



Escalating Alcohol-Involved Death Rates: Trends and Variation across the Nation and in the States from 2006 to 2019

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SUMMARY

This brief draws on CDC vital statistics data to present trends and variations in alcohol-related death rates across the nation, among the states, and by subpopulation breakdowns from 2006 to 2019. The brief paints a picture of the current landscape of alcohol-related deaths—highlighting geographic areas and demographic groups that warrant particular attention.

An accompanying set of 50-state infographics present trends in state-level alcohol-involved death rates from 2000-2019, show how each state's 2019 rate compares to the national average, and provide a glimpse into how 2019 alcohol-involved death rates and opioid overdose death rates compare in each state.

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INTRODUCTION

In the midst of the opioid epidemic, the United States has been quietly experiencing another mounting public health crisis as deaths involving alcohol have grown to historic highs. After years of stability, the rate of alcohol-related deaths began to increase in 2007, and has increased significantly almost every year since—growing to over 39,000 in 2019 alone.

Because alcohol can cause or contribute to a broad range of acute and chronic diseases, it is difficult to accurately account for all deaths in which alcohol plays a role. However, a limited group of conditions can be more definitively tied to alcohol use, such as a set of conditions—including alcoholic liver disease and alcohol poisoning—that the U.S. Centers for Disease Control and Prevention (CDC) considers to be “100% alcohol-attributable.”¹ Even a conservative estimate that only includes those deaths that are fully attributable to alcohol by this CDC definition finds 10.4 deaths per 100,000 people in 2019—a 49 percent increase over the rate of 7.0 deaths per 100,000 in 2006.

For our own analysis, we used a narrow definition of “alcohol-involved” deaths based on (but not solely defined by) the CDC’s list of causes it considers 100 percent attributable to alcohol, and we still identified a staggering number of fatalities at roughly 414,000 alcohol-involved deaths since 2006. Of those, 88,000 deaths stemmed from the increase in alcohol-involved death rates—representing 88,000 lives that may have been preserved if alcohol-involved deaths had held steady at 2006 rates.

The following brief describes trends and variation in alcohol-involved death rates at the state and national levels, and among demographic subgroups, using the CDC’s vital statistics data from 2006 to 2019. Except in the section on alcohol-involved death rates by age groups, our analysis uses age-adjusted rates.

Identifying alcohol-involved deaths

There is conflicting evidence on whether moderate alcohol consumption may have health benefits, but research has consistently demonstrated clear links between heavy drinking and binge drinking and numerous acute and chronic health conditions, such as alcoholic hepatitis and cirrhosis (liver diseases), several types of cancer, and alcohol-related injuries.^{2,3} Additionally, CDC research has found that more than 95,000 people die annually due to excessive alcohol consumption.⁴

HIGH-RISK DRINKING

Medical research has consistently demonstrated that high-risk patterns of alcohol consumption, such as binge drinking and heavy drinking, are associated with serious health risks.

BINGE DRINKING

Consuming enough alcohol to raise a one’s blood alcohol concentration (BAC) to 0.08 g/dl or above; a rate of roughly four or more drinks for women, and five or more drinks for men, within two hours.

HEAVY DRINKING

Consuming eight or more drinks per week for women, and 15 or more drinks per week for men.

Despite the links between alcohol and health, it can be difficult to conclusively determine from vital statistics records whether or not an individual death caused by certain health conditions was attributable to alcohol or to other origins. For instance, while fatal liver disease may be caused by alcohol use, it also could be caused by a viral infection or complications of obesity.

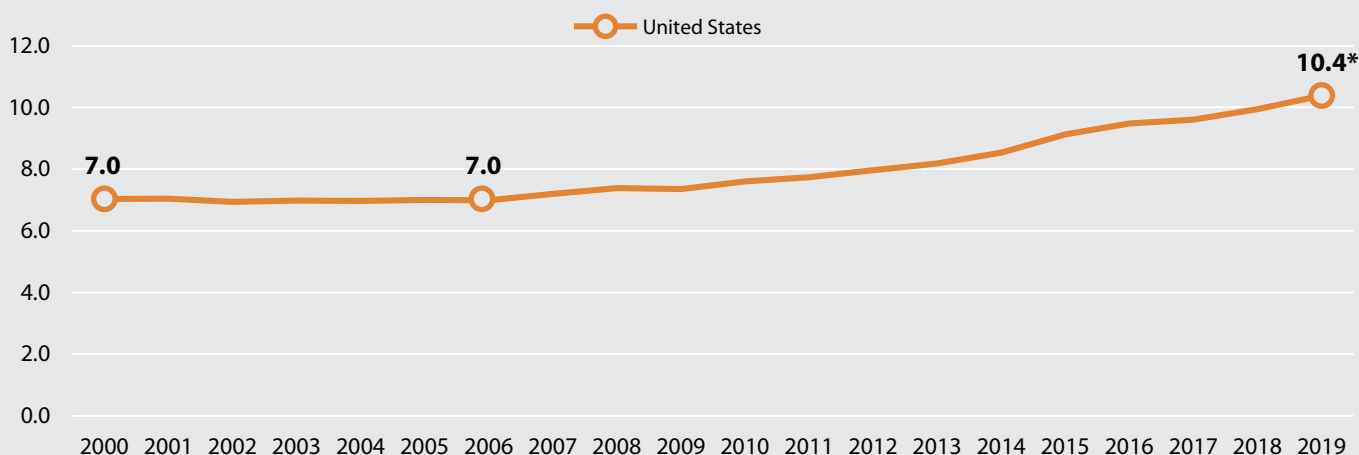
Because of the difficulty in conclusively determining whether a death is attributable to alcohol, our study takes a conservative approach to defining alcohol-involved deaths. Using data from the National Vital Statistics System's (NVSS) multiple cause of death mortality files, our analysis focuses on a limited set of health conditions considered by the CDC to be 100 percent attributable to alcohol as the primary cause of death.⁵ Additionally, we only include deaths in which an alcohol-attributable cause was listed as the "underlying cause of death" (i.e., the direct cause), rather than including deaths in which an alcohol-attributable cause was listed as a "multiple cause of death" (i.e., a contributing cause).

Although this narrower approach necessarily leaves out many deaths caused by alcohol—such as alcohol-involved motor vehicle accidents, and some health conditions, such as cirrhosis—it allows us to ensure that the death rate increases we found are more definitively associated with alcohol use. This aggregate category of deaths that are 100 percent attributable to alcohol, which we call "alcohol-involved deaths," includes deaths from chronic conditions driven by long-term alcohol use (e.g., alcoholic cardiomyopathy, alcoholic hepatitis and cirrhosis, alcohol-induced pancreatitis), as well as acute causes of death (e.g., alcohol poisoning).^{6,7,8}

National Alcohol Death Trends

From 2000 to 2019, death rates from alcohol-involved causes increased significantly.⁹ A closer analysis of year-by-year data shows that alcohol-involved death rates remained stable at 7.0 deaths per 100,000 people from 2000 to 2006, only breaking that trend and beginning to increase significantly in 2007 (Figure 1). For that reason, our analysis uses alcohol-involved death rates from 2006 as our baseline for comparison.

Figure 1. U.S. alcohol-involved death rates, 2000-2019



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

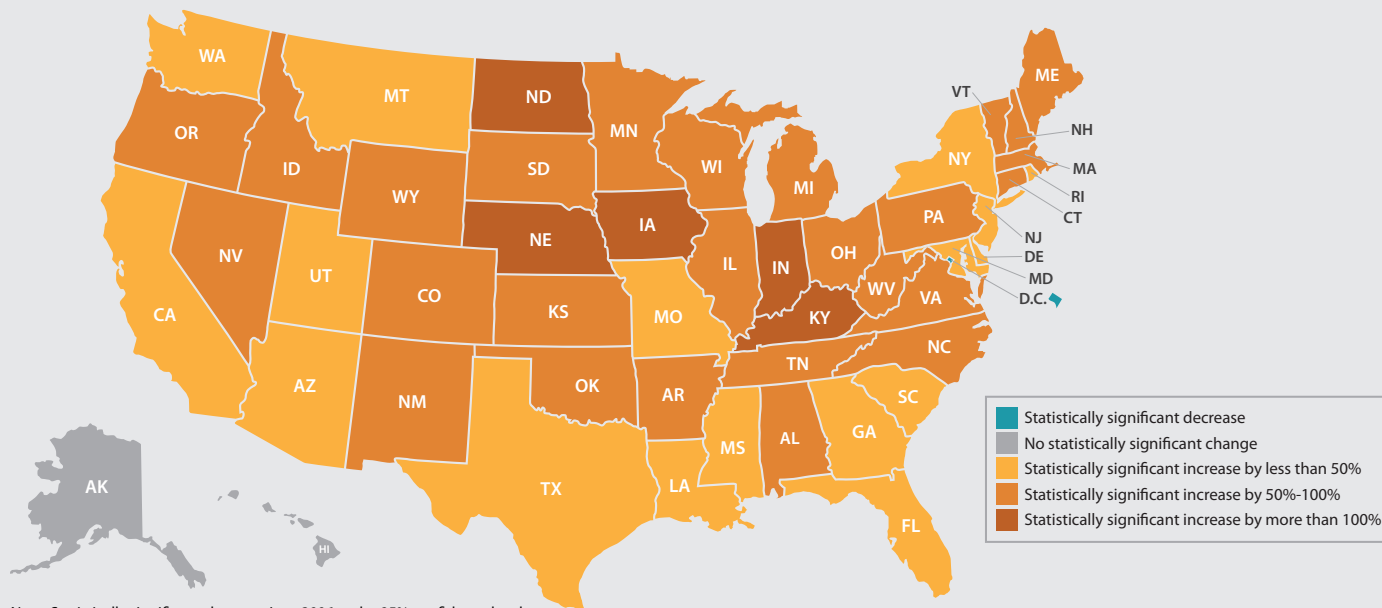
After years of stability, deaths from alcohol-involved causes increased significantly beginning in 2007 and continued to grow through the end of our study period in 2019. Since 2006, death rates from alcohol-related causes increased in 11 out of 13 years, gradually increasing by 49 percent, from 7.0 deaths per 100,000 people in 2006 to 10.4 deaths per 100,000 people in 2019.¹⁰ These increases are consistent with previous research, which also found increases in all-cause alcohol-involved deaths in the U.S.^{11,12} Previous research also has shown that rates of binge drinking and heavy drinking increased in the U.S. around this same time period—consumption behaviors that can lead to alcohol-involved deaths.^{13,14,15}

Trends in Alcohol Deaths by State

From 2006 to 2019, death rates from alcohol-involved causes increased significantly in nearly all states, with 48 states seeing increases during this time. Only two states (Alaska and Hawaii) had statistically unchanged rates, while the District of Columbia saw a statistically significant decline in alcohol-involved death rates.

Among the 48 states that experienced significant increases in their alcohol-involved death rates, the size of those increases ranged widely, from a relatively small increase of 11 percent in California (from 11.0 deaths per 100,000 people in 2006 to 12.2 deaths per 100,000 in 2019) to the largest increase of 126 percent in Nebraska (from 5.8 deaths per 100,000 people in 2006 to 13.0 deaths per 100,000 in 2019). In addition to Nebraska, four other states—Indiana, Iowa, Kentucky, and North Dakota—saw their alcohol-involved death rates more than double between 2006 and 2019.

Figure 2. State alcohol-involved death rate changes, 2006-2019



Note: Statistically significant changes since 2006 at the 95% confidence level.
Source: SHADAC analysis of vital statistics data from the CDC WONDER system.

Variation in Alcohol Death Rates by State

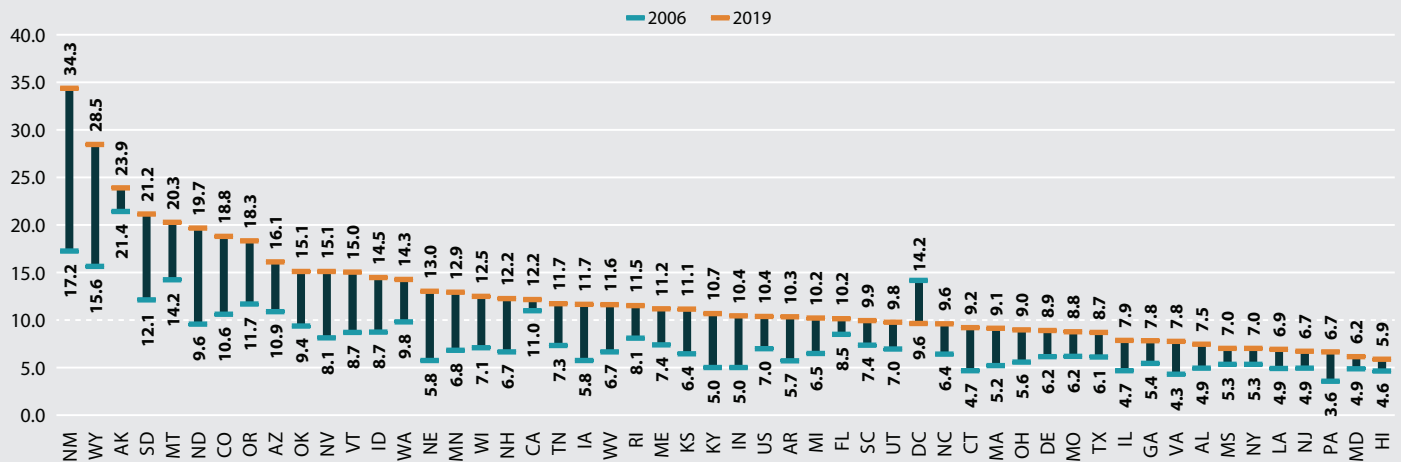
Although almost all states experienced statistically significant increases in alcohol-involved deaths since 2006, there was wide variation in death rates across the states. For instance, in 2019, New Mexico had the highest death rate from alcohol-involved causes, at 34.3 deaths per 100,000 people, which was nearly six times the lowest rate of 5.9 deaths per 100,000 people in Hawaii (Figure 3).

Figure 3. Five highest and lowest state alcohol-involved death rates, 2019

States with the 5 highest death rates per 100,000 people		States with the 5 lowest death rates per 100,000 people	
New Mexico	34.3	Hawaii	5.9
Wyoming	28.5	Maryland	6.2
Alaska	23.9	Pennsylvania & New Jersey	6.7
South Dakota	21.2	Louisiana	6.9
Montana	20.3	Mississippi & New York	7.0

By 2019, 30 states had alcohol-involved death rates in the double digits, compared with only 10 states that had double-digit death rates in 2006. In addition to New Mexico, four other states had alcohol-involved death rates of more than 20 deaths per 100,000 people in 2019. In contrast, only one state had an alcohol-involved death rate higher than 20 deaths per 100,000 people in 2006 (Alaska with a rate of 21.4 deaths per 100,000 people) (Figure 4).

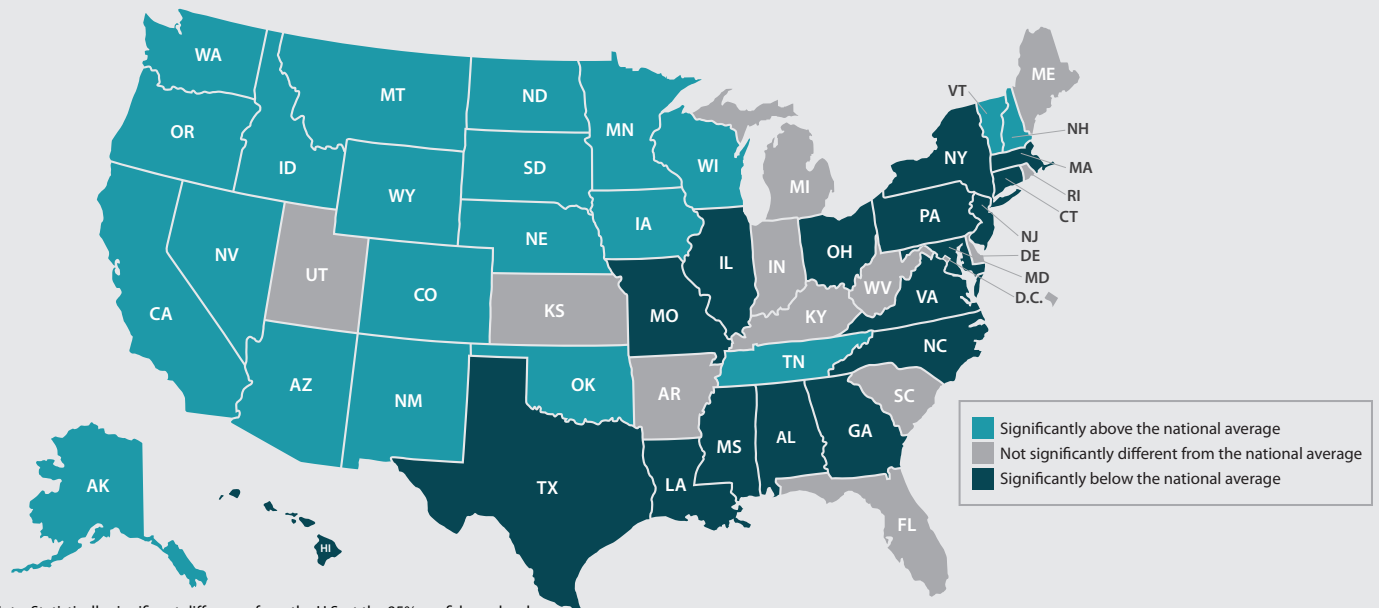
Figure 4. State alcohol-involved death rates, 2006-2019



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

A map of state alcohol-involved death rates compared to the U.S. rate illustrates a regional pattern, with the highest death rates largely found in the western portion of the country. Of the 21 states with alcohol-involved death rates that were significantly higher than the U.S. rate of 10.4 deaths per 100,000 people in 2019, all but four (New Hampshire, Tennessee, Vermont, and Wisconsin) were found west of the Mississippi River (see Figure 5). Additionally, only four states west of the Mississippi (Hawaii, Louisiana, Missouri, and Texas) had alcohol-involved death rates that were significantly lower than the U.S. rate.

Figure 5. State alcohol-involved death rates per 100,000 compared to the U.S. rate, 2019



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

U.S. Alcohol Deaths by Race and Ethnicity

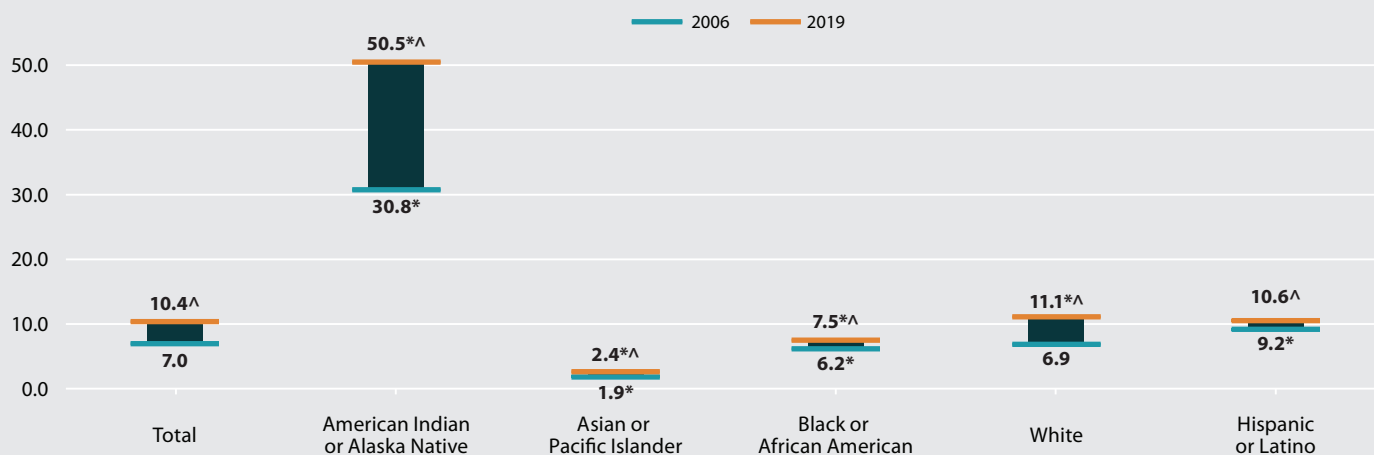
Between 2006 and 2019, all racial and ethnic groups that we examined experienced statistically significant increases in their alcohol-involved death rates. However, there was still wide variation in alcohol-involved death rate patterns between them.

In 2019, American Indian and Alaska Native people had the highest total alcohol-involved death rate, at 50.5 deaths per 100,000 people, which was significantly above—in fact, nearly five times higher than—the overall population rate of 10.4 deaths per 100,000 people (Figure 6). The 2019 rate for American Indian and Alaska Native people was also 64 percent higher than their 2006 rate of 30.8 deaths per 100,000 people, representing the largest increase among racial and ethnic groups.

White people had the second-highest alcohol-involved death rate in 2019, at 11.1 deaths per 100,000 people, which was significantly higher than the overall population rate. Their rate has increased 61 percent since 2006 (when the rate was 6.9 deaths per 100,000 people), which was the second largest increase among racial and ethnic groups.

Asian and Pacific Islander people had the lowest alcohol-involved death rate among racial and ethnic groups in 2019 at 2.4 deaths per 100,000 people, which was also significantly below the overall population rate and was approximately one quarter of the U.S. rate of 10.4 per 100,000 people. However the rate for Asian and Pacific Islanders has still risen by 29 percent since 2006 (when it was 1.9 deaths per 100,000 people) and was the third-highest increase among the racial and ethnic groups we examined.

Figure 6. U.S. alcohol-involved death rates by race/ethnicity, 2006 and 2019



* Statistically significant difference from total rate at 95% level.

[^] Statistically significant increase from 2006 rate at 95% level.

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

The alcohol-involved death rate for Latino people in 2019, at 10.6 per 100,000 people, was not significantly different from the overall population rate (10.4 deaths per 100,000 people). While their rate did increase significantly between 2006 and 2019, growing 14% from a 2006 alcohol-involved death rate of 9.2 deaths per 100,000 people, this was the smallest increase among racial and ethnic groups.

At 7.5 deaths per 100,000 people, Black people had the second-lowest alcohol-involved death rate in 2019, and it was significantly lower than the overall population rate of 10.4 deaths per 100,000 people. Additionally, the alcohol-involved death rate among Black people increased 22 percent from 2006 to 2019, which was the second-smallest increase among racial and ethnic groups.

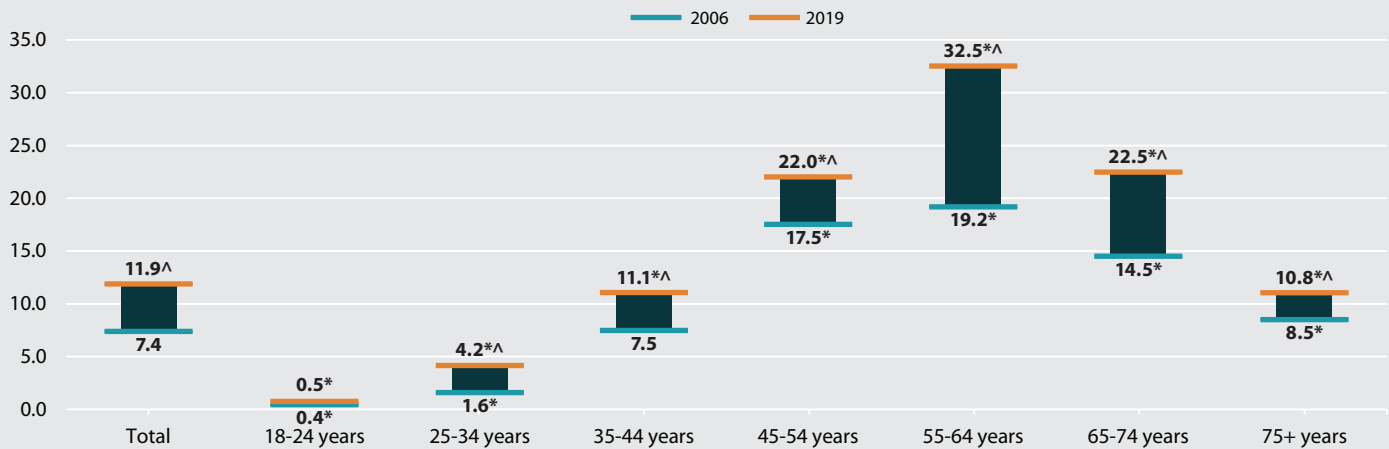
U.S. Alcohol Deaths by Age

Since 2006, nearly all age categories of U.S. adults have experienced statistically significant increases in alcohol-involved death rates. The only exception was young adults (age 18-24), whose rate remained statistically unchanged. Our analysis also found that some groups experienced particularly large increases in alcohol-involved death rates, and that alcohol-involved death rates ranged widely. It is important to note that unlike the rest of our analysis, which uses age-adjusted death rates, this section uses “crude” rates that are not age-adjusted, as age-adjusted rates cannot be used when analyzing death rates by age groups.¹⁶

In 2019, the U.S. unadjusted alcohol-involved death rate was 11.9 deaths per 100,000 people. Adults age 55-64 held the largest alcohol-involved death rate among age categories in 2019, at 32.5 deaths per 100,000 (Figure 7). This rate was almost three times as high as the overall population rate—a difference that was statistically significant. Adults age 55-64 also saw the second-highest increase their alcohol involved death rate among age groups, with their rate growing 70 percent after 2006, at which time their rate was 19.2 deaths per 100,000.

Although adults age 25-34 had the second-lowest alcohol-involved death rate in 2019 (4.2 deaths per 100,000 people), their death rate increase of 158 percent (more than doubling) was the largest increase of any age category, up from 1.6 deaths per 100,000 people in 2006.

Figure 7. U.S. alcohol-involved death rates by age, 2006 and 2019



* Statistically significant difference from total rate at 95% level.

[^] Statistically significant increase from 2006 rate at 95% level.

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

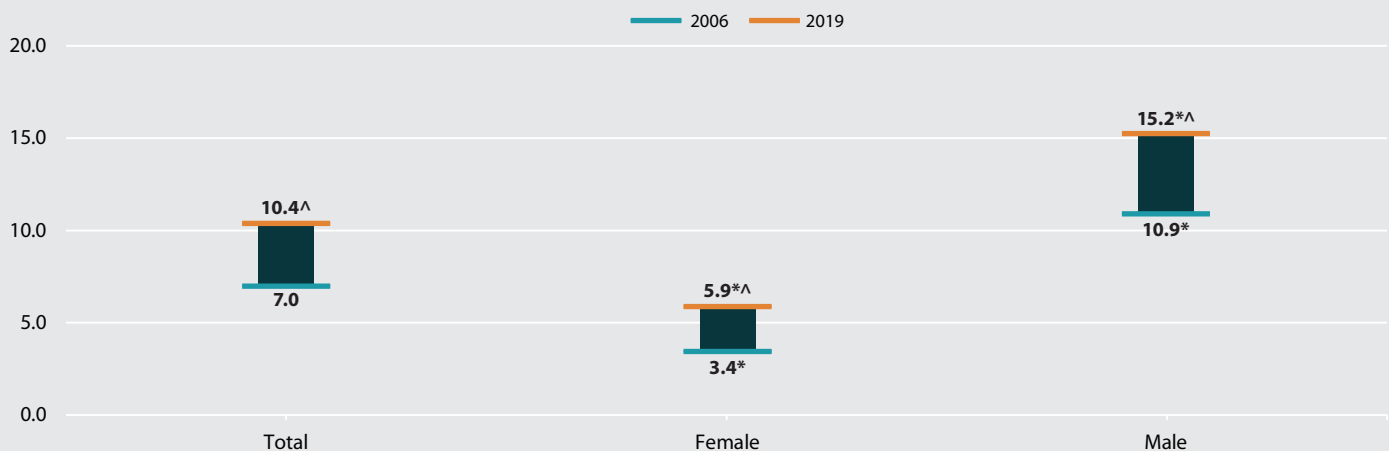
Young adults age 18-24 were the only age group not to experience a significant change in their rate of alcohol-involved deaths, remaining statistically unchanged since 2006. Their rate of 0.5 deaths also was the lowest of all age groups, and it was roughly 25 times smaller than the overall population rate.^{17,18,19,20}

U.S. Alcohol Deaths by Sex

From 2006 to 2019, death rates from alcohol-involved causes have been consistently higher among males than females. Although both male and female alcohol-involved death rates have increased significantly since 2006, females have been gradually closing the gender gap in alcohol deaths due to higher rates of increase than males.

In 2019, males' rate of alcohol-related deaths was 15.2 deaths per 100,000 people, which was significantly higher than the overall population rate of 10.4 deaths per 100,000 people (Figure 8). Females' death rate from alcohol-involved causes in 2019 was 5.9 deaths per 100,000 people, which was significantly lower than the overall population rate.

Figure 8. U.S. alcohol-involved death rates by sex, 2006 and 2019



* Statistically significant difference from total rate at 95% level.

[^] Statistically significant increase from 2006 rate at 95% level.

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

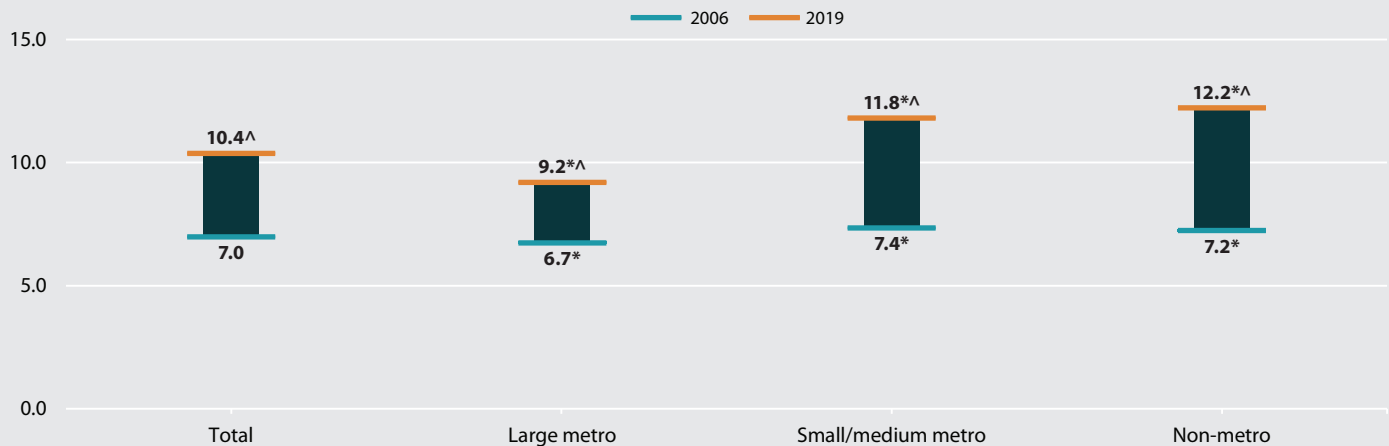
Over time, however, females' alcohol-involved death rates have gradually crept closer to males' rates. The alcohol-involved death rate for females was only 30 percent of the rate for males in 2006, but the female rate reached 40 percent of the male rate by 2019.

Alcohol Deaths by Urbanization

Although alcohol-involved death rates have increased significantly across all levels of urbanization since 2006, the trend has been more severe among people in non-metro (i.e., rural) areas and small/medium metropolitan areas, rather than large metros.

In 2019, rural areas had the highest alcohol-involved death rate, at 12.2 deaths per 100,000 people, which was significantly higher than the overall population rate of 10.4 deaths per 100,000 (Figure 9). The death rate for small/medium metro areas was in the middle in 2019, at 11.8 deaths per 100,000 people—though also significantly higher than the overall population rate. Large metro areas had the lowest alcohol-involved death rate in 2019, at 9.2 deaths per 100,000 people, which was significantly lower than the overall population rate of 10.4 deaths per 100,000.

Figure 9. U.S. alcohol-involved death rates by metropolitan area, 2006 and 2019



* Statistically significant difference from total rate at 95% level.

[^] Statistically significant increase from 2006 rate at 95% level.

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

The variation in alcohol-involved death rates in 2019 across levels of urbanization is due to differences in rates of increase. While alcohol-involved death rates were relatively close in rural areas, small/medium metros, and large metros in 2000 (7.2, 7.4, and 6.7 deaths per 100,000 people, respectively), the increase for rural areas (69 percent) was nearly double the increase for large metros (36 percent), and the increase for small/medium metros (61 percent) was similarly higher than the increase for large metros.

CONCLUSIONS AND DISCUSSION

Though opioids have dominated the national discourse around substance use and drug policy in recent years, our examination of mortality data demonstrates that alcohol also poses a serious and growing threat to health in the United States. From 2006 to 2019, the U.S. recorded approximately 416,000 opioid overdose deaths, compared to 414,000 total alcohol-involved deaths, based on our narrow definition of alcohol deaths. Those data illustrate that alcohol-involved deaths are a public health problem on par with the opioid crisis.

At the state level, our analysis found that 48 have experienced statistically significant increases in their total alcohol-involved death rates since 2006. However, increases in state alcohol-involved death rates ranged widely, from a relatively small 11 percent increase in California to a dramatic 126 percent increase in Nebraska.

We also found wide variation in death rates across the states in 2018, from a low of 5.9 alcohol-involved deaths per 100,000 people in Hawaii to 34.3 deaths per 100,000 people in New Mexico in 2019. A map of alcohol-involved death rates demonstrated a distinct geographic pattern, with almost all of the states with high death rates found in the western U.S.—a pattern near-opposite to opioid overdose death rates, which are generally highest in the eastern U.S.²¹

Further illustrating the scale of alcohol-involved deaths, we conducted a parallel analysis to this report which found that 21 states had alcohol-involved death rates that were as high as or even significantly higher than their opioid overdose death rates in 2019.²² This finding highlights the need to consider prevention and treatment of alcohol use disorder—and efforts to reduce other risky drinking behaviors—in addition to continuing with determined efforts to address the ongoing opioid crisis.

Our analysis also examined U.S. demographic subgroups, finding that nearly every group we examined has experienced statistically significant increases in alcohol-involved death rates. These findings are consistent with work by other research finding widespread increases in alcohol-involved deaths across demographic subgroups, including sex, age, urbanization, and race and ethnicity.^{23,24} However, we found that some demographic groups have been particularly affected by the surge in alcohol-involved deaths, with death rates that grew by more than 50 percent in just over a decade. For instance, adults age 25-34 experienced the largest growth in alcohol-involved death rates of any subgroup, with an increase of 158 percent. They were followed by adults age 55-64 and 65-74, whose rates increased 70 percent and 55 percent, respectively. American Indian and Alaska Native people saw their rate of alcohol-involved deaths grow 64 percent, and the rate for White people increased by 61 percent. Similarly, increases in alcohol-involved death rates were comparatively high in non-urban (i.e., rural) areas and small/medium metropolitan communities, increasing by 69 percent and 61 percent, respectively. And females' alcohol-involved death rate increased by 71 percent.

While the increases in alcohol-involved deaths in this analysis are startling and disturbing, it will remain important to monitor alcohol-involved death rates in coming years. Most of the alcohol-involved causes of death stem from chronic diseases associated with long-term alcohol use, conditions that typically cause years or decades to develop and result in deaths, so it seems likely that trends begun over the past decade may persist as health effects of risky alcohol consumption accumulate. Additionally, there is reason to worry that the nation's health toll from alcohol could further worsen amidst the fallout of the COVID-19 pandemic. Research has shown a great deal of growth in alcohol consumption and high-risk drinking behaviors as the course of the pandemic, with its attendant stressors, has progressed, potentially adding more fuel to the fire.^{25,26,27}

Suggested citation

Planalp, C., Au-Yeung, C., & Winkelman, T. (2021). *Escalating Alcohol-Involved Death Rates: Trends and Variation across the Nation and in the States from 2006 to 2019*. State Health Access Data Assistance Center (SHADAC). <https://www.shadac.org/publications/state-national-alcohol-involved-death-rates-2006-2019>

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⁶ Because our analysis focuses exclusively on adults, we accordingly exclude fetal and newborn deaths caused by alcohol, even though the CDC considers certain fetal and newborn deaths to be 100 percent attributable to alcohol. Our analysis also excluded a relatively small number of deaths due to a seldom-used underlying cause of death code (R78.0) for "excessive blood level of alcohol." Additionally, consistent with our conservative approach of focusing on deaths 100 percent attributable to alcohol, we excluded deaths due to the multiple cause of death codes (T51.0) for "toxic effect of ethanol," (T51.1) for "toxic effect of methanol," and T51.9 for "toxic effect of unspecified alcohol" because of research finding these codes are frequently secondary to other underlying causes of death (e.g., drowning).

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- ⁹ From 2000 to 2019, alcohol-involved death rates increased 49 percent, from 7.0 to 10.4 deaths per 100,000 people.
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- ¹⁶ For our analysis, we use age-adjusted rates where possible because alcohol-involved deaths range widely by age. The age profile of the U.S. population has changed over time, and states have different age profiles, so age-adjusted rates can be used to reconcile those differences.
- ¹⁷ Their relatively low alcohol-involved death rate and absence of a statistically significant increase in total alcohol-involved deaths for young adults age 18-24 may be partially a factor of time. Most of the alcohol-involved causes of death in our analysis are chronic diseases, typically caused by years of binge or heavy drinking, but the age of younger adults means they've had less time to develop chronic conditions associated with long-term alcohol abuse.
- ¹⁸ It may seem surprising that young adults have such low alcohol-involved death rates compared to other age groups, but the finding is similar to other contemporary public health crises: Young adults also have relatively low death rates from suicide and drug overdoses, including opioids.
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