



Pain in the Nation Update:

WHILE DEATHS FROM ALCOHOL, DRUGS, AND SUICIDE SLOWED SLIGHTLY IN 2017, RATES ARE STILL AT HISTORIC HIGHS

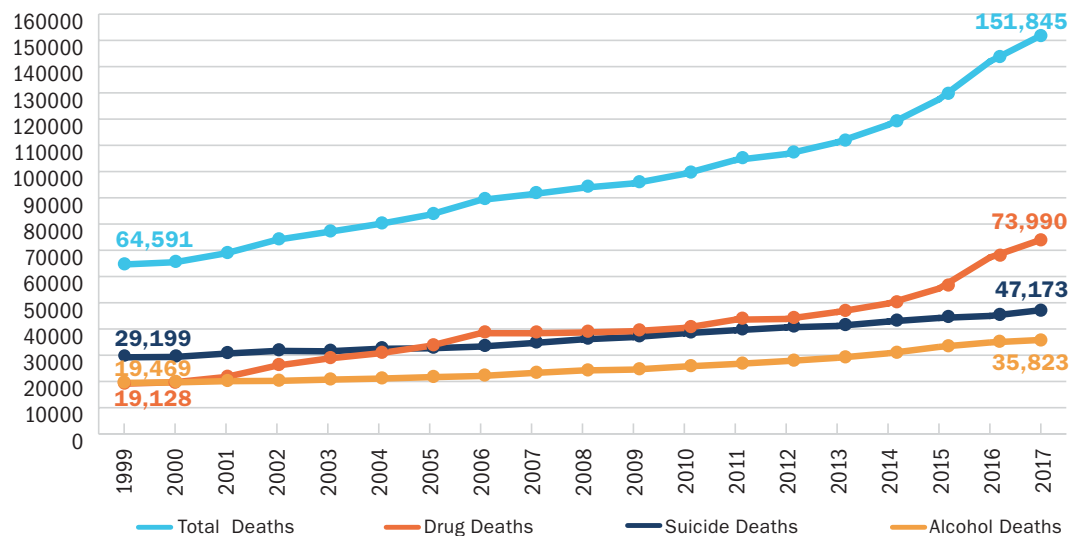
Deaths from Synthetic Opioids Continue to Rise Sharply and Suicides Are Growing at the Fastest Pace in Years

More than 150,000 Americans died from alcohol- and drug-induced causes and suicide in 2017 — more than twice as many as in 1999 — according to a new analysis by Trust for America's Health (TFAH) and Well Being Trust (WBT) of mortality data from the U.S. Centers for Disease Control and Prevention (CDC).¹

From 2016 to 2017, the combined death rate for alcohol, drug, and suicide increased 6 percent, from 43.9 to 46.6 deaths per 100,000 people.

While at historically high levels, the increase is lower than the prior two years, when there were 11 percent and 7 percent rises for 2015 to 2016 and 2014 to 2015, respectively.

Annual Deaths from Alcohol, Drugs, and Suicide in the United States, 1999–2017



Source: Trust for America's Health and Well Being Trust analysis of data from National Center For Health Statistics, CDC

The trends are worse for certain groups of Americans and in certain areas:

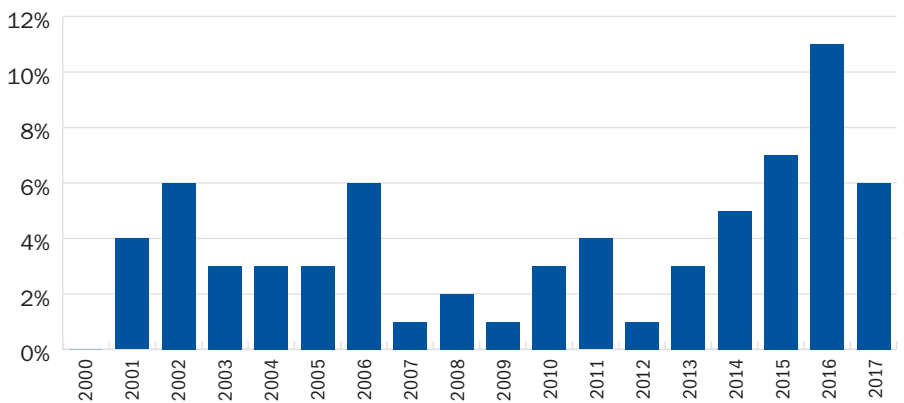
- **Among those age 35-54**, the rate of death by alcohol, drug, and suicide was 72.4 per 100,000.
- **For all males**, the rate was 68.2 deaths per 100,000.
- **Regionally**, 91 West Virginia residents and 77 New Mexico residents per 100,000 died from alcohol, drugs, and suicide. On the low end, 31.5 Texas residents and 34.1 Mississippi residents per 100,000 died from alcohol, drugs, and suicide.

Increasing Suicide Rate

The United States also saw deaths from suicide increase more than it has since 1999, rising 4 percent between 2016 and 2017 (from 13.9 to 14.5 deaths per 100,000). Over the past decade (2008–2017), suicide rates increased 22 percent. The analysis finds that:

- The increases in deaths by suicide over the past decade (2008–2017) were driven by increases in suicides by suffocation/hanging (42 percent increase) and firearms (22 percent increase). Poisoning/overdose and other methods of suicide remained steady.
- These increases were geographically widespread but proportionally higher among younger people (particularly adolescents), Blacks, and Latinos. Absolute suicide rates remained highest among males, Whites, and those living in rural areas.

Percent Increase in Annual Rate of Death from Alcohol, Drugs, and Suicide, 2000–2017



Source: Trust for America's Health and Well Being Trust analysis of data from National Center For Health Statistics, CDC

Synthetic Opioids

Synthetic-opioid deaths increased 10-fold over the prior five years, including a 45 percent climb between 2016 and 2017.² In fact, Americans are now dying at a faster rate from overdoses involving synthetic opioids than they did from all drugs in 1999 (8.7 synthetic-opioid deaths per 100,000 in 2017 versus 6.9 drug deaths per 100,000 in 1999). In addition, the analysis found that:

- Populations dying from synthetic opioids were somewhat different from the populations affected by other types of opioids, which were more predominant in the opioid epidemic earlier in this decade. In 2017, synthetic-opioid deaths were highest among males, Blacks, Whites, adults ages 18–54, and those living in urban areas while the populations affected earlier in the decade trended comparatively more White, older, and rural.

- Synthetic-opioid deaths were concentrated in the Northeast and Midwest, while the West had relatively low rates.³

Over the past two years, TFAH and WBT have released a series of Pain in the Nation reports that track the dire consequences of America's alcohol, drug, and suicide epidemics; share promising practices and policy solutions; and call on the nation to come together to support comprehensive prevention policies and a National Resilience Strategy to forestall future crises.

This brief, the latest in the series, covers the most recent developments in the synthetic-opioid crisis; the escalating rise in suicides; and the continued long-term climb in deaths by alcohol, drug, and suicide across demographic groups and geography based on CDC mortality data. This brief also highlights key recommendations to stem the current epidemic and avert future crises.⁴

Change in Synthetic Opioid Deaths per 100,000 2016 – 2017 and 2012 – 2017

45%
2016-2017

**10X
Higher**
2012-2017

WHAT ARE OPIOIDS AND SYNTHETIC OPIOIDS?

Opioids are a class of drug that have chemical compounds similar to opium poppies and interact with nerve cells to reduce pain and produce feelings of euphoria.⁵ Natural opioids are sourced from opium poppies, semisynthetic opioids are synthesized from naturally occurring opium, and synthetic opioids are made entirely in a lab.⁶

Regular opioid use can lead to dependence, and misuse can lead to overdose.⁷ Common prescription opioid drugs were the primary drivers of the opioid epidemic when it began a couple of decades ago. In 2009, however, the crisis moved toward more potent and illicit opioids: first heroin and then, in 2013, synthetic opioids.

The most common types of opioids include:

- **Natural/semisynthetic opioids** include the most common prescription opioids like codeine, hydrocodone (including Vicodin), oxycodone (including OxyContin and Percocet), and morphine.
- **Heroin** is an illicit semi-synthetic opioid that is twice as potent as morphine.
- **Synthetic opioids**, including fentanyl and carfentanil, are extremely potent opioids. Fentanyl is a medication that is 50-100 times as potent as morphine and most frequently used in anesthesia. Carfentanil is 10,000 times as potent as morphine and is used as a tranquilizer for large animals (such as elephants). Fentanyl and carfentanil, as well as their analogs, are also produced illicitly for recreational purposes and are extremely dangerous, proving deadly in miniscule amounts.^{8,9}
- **Methadone** is a medication used to treat individuals with opioid use disorders; it reduces withdrawal symptoms and cravings, and blocks highs from other opioids. Methadone is a type of synthetic opioid, but is typically grouped separately from other synthetic opioids (including in this report) because it is an effective treatment for opioid misuse.

Key Trends in 2017: Deaths from Synthetic Opioids and Suicide

In 2017, life expectancy decreased in the United States for the third year in a row.¹⁰ This was, in part, due to increases in death rates for alcohol, drugs, and suicide. The increases in deaths from synthetic-opioid overdoses and suicide in 2017 were particularly alarming.

Fentanyl and Synthetic Opioids

Two decades ago, fentanyl and synthetic opioids were associated with less than 10 percent of all drug deaths and resulted in fewer than 1,000 annual deaths nationwide.

In 2017, more than 1,000 Americans died from synthetic-opioid overdoses every two weeks (an average of 547

opioid overdose deaths per week), and overdoses were associated with 38 percent of all drug deaths. These increases happened almost entirely in the past few years, with mortality rates from synthetic opioids jumping in five years from less than one death per 100,000 in 2012 to 8.7 deaths per 100,000 in 2017.

OPIOID AND SYNTHETIC OPIOID DEATHS PER 100,000 AND PERCENT OF DRUG DEATHS INVOLVING OPIOID AND SYNTHETIC OPIOIDS, IN 1999, 2007, 2016, AND 2017

	Opioid Deaths								Synthetic Opioid Deaths							
	1999		2007		2016		2017		1999		2007		2016		2017	
	Deaths Per 100,000	% of Drug Deaths	Deaths Per 100,000	% of Drug Deaths	Deaths Per 100,000	% of Drug Deaths	Deaths Per 100,000	% of Drug Deaths	Deaths Per 100,000	% of Drug Deaths	Deaths Per 100,000	% of Drug Deaths	Deaths Per 100,000	% of Drug Deaths	Deaths Per 100,000	% of Drug Deaths
Overall	2.9	42%	6.1	48%	13.1	63%	14.6	64%	0.3	<10%	0.7	<10%	6.0	29%	8.7	38%
Female	1.4	33%	4.3	45%	8.4	59%	9.2	61%	0.2	<10%	0.7	<10%	3.4	24%	4.8	34%
Male	4.4	46%	8.1	50%	17.9	65%	20.2	66%	0.3	<10%	0.8	<10%	8.7	31%	12.8	42%
Asian	0.3	21%	0.6	28%	1.7	46%	1.8	44%	<0.1	<10%	<0.1	<10%	0.7	19%	1.0	24%
Black	3.2	38%	3.3	45%	10.0	59%	12.3	61%	0.1	<10%	0.2	<10%	5.5	31%	8.6	41%
Latino	3.1	54%	2.9	50%	6.0	62%	6.7	62%	0.1	<10%	0.2	<10%	2.6	27%	3.7	34%
White	3.0	43%	7.0	50%	14.6	64%	16.2	66%	0.3	<10%	0.9	<10%	6.6	29%	9.5	39%
0-17	0.1	34%	0.4	38%	0.3	61%	0.2	52%	<0.1	<10%	<0.1	<10%	0.1	20%	0.1	24%
18-34	3.3	46%	8.4	56%	20.4	72%	22.6	73%	0.2	<10%	0.8	<10%	10.6	37%	15.1	49%
35-54	6.4	45%	11.7	47%	22.6	62%	25.7	64%	0.6	<10%	1.5	<10%	10.4	29%	15.4	38%
55-74	1.1	26%	4.0	40%	10.7	53%	12.0	55%	0.2	<10%	0.6	<10%	3.7	18%	5.6	26%
75+	0.4	10%	0.8	19%	1.1	24%	1.3	28%	0.1	<10%	0.2	<10%	0.2	<10%	0.3	<10%
Northeast	3.5	47%	5.7	48%	18.9	69%	20.9	69%	0.2	<10%	0.7	<10%	11.5	42%	15.7	52%
Midwest	1.7	34%	5.1	44%	15.8	70%	18.3	71%	0.2	<10%	0.8	<10%	7.9	35%	12.1	47%
South	2.2	37%	6.5	50%	12.2	62%	13.7	64%	0.3	<10%	0.8	<10%	5.4	27%	8.0	37%
West	4.7	49%	6.8	49%	7.8	49%	8.2	50%	0.4	<10%	0.5	<10%	1.2	<10%	1.9	12%
Metro	3.2	43%	6.2	48%	13.5	64%	15.1	65%	0.3	<10%	0.7	<10%	6.3	30%	9.2	40%
Rural	1.3	31%	6.0	48%	10.5	56%	11.6	59%	0.3	<10%	1.0	<10%	4.1	22%	6.1	31%

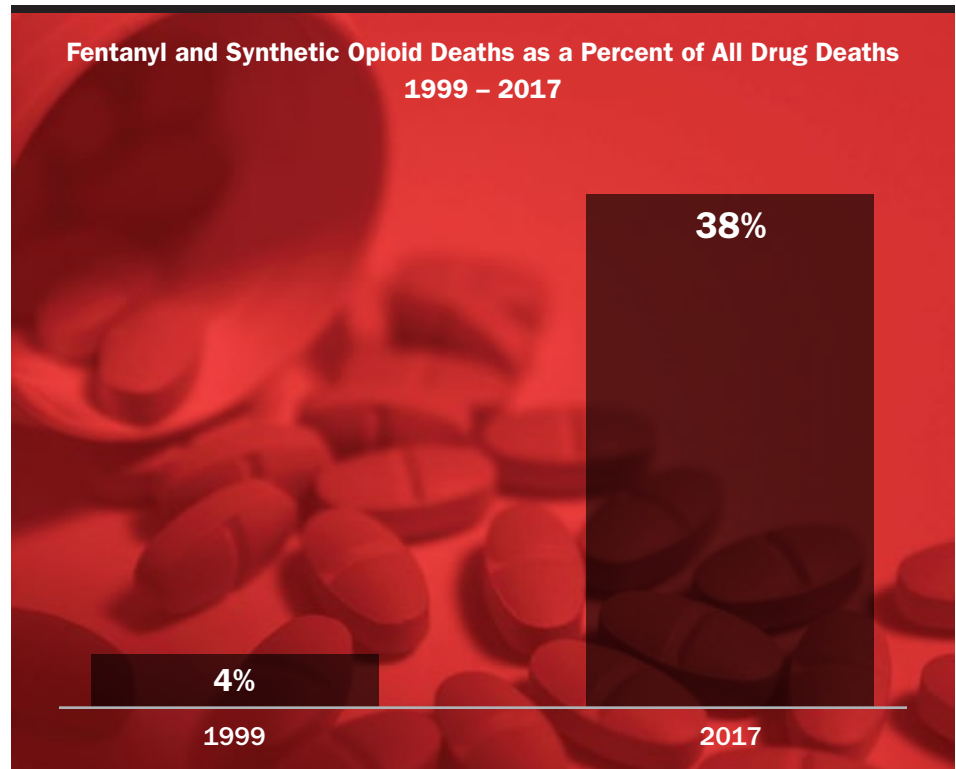
Source: Trust for America's Health and Well Being Trust analysis of data from National Center For Health Statistics, CDC

These increases in synthetic opioids have touched all demographic groups and geographic areas—but not uniformly. Synthetic-opioid use was highest among males (12.8 deaths per 100,000), Blacks (8.6 deaths per 100,000), Whites (9.5 deaths per 100,000), adults ages 18–54 (15.2 deaths per 100,000), and those living in metro areas (9.2 deaths per 100,000).

This is somewhat different from the populations affected by the opioid crisis earlier in the decade, which were disproportionately White and which had a broader urban-rural spread. As of 2017, however, these deaths affected more Blacks, younger adults, and those living in metro areas.

The geographic differences in synthetic-opioid overdose deaths were even more disparate. By region, the Northeast had the highest opioid mortality rates, with 15.7 deaths per 100,000, followed by 12.1 deaths per 100,000 in the Midwest, and 8.0 per 100,000 in the South. The West, meanwhile, saw just 1.9 deaths per 100,000.

Many Western and Plains states had relatively minimal deaths from synthetic opioids in 2017. Some of this difference is likely due to the differences in heroin supply across the country and how easily it mixes with synthetic opioids: the white powder heroin that is more common on the East Coast is easy to mix while the black tar heroin more common on the West Coast is not.^{11,12} If the kinds of heroin available change and/or synthetic opioids became more common in those states, the number of synthetic-opioid deaths nationally could increase substantially.



DATA LIMITATIONS: WHAT DOESN'T THIS DATA TELL US ABOUT DRUG OVERDOSES?

This brief focuses on mortality from alcohol, drugs, and suicide in 2017 and other recent trends. It doesn't capture local trends, what's happened in 2018, nor the full burden of these epidemics beyond mortality, such as nonfatal overdoses and substance-use disorders. Other factors to consider when looking at overdose data are:

- A reduction in fatal overdoses may indicate a successful harm reduction strategy (e.g. more overdoses are being reversed by Naloxone) but not an improvement in underlying issues.
- Mortality reporting policies and capacity, particularly regarding identifying drug type in overdoses, vary by state and could artificially lower mortality rates for synthetic opioids and other specific drug types.
- Overdose rates, chiefly in low population states, may be driven by one or more outbreaks from a particularly lethal or adulterated batch of illicit drugs. For example, roughly half of the synthetic-opioid overdose deaths in Alaska occurred in Anchorage in a three-week period.

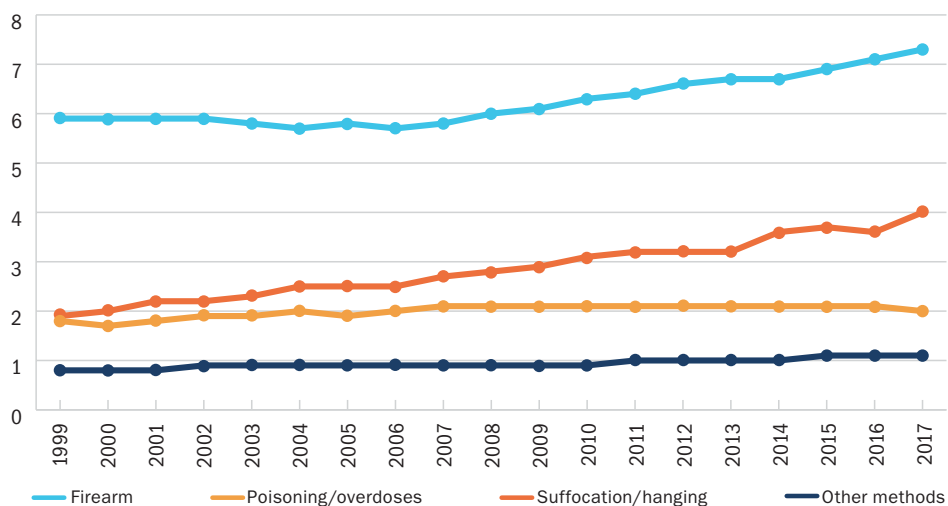
Suicide

The death rate from suicide was 4 percent higher in 2017 compared with 2016, climbing from 13.9 to 14.5 deaths per 100,000. This is the largest annual increase recorded since at least 1999 (when the dataset begins). Over the past decade (2008–2017), suicide rates increased 22 percent.

The rising suicide rates over the last decade (2008–2017) were largely due to

more suffocation/hanging suicides and firearm suicides. Suffocation/hanging suicides rose 42 percent, from 2.8 to 4.0 deaths per 100,000, and firearm suicides rose 22 percent, from 6.0 to 7.3 deaths per 100,000. Other methods of suicide, including overdose/poisoning, have held steady over the same time period (remaining between 3.0 and 3.2 deaths per 100,000).¹³

Suicide Deaths per 100,000 by Suicide Method, 1999–2017



Source: Trust for America's Health and Well Being Trust analysis of data from National Center For Health Statistics, CDC

Notably, the methods of suicide that rose also accounted for the majority of suicides: firearm suicides were 51 percent of and suffocation/hanging suicides were 28 percent of total suicides—and both are particularly lethal methods (firearm suicides prove lethal more than 80 percent of the time, and suffocation/hanging suicides are lethal more than 60 percent of the time, compared with less than 2 percent for drug overdoses/poisoning and cutting).¹⁴

Over the past decade (2008–2017), suicide increased in nearly every state (except Delaware and the District of Columbia) and touched every region of the country. There were substantial variations by demographics however—with larger proportional increases among younger people and racial and ethnic minorities, and continued higher rates and absolute increases among males, Whites, and those living in rural areas.

In particular, one of the most disturbing trends of the last decade is the rise in deaths by suicide among children and adolescents (although the number and rate is still relatively low compared with adults). Between 2016 and 2017, suicide death rates among children and adolescents ages 0–17 increased by 16 percent (from 2.1 to 2.4 deaths per 100,000).

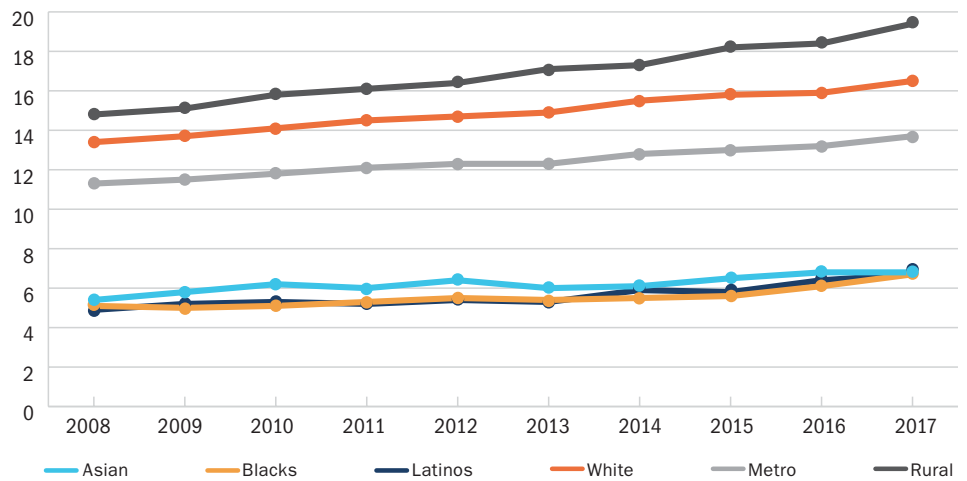
Suicide rates among young adults ages 18–34 increased 7 percent (15.9 to 17.0 deaths per 100,000), and rates increased 2 percent for adults ages 35 and older.

This same pattern held over the last decade (2008–2017): suicide among children and adolescents increased 82 percent (from 1.3 to 2.4 deaths per 100,000), young adults increased 36 percent (12.5 to 17.0 deaths per 100,000), and adults ages 35 and older increased 12 percent (16.4 to 18.4 deaths per 100,000).¹⁵ Over that same decade, 12,660 youth under age 18 died from suicide.

Suicide rates also increased proportionally more among racial and ethnic minority groups, particularly among Blacks and Latinos (while still remaining substantially lower than White suicide rates). Suicide rates among Blacks increased 9 percent last year (from 6.1 to 6.7 deaths per 100,000) and 30 percent over the last decade (5.1 to 6.7 deaths per 100,000), and rates among Latinos increased 5 percent last year (6.4 to 6.7 deaths per 100,000) and 36 percent over the last decade (4.9 to 6.7 deaths per 100,000).

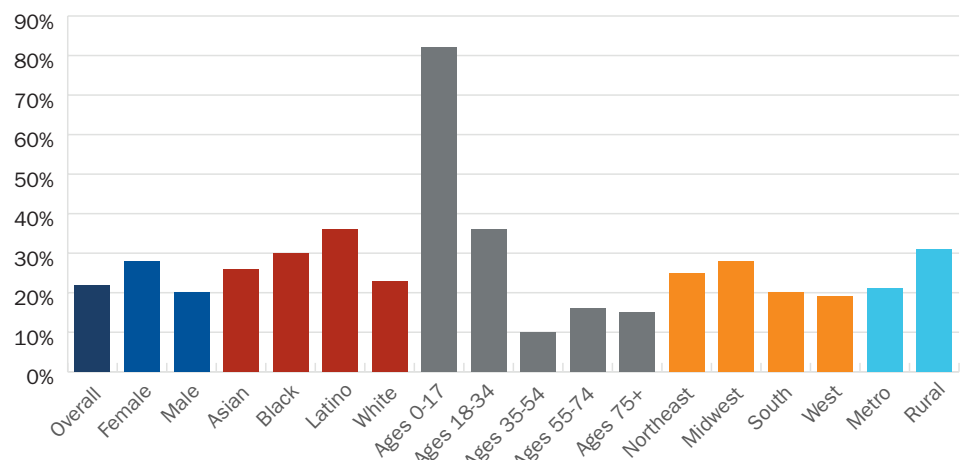
For suicide death rates by additional demographic and geographic breakdowns, see the chart on page 8.

Suicide Deaths per 100,000 by Key Demographics, 2008–2017



Source: Trust for America's Health and Well Being Trust analysis of data from National Center For Health Statistics, CDC

Percent Change in Suicide Rates by Demographics and Geography, 2008–2017



Source: Trust for America's Health and Well Being Trust analysis of data from National Center For Health Statistics, CDC

Deaths by Alcohol, Drug, and Suicide in 2017

There were 46.6 deaths by alcohol, drugs, and suicide per 100,000 people in the United States in 2017, a 6 percent increase over 2016 and a 54 percent increase over 2007. Separate trends in deaths from alcohol, drugs, and suicide are detailed below (followed by a state-by-state analysis).

ALCOHOL, DRUG, AND SUICIDE DEATHS PER 100,000 IN 1999, 2007, 2016, AND 2017, AND PERCENT CHANGE IN DEATH RATES 2007–2017															
	Alcohol Deaths					Drug Deaths					Suicide Deaths				
	1999	2007	2016	2017	% Change 2007-2017	1999	2007	2016	2017	% Change 2007-2017	1999	2007	2016	2017	% Change 2007-2017
Overall	7.0	7.7	10.8	11.0	43%	6.9	12.7	20.8	22.7	78%	10.5	11.5	13.9	14.5	26%
Female	3.2	3.8	5.9	6.0	59%	4.4	9.5	14.2	15.1	60%	4.0	4.8	6.2	6.3	31%
Male	10.9	11.8	15.9	16.2	37%	9.4	16.1	27.6	30.5	89%	17.1	18.4	21.8	22.9	25%
Asian	1.3	1.6	2.1	2.4	49%	1.3	2.0	3.6	4.0	101%	5.8	5.8	6.8	6.8	18%
Black	7.8	5.6	6.7	6.7	21%	8.6	10.4	17.6	21.0	103%	5.4	4.8	6.1	6.7	38%
Latino	6.4	6.4	8.2	8.2	27%	5.8	5.9	9.6	10.7	82%	5.0	5.3	6.4	6.7	25%
White	7.0	8.3	11.9	12.2	48%	6.9	13.9	22.9	24.7	78%	11.5	13.0	15.9	16.5	27%
0-17	<0.1	<0.1	<0.1	<0.1	n/a	0.3	0.6	0.5	0.5	n/a	1.4	1.1	2.1	2.4	113%
18-34	1.1	1.3	2.3	2.2	69%	7.2	14.9	28.3	30.9	108%	12.3	12.6	15.9	17.0	35%
35-54	12.0	12.9	15.5	15.7	22%	14.4	24.7	36.6	40.2	62%	14.1	16.7	18.6	19.1	14%
55-74	17.5	18.2	25.9	26.4	45%	4.1	10.1	20.2	21.9	116%	12.7	14.2	17.4	17.6	24%
75+	9.3	8.3	10.1	10.0	20%	4.1	4.2	4.5	4.7	11%	18.4	16.4	18.4	18.6	14%
Northeast	5.6	5.8	8.4	8.5	45%	7.4	11.9	27.6	30.4	155%	7.9	8.7	10.8	11.3	30%
Midwest	5.8	6.4	10.5	10.8	68%	5.1	11.6	22.7	25.8	122%	10.0	11.3	14.4	15.1	33%
South	6.7	7.0	9.5	9.7	40%	6.0	13.2	19.7	21.5	63%	11.3	12.1	14.4	15.0	24%
West	9.8	11.6	14.9	15.1	30%	9.5	13.7	15.9	16.4	20%	11.8	12.8	15.0	15.5	21%
Metro	6.9	7.5	10.4	10.7	42%	7.3	12.8	21.2	23.2	81%	10.1	11.0	13.2	13.7	24%
Rural	7.2	8.7	12.9	13.0	50%	4.4	12.4	18.7	19.8	60%	12.6	14.2	18.4	19.4	37%

Source: Trust for America's Health and Well Being Trust analysis of data from National Center For Health Statistics, CDC

Trends in Alcohol Deaths

- In 2017, 35,800 Americans died of alcohol-induced causes, and 292,400 Americans died of alcohol-induced causes over the past decade (2008–2017). *Note:* Alcohol-induced deaths include alcohol poisoning, liver diseases, and other diseases; it does not include alcohol-attributable deaths, such as alcohol-related vehicle, violence, or accidental fatalities. In this report, alcohol deaths include alcohol-induced causes only.
- The rate of American deaths from alcohol-induced causes was 2 percent higher in 2017 compared to 2016, increasing from 10.8 to 11.0 deaths per 100,000. This is the smallest increase since 2008–2009. Over the past decade (2008–2017), the alcohol death rate increased by a total of 38 percent.
- Alcohol death rates in 2017 were highest among males (16.2 per 100,000), Whites (12.2 per 100,000), adults ages 55–74 (26.4 per 100,000), and those living in the West (15.1 per 100,000) and in rural areas (13 per 100,000).
- Several groups had slightly lower or steady rates of alcohol deaths in 2017 compared with 2016 (including young adults ages 18-to-34 years old, older adults ages 75 years and older, Blacks, and Latinos), and nearly all groups held within 3 percent.

Trends in Drug Deaths

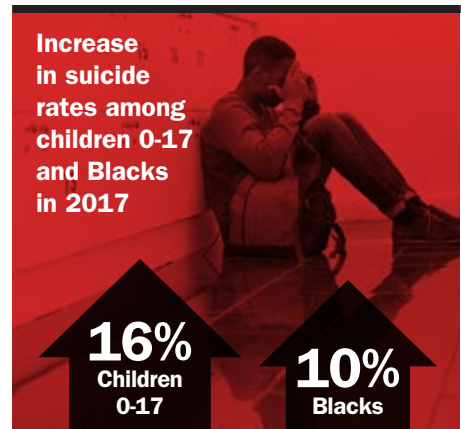
- In 2017, 74,000 Americans died from drug-induced causes, and 498,400 Americans died from drug-induced causes over the past decade (2008–2017).
- The rate that Americans died from drug-induced causes increased by 9 percent between 2016 and 2017, from 20.8 to 22.7 deaths per 100,000. While

a very large increase for a single year, it is a smaller increase than the prior year, when drug deaths increased by an unprecedented 21 percent. Over the past decade (2008–2017), the drug death rate increased 79 percent.

- Drug death rates in 2017 were highest among males (30.5 per 100,000), Whites (24.7 per 100,000), adults ages 35–54 (40.2 per 100,000), young adults ages 18–34 (30.9 per 100,000), and those living in the Northeast (30.4 per 100,000) and Midwest (25.8 per 100,000).
- Drug death rates were nearly universally higher in 2017 than 2016. Groups with the largest proportional increases were Blacks (20 percent) and those living in the Midwest (13 percent). Over the past decade, drug deaths have more than doubled for Asians, Blacks, young adults ages 18–35, adults ages 55–74, and those living in the Northeast and Midwest.

Trends in Deaths by Suicide

- In 2017, 47,200 Americans died as a result of suicide, and 411,700 Americans died of suicide over the past decade (2008–2017).
- Deaths by suicide in 2017 were particularly high among males (22.9 per 100,000), Whites (16.5 per 100,000), and those living in rural areas (19.4 per 100,000).
- Suicide rates in 2017 were higher than in 2016 across certain demographic and geographic groups. Groups with the largest proportional increases were children ages 0–17 (16 percent higher), Blacks (10 percent higher), and young adults ages 18–34 (7 percent higher).

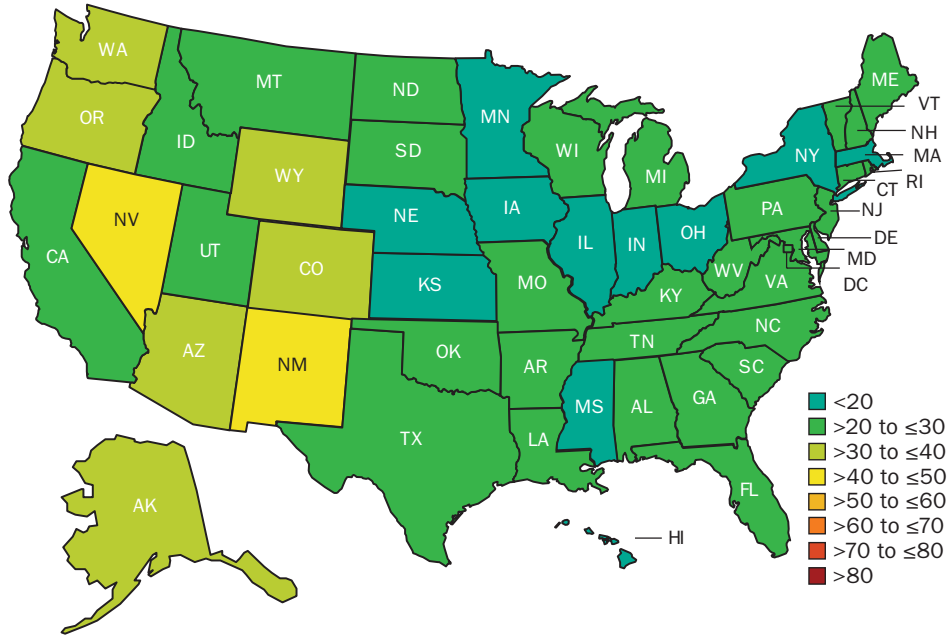


State Analysis

The growth in deaths by alcohol, drugs, and suicide is geographically widespread—although rates and trends vary substantially across regions. A state-level analysis follows, and charts on page 12 have state-level data on alcohol, drug, suicide, opioid, and synthetic-opioid deaths and death rates.

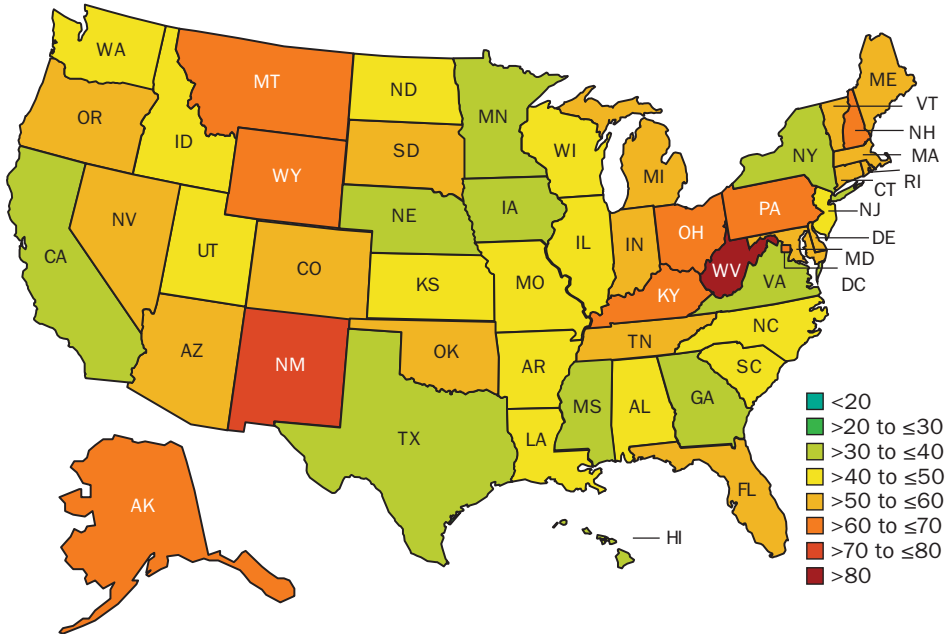
- **Deaths from alcohol, drugs, and suicides.** From 2016 to 2017, 43 states plus the District of Columbia saw higher rates of deaths from alcohol, drug, and suicide; five states had lower rates (Massachusetts, Oklahoma, Rhode Island, Utah, and Wyoming); and two states stayed the same (New Hampshire and New Mexico). Two states (Montana and New Jersey) had increases greater than 15 percent.
 - States with the highest death rates for alcohol, drug, and suicide in 2017 were West Virginia (91 per 100,000), New Mexico (77 per 100,000), Ohio (69.4 per 100,000), Alaska (67.6 per 100,000), and New Hampshire (66.0 per 100,000).
 - States with the lowest death rates for alcohol, drug, and suicide in 2017 were Texas (31.5 per 100,000), Mississippi (34.1 per 100,000), and Nebraska (34.4 per 100,000).
- **Alcohol deaths.** Between 2016 and 2017, 29 states had higher alcohol death rates, 19 states plus the District of Columbia had lower alcohol death rates, and two states stayed the same. Two states had an increase of more than 15 percent (Mississippi and Montana), and one state (Rhode Island) and the District of Columbia both had decreases of more than 15 percent.
 - States with the highest alcohol death rates in 2017 were New Mexico (31.6 per 100,000), Montana (23.7 per 100,000), and Wyoming (23.3 per 100,000).
 - States with the lowest alcohol death rates in 2017 were Maryland (6.5 per 100,000) and Hawaii (6.7 per 100,000).
- **Drug deaths.** Between 2016 and 2017, 39 states plus the District of Columbia had higher drug death rates, nine states had lower rates, and two stayed the same. There were seven states with increases of more than 15 percent (Delaware, Indiana, Maine, New Jersey, North Carolina, Ohio, and Pennsylvania).
 - States with the highest drug death rates in 2017 were West Virginia (56.3 per 100,000), Ohio (45.5 per 100,000), and Pennsylvania (42.9 per 100,000) as well as the District of Columbia (46.4 per 100,000).
 - States with the lowest drug death rates in 2017 were Nebraska (8.5 per 100,000), South Dakota (9.3 per 100,000), and North Dakota (9.7 per 100,000).
- **Deaths by Suicide.** Between 2016 and 2017, 42 states plus the District of Columbia had higher suicide rates, four states had lower suicide rates (Delaware, Nevada, Oklahoma, and Vermont) and four states stayed the same (California, Colorado, New York, and Virginia). Five states saw increases greater than 15 percent (Hawaii, Maine, Mississippi, Montana, and South Dakota).
 - States with the highest suicide rates in 2017 were Montana (29.6 per 100,000), Wyoming (27.1 per 100,000), and Alaska (27 per 100,000).
 - States with the lowest suicide rates in 2017 were New York (8.5 per 100,000) and New Jersey (8.8 per 100,000) plus the District of Columbia (6.8 per 100,000).
- **Opioid overdose deaths.** Between 2016 and 2017, 29 states plus the District of Columbia had higher rates of opioid deaths, and 13 states saw lower rates. (Eight states had insufficient data to determine trends.) There were seven states with increases of more than 15 percent, including two states with increases of more than 25 percent (New Jersey, 39 percent; and North Carolina, 28 percent).¹⁶
- **Synthetic-opioid overdose deaths.** Between 2016 and 2017, 37 states plus the District of Columbia saw higher rates of synthetic-opioid deaths, and two states saw lower (New Mexico and North Dakota). (The remaining 11 states did not have sufficient data to determine trends.) Thirty-three states and the District of Columbia had increases of more than 15 percent, including 13 states with increases of more than 50 percent. Arizona and North Carolina saw synthetic-opioid overdose death rates more than double between 2016 and 2017.

Alcohol, Drug, and Suicide (Combined) Deaths per 100,000, 1999



Source: National Center for Health Statistics, CDC

Alcohol, Drug, and Suicide (Combined) Deaths per 100,000, 2017



Source: National Center for Health Statistics, CDC

ALCOHOL, DRUG, SUICIDE, OPIOID, AND SYNTHETIC-OPIOID DEATHS BY STATE IN 2017, AND PERCENT CHANGE 2016-2017

	Alcohol, Drug, & Suicide Combined			Alcohol			Drug			Suicide			Opioid*			Synthetic Opioid*		
	2017 Deaths	2017 Deaths Per 100,000	% Change in Rate 2016-2017	2017 Deaths	2017 Deaths Per 100,000	% Change in Rate 2016-2017	2017 Deaths	2017 Deaths Per 100,000	% Change in Rate 2016-2017	2017 Deaths	2017 Deaths Per 100,000	% Change in Rate 2016-2017	2017 Deaths	2017 Deaths Per 100,000	% Change in Rate 2016-2017	2017 Deaths	2017 Deaths Per 100,000	% Change in Rate 2016-2017
Alabama	2,131	43.7	7%	387	7.9	-2%	960	19.7	12%	836	17.1	6%	-	-	-	-	-	-
Alaska	500	67.6	1%	159	21.5	-13%	158	21.4	15%	200	27.0	4%	102	13.8	9%	37	5.0	**
Arizona	4,039	57.6	1%	1,228	17.5	-9%	1,628	23.2	7%	1,327	18.9	3%	927	13.2	19%	267	3.8	114%
Arkansas	1,308	43.5	8%	261	8.7	-9%	481	16.0	13%	631	21.0	13%	-	-	-	-	-	-
California	14,196	35.9	1%	5,096	12.9	0%	5,302	13.4	3%	4,312	10.9	0%	2,199	5.6	9%	536	1.4	50%
Colorado	3,095	55.2	5%	1,018	18.2	10%	1,050	18.7	7%	1,181	21.1	0%	578	10.3	7%	112	2.0	54%
Connecticut	1,800	50.2	9%	354	9.9	5%	1,103	30.7	10%	405	11.3	2%	955	26.6	11%	686	19.1	37%
Delaware	551	57.3	9%	104	10.8	-1%	342	35.6	18%	112	11.6	-7%	-	-	-	-	-	-
DC	425	61.2	8%	63	9.1	-23%	322	46.4	15%	47	6.8	15%	244	35.2	15%	182	26.2	38%
Florida	10,766	51.3	2%	2,598	12.4	-4%	5,347	25.5	6%	3,227	15.4	1%	3,245	15.5	14%	2,126	10.1	33%
Georgia	3,816	36.6	6%	848	8.1	6%	1,629	15.6	10%	1,451	13.9	2%	1,014	9.7	9%	419	4.0	50%
Hawaii	514	36.0	11%	95	6.7	-2%	221	15.5	7%	227	15.9	31%	53	3.7	-31%	**	**	**
Idaho	840	48.9	4%	221	12.9	-2%	264	15.4	0%	392	22.8	9%	103	6.0	-15%	22	1.3	8%
Illinois	5,222	40.8	8%	1,116	8.7	0%	2,812	22.0	15%	1,474	11.5	4%	2,201	17.2	13%	1,251	9.8	38%
Indiana	3,663	54.9	13%	722	10.8	2%	1,925	28.9	22%	1,092	16.4	5%	-	-	-	-	-	-
Iowa	1,178	37.4	5%	404	12.8	6%	357	11.3	5%	479	15.2	6%	206	6.5	12%	92	2.9	58%
Kansas	1,174	40.3	9%	314	10.8	9%	360	12.4	8%	553	19.0	7%	144	4.9	-2%	32	1.1	18%
Kentucky	2,858	64.2	5%	484	10.9	-4%	1,662	37.3	9%	770	17.3	1%	1,160	26.0	17%	780	17.5	67%
Louisiana	2,142	45.7	7%	341	7.3	5%	1,138	24.3	10%	720	15.4	6%	-	-	-	-	-	-
Maine	864	64.7	15%	194	14.5	1%	443	33.2	20%	274	20.5	21%	360	26.9	19%	278	20.8	39%
Maryland	3,239	53.5	9%	393	6.5	10%	2,296	37.9	9%	630	10.4	7%	1,985	32.8	8%	1,542	25.5	41%
Massachusetts	3,594	52.4	-1%	683	10.0	-2%	2,323	33.9	-3%	682	9.9	7%	1,913	27.9	-5%	1,649	24.0	6%
Michigan	5,345	53.7	8%	1,049	10.5	2%	3,034	30.5	12%	1,457	14.6	6%	2,033	20.4	15%	1,368	13.7	48%
Minnesota	2,166	38.8	3%	641	11.5	-5%	825	14.8	9%	783	14.0	4%	422	7.6	5%	184	3.3	84%
Mississippi	1,017	34.1	12%	214	7.2	20%	387	13.0	4%	445	14.9	16%	185	6.2	3%	81	2.7	80%
Missouri	3,030	49.6	2%	556	9.1	3%	1,426	23.3	0%	1,151	18.8	1%	952	15.6	4%	618	10.1	40%
Montana	671	63.9	17%	249	23.7	34%	132	12.6	-4%	311	29.6	16%	-	-	-	-	-	-
Nebraska	661	34.4	11%	245	12.8	11%	163	8.5	11%	275	14.3	11%	-	-	-	-	-	-
Nevada	1,733	57.8	1%	513	17.1	7%	698	23.3	1%	627	20.9	-5%	412	13.7	-1%	66	2.2	22%
New Hampshire	886	66.0	0%	176	13.1	-1%	479	35.7	-4%	265	19.7	8%	424	31.6	-4%	374	27.9	2%
New Jersey	4,070	45.2	22%	647	7.2	10%	2,752	30.6	28%	795	8.8	15%	1,969	21.9	39%	1,376	15.3	98%
New Mexico	1,608	77.0	0%	659	31.6	-2%	515	24.7	-2%	491	23.5	4%	332	15.9	-5%	75	3.6	-4%
New York	7,186	36.2	3%	1,584	8.0	1%	4,117	20.7	5%	1,696	8.5	0%	3,224	16.2	7%	2,238	11.3	36%
North Carolina	4,864	47.3	15%	1,019	9.9	5%	2,515	24.5	22%	1,521	14.8	9%	1,953	19.0	28%	1,285	12.5	111%
North Dakota	331	43.8	1%	111	14.7	-1%	73	9.7	-15%	154	20.4	10%	35	4.6	-35%	12	1.6	-20%
Ohio	8,091	69.4	13%	1,219	10.5	6%	5,299	45.5	18%	1,740	14.9	2%	4,293	36.8	18%	3,523	30.2	53%
Oklahoma	2,094	53.3	-5%	605	15.4	1%	805	20.5	-4%	756	19.2	-8%	388	9.9	-13%	102	2.6	4%
Oregon	2,285	55.2	4%	879	21.2	5%	676	16.3	3%	825	19.9	6%	344	8.3	9%	85	2.1	95%
Pennsylvania	8,208	64.1	11%	930	7.3	-1%	5,495	42.9	15%	2,030	15.9	3%	-	-	-	-	-	-
Rhode Island	552	52.1	-6%	123	11.6	-17%	322	30.4	-3%	129	12.2	2%	277	26.1	-1%	201	19.0	10%
South Carolina	2,454	48.8	8%	631	12.6	9%	1,052	20.9	12%	838	16.7	2%	748	14.9	18%	404	8.0	68%
South Dakota	435	50.0	12%	181	20.8	13%	81	9.3	7%	191	22.0	17%	35	4.0	-17%	14	1.6	39%
Tennessee	3,764	56.0	8%	804	12.0	8%	1,898	28.3	8%	1,166	17.4	4%	1,269	18.9	6%	590	8.8	48%
Texas	8,909	31.5	5%	2,325	8.2	4%	3,120	11.0	4%	3,778	13.3	7%	1,458	5.2	4%	348	1.2	37%
Utah	1,503	48.5	-1%	259	8.3	-8%	691	22.3	-1%	663	21.4	5%	456	14.7	-4%	92	3.0	26%
Vermont	335	53.7	1%	94	15.1	-4%	145	23.2	11%	112	18.0	-5%	114	18.3	13%	77	12.3	46%
Virginia	3,303	39.0	4%	696	8.2	3%	1,558	18.4	7%	1,179	13.9	0%	1,241	14.7	9%	829	9.8	27%
Washington	3,621	48.9	11%	1,152	15.6	11%	1,309	17.7	6%	1,297	17.5	12%	742	10.0	3%	143	1.9	51%
West Virginia	1,653	91.0	13%	264	14.5	15%	1,023	56.3	13%	393	21.6	9%	833	45.9	15%	618	34.0	43%
Wisconsin	2,803	48.4	7%	780	13.5	5%	1,205	20.8	9%	926	16.0	7%	926	16.0	7%	466	8.0	61%
Wyoming	352	60.8	-4%	135	23.3	-2%	72	12.4	-29%	157	27.1	10%	47	8.1	-5%	17	2.9	**
United States	151,845	46.6	6%	35,823	11.0	2%	73,990	22.7	9%	47,173	14.5	4%	47,597	14.6	12%	28,466	8.7	45%

*There is variation between states in their reporting of drug type involved in overdoses that makes some state comparisons of drug-specific overdose deaths unreliable. TFAH did not analyze state-level data on opioid and synthetic opioid deaths from eight states (Alabama, Arkansas, Delaware, Indiana, Louisiana, Montana, Nebraska, and Pennsylvania) that reported the type of drug in less than 75 percent of overdose cases in 2016 and/or 2017. Deaths from these states are included in regional and national data.

** Data unavailable for privacy reasons. Source: National Center for Health Statistics, CDC

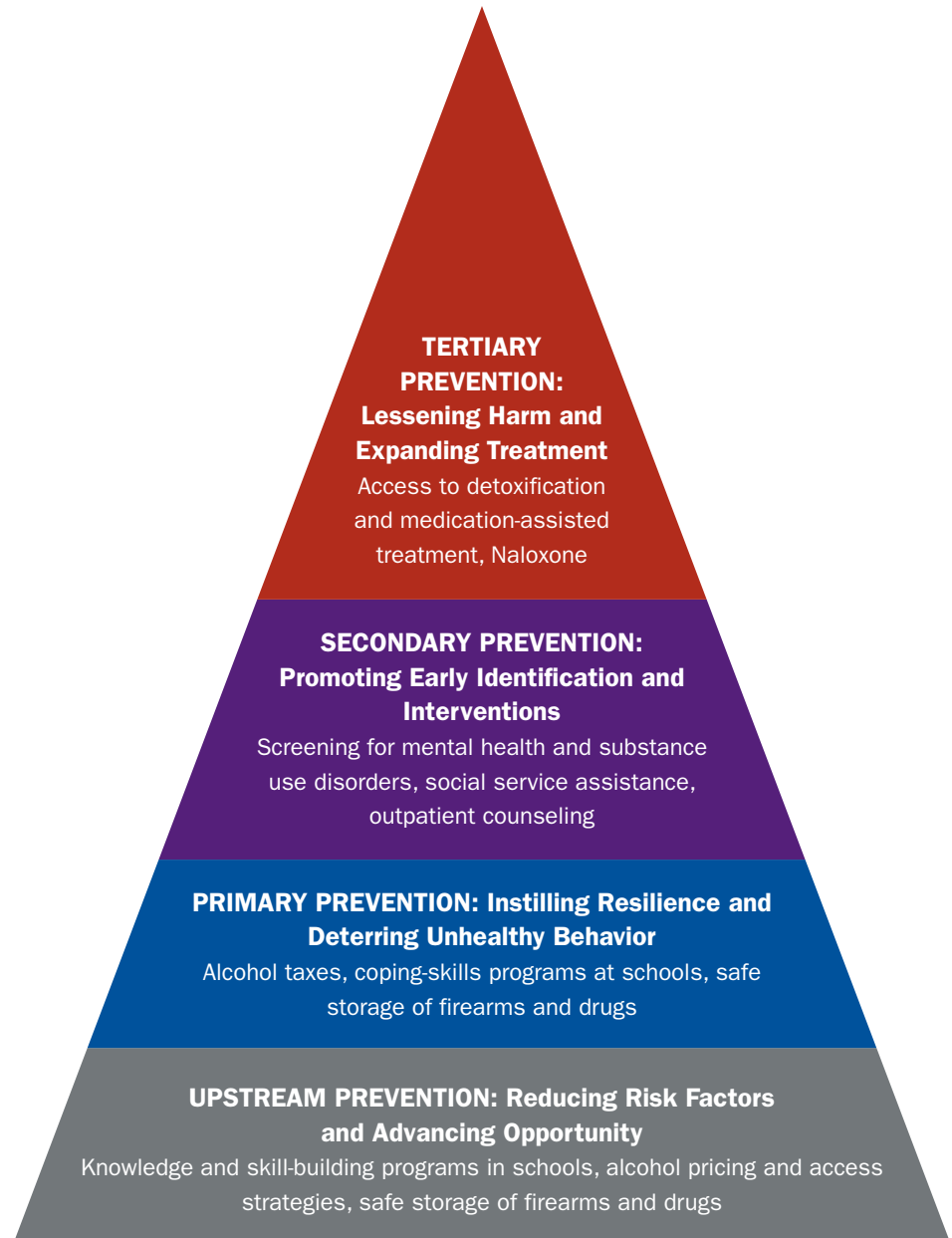
Conclusion and Recommendations

The federal response, including the Substance Use-Disorder Prevention that Promotes Opioid Recovery and Treatment (SUPPORT) for Patients and Communities Act (Pub. L. 115-271), has tended to prioritize treatment, overdose reversal, and reducing inappropriate opioid prescribing. While critical areas of focus, these actions are mostly aimed at the supply but not curbing the need for illicit substances. In fact, little attention or resources have been devoted to early prevention strategies and the upstream factors fueling these epidemics. Said differently, we can decrease the supply of opioids, but if we do not address the demand, we have done little to stem the tide of an epidemic—instead just redirecting it.

Deaths from the alcohol, drugs, and suicide are the end result of complicated and deep-seated problems in communities that require long-term initiatives and investments in a range of policies and programs. Policymakers should consider the full continuum of prevention in their work: from upstream strategies focused on reducing risk factors like poverty, racism, and social isolation; to prevention approaches that build resilience and coping-skills; to early identification of and assistance in offering substance misuse and crisis intervention; to harm reduction for individuals, and their families and communities, to reduce the likelihood of devastating consequences.

These new data reinforce the need for a multi-faceted, multi-sector response, including the healthcare, mental health, public health, education, economic development, criminal justice, family service and other sectors.

Four Levels of the Prevention Continuum¹⁷



TFAH and WBT continue to call for a comprehensive approach at the national, state, and local levels to counter the alcohol, drug, and suicide epidemics, including implementation of the following key recommendations:

1. Reduce risk factors and promote resilience in children, families, and communities by supporting policies and programs that reduce traumatic and adverse experiences—such as exposure to violence, unstable housing, and racial and ethnic discrimination—which have the biggest long-term impact on later substance misuse; promote better mental health; and reduce economic hardship.

These kinds of policies and programs include rental assistance and subsidized housing programs, earned income tax credits, universal pre-kindergarten, and parental training and support programs. Many of these programs are cost effective. For instance, nurse family home visiting programs have a return of \$5.70 for every \$1 invested, and early childhood education programs have a \$4 to \$12 return for every \$1 invested.^{18,19}

CASE STUDY

NURSE-FAMILY PARTNERSHIP (NFP) works with young, low-income, first-time pregnant women who are not ready to take care of a child by, first, establishing a trusted relationship with a public health nurse who meets with the mother from pregnancy until the baby turns two years old. For more than 35 years, NFP has enrolled mothers early in their pregnancies and helped public health nurses continuously conduct home visits over a two-and-a-half-year period. Home visits connect first-time mothers with the care and support they need to ensure a healthy pregnancy and birth. The model has been shown to have dramatic benefits to society. For instance, when Medicaid pays for NFP services, the federal government gets a 54 percent return on its investment.²⁰



2. Expand substance misuse prevention and mental health programs in schools by increasing the number of schools that get training for, can screen for, and can respond to childhood trauma. In addition, schools should be supported in scaling up evidence-based life- and coping-skills programs, like the Good Behavior Game; and increasing the availability of culturally appropriate mental health and other services. Several federal programs support evidence-based prevention programs in schools that promote protective factors and reduce risk behaviors, including CDC’s Division of Adolescent and School Health. Top school substance misuse prevention programs have a \$3.80 to \$34 return for every \$1 invested; social-emotional learning programs have an \$11 for \$1 return; and school violence prevention (including suicide) programs have a \$15 to \$81 for \$1 return.^{21,22,23,24,25}



CASE STUDY
THE LIFE SKILLS TRAINING (LST) Program is focused on middle school students and includes a “booster” program for high school students. LST is designed to address a wide range of risk and protective factors by teaching general, personal and social skills, along with drug resistance skills and normative education. The program has been extensively tested over the

past 20 years and has been found to reduce the prevalence of tobacco, alcohol and illicit drug use relative to controls by 50 to 87 percent. When combined with booster sessions, LST was shown to reduce the prevalence of long-term substance misuse by as much as 66 percent, with benefits still in place beyond the high school years.²⁶

3. Lower excessive alcohol use through evidence-based policies, such as by increasing pricing, limiting hours and density of alcohol sales; enforcing underage drinking laws;

and holding sellers and hosts liable for serving minors. For example, a 10 percent increase in the price of alcoholic beverages is shown to reduce consumption by 7.7 percent.²⁷

CASE STUDY
RECOVERY HIGH SCHOOLS are designed for students recovering from a substance use disorder as part of the continuum of recovery care. These schools offer programs that uniquely meet the education and therapeutic challenges faced by those in recovery and who were struggling to succeed in traditional school settings. They provide an alternative to the justice system and delinquency,

and are a way to reduce school violence while improving education attainment, typically by providing intensive therapeutic and peer-recovery support and an academic curriculum with structured recovery-focused programming. A study found that complete avoidance of alcohol or other drugs increased from 20 percent during the 90 days before entering the school to 56 percent after.²⁸

4. Promote harm reduction and treatment for individual with substance-use disorders by expanding access to overdose-prevention medications—such as naloxone—to first responders and to those at high risk for overdose and their families and friends; expand medication-assisted treatment in new and innovative ways, like at syringe exchange

programs; and promote clean syringe access initiatives through exchange programs and over-the-counter sales. Syringe exchange programs do not increase the rate of drug use and have been found to increase safe injection practices, reduce infectious disease spread, promote substance use treatment, and are cost-effective.²⁹



5. Modernize and increase access to mental health and substance use services by aligning healthcare provider reimbursement, quality measures, and training towards clinical models focused on the “Whole Health” of individuals, and prioritizing integrated delivery models; expanding comprehensive health insurance to all Americans and ensure parity in covered mental health

and substance use services and provider networks; and offering widespread medication-assisted treatment in new and innovative ways. Special attention is needed to address equitable access where treatment options and providers are not readily available, such as in rural areas. Some effective substance use treatment programs have a return of \$3.77 per \$1 invested.³⁰

CASE STUDY

“Navigators” such as the **ACCOUNTABLE HEALTH COMMUNITIES (AHC)** pilot model, focus on bridging the gap between clinical medical care and community services. They do this by systematically identifying and addressing beneficiaries’ health-related social needs, and assessing whether establishing these linkages can reduce healthcare costs and improve quality of care and outcomes. AHCs address housing instability and quality, food insecurity, utility needs, interpersonal violence and transportation needs.³¹

6. Limit access to lethal means of suicide by promoting safe storage of medications and firearms through public education and laws; restricting access to firearms for children and individuals in crisis or at risk of suicide; and providing education and creating protocols for health care providers, counselors, and first responders on how to interact with and counsel

patients and families to create safe environments. The Counseling on Access to Lethal Means (CALM) model has shown to improve medication and firearms storage behavior — with one study, focusing on parental counseling for suicidal youth in the emergency department, finding 100 percent firearms lockup at follow-up.³²

7. Expand crisis intervention and support for at-risk populations, such as increasing crisis intervention services and hotlines with ready linkages to services; boosting funding for state and local health departments to implement suicide prevention programs; and creating new support systems for

high-risk populations—like military personnel transitioning to civilian life, individuals reintegrating into the community from a correctional facility, and those facing severe financial problems. The Zero Suicide model program has shown 80 percent reductions in suicides.^{33,34}

CASE STUDY

THE ZERO SUICIDE INITIATIVE is a comprehensive approach to improve depression care in health systems, integrating suicide prevention into primary and behavioral health care. The model requires primary care doctors to screen every patient during every visit with two questions: How often have you felt down in the past two weeks? And how often have you felt little pleasure in doing things? High scores lead to further questions about sleep disturbances, changes in appetite and/or thoughts of

hurting oneself. Providers must indicate on each patient's medical record that they completed the screening — and when they recognize a mental health problem, assign patients to appropriate care, which includes cognitive behavioral therapy, medication, group counseling or new care models such as same-day psychiatric evaluations, drop-in group therapy visits, and hospitalization, if necessary.^{35,36,37}



8. Address the impact of the substance misuse epidemic on children — and the need for a multi-generational response that includes substance use disorder treatment for parents and wrap-around services for children and families, including grandparents and other relatives who

help care for children, and expand support for the foster care system. Model programs have been effective in helping mothers achieve sobriety, reduced state custody placement of children by half and had a return on investment of \$2.22 for every \$1 spent on child welfare programs.³⁸

CASE STUDY

SOBRIETY TREATMENT AND RECOVERY TEAMS is a Kentucky-based program for families with parental substance use disorders, and issues of child abuse and/or neglect that helps parents achieve sobriety and keep children with parents when it is possible and safe. Mothers who participated in START achieved sobriety at nearly twice the rate of mothers treated without START (66 percent and 37 percent, respectively).

Children in families served by START were half as likely to be placed in state custody as compared with children in a matched control group (21 percent and 42 percent, respectively). For every dollar spent on START, Kentucky avoided spending \$2.22 on foster care. In Kentucky, areas have reported that demand for the program is higher than the available services.³⁹



9. Reduce availability of illicit opioids and inappropriate prescriptions through responsible opioid prescribing practices (such as compliance with the CDC Guideline for Prescribing Opioids and support for high-functioning Prescription Drug Monitoring Programs); public education about misuse and safe disposal of unused drugs; and “hotspot”

monitoring, intervention and anti-trafficking strategies focused on heroin, fentanyl and other illicit drugs. After multi-faceted initiatives to promote appropriate prescribing, the rate of opioid prescriptions declined annually from 2012 to 2017—and in 2017, the prescribing rate fell to the lowest in more than 10 years.⁴⁰

CASE STUDY

PRESCRIPTION DRUG MONITORING PROGRAMS (PDMP) are database tools that track dispensed controlled substances in a state. For instance, in Kentucky, mandatory requirements increased use five-fold; multiple prescriptions were reduced by more than half; and opioid prescribing was reduced by around 12 percent. In Tennessee, PDMP use increased by more than 400 percent; opioid prescribing decreased by 7 percent within one year; and patients being able to fill multiple overlapping prescriptions decreased by 31 percent.⁴¹

10. Improve data accuracy and timeliness through additional funding for local and state health agencies to bolster their capacity for medical examinations and toxicological services, improve reporting of non-fatal overdoses and suicide attempts, and modernize and standardize their data system; and CDC for additional data

support and analyses at the national level and in support of local and state programs. Ensuring policymakers at the state, local, and national level, as well as healthcare providers and other critical sectors, have the best, most recent data possible allows for faster and smarter responses to critical and emerging health threats.

Appendix: Data Methodology

Unless otherwise referenced, data used in this report are from the National Center for Health Statistics’ Multiple Cause of Death Files, 1999–2017, and were accessed via the CDC Wide-ranging ONline Data for Epidemiologic Research (WONDER) Database (<http://wonder.cdc.gov/mcd-icd10.html>).

For alcohol and drug deaths, TFAH used the CDC’s underlying cause of death categories, “Drug/Alcohol Induced Causes” and, for deaths by suicide, used the “Injury Intent and Mechanisms” category. Because a small number of deaths are categorized as both alcohol-

or drug-induced and a suicide, TFAH removed duplicates (ICD-10 underlying causes of death codes X60–65) when determining combined death totals.

For deaths related to specific drugs, TFAH used ICD-10 codes as follows:

- All opioid deaths: X40–44, X60–64, X85, and Y10–14 “underlying causes of death” codes plus T40.0–40.4 and T40.6 “multiple causes of death” codes.
- Synthetic-opioid deaths: X40–44, X60–64, X85, and Y10–14 “underlying causes of death” codes plus T40.4 “multiple causes of death” code.

- Heroin deaths: X40–44, X60–64, X85, and Y10–14 “underlying causes of death” codes plus T40.1 “multiple causes of death” code.

- Common prescription opioid deaths: X40–44, X60–64, X85, and Y10–14 “underlying causes of death” codes plus T40.2 “multiple causes of death” code.

Note: CDC and other analyses of drug deaths may use a slightly narrower drug-overdose category compared with the “drug-induced cause” category used in this brief.

Endnotes

- 1 All mortality data in the brief is from the National Center for Health Statistics at CDC, and was obtained from the WONDER database in December 2018. For more information on method, see appendix on page 18.
 - 2 Methadone is grouped separately and is not included in the synthetic-opioids category in this brief.
 - 3 As defined by the U.S. Census Bureau, the Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; the Midwest includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; the South includes Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, Tennessee, Texas, South Carolina, and Virginia; and the West includes Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
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 - 5 "Opioids." In: Substance Abuse and Mental Health Services Administration, February 2016. <https://www.samhsa.gov/atod/opioids> (accessed January 10, 2019).
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 - 7 "Opioids." In: National Institute on Drug Abuse, February 2017. <https://www.drugabuse.gov/drugs-abuse/opioids> (accessed January 10, 2019).
 - 8 U.S. Drug Enforcement Agency. "DEA Issues Carfentanil Warning to Police and Public." Press Release, September 22, 2016. <https://www.dea.gov/divisions/hq/2016/hq092216.shtml> (accessed January 10, 2019).
 - 9 Saburn J. "Heroin Is Being Laced With a Terrifying New Substance: What to Know About Carfentanil." Time, September 12, 2016. <http://time.com/4485792/heroin-carfentanil-drugs-ohio/> (accessed January 10, 2019).
 - 10 Murphy SL, Xu JQ, Kochanek KD, and Arias E. "Mortality in the United States, 2017." National Center for Health Statistics, NCHS Data Brief, no. 328, November 2018. <https://www.cdc.gov/nchs/products/databriefs/db328.htm> (accessed January 10, 2019).
 - 11 Frenk RG, Pollack HA. "Addressing the Fentanyl Threat to Public Health", *New England Journal of Medicine*, February 2017; 376:605-607; <https://www.nejm.org/doi/full/10.1056/NEJMp1615145>
 - 12 Chang A, Macy B. "What's Behind The Geographical Disparities Of Drug Overdoses In The US." *National Public Radio*, November 2018. <https://www.npr.org/2018/11/29/671996727/whats-behind-the-geographical-disparities-of-drug-overdoses-in-the-u-s>
 - 13 Research suggests that suicide by drug overdose may be undercounted due to the difficulty of understanding intent, which means the overall suicide rate is higher than official reports and the true rates and trends of overdose/poisoning suicides need more careful study.
- See: Rockett IRH, Caine ED, et al. "Discerning Suicide in Drug Intoxication Deaths: Paucity and Primacy of Suicide Notes and Psychiatric History." *PLoS ONE*, 13(1): e0190200, 2018. <https://doi.org/10.1371/journal.pone.0190200> (accessed January 10, 2019).
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 - 15 Suicide is not an official cause of death for children under age 5.
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 - Upstream or Primordial Prevention: Actions and measures that inhibit the emergence and establishment of environmental, economic, social and behavioral conditions, and cultural patterns of living known to increase the risk of disease. (Definition from *Dictionary of Epidemiology*, Fourth Edition.)
 - Primary Prevention: Interventions before health effects occur, through a variety of measures, including education and skill-building, policy development and implementation, and clinical services. (Definition by TFAH.)
 - Secondary Prevention: Screening to identify diseases in the earliest stages, before the onset of signs and symptoms, through measures such as mammography and regular blood-pressure testing. (Definition from CDC.)
 - Tertiary Prevention: Managing disease post-diagnosis to slow or stop disease progression through measures such as chemotherapy, rehabilitation, and screening for complications. (Definition from CDC.)
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