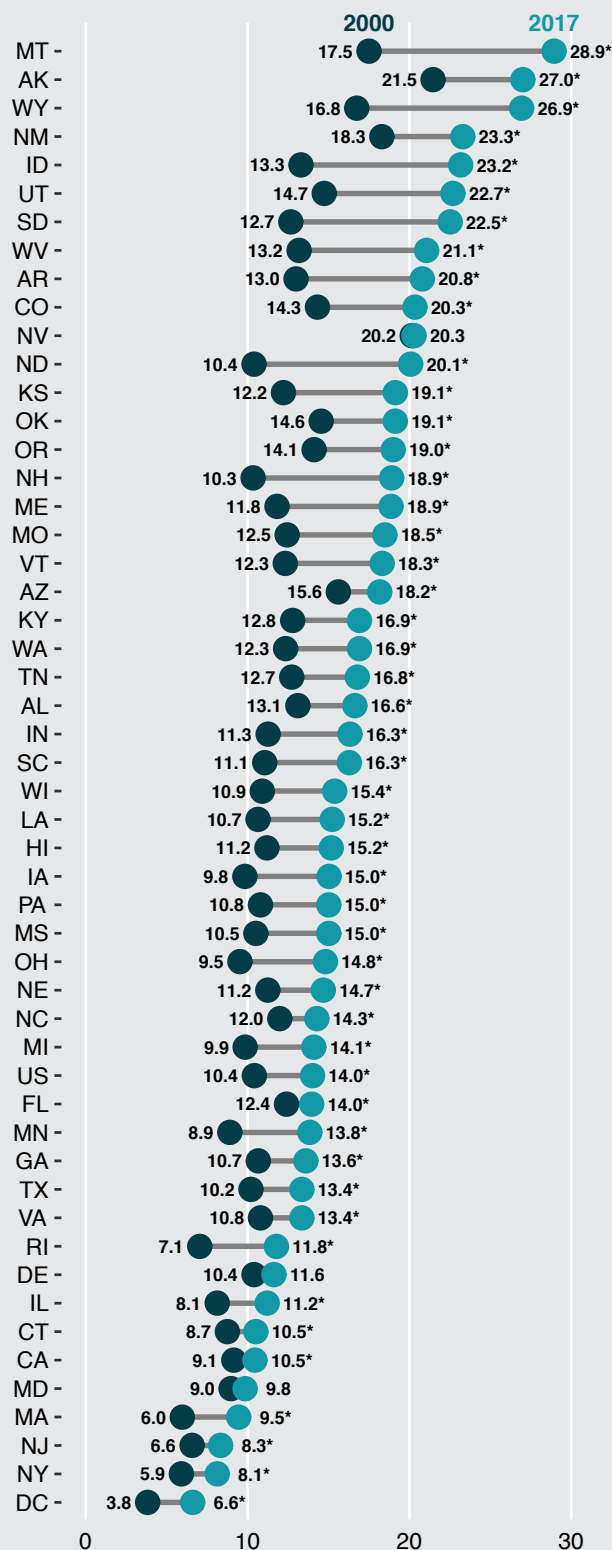
Throughout the U.S., states' suicide death rates range widely. In 2017, Montana had the highest suicide rate of 28.9 deaths per 100,000 people, which was more than quadruple the lowest rate of 6.6 deaths per 100,000 people in the District of Columbia (Figure 3). Across the states, 10 states and the District of Columbia had suicide death rates in 2017 that were significantly lower than the U.S. rate (14.0 deaths per 100,000 people), 10 states had rates statistically equivalent to the U.S. rate, and 30 states had rates significantly higher than the U.S. rate (Figure 4).

Figure 4. State Suicide Death Rates per 100,000 People Compared to the United States Rate, 2017



Statistically significant at 95% level.
 Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

Figure 5. Increases in State Suicide Death Rates per 100,000 People, 2000-2017



* Statistically significant increase since 2000 at 95% level.
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

Figure 6. Largest and Smallest Significant Increases in State Suicide Rates per 100,000 People, 2000-2017

States with the largest significant increase	
North Dakota	93%
New Hampshire	83%
South Dakota	78%
Idaho	74%
District of Columbia	73%

States with the smallest significant increase	
Florida	13%
California	14%
Arizona	16%
North Carolina	19%
Connecticut	20%

Note. Delaware, Maryland and Nevada experienced no significant change in their suicide death rates from 2000-2017.

Despite the wide range of suicide rates across the U.S., nearly all states have experienced statistically significant increases in suicide death rates. From 2000 to 2017, only three states experienced no statistically significant change in their suicide rates—Delaware, Maryland and Nevada (Figure 5).¹⁷ Of those three states, Delaware and Maryland offer rare positive examples, with suicide death rates that have not increased significantly since 2000, and that were significantly below the U.S. rate in 2017. In contrast, while Nevada did not experience a significant change in suicide death rates, its rate was approximately double the U.S. rate in 2000 (20.2 vs. 10.4 deaths per 100,000 people) and remained significantly higher than the U.S. rate in 2017.

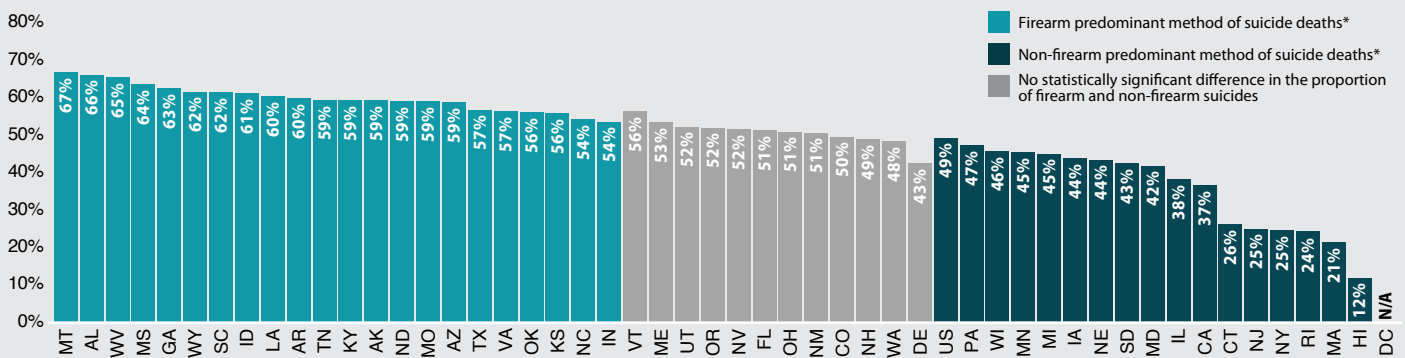
The remaining 47 states and the District of Columbia experienced significant increases in suicide death rates ranging from 13 percent in Florida, which saw its suicide rate grow an additional 1.6 deaths per 100,000 people (from 12.4 to 14.0 suicide deaths per 100,000 people), to 93 percent in North Dakota, which saw its suicide rate grow an additional 9.7 deaths per 100,000 people (from 10.4 to 20.1 suicide deaths per 100,000 people) (Figure 6).

Suicide deaths by method

In addition to suicide death rates overall, we also analyzed trends in suicide death rates by the cause of death, examining suicide deaths by firearms versus all other non-firearm methods combined (e.g., suffocation, poisoning). Those two categories each account for roughly half of suicide deaths.^{18,19}

Across the states, there is substantial variation in the predominant method of suicide. In 2017, there were 22 states where firearms accounted for a statistically significant majority of suicide deaths, with Montana having the largest share of suicide deaths from firearms at 67 percent (Figure 7). There were 16 states where non-firearm methods accounted for a statistically significant majority of suicide deaths, with Hawaii having the largest share of deaths from non-firearm causes (88 percent). In the remaining 12 states, there was not a statistically significant difference in the proportion of firearm and non-firearm suicides (i.e., a statistically even split across firearm and non-firearm methods).

Figure 7. Percentage of State Suicides by Firearm Method, 2017

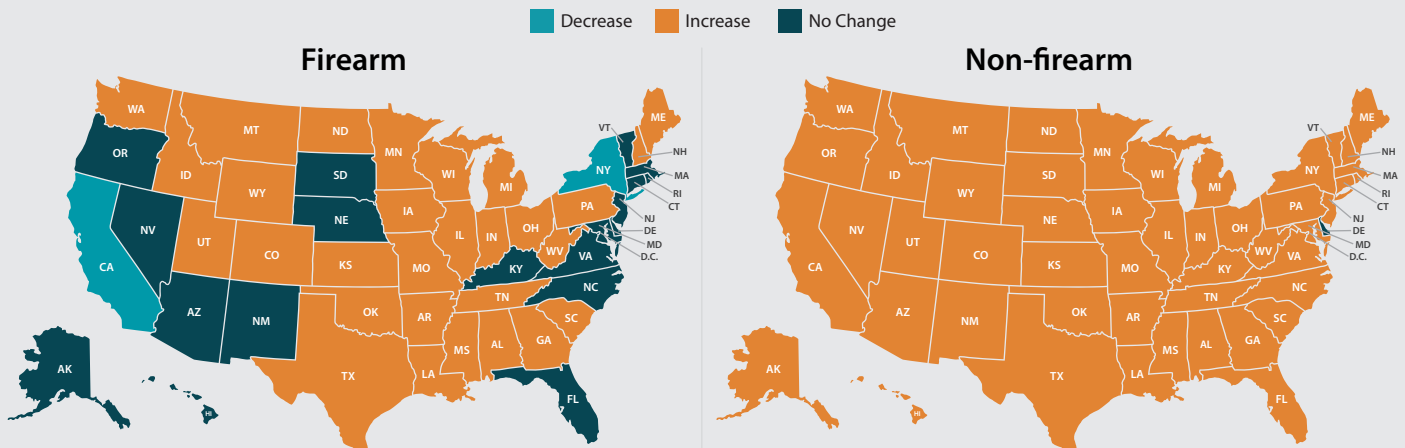


*Statistically significant at 95% level.
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

At the U.S. level, suicide deaths rates have increased significantly by both firearm and non-firearm methods since 2000, but deaths from non-firearm suicides have increased at a more rapid pace. Because of that, suicide deaths from non-firearm methods were slightly more common in 2017 (51 percent non-firearm vs. 49 percent firearm), which was not the case in 2000.

In examining trends at the state level, we see similar patterns. From 2000 to 2017, 49 states experienced statistically significant increases in death rates from non-firearm methods, with the largest increase in South Dakota (121 percent) (Figure 8).²⁰ Only Delaware saw no significant change in its non-firearm suicide rate.²¹ In contrast, only 29 states experienced statistically significant increases in firearm suicide death rates, with the largest increase in North Dakota (122 percent). Two states experienced significant declines in their firearm suicide rates (California and New York), while the other 19 states did not experience statistically significant changes in their firearm suicide rates.

Figure 8. State Changes in Suicide Rate by Method (Firearm, Non-firearm), 2000-2017

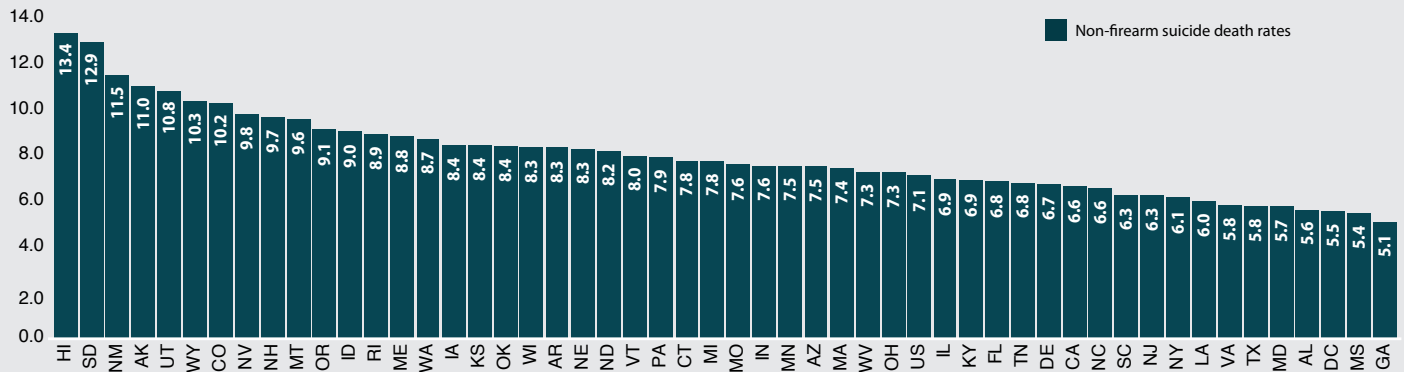


Statistically significant change at 95% level.
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

In addition to the predominant method of suicide death by state, we also see differences in the range of suicide death rates across states by firearm and non-firearm causes. For non-firearm suicide deaths, Hawaii had the highest rate in 2017, at 13.4 deaths per 100,000 people, which was nearly triple the lowest rate of 5.1 deaths per 100,000 people in Georgia (Figure 9).

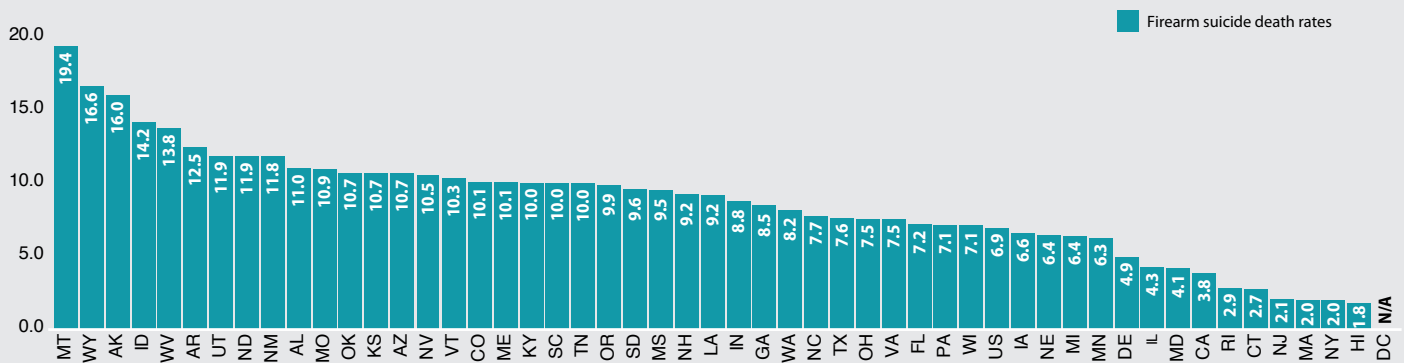
However, the range in suicide death rates by firearm method was substantially larger. In 2017, Montana had the highest firearm suicide death rate at 19.4 deaths per 100,000 people, which was almost 11 times the lowest rate of 1.8 deaths per 100,000 people in Hawaii (Figure 10).

Figure 9. Non-Firearm Suicide Death Rates per 100,000 People, 2017



Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

Figure 10. Firearm Suicide Death Rates per 100,000 People, 2017



Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

CONCLUSIONS

Since 2000, the U.S. has seen suicide death rates increase by 35 percent, from 10.4 to 14.0 per 100,000 in 2017. Viewed alone, however, that finding obscures substantial variation at the state level, which is important to understanding the dynamics of the growing problem regarding suicide deaths.

Although nearly all states have experienced statistically significant increases in their suicide rates, that growth has proved much more dramatic in some. For example, while some states saw relatively small increases of around 13-20 percent (Arizona, California, Connecticut, Florida and North Carolina), some other states saw increases of more than 70 percent (District of Columbia, Idaho, New Hampshire, North Dakota and South Dakota). Additionally, the comparative size of states' suicide rates also range widely. For example, Montana's suicide death rate of 28.9 per 100,000 people—the highest in 2017—was more than quadruple the lowest rate (6.6 deaths per 100,000 people in the District of Columbia).

Another area of substantial variation is the method of suicide. Nationally, there has been an increase in the proportion of suicide by non-firearm methods, rising from 43 percent in 2000 to 51 percent in 2017. However, again we see substantial variation in the predominant method of suicide by state. For example, firearms accounted for only 12 percent of suicide deaths in Hawaii in 2017, but firearms accounted for 67 percent of suicides in Montana.

Finally, one of the most concerning findings from our study is the indication that the increase in suicide rates over the past two decades may be accelerating. At the U.S. level, the rate of increase was higher from 2009 to 2017 than it was from 2000 to 2008, and the increase from 2016 to 2017 was the largest single-year increase yet. The state-level data tell a similar story: From 2000 to 2008, less than half of states experienced significant increases in suicide death rates, but from 2009 to 2017, that flipped to more than half of the states experiencing significant increases in suicide rates.

Considering the nearly two-decade trend of growth and the evidence indicating that trend may be accelerating, it seems unlikely that high rates of suicide will spontaneously stop or reverse course in the near term. To help develop and guide efforts to reduce suicides and evaluate whether those efforts are succeeding, it will be important to continue monitoring U.S. suicide rates, as well as to leverage other data to improve our understanding of the underlying causes that are driving the increased prevalence of suicide deaths. Additionally, because of the wide variation across states—in the size of their suicide rates, the pace at which suicides are increasing, and the methods of suicide—it will be particularly important for policy makers to monitor state-level data to ensure they have the most accurate information on the particular conditions in their own states.

Suggested Citation

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14 The suicide death rates reported in this brief are age-adjusted.

15 Due to our rounding of rates reported in this brief, differences between rates (e.g., percent change over time, number of additional deaths) calculated using these may not match the differences we report.

16 Although the District of Columbia's suicide rates are relatively low compared to other states, its suicide death rates also are relatively volatile year-to-year. For example, its suicide death increased about 70 percent from 2000 to 2001, and its rate decreased about 40 percent from 2008 to 2009.

17 Suicide rates in Delaware and Maryland offer relatively positive examples among states. They are the only states with 2017 suicide rates significantly below the U.S. rate that also experienced no statistically significant increase since 2000. Although Nevada's suicide rate did not change significantly from 2000 to 2017, its suicide rate has consistently remained significantly higher than the U.S. rate in 2000 and 2017.

18 Although we don't examine method of suicide by different demographic groups (e.g., age, sex, race/ethnicity, urbanization), other research has found that it can vary. For example, a CDC study found that rates of suicide by firearm are higher for males than females.

19 National Institute of Mental Health. (2019). Mental Health Information: Suicide. Retrieved from <https://www.nimh.nih.gov/health/statistics/suicide.shtml>

20 Only Delaware did not experience a statistically significant increase in deaths from non-firearm suicides. Testing was not possible for the District of Columbia because its rate from 2000 was suppressed due to a small number of deaths.

21 Statistical testing for changes in the District of Columbia's non-firearm suicide rate was not possible because its 2000 rate was suppressed due to a small number of deaths. Testing likewise was not possible for D.C.'s firearm suicide rate because its 2000 and 2017 rates were suppressed due to a small number of deaths.