



# Suicide Rates on the Rise: State Trends and Variation in Suicide Deaths from 2000 to 2018

## AUTHORS

**Colin Planalp, MPA**  
Senior Research Fellow,  
SHADAC

**Robert Hest, MPP**  
Research Fellow, SHADAC

**Carrie Au-Yeung, MPH**  
Research Fellow, SHADAC

## COMPANION BRIEF

To read SHADAC's analysis of National suicide death rates by demographic groups of age, sex, race/ethnicity and urbanization, as well as by firearm and non-firearm methods of suicide, visit: [www.shadac.org/2020SuicideBriefs](http://www.shadac.org/2020SuicideBriefs)

Stay up to date on SHADAC work by visiting us at:

[WWW.SHADAC.ORG](http://WWW.SHADAC.ORG)

## 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.<sup>1,2</sup> Prior to that, U.S. life expectancy hadn't dropped in decades—not since 1993.<sup>3</sup> 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.<sup>4,5</sup> 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.<sup>6,7,8</sup>

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.<sup>9,10</sup> 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.<sup>11</sup>

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.<sup>12,13</sup>

---

***Since 2000, suicide deaths have killed over 700,000 people—more than the number killed by opioids during the same time period.***

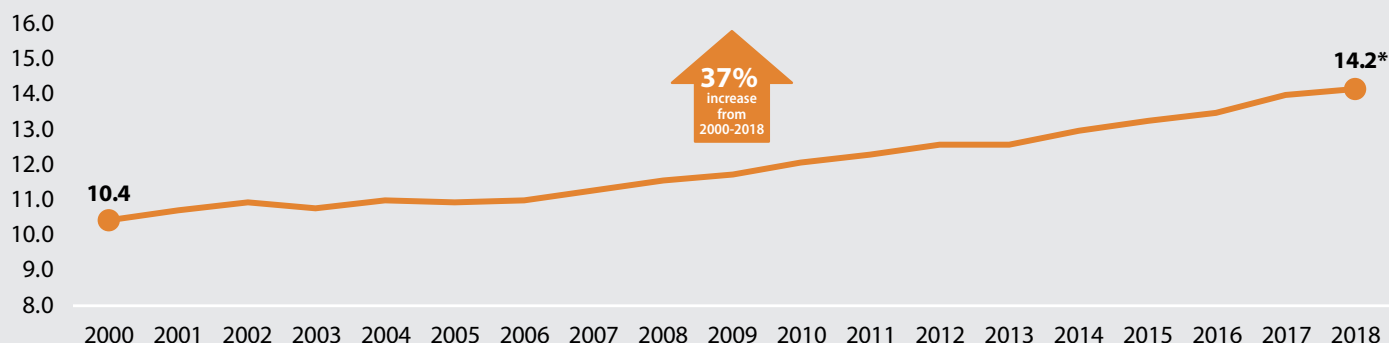
---

This issue brief examines state-level data on suicide death rates from 2000 to 2018. 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.

### Suicide death rates over time

Over nearly two decades, suicide deaths in the U.S. have increased significantly. From 2000 to 2018, the U.S. suicide death rate increased from 10.4 to 14.2 per 100,000 people, an increase of 37 percent—representing an additional 3.8 deaths per 100,000 people per year (Figure 1).

**Figure 1. United States Suicide Death Rate per 100,000 People, 2000-2018**



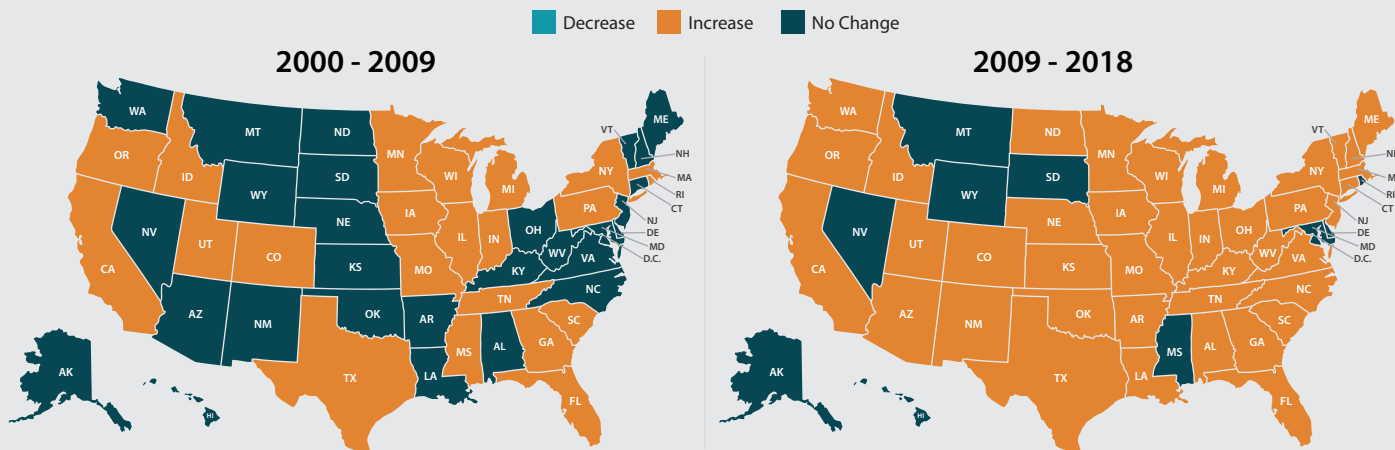
\* Statistically significant increase at 95% level.  
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

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 2009, suicide death rates grew from 10.4 to 11.8 deaths per 100,000 people—an increase of 13 percent, or 1.3 additional deaths per 100,000 people. From 2009 to 2018, suicide death rates grew from 11.8 to 14.2 deaths per 100,000 people—an increase of 2.5 additional deaths per 100,000 people (a 21 percent increase).

Additionally, there were more statistically significant annual increases in suicide death rates from 2009 to 2018 (in 8 of 9 years) compared to 2000 to 2009 (in 5 of 9 years). The later time period also saw larger increases in suicide death rates. From 2000 to 2009, 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 2018, 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 2009, only 22 states experienced statistically significant increases in their suicide death rates, led by Rhode Island's 53 percent increase (Figure 2). From 2009 to 2018, however, 41 states experienced statistically significant increases in their suicide death rates, led by the District of Columbia's 70 percent increase.<sup>14</sup>

**Figure 2. State Changes in Suicide Rates, 2000-2009 and 2009-2018**



Statistically significant change at 95% level.  
Notes: Suicide rates in the District of Columbia saw no significant change from 2000-2009 and increased from 2009-2018.  
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

**Figure 3. Highest and Lowest State Suicide Rates per 100,000 People, 2018**

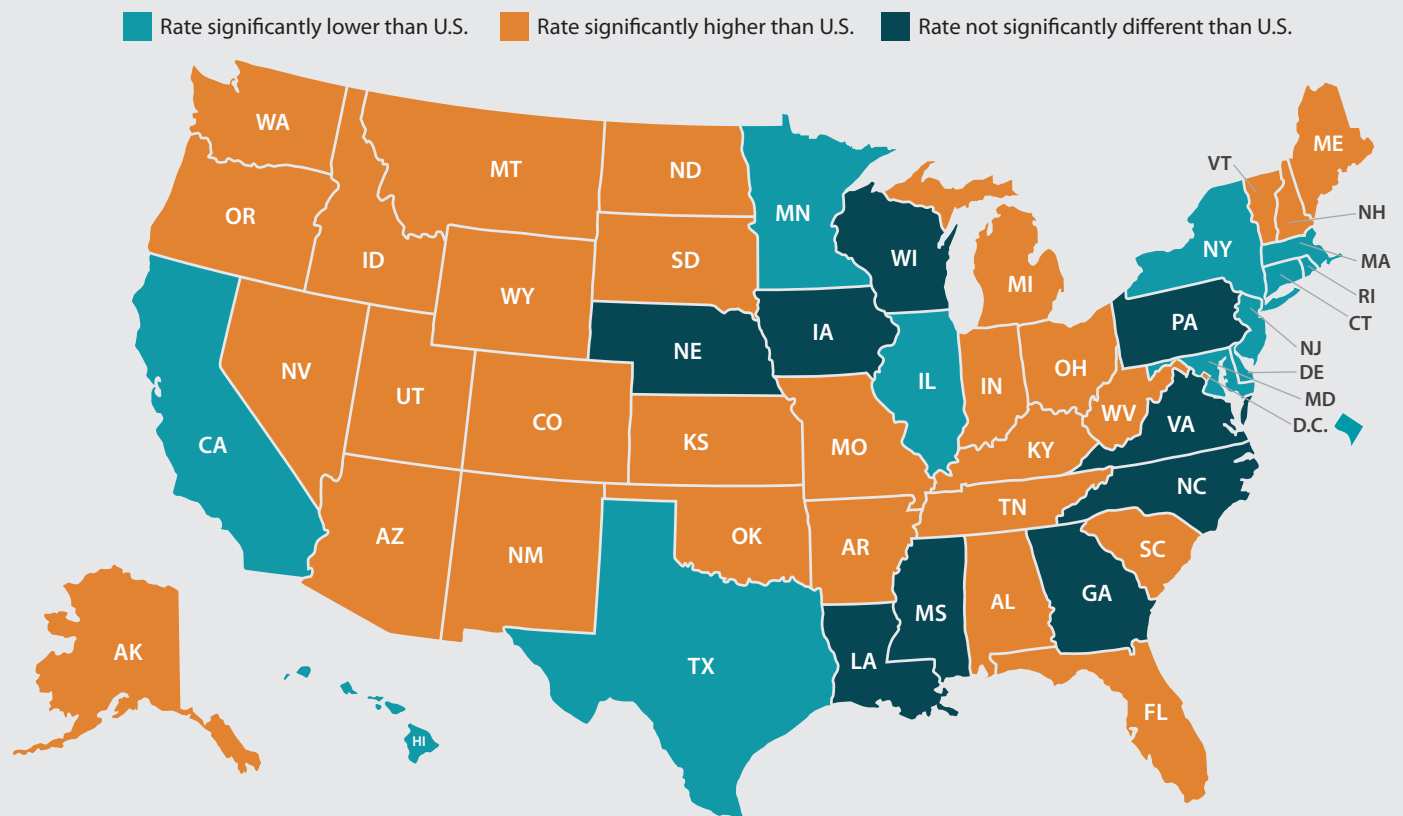
States with the highest suicide rates	
Wyoming	25.2
New Mexico	25.0
Montana	24.9
Alaska	24.6
Idaho	23.9
<b>United States suicide rate</b>	
	<b>14.2</b>
States with the lowest suicide rates	
District of Columbia	7.5
New York	8.3
New Jersey	8.3
Rhode Island	9.5
Massachusetts	9.9

**State suicide death rates**

Throughout the U.S., states' suicide death rates range widely. In 2018, Wyoming had the highest suicide rate of 25.2 deaths per 100,000 people, which was more than triple the lowest rate of 7.5 deaths per 100,000 people in the District of Columbia (Figure 3).

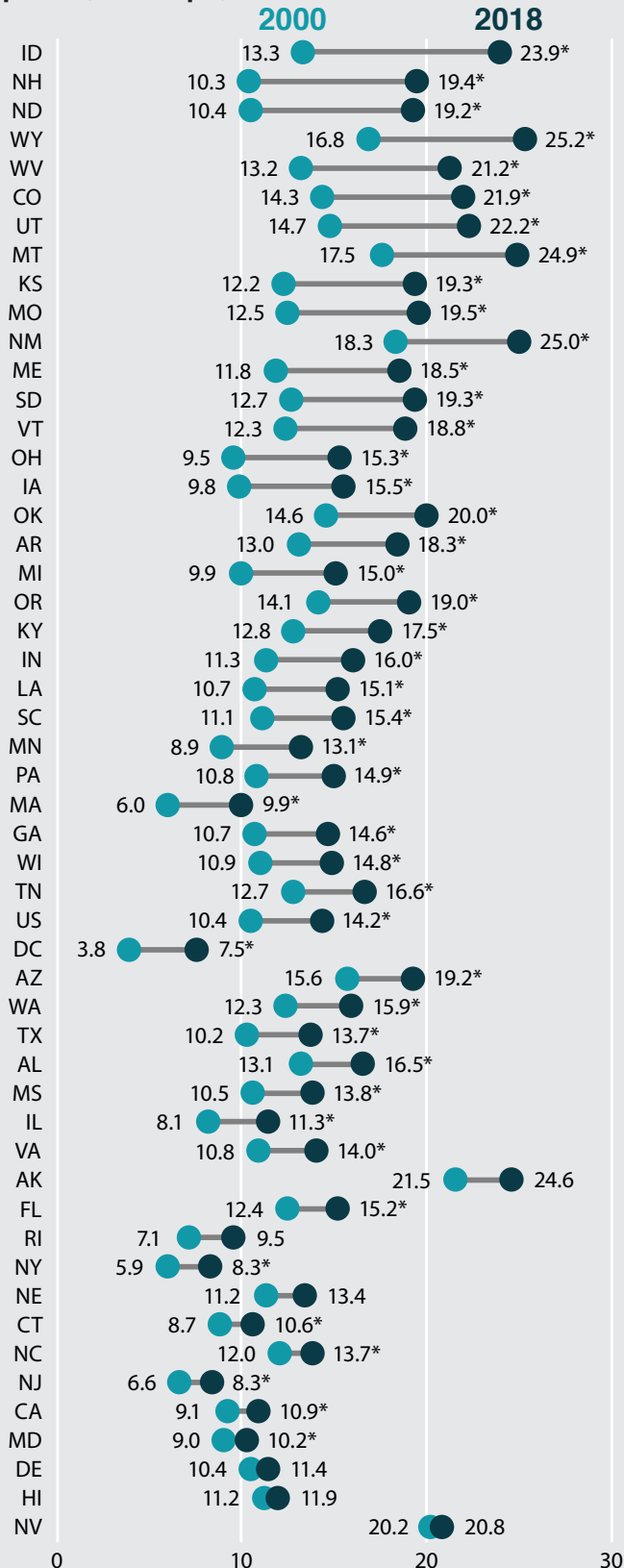
Across the country, 12 states and the District of Columbia had suicide death rates in 2018 that were significantly lower than the national rate (14.2 deaths per 100,000 people), 9 states had rates statistically equivalent to the U.S. rate, and 29 states had rates significantly higher than the U.S. rate (Figure 4).

**Figure 4. State Suicide Death Rates per 100,000 People Compared to the United States Rate, 2018**



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, 2000-2018**



\* 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, 2000-2018**

States with the largest significant increase	
District of Columbia	97%
New Hampshire	88%
North Dakota	84%
Idaho	80%
Massachusetts	66%

Increase in United States suicide rate	
Increase in United States suicide rate	37%

States with the smallest significant increase	
Maryland	14%
North Carolina	15%
California	19%
Connecticut	21%
Florida	22%

Note: Alaska, Delaware, Hawaii, Nebraska, Nevada, and Rhode Island experienced no significant change in their suicide death rates from 2000-2018.

Despite the wide range of suicide rates across the U.S., nearly all states have experienced statistically significant increases in suicide death rates since the turn of the century. From 2000 to 2018, only six states experienced no statistically significant change in their suicide rates—Alaska, Delaware, Hawaii, Nebraska, Nevada, and Rhode Island (Figure 5). Of those six states, Delaware, Hawaii, and Rhode Island 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 2018. 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 2018 (20.8 vs. 14.2 deaths per 100,000 people).

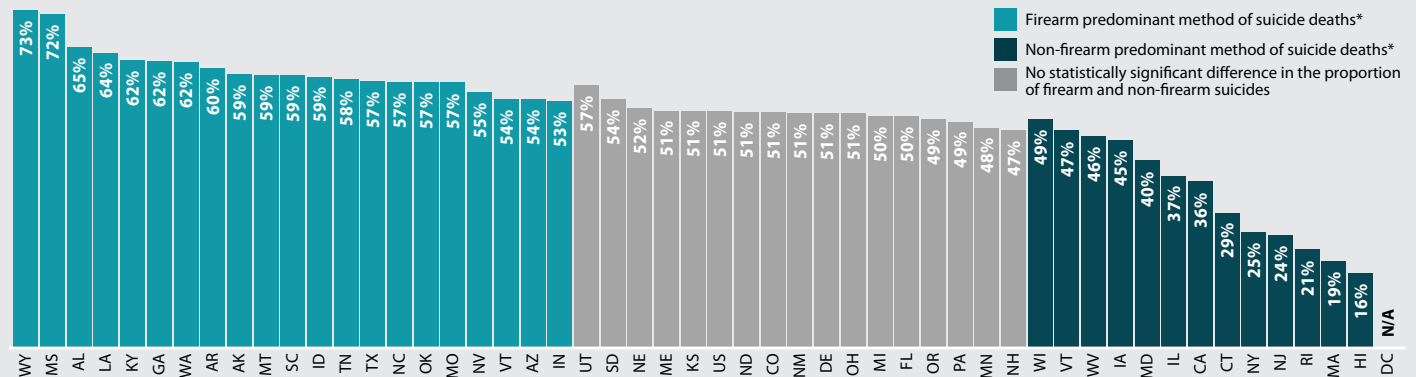
The remaining 44 states and the District of Columbia experienced significant increases in suicide death rates from 2000 to 2018, ranging from a low of 14 percent in Maryland, which saw its suicide rate grow an additional 1.2 deaths per 100,000 people (from 9.0 to 10.2 suicide deaths per 100,000 people), to a high of 97 percent in the District of Columbia, which saw its suicide rate grow an additional 3.7 deaths per 100,000 people (from 3.8 to 7.5 suicide deaths per 100,000 people) (Figure 6).

### Suicide deaths by method

In addition to suicide death rates overall, we 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.<sup>15,16</sup>

Across the states, there is substantial variation in the predominant method of suicide. In 2018, there were 21 states where firearms accounted for a statistically significant majority of suicide deaths, with Wyoming having the largest share of suicide deaths from firearms at 73 percent (Figure 7). There were 13 states where non-firearm methods accounted for a statistically significant majority of suicide deaths in 2018, with Hawaii having the largest share of deaths from non-firearm causes (84 percent). In the remaining 16 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).<sup>17</sup>

**Figure 7. Percentage of State Suicides by Firearm Method, 2018**

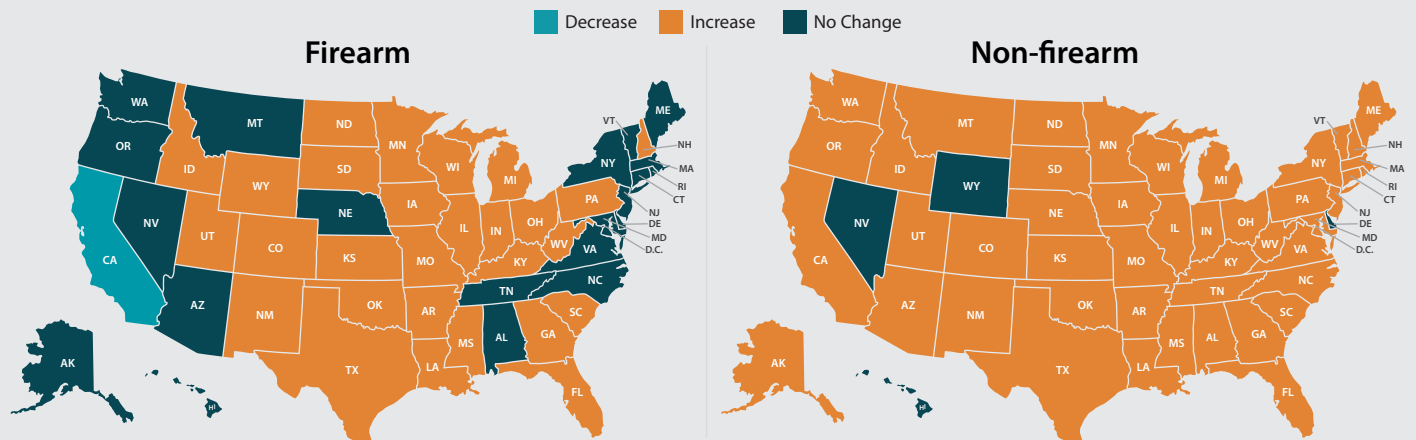


\*Statistically significant at 95% level.  
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

At the national level, suicide death 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 2018 (51 percent non-firearm vs. 49 percent firearm), than in 2000 (43 percent non-firearm vs. 57 percent firearm).

From 2000 to 2018, 46 states experienced statistically significant increases in death rates from non-firearm methods, with the largest increase in Idaho (113 percent) (Figure 8).<sup>18</sup> Only Delaware, Hawaii, Nevada, and Wyoming saw no significant changes in their non-firearm suicide rates.<sup>19</sup> In contrast, 28 states experienced statistically significant increases in death rates from firearm methods, with the largest increase in North Dakota and Wyoming (83 percent each). California was the only state to experience a significant decrease in its firearm suicide rate, while the remaining 21 states did not experience statistically significant changes.

**Figure 8. State Changes in Suicide Rate by Method (Firearm, Non-firearm), 2000-2018**

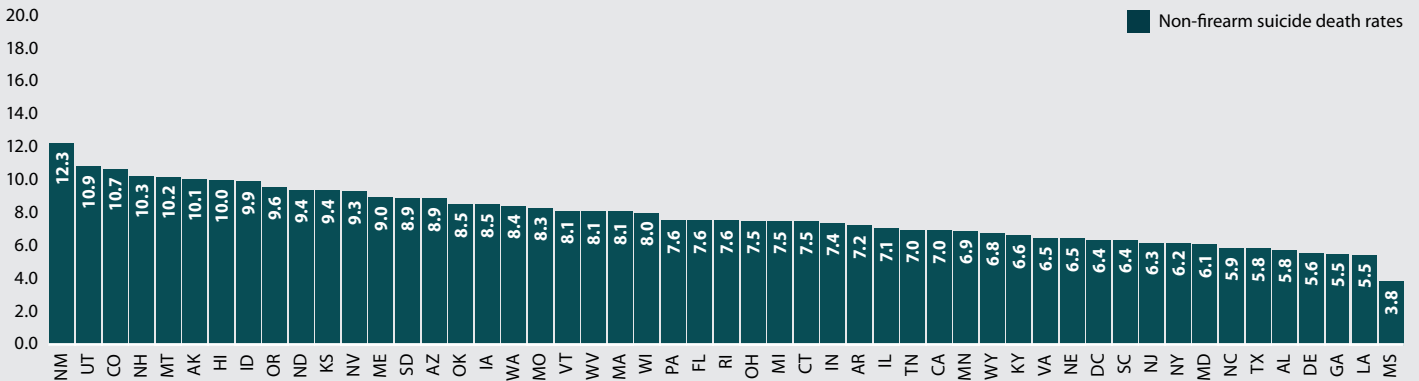


Statistically significant change at 95% level.  
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

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, New Mexico had the highest rate in 2018, at 12.3 deaths per 100,000 people, which was more than triple the lowest rate of 3.8 deaths per 100,000 people in Mississippi (Figure 9).

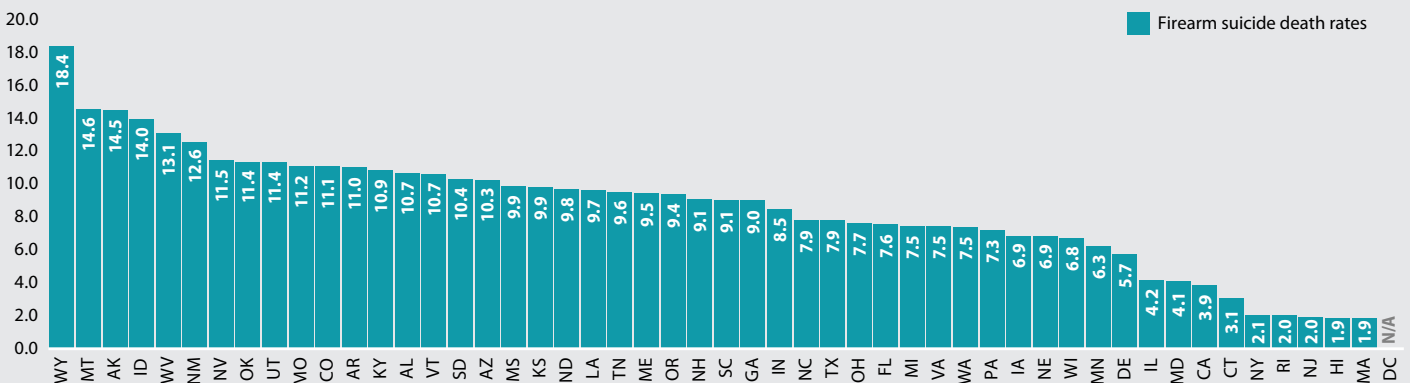
However, the range in suicide death rates by firearm method was substantially larger. In 2018, Wyoming had the highest firearm suicide death rate at 18.4 deaths per 100,000 people, which was almost 10 times the lowest rate of 1.9 deaths per 100,000 people in Hawaii and Massachusetts (Figure 10).

**Figure 9. Non-firearm Suicide Death Rates per 100,000 People, 2018**



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

**Figure 10. Firearm Suicide Death Rates per 100,000 People, 2018**



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 37 percent, from 10.4 to 14.2 per 100,000 in 2018. 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 a few states saw relatively small increases of around 10-20 percent (California, Maryland and North Carolina), other states saw increases of more than 80 percent (District of Columbia, Idaho, New Hampshire, and North Dakota). Additionally, the comparative size of states' suicide rates range widely. For example, Wyoming's suicide death rate of 25.2 per 100,000 people—the highest in 2018—was more than triple the lowest 2018 rate (7.5 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 2018. However, again we see substantial variation in the predominant method of suicide by state. For example, firearms accounted for only 16 percent of suicide deaths in Hawaii but accounted for 73 percent of suicides in Wyoming in 2018.



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 2018 than it was from 2000 to 2009. The state-level data tell a similar story: From 2000 to 2009, 22 states experienced significant increases in suicide death rates, but from 2009 to 2018, 40 states and the District of Columbia experienced significant increases.

Considering the nearly two-decade trend of growth in suicide rates and the evidence indicating that this trend may be accelerating, it is 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 that predominate—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

Planalp, C., & Hest, R., & Au-Yeung, C. (2020). *Suicide Rates on the Rise: [National/State] Trends and Demographics in Suicide Deaths from 2000 to 2018* [PDF file]. Retrieved from <https://www.shadac.org/2020SuicideBriefs>

*Support for this brief was provided by the Robert Wood Johnson Foundation. The views expressed here do not necessarily reflect the views of the Foundation.*

## References

- 1 Xu, J.Q., Murphy, S.L., Kochanek, K.D., & Arias, E. (2016). *Mortality in the United States, 2015* [National Center for Health Statistics Data Brief—No. 267]. Retrieved from <https://www.cdc.gov/nchs/data/databriefs/db267.pdf>
- 2 Stein, R. (2018, December 8). Life Expectancy In U.S. Drops for First Time in Decades, Report Finds. *National Public Radio*. Retrieved from <https://www.npr.org/sections/health-shots/2016/12/08/504667607/life-expectancy-in-u-s-drops-for-first-time-in-decades-report-finds>
- 3 Rogers, K. (2016, December 8). Life Expectancy in U.S. Declines Slightly, and Researchers are Puzzled. *The New York Times*. Available at <https://www.nytimes.com/2016/12/08/health/life-expectancy-us-declines.html>
- 4 Kochanek, K.D., Murphy, S.L., Xu, J.Q., & Arias, E. (2017). *Mortality in the United States, 2016* [National Center for Health Statistics Data Brief—No. 293]. Retrieved from <https://www.cdc.gov/nchs/data/databriefs/db293.pdf>
- 5 Murphy, S.L., Xu, J.Q., Kochanek, K.D., & Arias, E. (2018). *Mortality in the United States, 2017* [National Center for Health Statistics Data Brief—No. 328]. Retrieved from <https://www.cdc.gov/nchs/data/databriefs/db328-h.pdf>
- 6 Xu, J.Q., Murphy, S.L., Kochanek, K.D., & Arias, E. (2016). *Mortality in the United States, 2015* [National Center for Health Statistics Data Brief—No. 267]. Retrieved from <https://www.cdc.gov/nchs/data/databriefs/db267.pdf>
- 7 Kochanek, K.D., Murphy, S.L., Xu, J.Q., & Arias, E. (2017). *Mortality in the United States, 2016* [National Center for Health Statistics Data Brief—No. 293]. Retrieved from <https://www.cdc.gov/nchs/data/databriefs/db293.pdf>
- 8 Murphy, S.L., Xu, J.Q., Kochanek, K.D., & Arias, E. (2018). *Mortality in the United States, 2017* [National Center for Health Statistics Data Brief—No. 328]. Available at: <https://www.cdc.gov/nchs/data/databriefs/db328-h.pdf>
- 9 Case, A., & Deaton, A. (2015, December 8). Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21<sup>st</sup> century. *Proceedings of the National Academy of Sciences of the United States of America*, 112(49), 15078-15083. <https://doi.org/10.1073/pnas.1518393112>
- 10 Case, A., & Deaton, A. (2017). Mortality and Morbidity in the 21<sup>st</sup> Century. *Brookings Papers on Economic Activity*, (Spring 2017), 397-476. Retrieved from <https://www.brookings.edu/wp-content/uploads/2017/08/casetextsp17bpea.pdf>
- 11 Case, A., & Deaton, A. (2017). Mortality and Morbidity in the 21<sup>st</sup> Century. *Brookings Papers on Economic Activity* [PDF file]. Available at: <https://www.brookings.edu/wp-content/uploads/2017/08/casetextsp17bpea.pdf>
- 12 Planalp, C., Hest, R., & Lahr, M. (2019). *The Opioid Epidemic: National Trends in Opioid-Related Overdose Deaths from 2000 to 2017* [PDF file]. Retrieved from <https://www.shadac.org/publications/opioid-epidemic-national-and-state-trends-opioid-related-overdose-deaths-2000-2017>

13 Planalp, C., Hest, R., & Lahr, M. (2019). *The Opioid Epidemic: State Trends in Opioid-Related Overdose Deaths from 2000 to 2017* [PDF file]. Retrieved from <https://www.shadac.org/publications/opioid-epidemic-national-and-state-trends-opioid-related-overdose-deaths-2000-2017>

14 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 rate increased about 70 percent from 2000 to 2001, while its rate decreased about 40 percent from 2008 to 2009.

15 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.

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

17 Statistical testing for differences between the District of Columbia's 2018 firearm and non-firearm suicide rates was not possible because the 2018 firearm rate was suppressed due to a small number of deaths.

18 Only Delaware, Hawaii, Nevada, and Wyoming did not experience statistically significant increases 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.

19 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 the District of Columbia's firearm suicide rate because its 2000 and 2018 rates were suppressed due to a small number of deaths.