

The Numbers Behind the Opioid Crisis

Revised Utah Edition

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social capital project

A project of the Joint Economic Committee – Republicans | Chairman, Sen. Mike Lee
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A NOTE FROM SENATOR LEE ON THE REVISED UTAH EDITION

In 2017, I assumed the Vice Chairmanship of the Joint Economic Committee (JEC) of Congress. I knew that I wanted to use this opportunity to do something different. Many of our biggest challenges today (including our economic challenges) are rooted in changes that are fundamentally social in nature: the breakdown of the family, the withering of civil society, the retreat from community life, and the evaporation of trust in our institutions. I created the Social Capital Project within the JEC in order to shine a light on the importance and state of associational life in America. Over the past two years, the project has released a number of reports and other products assessing our social assets and deficits.

One of those reports explored the opioid crisis, one of the most pressing issues of our time. Who succumbs to addiction—and is therefore at risk of dying from a drug overdose—is affected by a variety of factors, but many of them are social. Married men are much less likely to die of an opioid overdose than single men, perhaps because of the support that marriage provides them. Adults who experience childhood trauma—often at the hands of a family member—are also especially at risk of addiction.

This revised edition of that report, “The Numbers behind the Opioid Crisis,” coincides with the 2018 Solutions Summit I have organized to address Utah’s frighteningly high opioid mortality rate. It updates a number of estimates from the original report with 2016 data, and it includes a special emphasis on the situation in Utah.

It is my hope that you will find the report to be a valuable resource and that it will help communities in Utah and elsewhere as they develop solutions to this public health emergency.

Senator Mike S. Lee
October 1, 2018

EXECUTIVE SUMMARY

In 2016, roughly 64,000 people died from drug overdoses, and opioids accounted for nearly two-thirds of those deaths.¹ It is difficult to comprehend the full scope and magnitude of the opioids crisis, its causes, and its consequences—for families, communities, and workplaces. But better understanding the challenges it poses is a necessary first step to informed public policy. This report gathers an unprecedented amount of data on the opioids crisis. Key findings include:

Nationally, opioid overdose deaths have risen to an alarming rate

- In 2016, approximately 64,000 people died from drug overdoses, and opioid overdose deaths alone accounted for nearly two-thirds of them.
- Since 1999, opioid-related deaths have quadrupled, and between 2015 and 2016, the number of deaths from fentanyl and other synthetic opioids more than doubled.² There is a glimmer of optimism in that it looks like these increases have decelerated over the past year.

In Utah, opioid deaths may have peaked but are still elevated.

- Since 2012, opioid deaths have hovered at around 16 to 17 per 100,000 Utahns. That remains above the national rate of 13 per 100,000.
- While opioid deaths are surging at the national level, because Utah's epidemic has involved primarily prescription opioids, it has not seen the same recent spike.

Opioid-related deaths are shifting to younger demographic groups, typically white, single or divorced, and with relatively less formal education

- In 2015, of the population age 25 and older, 61 percent of Americans were married, and together with widowed Americans made up 68 percent of the population, but accounted for only 28 percent of opioid overdose deaths. In contrast, never-married and divorced Americans made up about 32 percent of the population, but accounted for 71 percent of all opioid overdose deaths.
- In 2015, among those age 25 and older, 33 percent had a bachelor's degree or higher, but they accounted for only 9 percent of all opioid overdose deaths. In stark contrast, 40 percent had no more than a high school diploma or equivalent, but they accounted for 68 percent of opioid overdose deaths.

The oversupply and abuse of legal prescription pain relievers is at the heart of the crisis

- In the 1960s, four out of five heroin addicts began with heroin, but by the 2000s three out of four heroin addicts began either with prescription opioids obtained legally through a doctor's prescription or illegally from someone else's prescription.³ Drugs freely given by friends and family

constitute over 40 percent of prescription pain relievers taken by abusers of those drugs.

- In 2016, nearly 215 million prescriptions for opioids were filled in the United States. Data analyzed by the CDC show that 61.8 million patients received those prescriptions, or 19.1 percent of the U.S. population.⁴
- In the median U.S. county, physicians prescribed an amount of opioids in 2015 equivalent to a nearly two-week supply of oxycodone for every resident.
- A majority of opioid overdose deaths are a result of combining opioids or combining them with other central nervous system agents, including benzodiazepines (often used to treat anxiety and sleep problems).

Illegally obtained opioids have rapidly become a major problem

- As prescription rates for opioids have declined, there has been a growing threat from illegal opioids, such as heroin and synthetic opioids like fentanyl (which is 25 to 50 times more powerful than heroin). Fentanyl is often disguised in a substance that resembles heroin or in counterfeit prescription pills.
- Fentanyl seizures by law enforcement increased by a factor of six between 2014 and 2016.

Hospitalization for opioids abuse has also risen across geographic, demographic, and socioeconomic groups

- Heroin use and opioid prescription misuse resulting in emergency room visits have been rising in many states and their major metropolitan areas.
- As with prescribing rates, opioid-related inpatient hospital stays are concentrated in Appalachia, the West, and New England.
- In 2014, those aged 25-64 had the highest rates of inpatient stays, and lower income individuals and those in the large metropolitan areas had higher rates of stays than other groups from 2005-2014.

The opioid crisis will affect the next generation for years to come

- Reports of young children overwhelming foster care systems are pouring out of states like Ohio, which since 2010 have witnessed an increase of nearly one-fifth in the number of children placed with relatives or in foster care.⁵
- Between 2009 and 2014, the percent of children nationwide with parental alcohol or drug use as a factor in out-of-home placement rose from 29.4 percent to 35.1 percent.
- New England and the South have the highest rates of neonatal abstinence syndrome (NAS) per 1,000 hospital births. In 2013, according to a CDC study, NAS incidence per 1,000 hospital births was highest in Vermont (33.3) and West Virginia (33.4).⁶ The recent rise in NAS has been fueled by opioid addiction.

In 2016, approximately 64,000 people died from drug overdoses.⁷ In fact, drug overdoses are now the top cause of accidental death for all Americans under age 50.⁸ Opioid overdose deaths alone accounted for nearly two-thirds of drug overdose deaths, and have surpassed the all-time peaks of annual deaths caused (individually) by car crashes, H.I.V., and guns.⁹ Today's opioid mortality crisis dwarfs earlier waves in the 1970s and the years around 1990.

More than 20,000 deaths in 2016 were attributable to synthetic opioids like fentanyl (a number that more than doubled over the previous year), over 15,000 were attributable to heroin, and over 14,000 to prescription opioids like oxycodone. Some of these deaths involved multiple opioids, and final numbers have yet to show the proportion of 2016 drug overdose deaths involving opioids. In 2015, however, 33,091 deaths were attributed to opioids, or 63.1 percent of the 52,404 drug overdose deaths in that year.¹⁰ Since 1999, opioid-related deaths have quadrupled.¹¹ The United States consumes more opioids than any other country by a wide margin, and as a result has the highest opioid-related death rate in the world.¹²

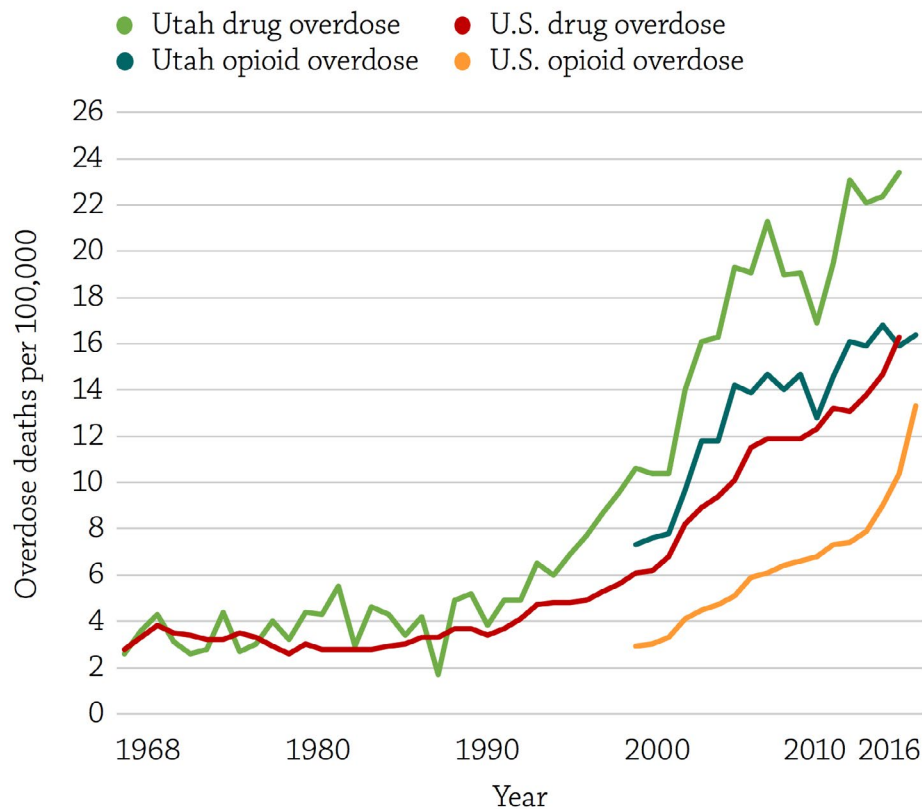
The effects of our opioid crisis on families, communities, and workplaces are far-reaching.¹³ For the first time since 1993, life expectancy in the United States declined, with one research paper estimating that opioid overdose deaths accounted for 2.5 months of the 4 months' decline.¹⁴ The increase in opioid-related drug overdose deaths is a significant contributor to the troubling mortality trends that Princeton University economists Anne Case and Angus Deaton identified among white non-Hispanics. It has been linked to labor market outcomes in research by Princeton University economist Alan Krueger. The Joint Economic Committee (JEC) also recently shined a light on this issue in a hearing on the "Economic Aspects of the Opioid Crisis," where a broad range of both causes and consequences of the crisis were discussed.¹⁵

This data brief gathers together for the first time the available data on the opioids crisis. It is our hope that the Social Capital Project can help inform public policy aimed at addressing what President Trump and his Department of Health and Human Services have declared a national public health emergency.

OPIOID OVERDOSE DEATHS IN AMERICA CONTINUE TO SKYROCKET, BUT IN UTAH THEY MAY HAVE PEAKED

The Social Capital Project's initial post on the opioid crisis showed unintentional drug and opioid overdose death rates since 1968.¹⁶ Figure 1 below shows overdose death rates of all intents over the same time frame. (All rates in this paper are per 100,000 people unless otherwise indicated. For full methodological details to all charts, see the Source Notes at the end of this report.) In 1968, opioid overdose deaths were a small fraction of overall drug overdose deaths, but in 2016 they accounted for the majority of all drug-related deaths.

Figure 1. Ageadjusted overdose death rates (all intents), 1968-2016

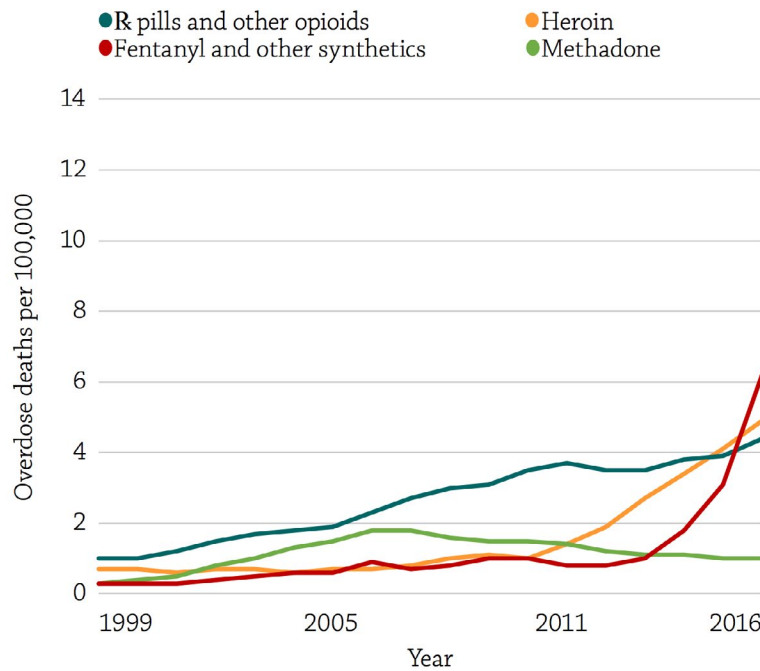


Source: Centers for Disease Control and Prevention (CDC). Includes all deaths, unintended or otherwise. National Vital Statistics System data produced using CDC WONDER's Multiple Cause of Death Module: 1999-2016 (<https://wonder.cdc.gov/mcd.html>). National Vital Statistics System downloadable Multiple Cause of Death files: 1968-78 and 1979-1998 (https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm). Provided by CDC staff to Social Capital Project.

Figure 1 shows that as of 2016, drug and opioid overdose death rates remained higher in Utah than in the US as a whole. However, it also indicates that in Utah, drug and opioid overdose deaths have plateaued. There has been no discernable trend since 2012, even though nationally, death rates accelerated.

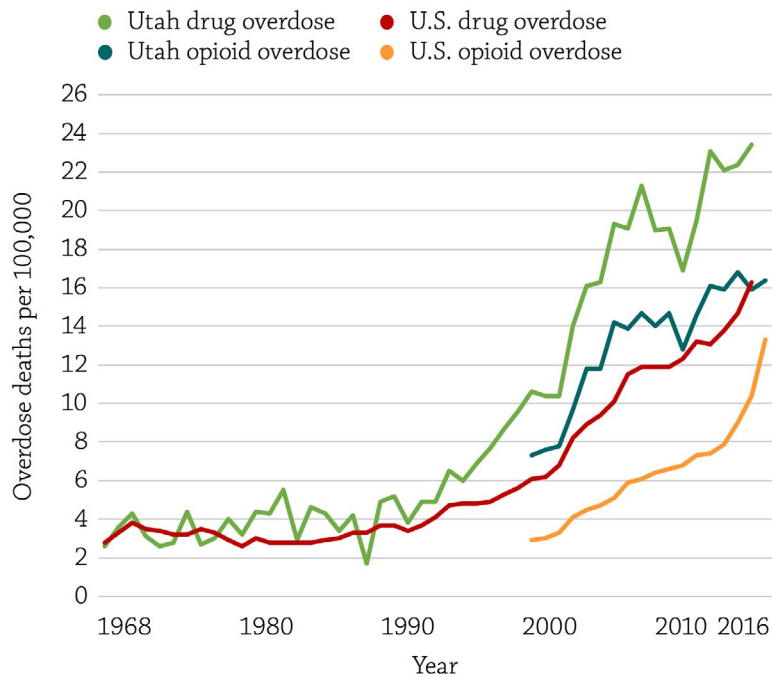
The opioid crisis has worsened recently because of the expanding supply of synthetic opioids that are flooding into illegal drug markets, such as fentanyl (which is 25 to 50 times stronger than heroin), carfentanil (roughly 5,000 times stronger than heroin), and others.¹⁷ Opioid overdose deaths can be classified consistently by type of drug back to 1999. Figure 2a below shows trends in death rates from five categories of opioids: heroin, methadone, "other synthetic opioids" (besides methadone, but including fentanyl), "other natural and semisynthetic opioids" (including oxycodone, hydrocodone, and most opioid prescription painkillers, as well as morphine), and "other and unspecified opioids" (including unidentified opioids). From 2014 to 2016, deaths from these synthetic opioids increased by an astonishing 250 percent, and they accounted for 31 percent of drug overdose deaths in 2016.¹⁸

Figure 2a. National age-adjusted overdose deaths by opioid type, 1999-2016



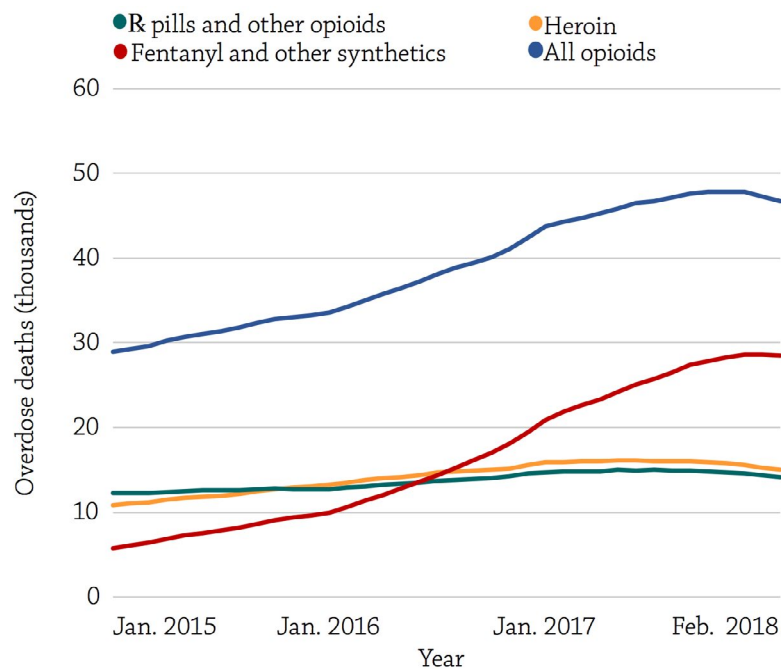
Source: Age-adjusted rates. Includes all deaths, unintended or otherwise. CDC WONDER (<https://wonder.cdc.gov>).

Figure 2b. Ageadjusted overdose deaths in Utah by opioid type, 1999-2016



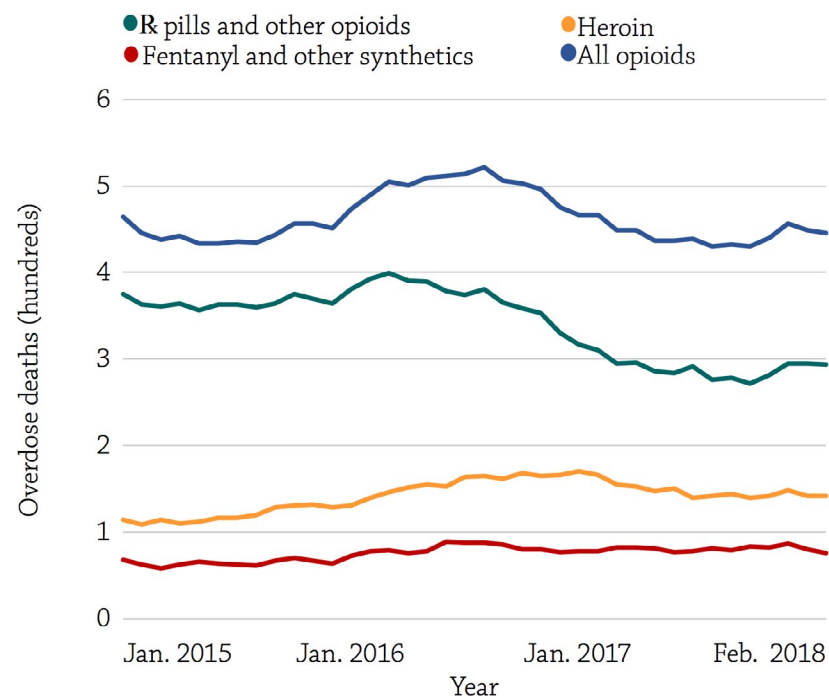
Source: Age-adjusted rates. Includes all deaths, unintended or otherwise. CDC WONDER (<https://wonder.cdc.gov>).

Figure 2c. National provisional overdose death counts by opioid type, January 2015 to February 2018



Source: Data for overdose deaths for 12 months ending in each month indicated from Provisional Drug Overdose Death Counts, NVSS, accessed at <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>.

Figure 2d. Provisional overdose death counts in Utah by opioid type, January 2015 to February 2018



Source: Data for overdose deaths for 12 months ending in each month indicated from Provisional Drug Overdose Death Counts, NVSS, accessed at <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>.

In Utah, the story is quite different (Figure 2b). Opioid deaths have primarily involved—and continue to primarily involve—prescription drug overdoses. The sharp rise in deaths from synthetic opioids at the national level did not occur in Utah, though heroin deaths continue to rise and exceeded national levels in 2016.

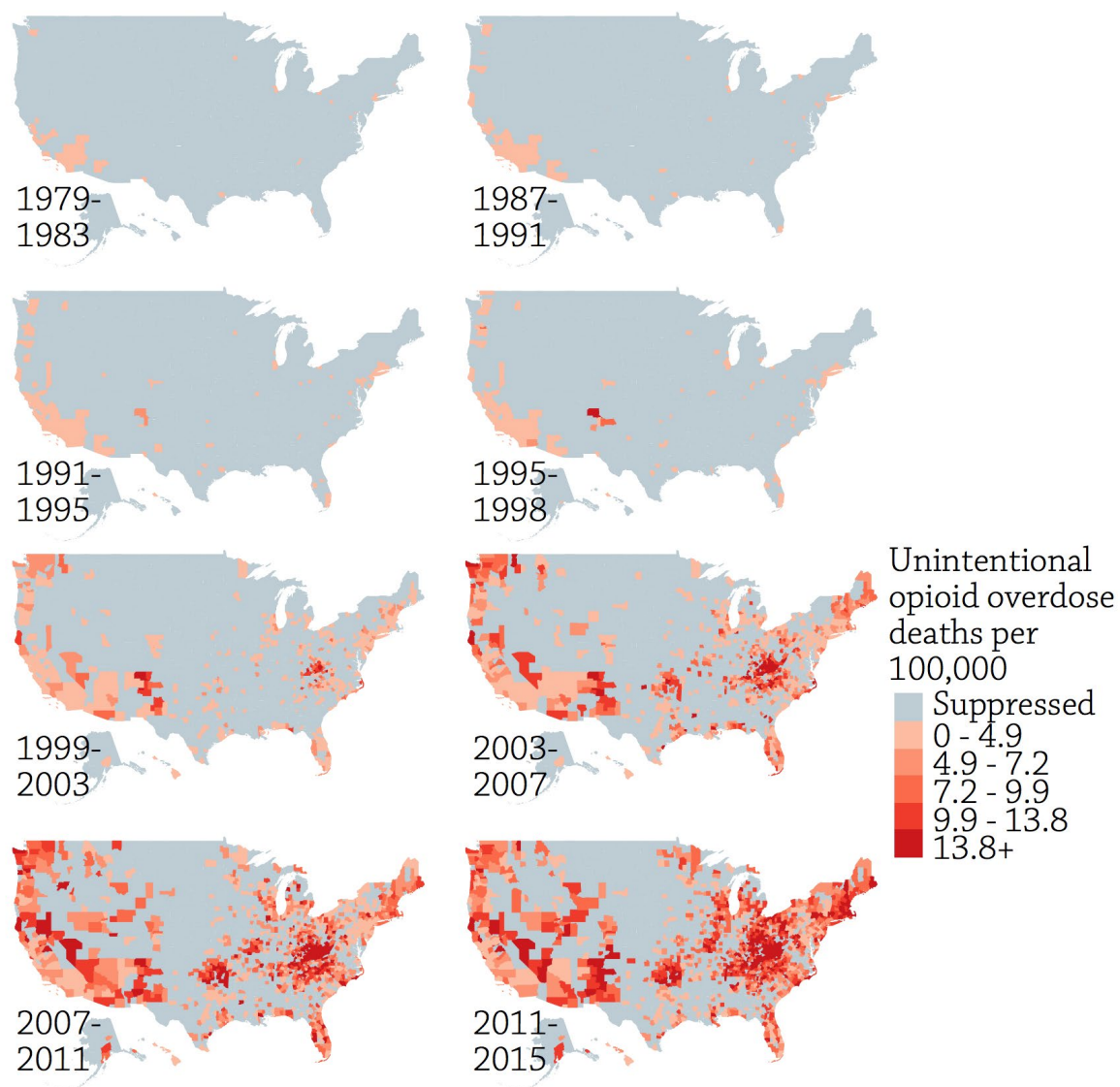
Figures 2c and 2d look at more recent trends through February 2018, for the US and Utah. The charts display for each month back to January 2015 the number of overdose deaths from opioids over the preceding 12 months. In other words, the estimate for February 2018 is for deaths between March 2017 and that month. Note that these are deaths, not death rates—they have not been adjusted for population change.

Nationally, the increase in opioid overdose deaths in recent years has been driven by synthetics. However, the rise in both has decelerated, and there is a glimmer of hope that the tide may even be turning. More data is needed, however, before we can conclude that with any confidence.

Figure 2d indicates that in Utah, opioid deaths peaked between September 2015 and August 2016, and deaths from prescription opioids peaked between April 2015 and March 2016. The most recent opioid death estimates show a slight increase, but the February 2018 estimate remains 15 percent lower than the peak. For the category including prescription opioids, deaths are down 26 percent from their peak. Even deaths from heroin and from synthetics appear to be declining.

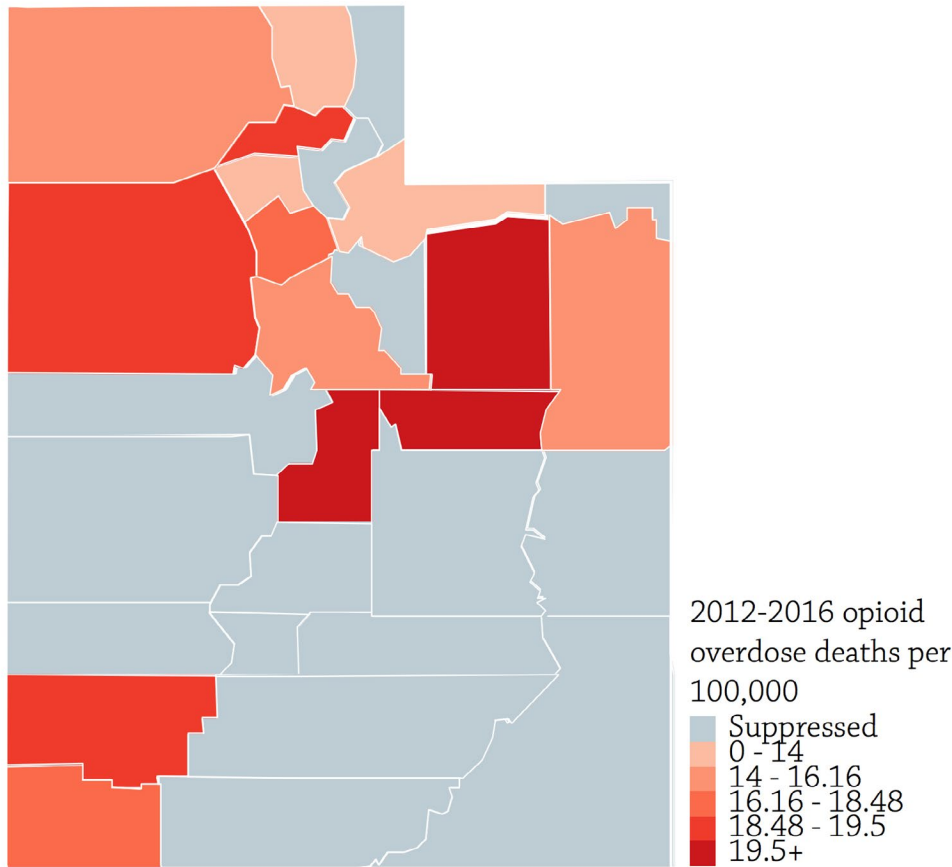
The maps below show the spread of unintentional opioid overdose deaths over time and geography, as originally presented in the first Social Capital Project post on the opioids crisis.¹⁹ (See the original post for state-specific maps.)

Figure 3a. Geographic spread of unintentional opioid overdose deaths, by county, 1979-83 to 2011-15



Source: CDC, Compressed Mortality File (CMF) 1979-1998 and Multiple Cause of Death (MCD) 1999-2015 on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/cmfi-icd9.html> and <http://wonder.cdc.gov/mcd-icd10.html>.

Figure 3b. Opioid overdose deaths in Utah, by county, 2012-2016



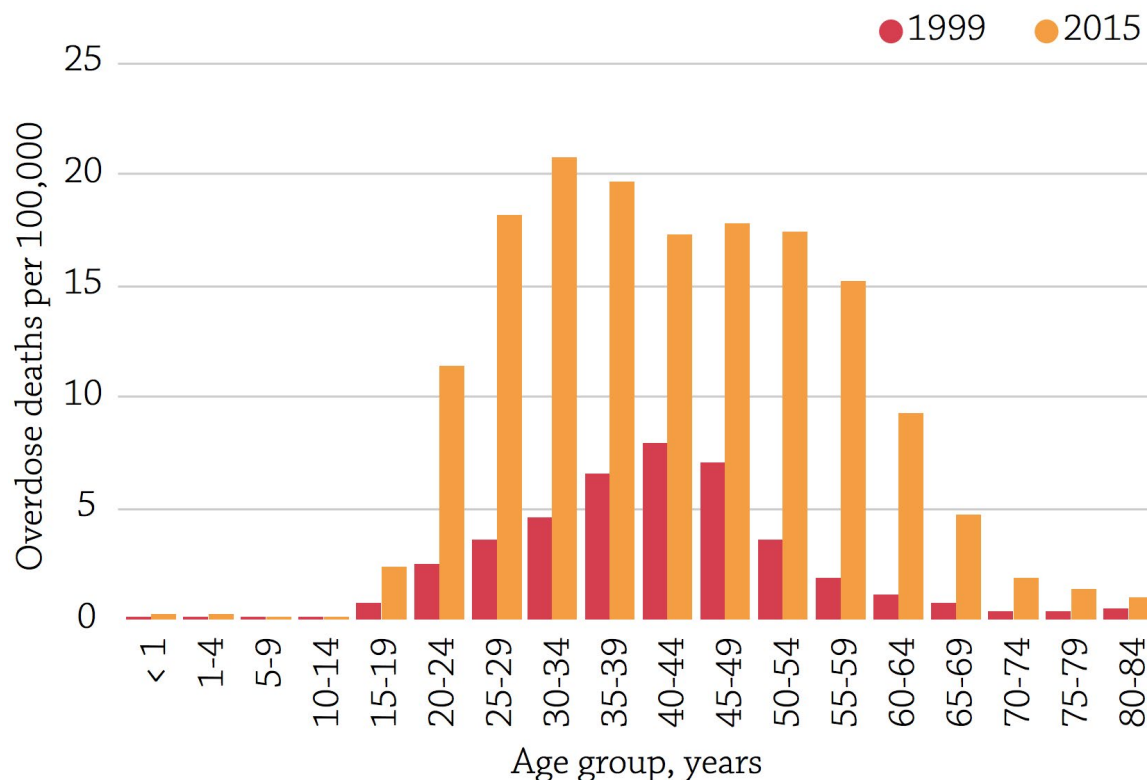
Source: Age-adjusted rates. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.

Figure 3b displays opioid overdose death rates for Utah counties with reliable data (14 of the state's 19 counties). The lightest counties in the chart have suppressed data. Unlike in the national maps, this one includes all opioid overdose deaths (regardless of intent) and uses age-adjusted rates. Sanpete, Carbon, and Duchesne Counties stand out as having the highest rates. Cache, Davis, and Summit Counties have the lowest.

BETWEEN 1999 AND 2015, OPIOID DEATHS SHIFTED TO YOUNGER DEMOGRAPHIC GROUPS, TYPICALLY WHITE, SINGLE OR DIVORCED, AND WITH RELATIVELY LESS FORMAL EDUCATION

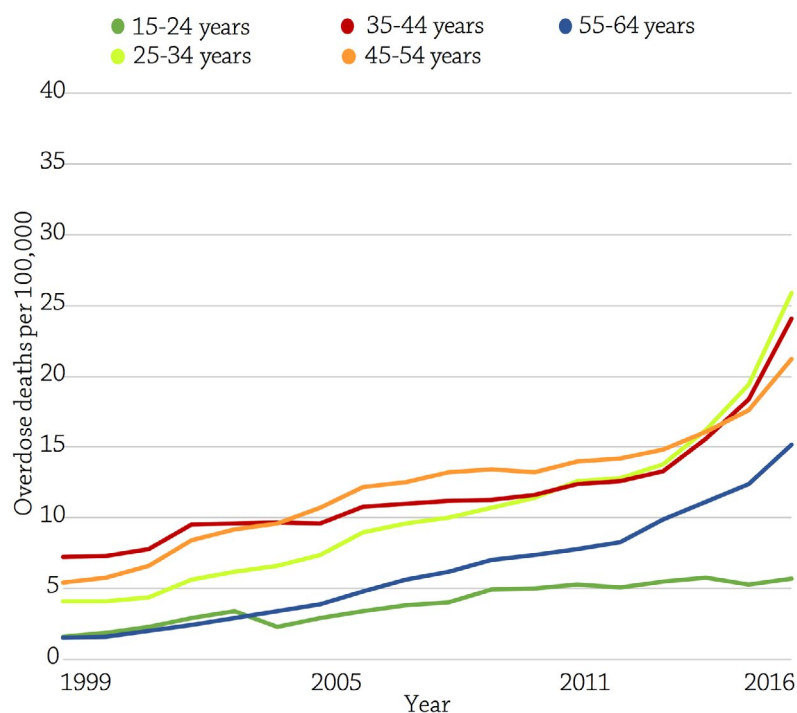
Between 1999 and 2015, overdose deaths for opioids like heroin and fentanyl have skewed younger, with the highest overdose death rates occurring among those between 25 and 39 years of age (Figure 4a).²⁰ By comparison, overdose deaths from prescription opioids, particularly for opioid medications commonly distributed in pill form, have dramatically risen for those 45 to 59 years of age. Deaths categorized as resulting from unspecified narcotics have fallen, likely in part because medical examiners and coroners are better able to identify specific opioids on death certificates.

Figure 4a. Opioid overdose deaths by age group, 1999 and 2015



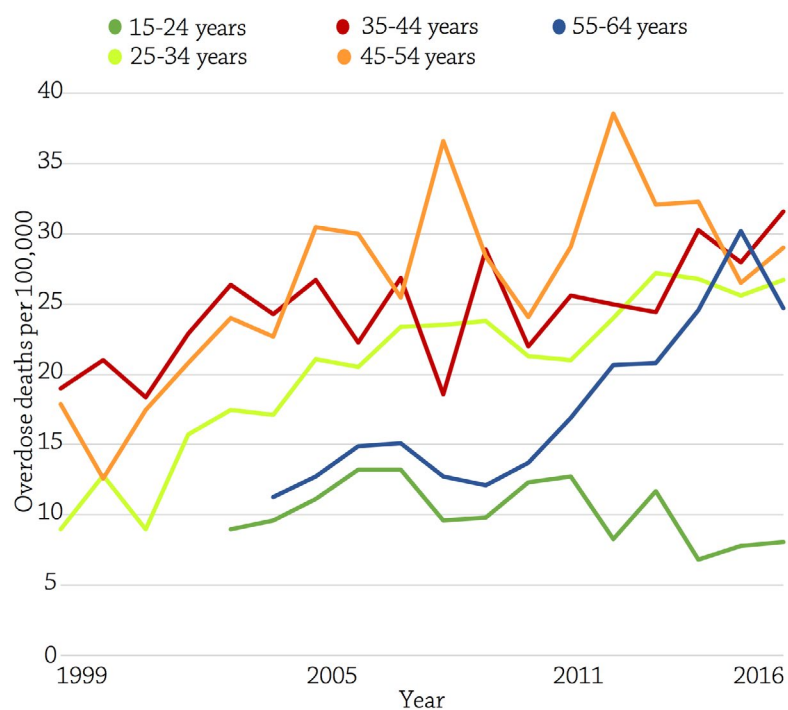
Source: Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.

Figure 4b. Opioid overdose deaths by age group, 1999-2016



Source: Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.

Figure 4c. Opioid overdose deaths in Utah by age group, 1999-2016



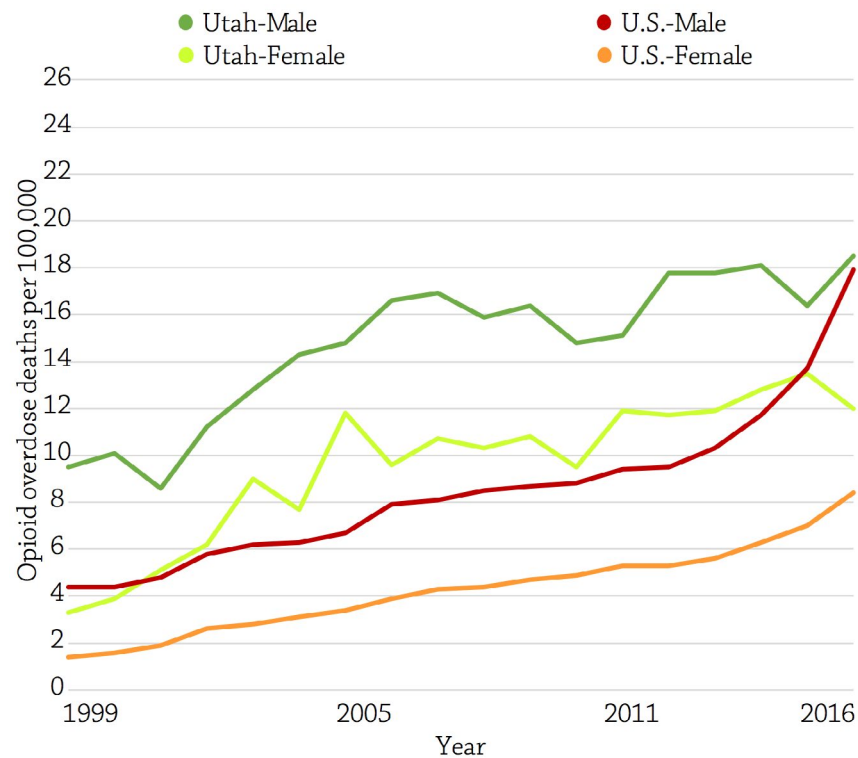
Source: Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.

Figure 4b organizes people into larger age groups and displays the full 1999-to-2016 trend. The increase in opioid overdose deaths has been sharpest among those ages 25 to 44, but it has been substantial for older adults too.

Age trends for Utah are shown in Figure 4c. The plateauing of overdose deaths apparent in Figure 1 is less evident here. Older Utahns, between the ages of 55 and 64, have seen an especially large increase in overdose deaths compared with older Americans generally. Though for years their overdose death rates were unusually high, Utahns under age 35 no longer have rates that are higher than in the nation as a whole.

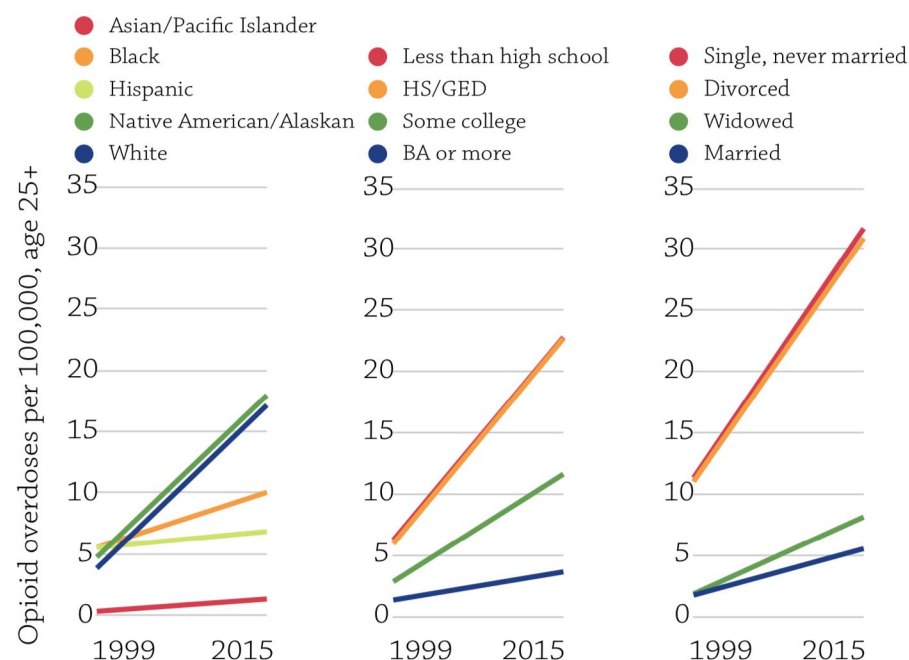
Next, Figure 5 displays opioid overdose deaths by sex. Nationally, men have seen much bigger increases than women, especially in terms of deaths from heroin and synthetics. Because of data suppression issues, we show the Utah trend only for overall opioid mortality. In contrast to the national pattern, men and women in Utah have seen a similar increase in opioid deaths. This parity reflects the prominence of prescription opioids in Utah. Even nationally, men and women have seen similar increases in opioid overdose deaths from the category that includes prescription drugs.

Figure 5. Opioid overdose deaths by type of opioid and sex



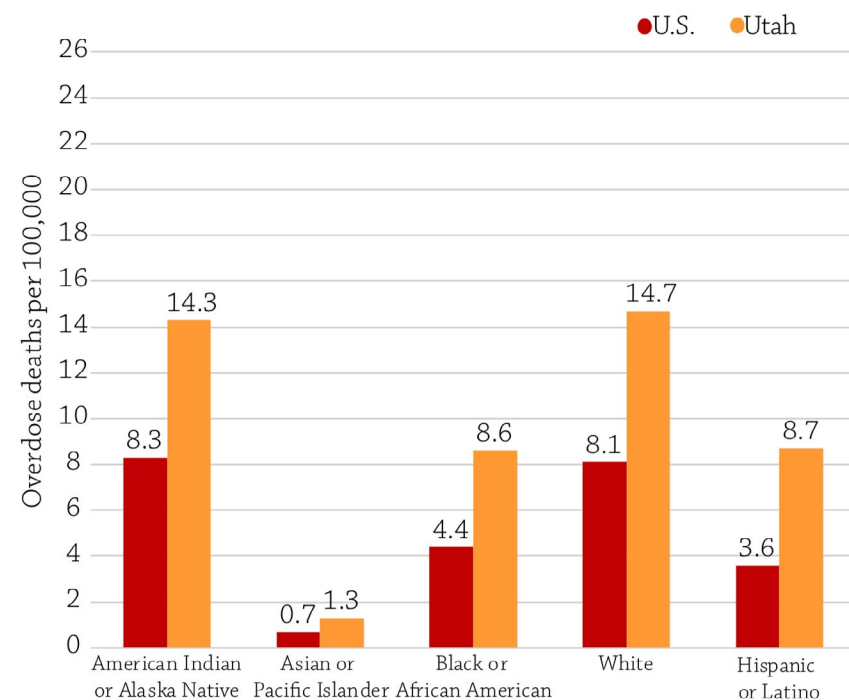
Source: Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 and 1999-2016 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.

Figure 6a. Opioid overdose deaths by race, by educational attainment, and by marital status, 1999 and 2015



Source(s): Social Capital Project staff calculations, crude rates shown. CDC. Includes all deaths, unintended or otherwise. See Source Notes for details.

Figure 6b. Opioid overdose deaths by race, Utah vs U.S., 1999–2016

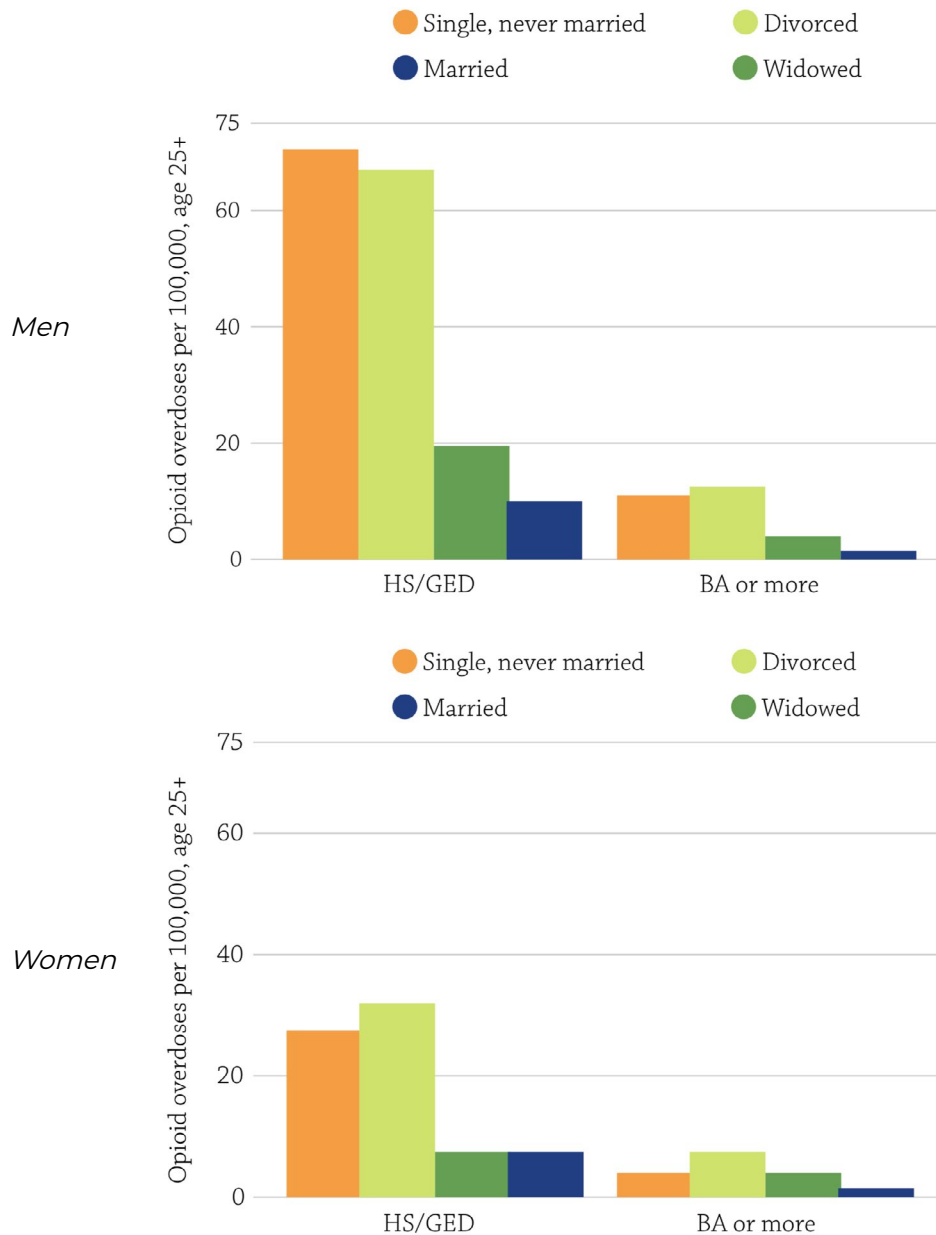


Source(s): Age-adjusted rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2016 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>. See Source Notes for details.

Between 1999 and 2015, Native Americans and non-Hispanic whites saw more dramatic increases in overdose death rates (Figure 6a). Opioid overdose death rates have remained remarkably low for Asian Americans and Pacific Islanders.

In Figure 6b, we compare the racial breakdown for Utah to the national figures. Utahns of every background have higher opioid mortality rates than their counter- parts in the rest of the country.

Figure 7. Opioid overdose death rates by gender, educational attainment, and marital status, 2015



Source(s): Social Capital Project Staff calculations, crude rates shown. Includes all deaths, unintended or otherwise. CDC. See Source Notes for details.

Adults with lower educational attainment and who are divorced or have never married have higher opioid overdose death rates and have experienced larger increases in mortality (Figure 7). Across education groups, generally those either widowed or married still had a relatively lower overdose death rate than those single or divorced. In 2015, of the population age 25 and older, 61 percent of Americans were married, and together with widowed Americans made up 68 percent of the population, but accounted for only 28 percent of opioid overdose deaths. In contrast, never-married and divorced Americans made up about 32 percent of the population, but accounted for 71 percent of all opioid overdose deaths.

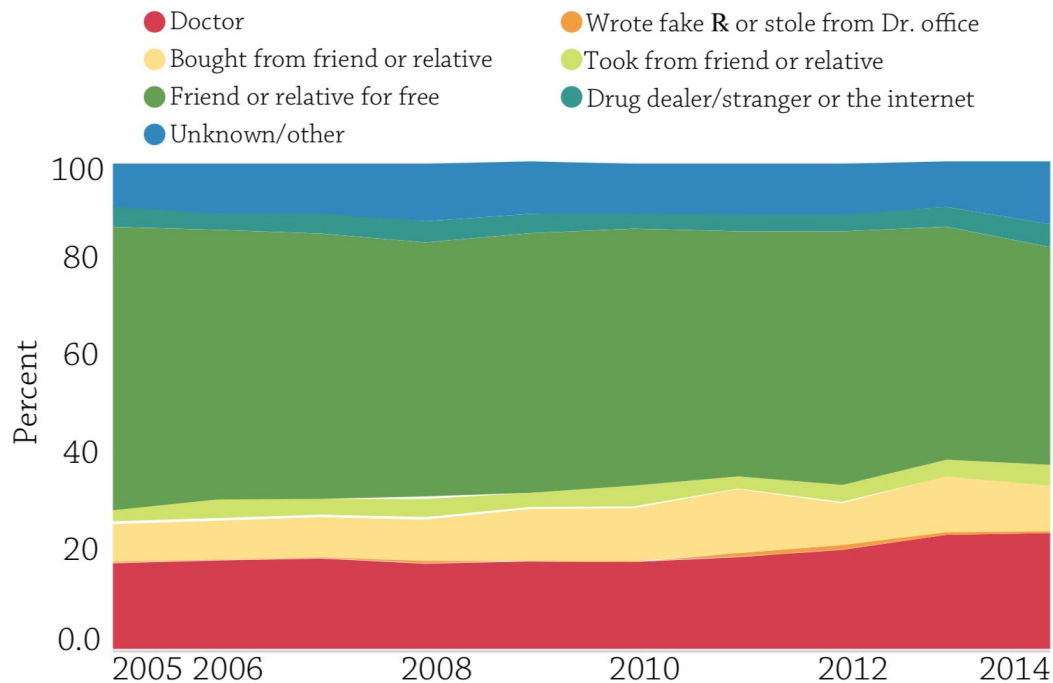
In 2015, among those age 25 and older, 33 percent had a bachelor's degree or higher, but they accounted for only 9 percent of all opioid overdose deaths. In stark contrast, 40 percent had no more than a high school diploma or equivalent, but they accounted for 68 percent of opioid overdose deaths. (Not shown in Figure 7, 27 percent had some college education, accounting for 23 percent of opioid overdose deaths.)

ABUSE OF PRESCRIPTION PAIN RELIEVERS IS AT THE HEART OF THE CRISIS

One reason for the severity of the opioid crisis is that for much of the crisis opioids have been easily and often legally obtained by prescription. In the 1960s, four out of five heroin addicts began with heroin, but by the 2000s three out of four heroin addicts began either with prescription opioids obtained legally through a doctor's prescription or illegally from someone else's prescription.²¹

Studies that try to estimate rates of addiction among people who are prescribed opioids often use inconsistent methods and definitions, making comparisons and generalizations difficult.²² According to one review of studies focused on opioid abuse in chronic non-cancer pain management, individuals who are prescribed opioids have a 15-26 percent chance of misusing or abusing opioids, or expressing "addiction-related aberrant behaviors."²³ These behaviors can include forging prescriptions, earlier-than-typical requests for refills on medication, and injecting medications that were intended for oral use. In another review of studies, addiction rates ranged from 8 to 12 percent among individuals who had been prescribed opioids to manage chronic non-cancer pain.²⁴ A 2013 survey found that, among those who used pain relievers non-medically between 2002 and 2011, 4 percent began using heroin within five years.²⁵

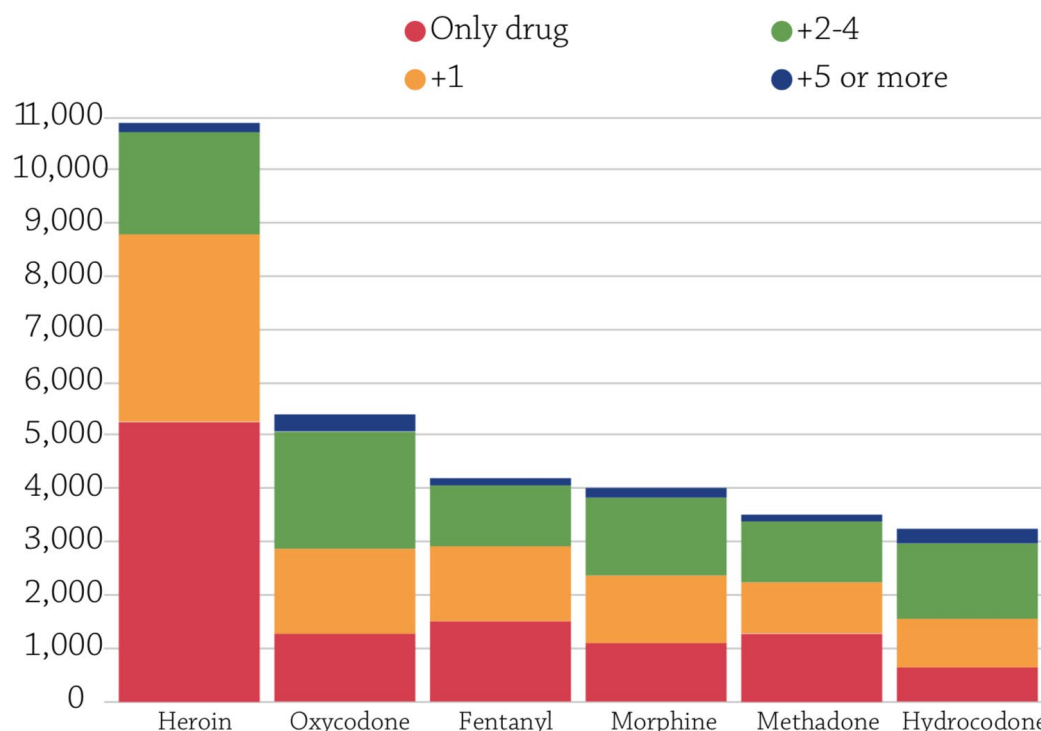
Figure 8. Source of pain relievers among prescription abusers in the past year, 2005-2014



Source: Social Capital Project analyses of the National Survey on Drug Use and Health (NS- DUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>.

The majority of individuals who misused pain relievers in the past year gained access to it through a friend or relative. A teenager may steal from their parents' medicine cabinet; a grandparent might offer their extra pills to a son-in-law who is struggling with back pain; a neighbor may ask for advice on pain relief and receive a few doses. In each case, relatively close social relationships serve to expand the reach of prescription pain relievers beyond their intended use. Social network analysis has shown that, in some areas, illegal pills are a form of community currency, with those who use opioids daily having relatively more social connections.²⁶ Figure 8 shows the source of pain relievers among “nonmedical pain reliever” users in the last year.

Figure 9. Opioid overdose deaths by number of drugs involved, 2014



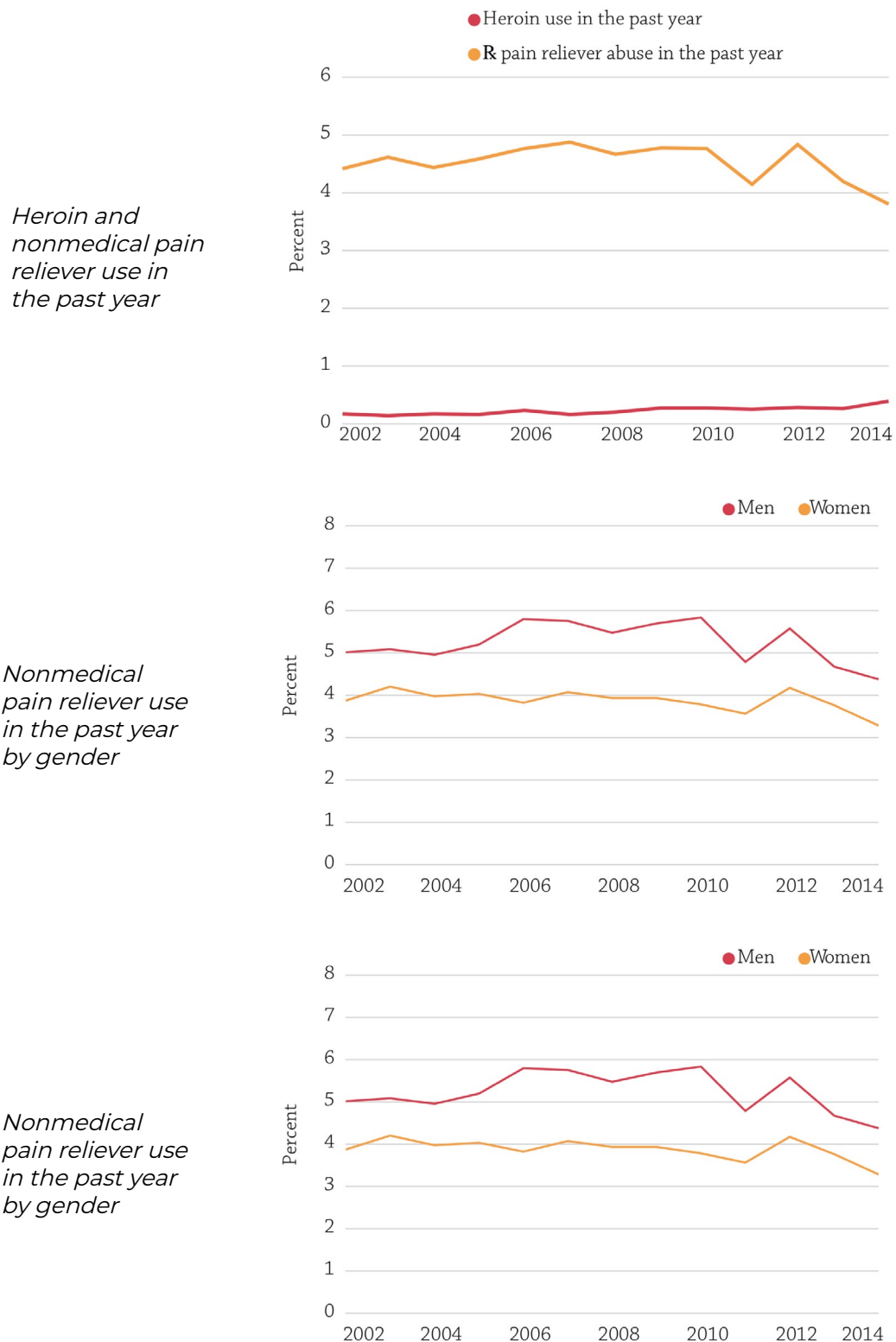
Source: CDC, National Vital Statistics Reports, Vol. 65, No. 10, December 20, 2016, Table 5 (https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_10.pdf). Includes all deaths, unintended or otherwise.

Despite the closeness of social networks among prescription opioid abusers, they can remain remarkably isolated from other friends and family members who remain largely unaware of misuse or addiction.²⁷ One mental-health literacy survey conducted by Michigan State University researchers found that nearly one-third of respondents couldn't identify the signs of prescription drug misuse.²⁸

Another indicator of the centrality of prescription drugs to the opioid crisis is the fact that a majority of opioid overdose deaths are a result of combining opioids or combining them with other central nervous system agents, including benzodiazepines (often used to treat anxiety and sleep problems). In 2014, for example, over half of heroin overdose deaths involved at least one other drug, as did over eight in ten hydrocodone overdose deaths (see Figure 9).²⁹

Abuse of prescription pain relievers ("nonmedical pain reliever use") declined between 2010 or 2012 and 2014. However, as shown in Figure 10, it remains much more widespread than heroin use. Reported prescription pain reliever abuse is higher for men than women. Hispanics, non-Hispanic whites, and non-Hispanic blacks have similar rates of prescription pain reliever abuse, while non-Hispanic Asians have lower rates.

Figure 10. Type of nonmedical opioid use in the past year, ages 18 and older, 2002-2014



Source: Social Capital Project analyses of the National Survey on Drug Use and Health (NS- DUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>.

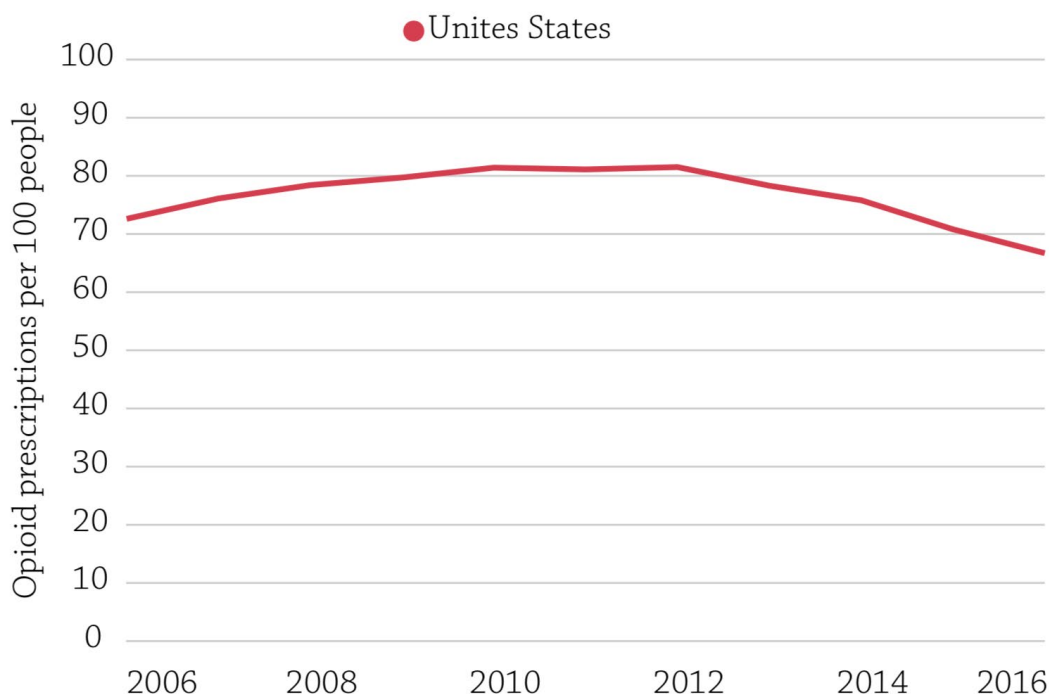
THE OVERSUPPLY OF PRESCRIPTION PAIN KILLERS CONTINUES TO CONTRIBUTE TO THE OPIOID CRISIS

A March 2017 study from the CDC determined that 13.5 percent of patients receiving eight days or more of prescription opioid therapy used opioids one year later—up from 6 percent among patients receiving any prescription opioid therapy.³⁰ Among patients taking prescription opioids for at least 30 days, 30 percent were using opioids one year later.

Research examining the introduction of the Medicare Part D prescription drug benefit found that a 10 percent increase in the supply of prescription opioids leads to an estimated 7.4 percent increase in opioid-related deaths.³¹ Prescribing practices are tied to several risk factors for both prescription opioid addiction and overdose.³² These factors include daily doses of more than 100 morphine milligram equivalents (MME) and opioid use of longer than three months. MME units are a way to aggregate opioid prescriptions in order to estimate the dosage level of a given prescription.

According to the CDC, daily dosages of more than 20 MME increase the risk of overdose, and dosages of 50 MME per day or more double the risk of overdose relative to the risk at a dosage of less than 20 MME per day.³³ Fifty MME is equivalent to approximately two 15mg tablets of sustained-release oxycodone.

Figure 11. Opioid prescriptions per 100, 2006-2016

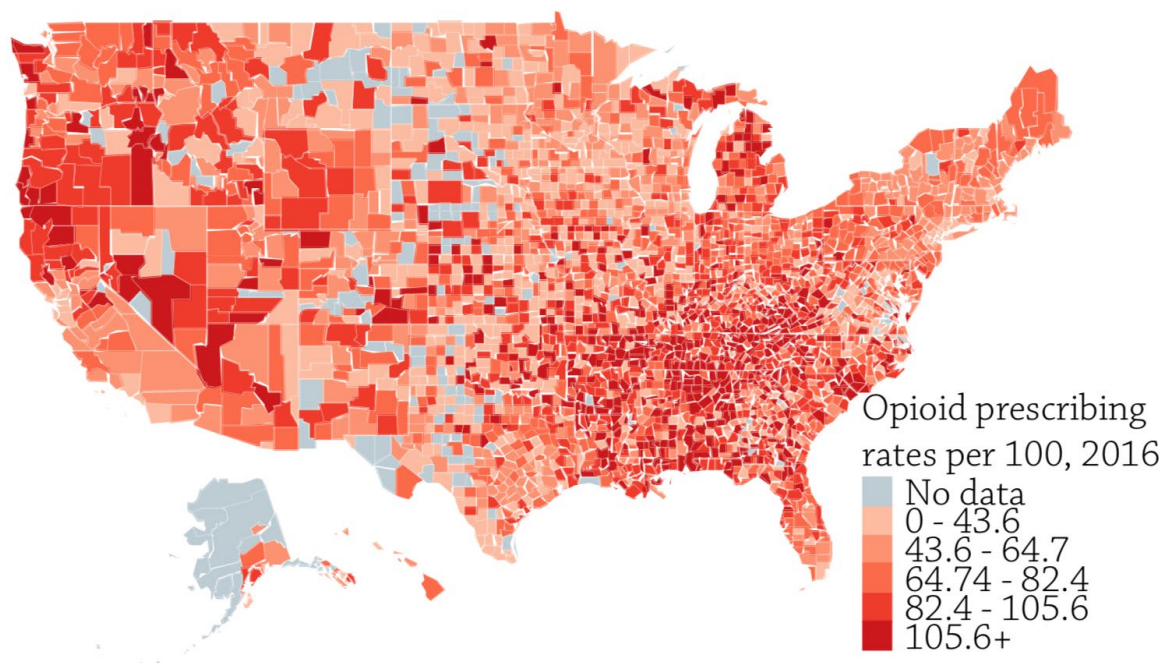


Source: "Table 1. Total number and rate of opioid prescriptions dispensed, United States, 2006- 2016," U.S. Prescribing Rate Maps, CDC, last modified July 31, 2017, <https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html>.

In 2016, nearly 215 million prescriptions for opioids were filled in the United States. Data analyzed by the CDC show that 61.8 million patients received those prescriptions, or 19.1 percent of the U.S. population.³⁴ Of the patients who were prescribed opioids, 3.7 million were ages 19 and under. Forty-one percent of opioid prescriptions were for a supply of 30 days or more, and 26.4 percent were for at least 50 MME per day. Ten percent of the prescriptions were for dosages of greater than 90 MME per day. The average number of prescriptions per patient was 3.5 and the average supply per prescription was 18.1 days.

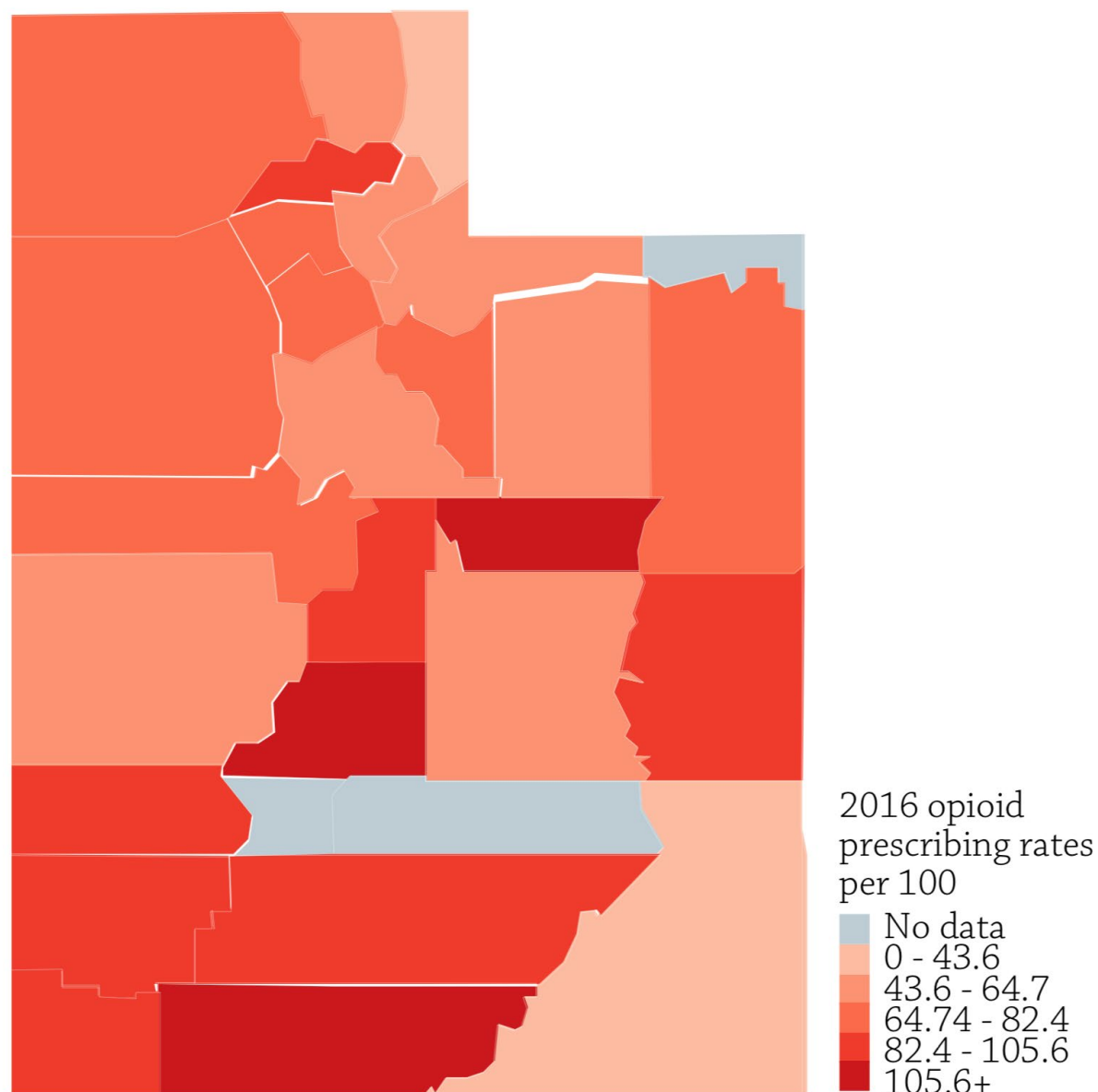
Based on Alan Krueger's research, in 2015 physicians prescribed 648.7 MMEs per person in the median U.S. county.³⁵ That amounts to nearly a two-week supply of oxycodone for every resident. The prescribed amount for the county at the 75th percentile was 930 MME per capita, more than an 18-day supply of oxycodone.

Figure 12a. Opioid prescriptions per 100, by county, 2016



Source: "U.S. County Prescribing Rates, 2016," CDC, last modified July 31, 2017, <https://www.cdc.gov/drugoverdose/maps/rxcounty2016.html>.

Figure 12b. Opioid prescriptions per 100 in Utah, by county, 2016

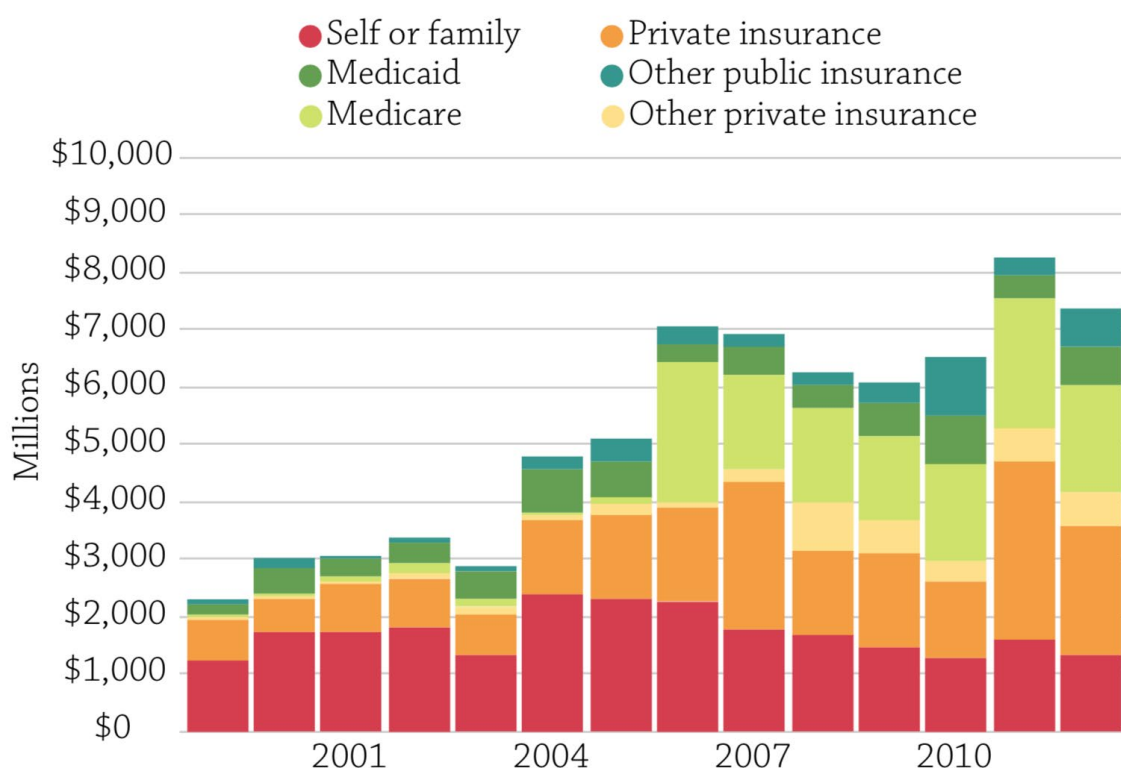


Source: "U.S. County Prescribing Rates, 2016," CDC, last modified July 31, 2017, <https://www.cdc.gov/drugoverdose/maps/rxcounty2016.html>.

From 1999 to 2010, opioid prescribing rates based on MME steadily increased.³⁶ But as Figure 11 shows, since 2012, opioid prescriptions per person have declined. Figures 12a and 12b display maps of prescription rates for U.S. and Utah counties. Kane, Sevier, and Carbon Counties had the highest rates in Utah, while Rich and San Juan Counties had the lowest rates.

As prescribing steadily increased between 1999 and 2010, payment trends for opioids also shifted. In 2012, the latest year for which data are available, private insurance and Medicare accounted for most of the spending on opioid prescriptions, with Medicare's share of payments having increased significantly following the implementation of the Part D drug benefit program in 2006 (Figure 13). Between 1999 and 2012, Medicaid and out-of-pocket expenditures on prescription opioids remained relatively stable, although Medicaid spending on opioids for the population under age 65 rose from \$135 million in 1999 to \$648 million in 2012 (2009 dollars).

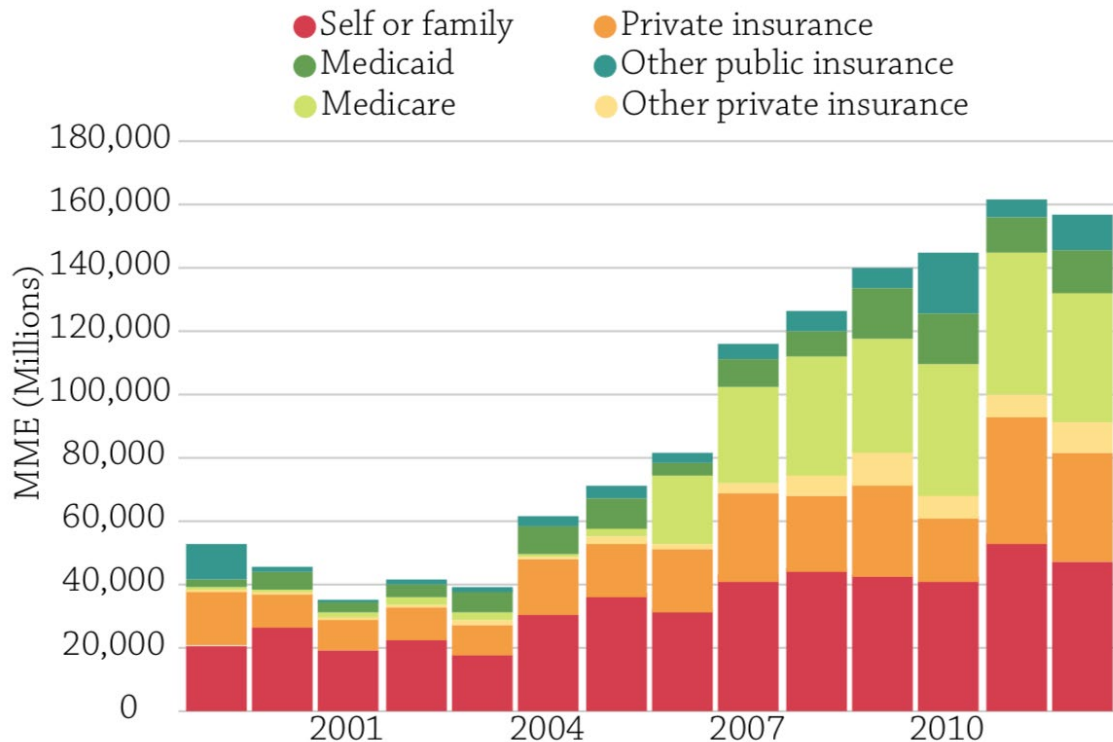
Figure 13. Total expenditures for opioid prescriptions by insurance type, 1999-2012



Source: Chao Zhou, Cutis S. Florence, and Deborah Dowell, "Payments for Opioids Shifted Substantially to Public and Private Insurers While Consumer Spending Declined, 1999-2012," *Health Affairs* 35, no. 5 (May 2016): 829, <https://doi.org/10.1377/hlthaff.2015.1103>.

There is some debate over the extent to which the Medicaid expansion included in the Affordable Care Act contributed to the opioid epidemic.³⁷ Since increasing the supply of opioid prescriptions tends to increase mortality from opioids, expanded prescription drug coverage through not only Medicare Part D but through Medicaid expansions would be expected to increase opioid overdose deaths.

Figure 14. Total morphine milligram equivalents (MME) by payer type, 1999-2012

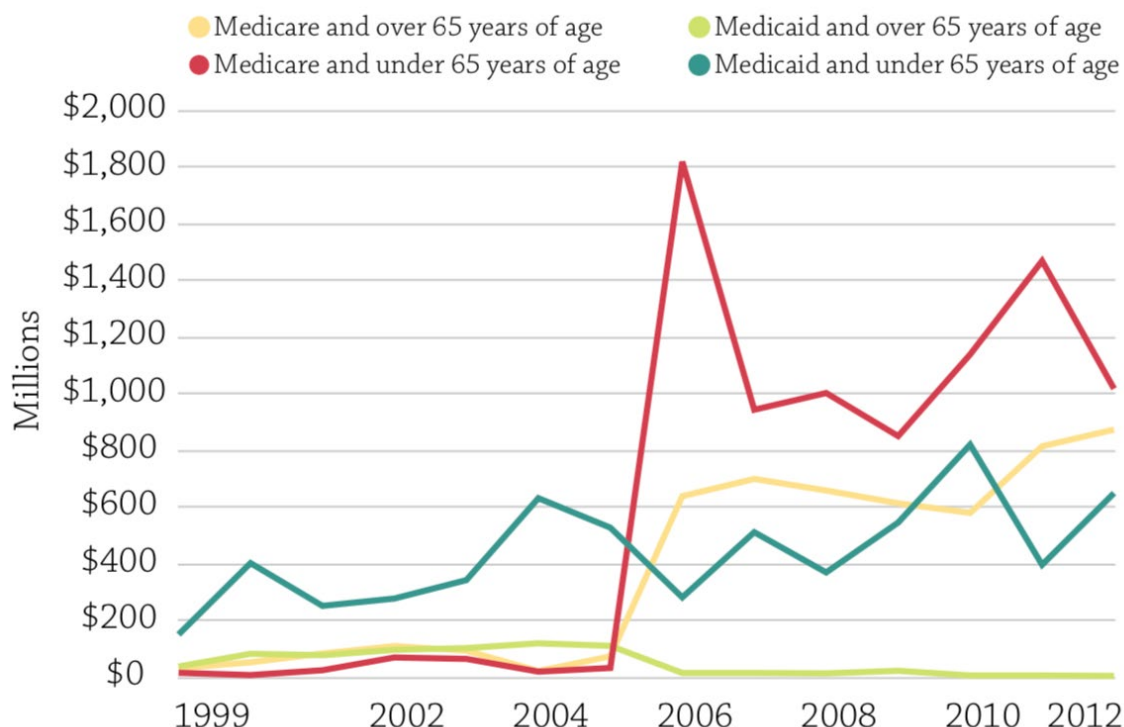


Source: Chao Zhou, Cutis S. Florence, and Deborah Dowell, "Payments for Opioids Shifted Substantially to Public and Private Insurers While Consumer Spending Declined, 1999-2012," *Health Affairs* 35, no. 5 (May 2016): 829, <https://doi.org/10.1377/hlthaff.2015.1103>.

However, ascertaining the importance of Medicaid expansion is complicated by the fact that opioid mortality rose disproportionately in Medicaid expansion states prior to those states expanding the program. Medicaid beneficiaries have a higher-than-usual rate of opioid use disorder, but as Figure 14 makes clear, Medicaid was responsible for only a small share of opioid prescriptions as of 2012.³⁸ And opioid spending within Medicaid is presumably heavily concentrated among recipients of Supplemental Security Income (SSI) disability benefits, who were eligible for Medicaid before the Affordable Care Act passed.

While the vast majority of those who are eligible for Medicare are over the age of 65, the program spends significantly more money on opioid prescriptions for the enrolled population that is under 65. Medicare eligibility factors for those under 65 include receipt of Social Security Disability Insurance (SSDI), following a 24-month waiting period, and end-stage renal disease. Because prescription opioids are meant to address serious pain, it is worth noting that, in 2012, 27.1 percent of SSDI beneficiaries received disability payments due to musculoskeletal-related impairments (and in 2016, this number was 29 percent).³⁹ This is particularly relevant because of the strong connection between musculoskeletal disease and prescription pain medication among the disabled population.⁴⁰

Figure 15. Opioid expenditures by age group and Medicare or Medicaid reciprocity, 1999-2012



Source: Chao Zhou, Cutis S. Florence, and Deborah Dowell, "Payments for Opioids Shifted Substantially to Public and Private Insurers While Consumer Spending Declined, 1999-2012," *Health Affairs* 35, no. 5 (May 2016): 829, <https://doi.org/10.1377/hlthaff.2015.1103>.

THE OVERSUPPLY OF PRESCRIPTION PAIN KILLERS CONTINUES TO CONTRIBUTE TO THE OPIOID CRISIS

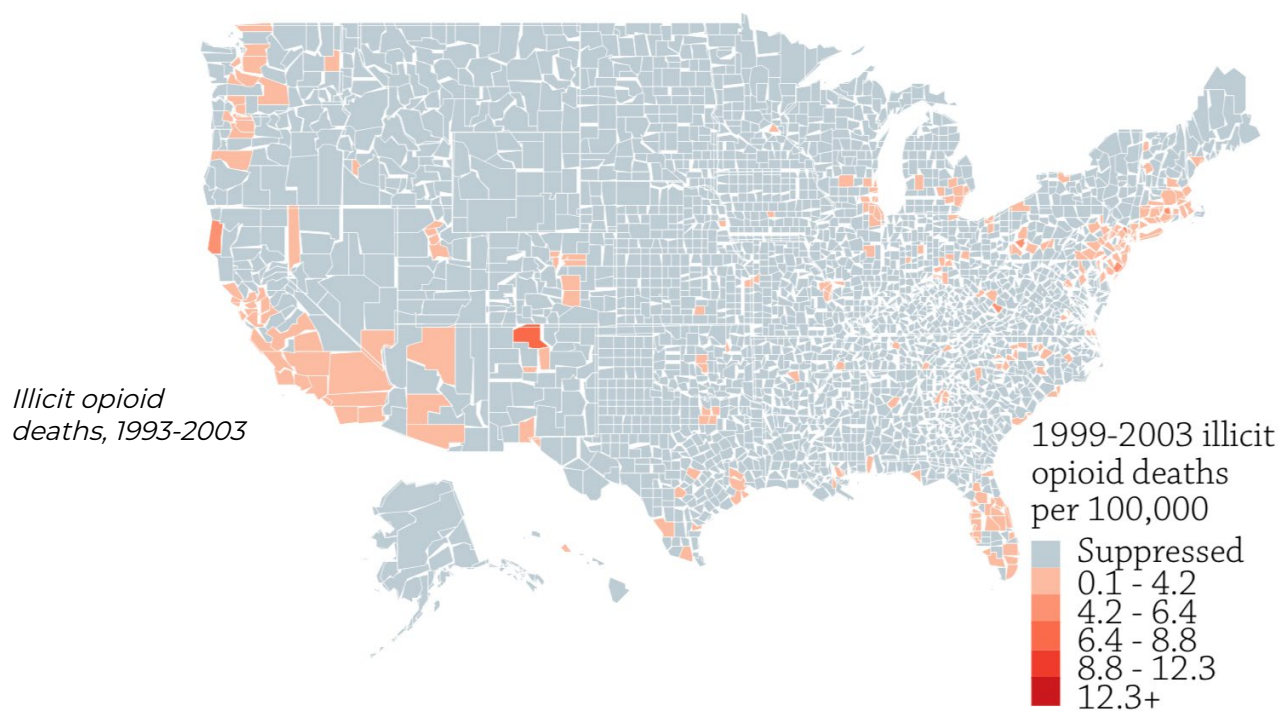
Heroin overdose deaths have been a persistent problem for several counties with dense metropolitan areas for a number of decades. The arrival of new prescription opioids in the late 1990s and their use in the treatment of chronic pain presented a new avenue for opioid misuse. In 1999, prescription opioids were already a becoming a problem in a handful of areas around the United States, but deaths from prescription opioid overdoses were widespread by 2015. Heroin followed suit, with overdose death rates spreading in areas that heavily overlap with prescription overdose deaths.

In the following maps, opioid overdose deaths are broken out into illicit and licit opioids. The illicit opioids category includes heroin and opium (and other synthetic opioids like fentanyl, which is increasingly manufactured and distributed illegally). The licit opioids category involves prescription opioids (including semisynthetic opioids like oral pain medication, and addiction treatment drugs like methadone).

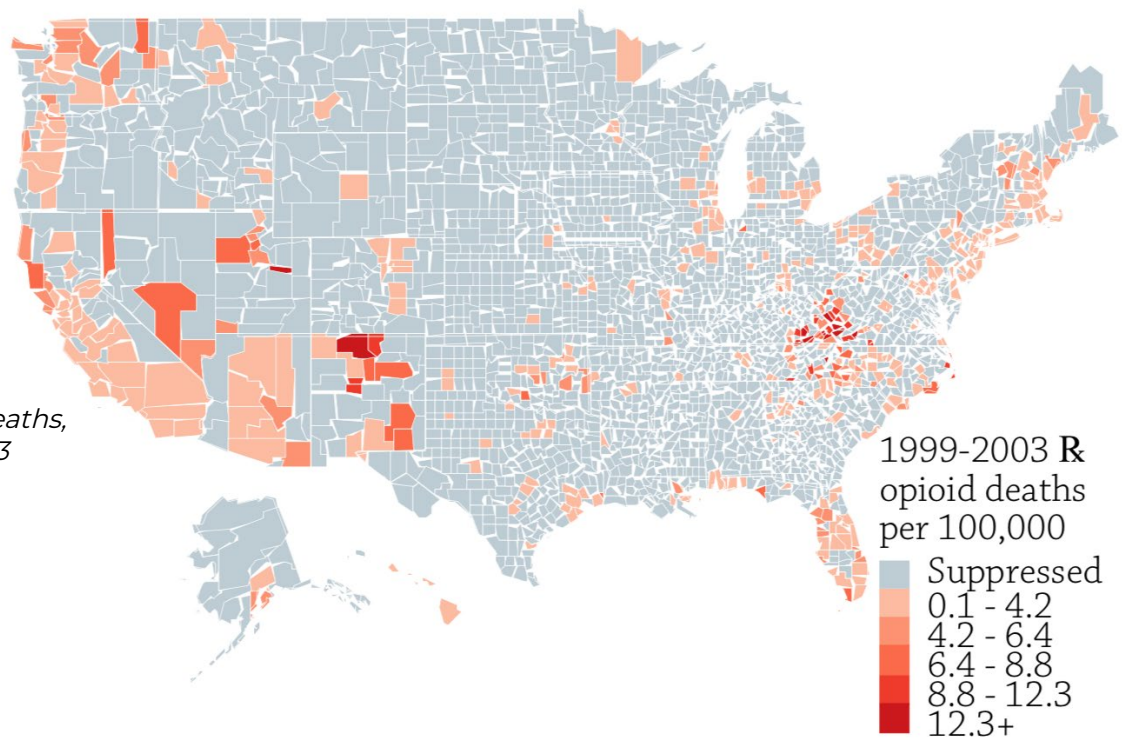
Broken down by sub-type of opioid, regional differences in type of opioid over- dose deaths become apparent. For example, synthetic opioid overdose death rates, like those from fentanyl and its derivatives, still remain largely concentrated in the eastern United States. Recent literature suggests that this might reflect a divide in the type of heroin distributed in the eastern and western United States. West of the Mississippi River, heroin is still largely found as black tar heroin, while in the eastern United States, heroin is mostly sold and distributed in white powder form.⁴¹ This makes fentanyl and its derivatives, which are also commonly in white powder form, more easily disguisable as heroin and counterfeit pills in the eastern states.⁴²

The maps of Figure 17 show single-year overdose death rates for 1999 and 2015 by state rather than by county for individual subtypes of opioids, as county level data are frequently obscured by suppression for confidentiality purposes when broken down by specific opioid types.

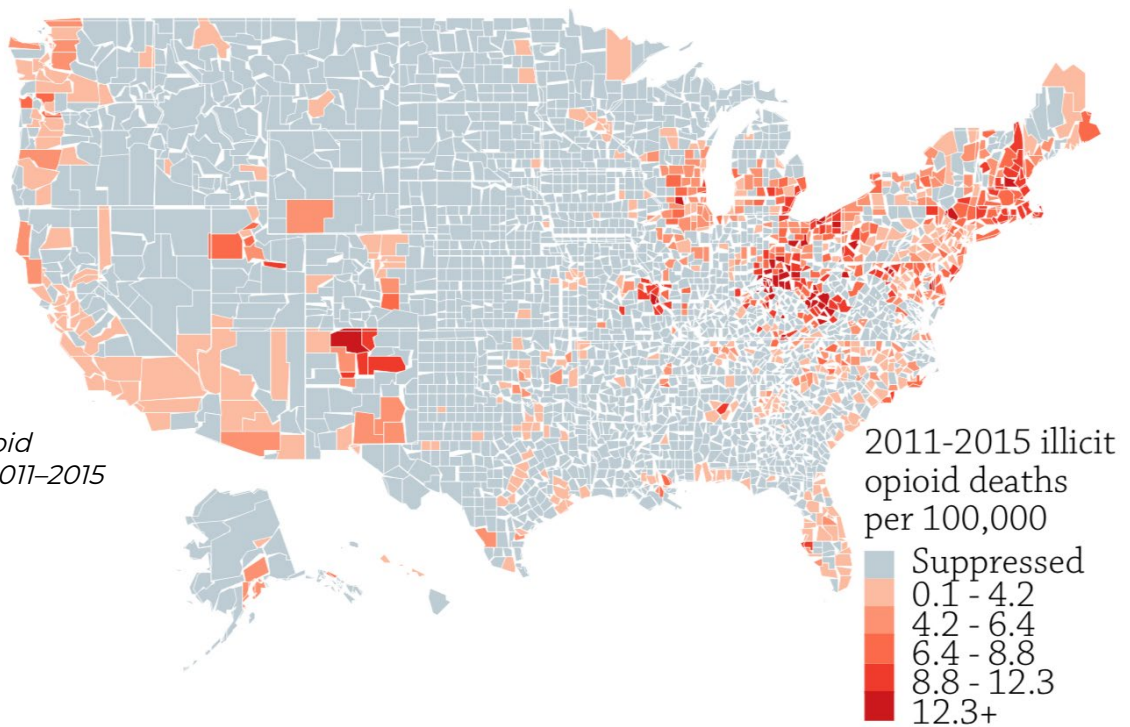
Figure 16. Licit and illicit opioid deaths, by county

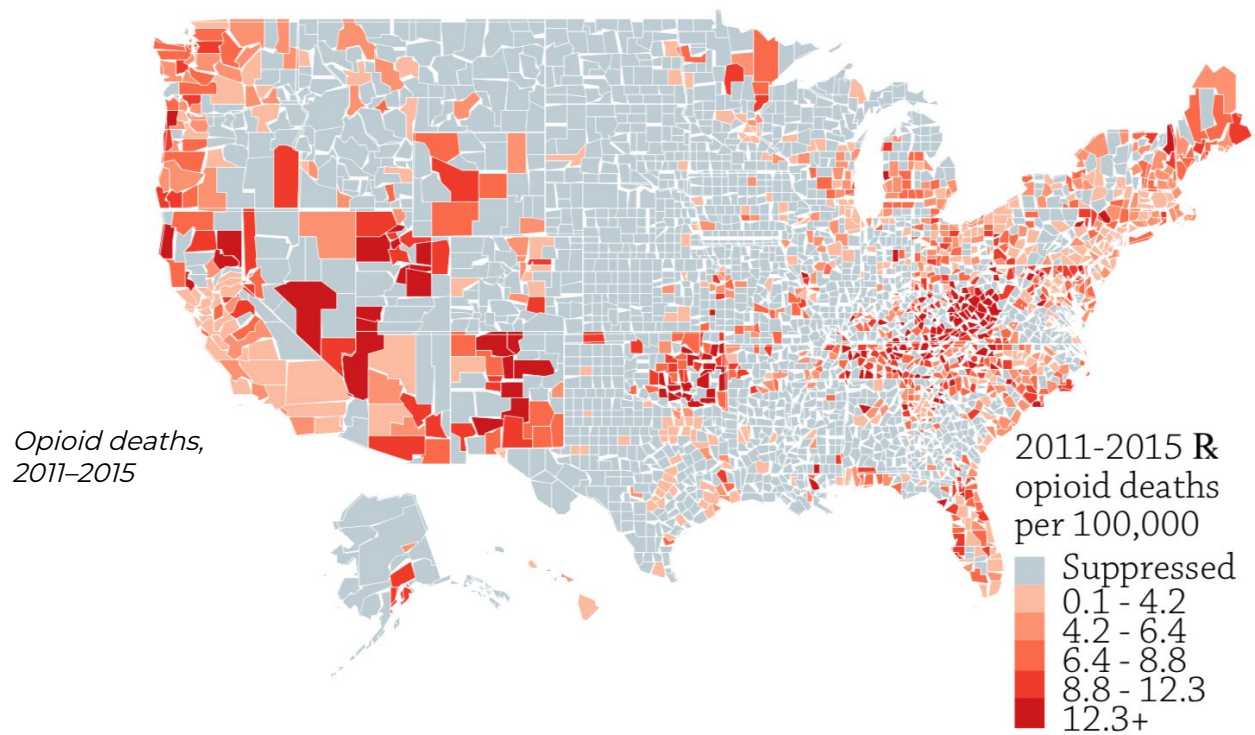


*Opioid deaths,
1993–2003*



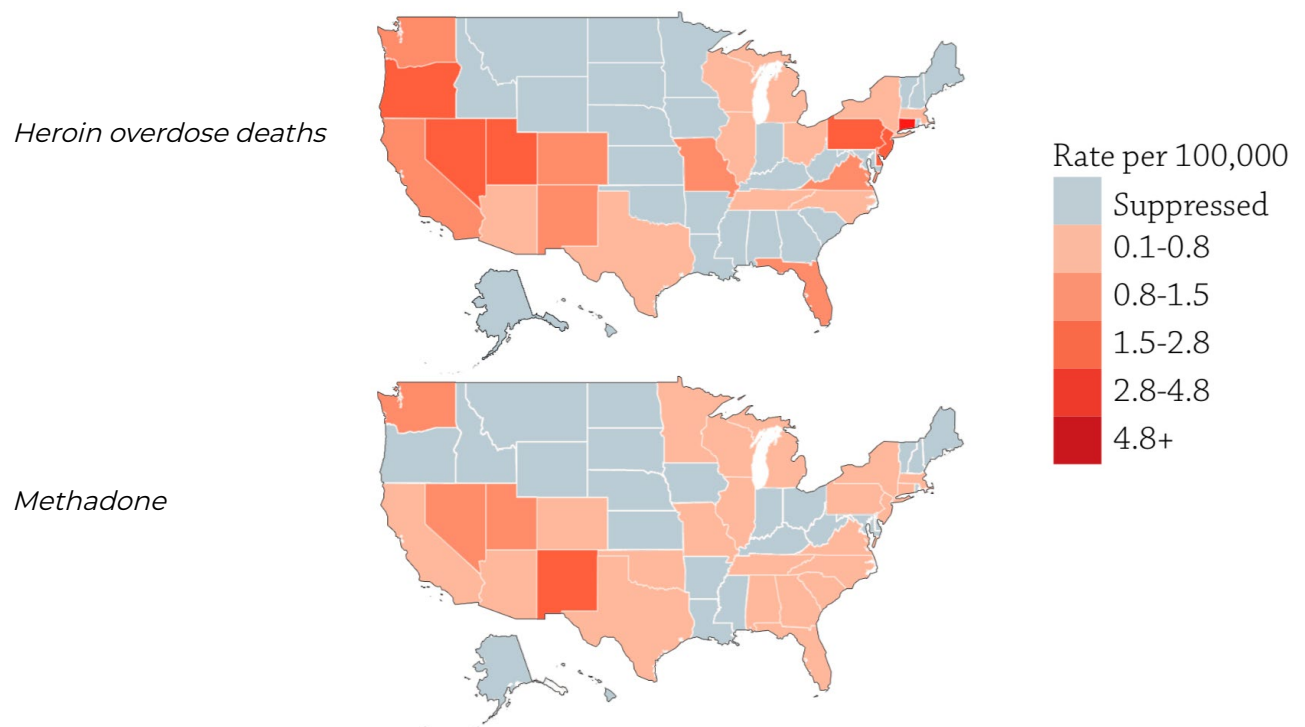
*Illicit opioid
deaths, 2011–2015*



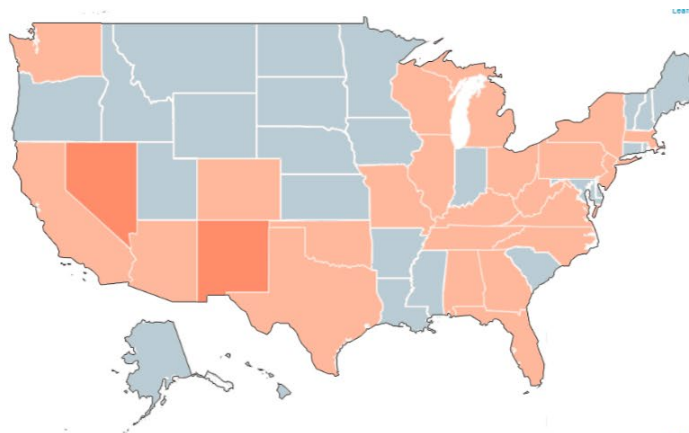


Source: CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>. Includes all deaths, unintended or otherwise.

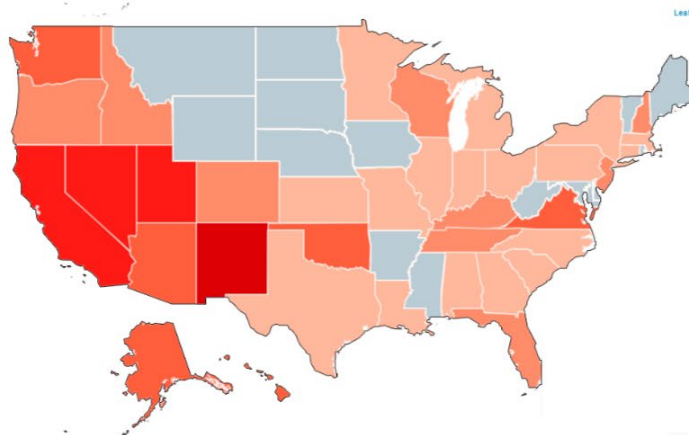
Figure 17. Opioid overdose deaths by type by state, 1999 and 2015



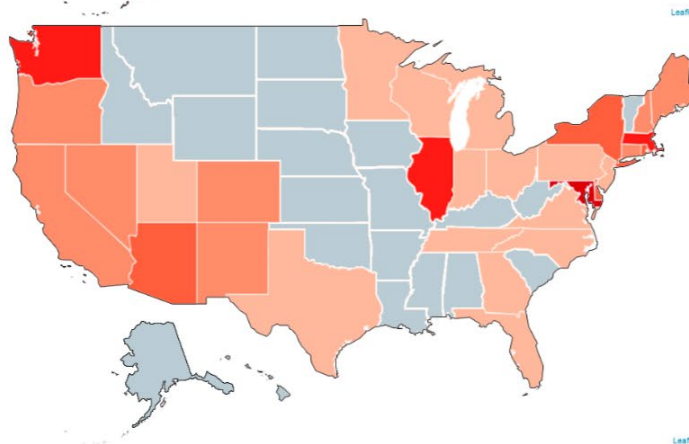
*Other synthetic opioids
(including fentanyl)*



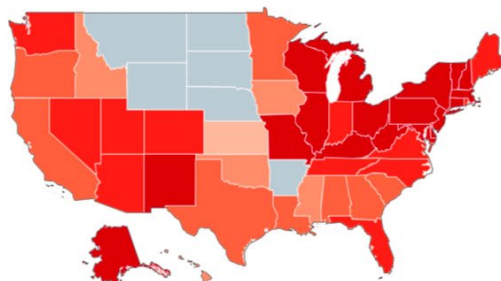
Prescription opioids



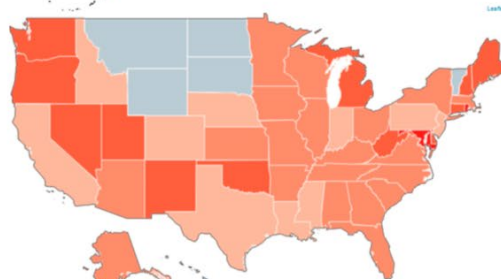
Unspecified opioids



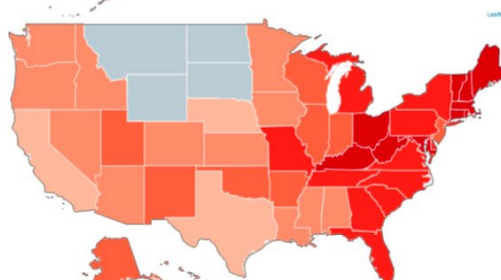
Heroin overdose deaths



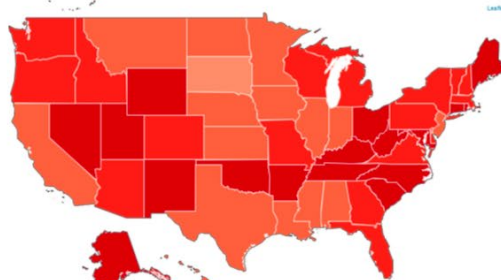
Methadone



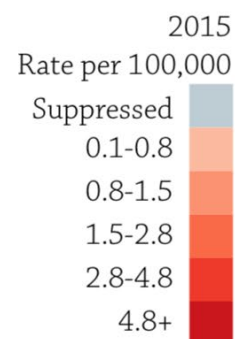
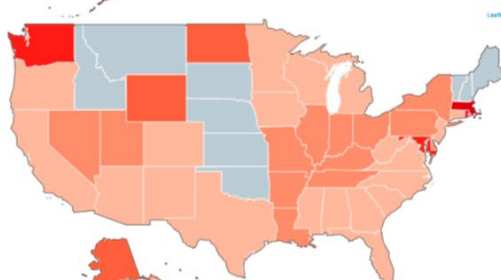
*Other synthetic opioids
(including fentanyl)*



Prescription opioids



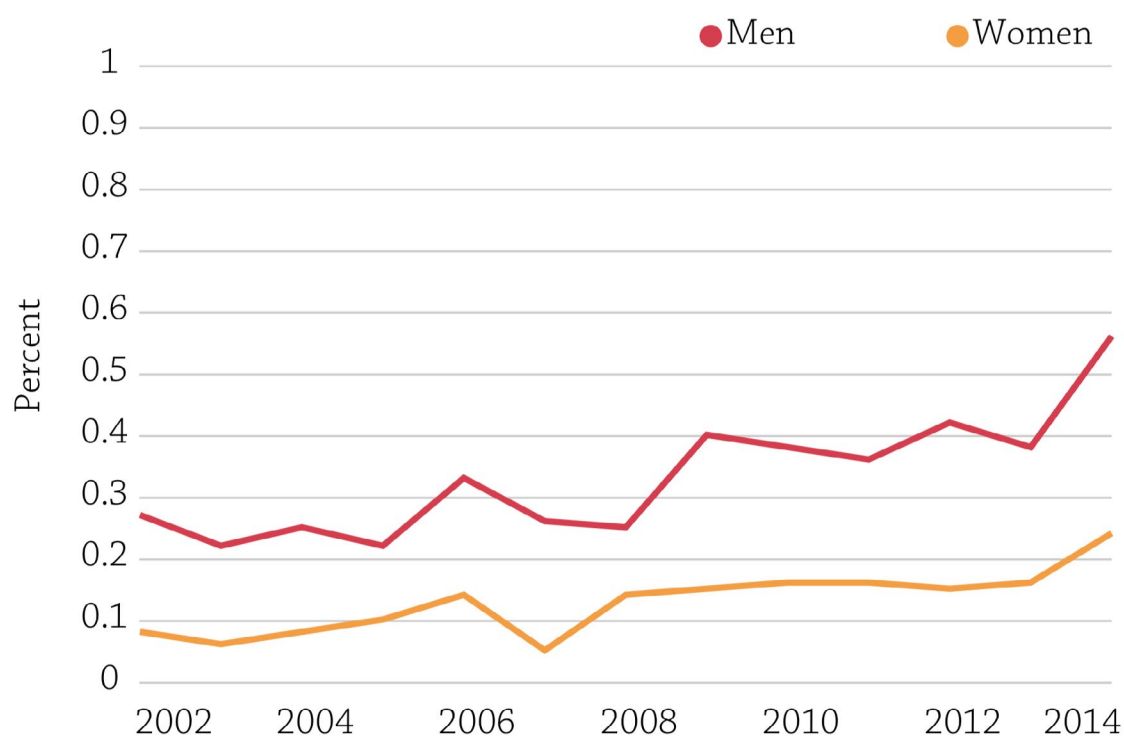
Unspecified opioids



Source: CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>. Includes all deaths, unintended or otherwise.

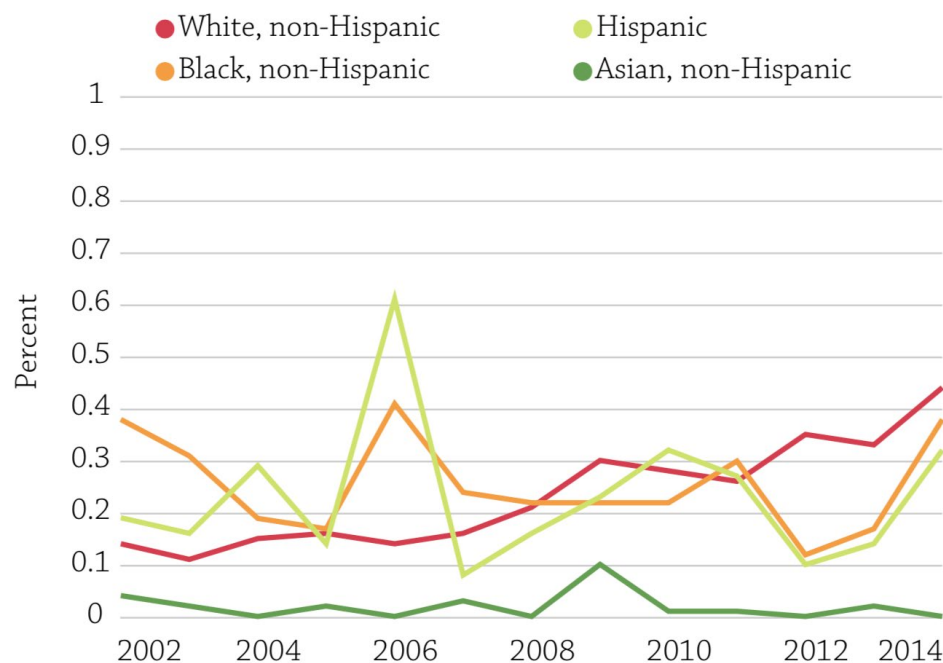
As prescription rates for opioids have declined, there has been a growing threat from illegal opioids, such as heroin and synthetic opioids like fentanyl. Heroin use is on the rise among both men and women (Figure 18). It is higher for men than women, and for non-Hispanic whites than Hispanics, non-Hispanic blacks, and non-Hispanic Asians. The spike in past-year heroin use among Hispanics and non-Hispanic blacks in 2006 may be due to noise in the data. However, the spike also corresponds with a known increase in the supply of fentanyl that occurred in 2006. Fentanyl is often disguised in heroin, and the NSDUH survey does not specifically ask about fentanyl. Similar spikes in usage, hospitalization, overdose deaths, and drug trafficking around 2006 can be seen in trend data throughout this report.

Figure 18. Heroin use in the past year by gender, ages 18 and older, 2002-2014



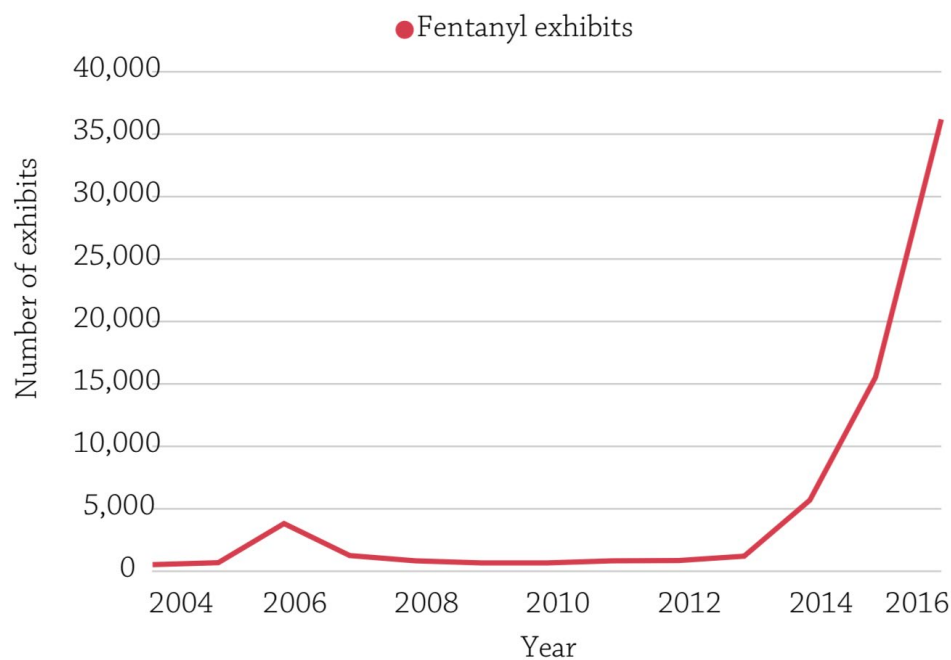
Source: Social Capital Project analyses of the National Survey on Drug Use and Health (NS- DUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>.

Figure 19. Heroin use in the past year by race, ages 18 and older, 2002-2014



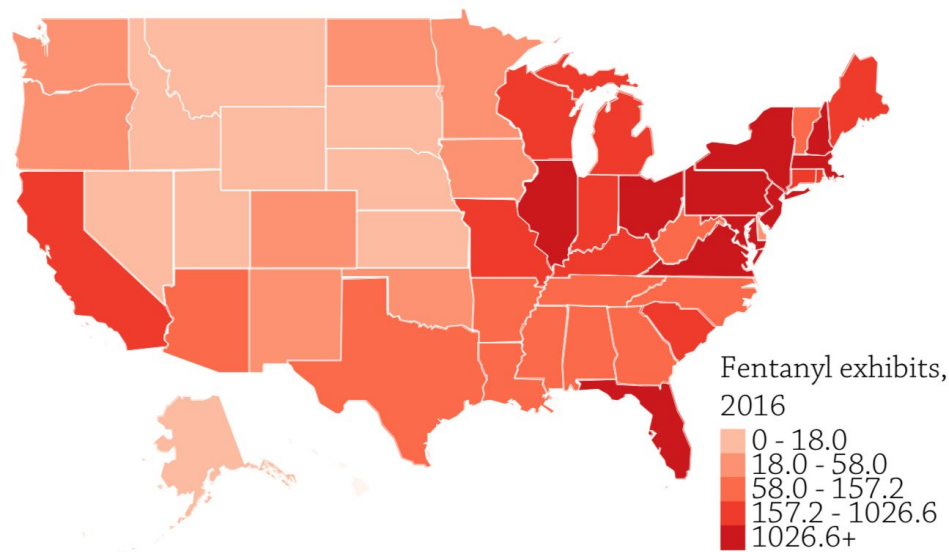
Source: Social Capital Project analyses of the National Survey on Drug Use and Health (NS- DUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>.

Figure 20. Fentanyl exhibits, 2004-2016



Source: Drug Enforcement Agency (DEA), National Forensic Laboratory Information System (NFLIS).

Figure 21. Fentanyl exhibits by state, 2016



Source: "2017 National Drug Threat Assessment," Drug Enforcement Agency, (2017): 59, accessed October 30, 2017, https://www.dea.gov/sites/default/files/2018-07/DIR-040-17_2017-NDTA.pdf.

Because fentanyl is often disguised in a substance that resembles heroin or in counterfeit prescription pills, even though an addict may think they are buying a prescription opioid or their usual dosage of heroin from a street dealer, they might in fact be purchasing a drug that is extremely dangerous and 25 to 50 times more powerful than heroin.

Forensic labs around the nation have been tracking the rise of fentanyl in drug seizures. When law enforcement seizes drugs as part of a case against a drug trafficker, each separate container of similar-looking substances (boxes, sandwich bags, or otherwise) is recorded as an exhibit for that crime. When a laboratory receives these exhibits, they are analyzed for the type of drugs that they contain.

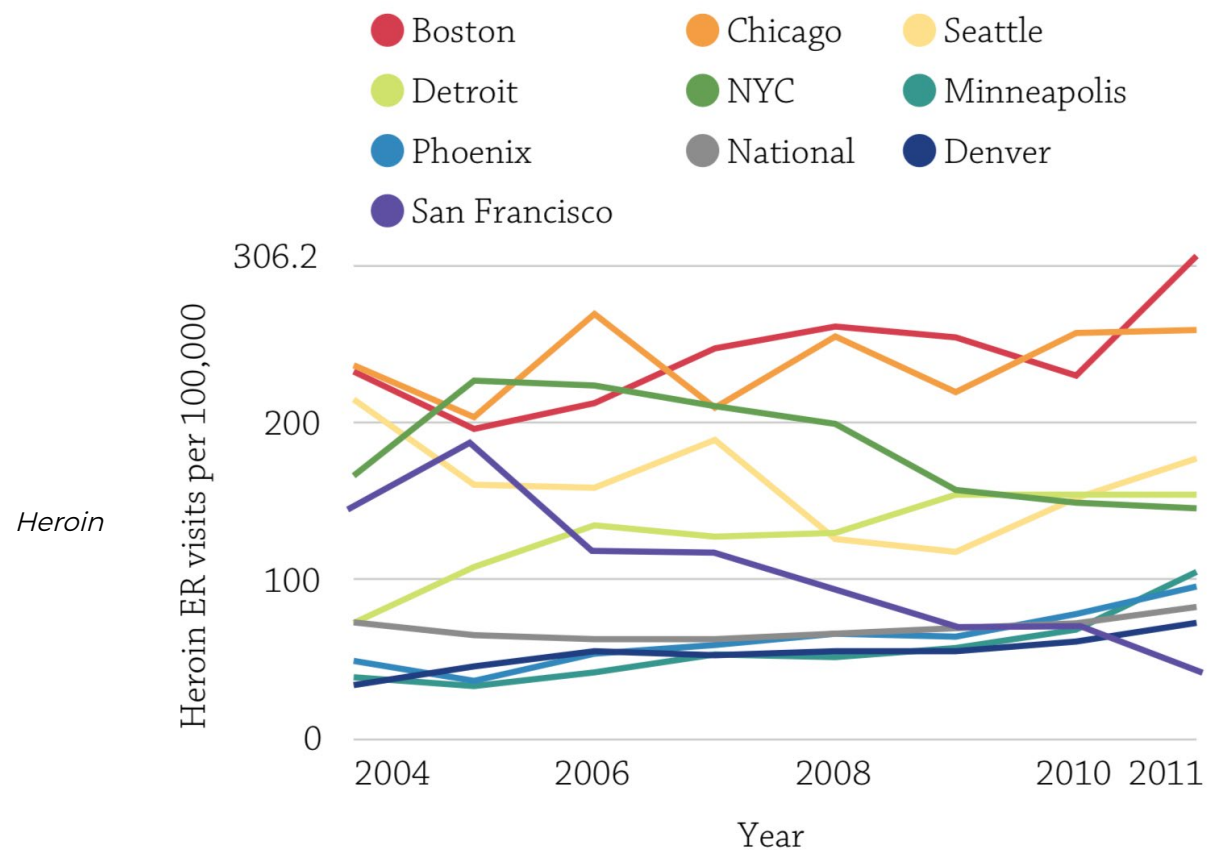
Prior to 2014 fentanyl rarely showed up in these exhibits (Figure 20). Around 2006, the supply of fentanyl in the U.S. illegal drug market temporarily increased, but it was traced to a single lab. After that lab was shut down, the surge went away. Since 2013, the number of exhibits identified as containing fentanyl by crime labs has skyrocketed. Seizures of drugs later found to contain fentanyl are heavily concentrated in the northeast where white powder heroin is more common, making it easier to disguise the fentanyl.

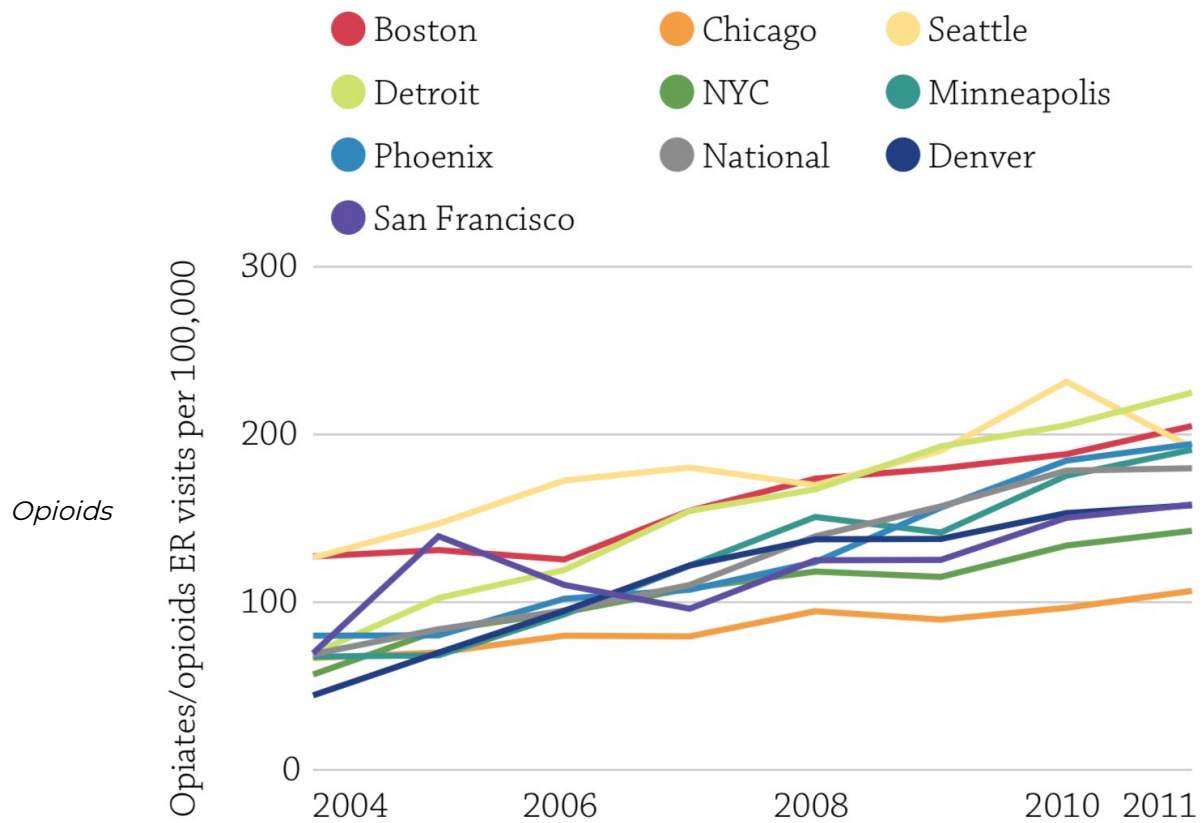
HOSPITALIZATION FOR OPIOID USE AND MISUSE HAS ALSO RISEN ACROSS GEOGRAPHIC, DEMOGRAPHIC AND SOCIOECONOMIC GROUPS

Heroin use and opioid prescription misuse resulting in emergency room visits have been rising in many states and their major metropolitan areas. In some cases, some metropolitan areas had an elevated emergency department visit rate even in 2004, when the data were first published (Figure 22).

As with prescribing rates, opioid-related inpatient hospital stays are concentrated in Appalachia, the West, and New England (Figure 23).

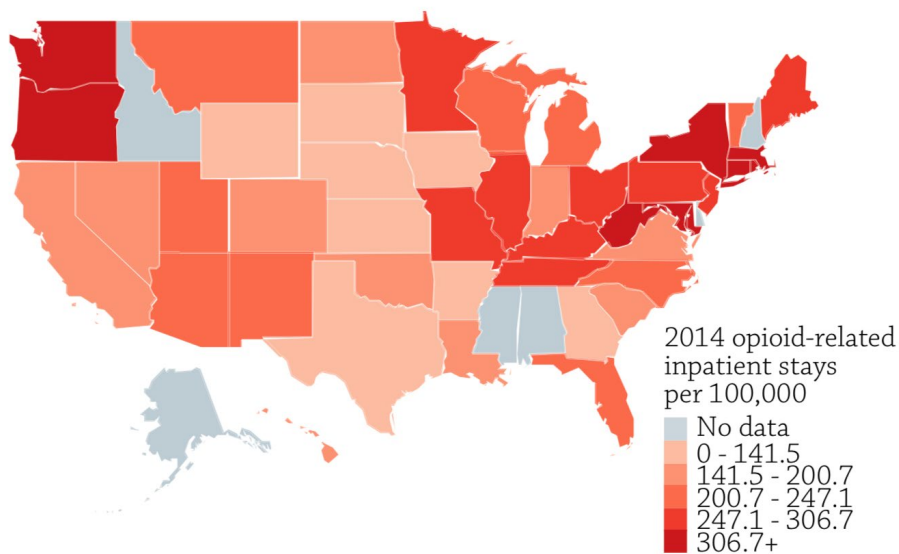
Figure 22. Emergency room visits by metropolitan area by drug type: heroin and opioid medications, 2004-2011





Source: Drug Abuse Warning Network (DAWN) 2004-2011, Substance Abuse and Mental Health Services Administration (SAMHSA). Accessed at <https://www.datafiles.samhsa.gov/study-series/drug-abuse-warning-network-dawn-nid13516>.

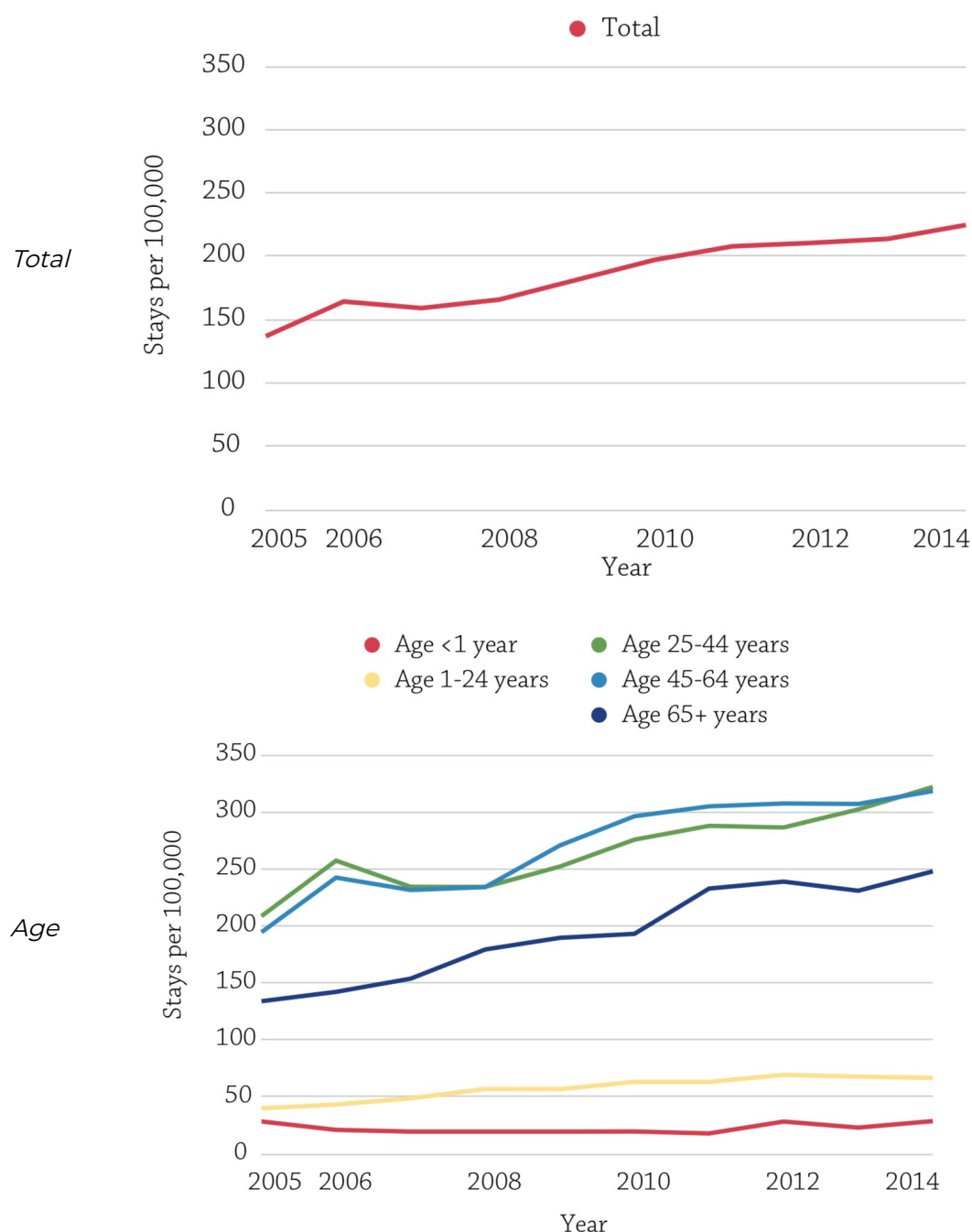
Figure 23. Opioid- related inpatient hospital stays per 100,000, 2014

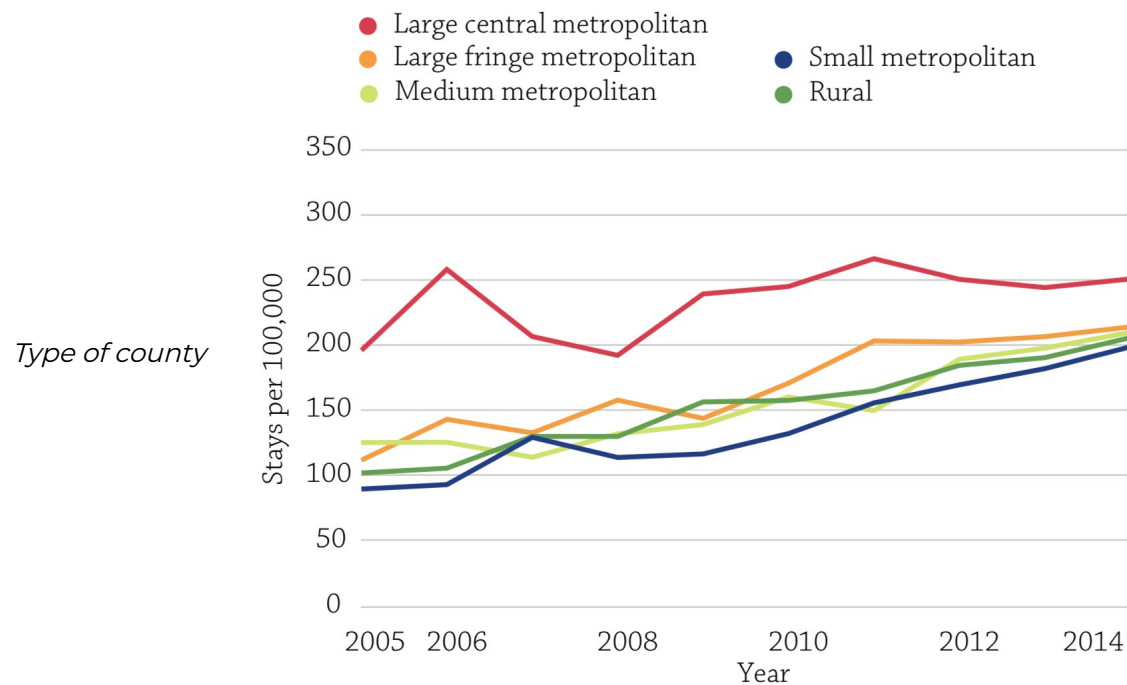
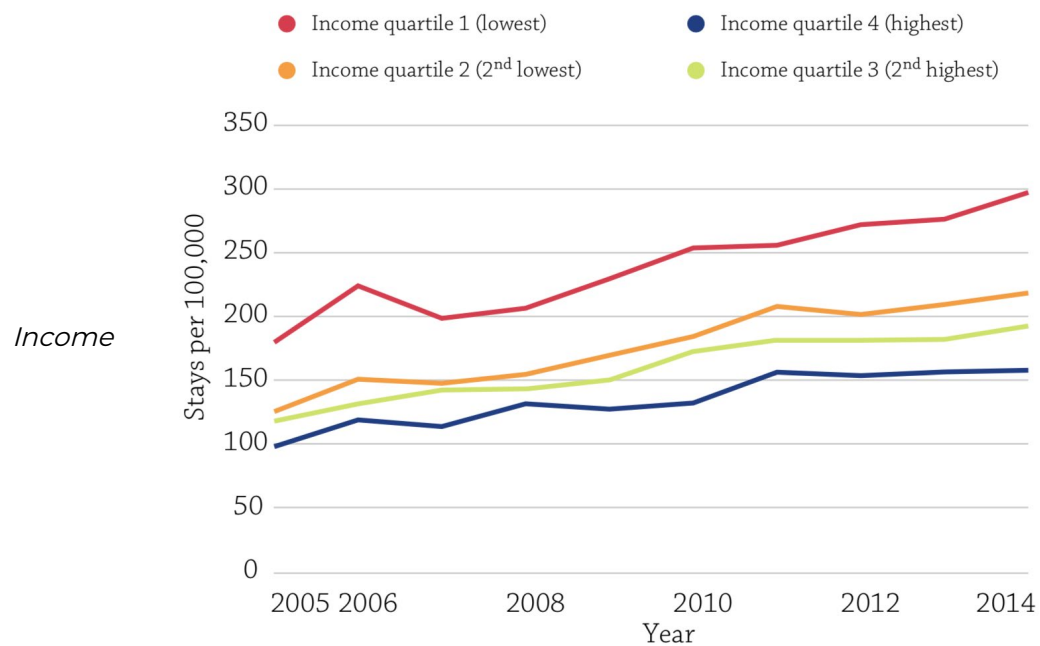


Source: "HCUP Fast Stats National and State-Level Trends in Opioid-Related Hospital Use, Rate of Inpatient Stays and Emergency Department Visits by Discharge Year," Healthcare Cost and Utilization Project (HCUP), accessed October 20, 2017, <https://www.hcup-us.ahrq.gov/faststats/OpioidUseServlet>.

Inpatient hospital stays per 100,000 population related to opioids have also been on the rise for a number of years (Figure 24). In 2014, those aged 25-64 had the highest rates of inpatient stays, and lower income individuals and those in the large metropolitan areas had higher rates of stays than other groups from 2005-2014 (Figure 24). The bump from the 2006 fentanyl episode is evident in each of the charts, with some groups more affected than others.

Figure 24. Opioid- related inpatient hospital stays per 100,000, 2005-2014





Source: "HCUP Fast Stats National and State-Level Trends in Opioid-Related Hospital Use, Rate of Inpatient Stays and Emergency Department Visits by Discharge Year," Healthcare Cost and Utilization Project (HCUP), accessed October 20, 2017, <https://www.hcup-us.ahrq.gov/faststats/OpioidUseServlet>.

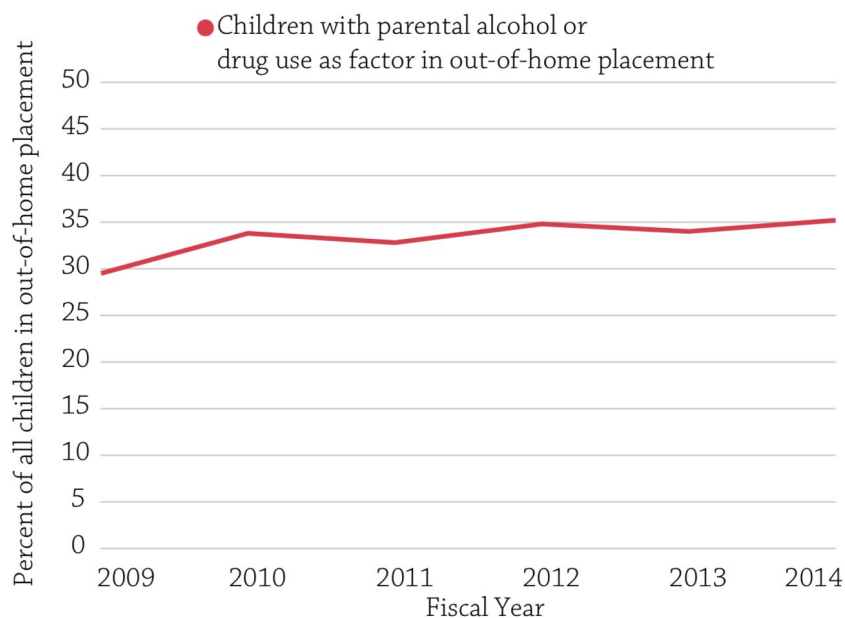
THE OPIOID CRISIS WILL AFFECT THE NEXT GENERATION FOR YEARS TO COME

An opioid-related addiction, overdose, or death is far from an isolated event. Many lives are affected by the devastation caused by these drugs. Families struggle to keep their loved ones alive through treatments and interventions. Children are affected directly, making this crisis multigenerational.

Reports of young children overwhelming foster care systems are pouring out of states like Ohio, which since 2010, have witnessed an increase of nearly one-fifth in the number of children placed with relatives or in foster care.⁴³ Between 2009 and 2014, the percent of children nationwide with parental alcohol or drug use as a factor in out-of-home placement rose from 29.4 percent to 35.1 percent, according to written testimony provided to the U.S. Senate Committee on Finance in February 2016 by Nancy Young, the Director of Children and Family Futures (Figure 25).⁴⁴ Young also testified that, between 2009 and 2014, parental drug abuse showed the largest increase (from 22.1 percent to 29.7 percent) of any reason for a child to be removed from a home.

Rising rates of neonatal abstinence syndrome (NAS), the diagnosis of a newborn that is physiologically dependent on drugs or alcohol and will go through withdrawals, are generally driven by the opioids that their mothers are dependent on while pregnant.⁴⁵ About half of babies who are exposed to opioids during pregnancy will experience NAS.⁴⁶

Figure 25. Percent of children with parental alcohol or drug use as factor in out-of-home placement, 2009-2014

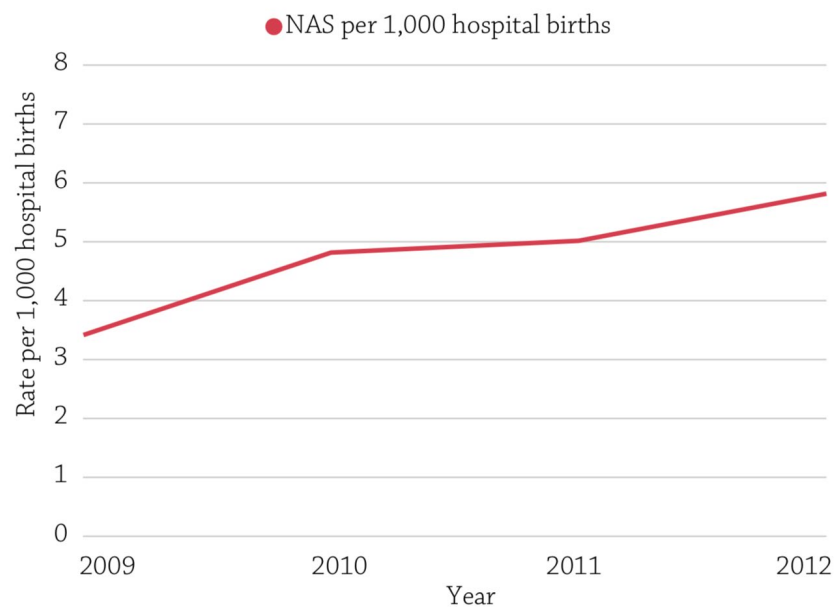


Source: "Examining the Opioid Epidemic: Challenges and Opportunities," 114th Congress (2016) 30 (statement of Nancy K. Young, Director, Children and Family Futures, Inc.): 7, <https://www.finance.senate.gov/imo/media/doc/23feb2016Young.pdf>.

New England and the South have the highest rates of NAS per 1,000 hospital births. In 2013, according to a CDC study, NAS incidence per 1,000 hospital births was highest in Vermont (33.3) and West Virginia (33.4).⁴⁷ In 2012, Maine had a similar level (30.4), but data were not available for 2013.

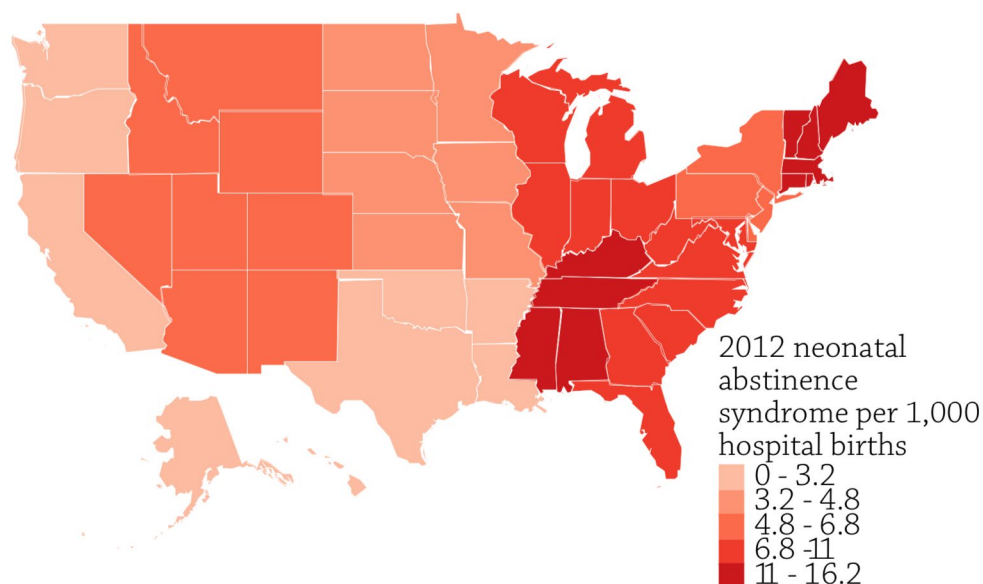
Increasing numbers of children entering foster care, living with grandparents, or entering the world dependent on opioids will have consequences for decades to come. Many dealing with the childhood trauma of a parent addicted to opioids have suffered severe physical and mental distress, and some researchers speculate that the damage may be behind the recent rise in suicides among children and teenagers.⁴⁸

Figure 26. Incidence of neonatal abstinence syndrome (NAS) per 1,000 hospital births, 2009-2012



Source: "Examining the Opioid Epidemic: Challenges and Opportunities," 114th Congress (2016) 30 (statement of Nancy K. Young, Director, Children and Family Futures, Inc.): 7, <https://www.finance.senate.gov/imo/media/doc/23feb2016Young.pdf>.

Figure 27. Incidence of neonatal abstinence syndrome (NAS) per 1,000 hospital births by region, 2012



Source: Stephen W. Patrick et al., "Increasing Incidence and Geographic Distribution of Neonatal Abstinence Syndrome: United States 2009-2012," *Journal of Perinatology* 35, no. 8 (August 2015): 650-655, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4520760/pdf/nihms672061.pdf>.

LOOKING FORWARD

With rising overdose death rates driven by heroin and fentanyl, most indicators suggest that the worst of the crisis has yet to pass.⁴⁹ Data from 2016 indicate that overdose deaths from synthetic opioids like fentanyl have surpassed those from heroin, rising to over 19,000 deaths.⁵⁰ Heroin abuse continues to rise. Abuse of prescription opioids appears to be falling, along with opioid prescription rates, but slowly, and deaths from the category of opioids that includes prescription pain relievers continue to rise.

Beyond the proximal factors contributing to the opioid crisis, there is the question of why some people succumb to addiction and some do not. As we have seen, there are regular patterns in the national picture of opioid use, abuse, and death; some people and places are more vulnerable to addiction than others. This is true of other forms of despair as well. The special evilness of opioids is that they offer practically no quarter to those who are most vulnerable to addiction. For opioid addicts, compared to others dependent on drugs, "the recovery period is longer and the chance of relapse is higher."⁵¹ One study interviewed 109 patients following discharge from residential addiction treatment and found that over nine in ten reported a relapse, with nearly six in ten of those occurring in the first week.⁵²

Successfully combatting the opioid crisis will require that we better understand the sources of despair and vulnerability that lead to addiction. As Christopher Caldwell poignantly notes:

Calling addiction a disease usefully describes certain measurable aspects of the problem—particularly tolerance and withdrawal. It fails to capture what is special and dangerous about the way drugs bind with people’s minds. Almost every known disease is something people wish to be rid of. Addiction is different. Addicts resist known cures—even to the point of death. If you do not reckon with why addicts go to such lengths to continue suffering, you are unlikely to figure out how to treat them. This turns out to be an intensely personal matter.⁵³

Preliminary evidence suggests that a focus on economic sources of despair is unlikely to be productive.⁵⁴ In ongoing work, the Social Capital Project is examining whether social disrepair provides a more useful way of thinking about “deaths of despair,” including first and foremost deaths from opioid overdoses. Above, we documented dramatically higher rates of opioid overdose mortality among single men who have no more than a high school education as compared with their married counterparts. That difference hints that being embedded within social relationships may protect against addiction or make treatment more successful, though the evidence is only suggestive.⁵⁵

There is much more to understand about the opioid crisis, its causes, and the way out of it. But one thing is clear: we are many years into this national public health emergency, and we are not winning the battle.

SOURCE NOTES

- **Figure 1. Age-adjusted overdose death rates, 1968-2016**

Centers for Disease Control and Prevention (CDC). Includes all deaths, unintended or otherwise. National Vital Statistics System data produced using CDC WONDER’s Multiple Cause of Death Module: 1999-2016 (<https://wonder.cdc.gov/mcd.html>). National Vital Statistics System downloadable Multiple Cause of Death files: 1968-78 and 1979-1998 (https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm). Provided by CDC staff to Social Capital Project.

Note from source: “The multiple cause data for 1972, 1981 and 1982 are based on sample data. For 1972, it is a 50 percent sample for the entire U.S. For 1981-1982, it is a 50 percent sample for 19 registration areas [out of a current 54] and 100 percent for the rest. Figures are weighted accordingly. Underlying cause ICD-10 codes for years 1999-2016: X40-X44, X60-X64, X85, Y10-Y14. Multiple cause ICD-10 codes for years 1999-2015: T40.1-T40.4, T40.6. Underlying cause ICD-9 codes for years 1979-1998: E850-E858, E950.0-E950.5, E962.0, E980.0-E980.5. Multiple cause ICD-9 codes for years 1979-1998: 965.0. Underlying cause ICDA-8 codes for years 1968-1978: E850-E859, E950.0-E950.3, E962, E980.0-E980.3. Multiple cause ICDA-8 codes for years 1968-1978: 965.0.”

- **Figure 2a. National age-adjusted overdose deaths by opioid type, 1999-2016**

Age-adjusted rates shown from CDC. Includes all deaths, unintended or otherwise. CDC WONDER (<https://wonder.cdc.gov>).

The 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) multiple cause-of-death (MCD) codes for opioids include the

following: T40.0, T40.1, T40.2, T40.3, T40.4, or T40.6. Of these, opium (T40.0), heroin (T40.1), and methadone (T40.3) have their own individual specific codes (https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6450a3.htm?s_cid=mm6450a3_w). (We exclude opium from our analyses, as deaths from opium overdoses are exceedingly rare.) Natural and semisynthetic opioids (T40.2), however, are a collection of prescription opioids that can include morphine, oxycodone, hydrocodone, and a range of other medications. This is true of synthetic opioids other than methadone (T40.4) as well, including fentanyl and tramadol. Finally, other and unspecified narcotics (T40.6) include opioids that are unidentified. Estimates for T40.6, "Other and unspecified narcotics," not listed for 2016. Social Capital Project staff calculations done with July 2016 Bridged-Race Population Estimates provided by Census to CDC to obtain 2016 overdose deaths per 100,000.

Complicating the issue, some deaths from opioid overdoses can be misclassified, not only because they may be unidentifiable, but because some opioids may metabolize similarly (<https://www.cdc.gov/mmwr/volumes/65/wr/mm655051e1.htm>), such as morphine and heroin. Furthermore, in many cases, an overdose can occur from more than one opioid, so the trends in overdose death rates by opioid type are not mutually exclusive.

In addition, accuracy of counting opioid overdose deaths by type of opioid significantly depends on the judgment of state or local medical examiners and coroners when writing up the death certificate. In many cases, the underlying causes of death are not obvious unless an autopsy or a toxicology report is ordered, which present costs and personnel problems (http://www.slate.com/articles/technology/future_tense/2017/08/the_opioid_epidemic_might_be_even_worse_than_we_realize.html).

- **Figure 2b. Age-adjusted overdose deaths in Utah by opioid type, 1999-2016**
Age-adjusted rates shown from CDC. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999- 2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.
- **Figure 2c. National provisional overdose death counts by opioid type, January 2015 to February 2018**
Preliminary data for population estimates from CDC. Data for overdose deaths for 12 months ending in each month indicated from Provisional Drug Overdose Death Counts, NVSS, accessed at <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>.
- **Figure 2d. Provisional overdose death counts in Utah by opioid type, January 2015 to February 2018**
Preliminary data for population estimates from CDC. Data for overdose deaths for 12 months ending in each month indicated from Provisional Drug Overdose Death Counts, NVSS, accessed at <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>.
- **Figure 3a. Geographic spread of unintentional opioid overdose deaths, by county, 1979-83 to 2011-15**
CDC, Compressed Mortality File (CMF) 1979-1998 and Multiple Cause of Death (MCD) 1999-2015 on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/cmfi-icd9.html> and <http://wonder.cdc.gov/mcd-icd10.html>. From previous Social Capital Project opioid post.
- **Figure 3b. Opioid overdose deaths in Utah, by county, 2012-2016**
Source: Age-adjusted rates shown from CDC. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.
- **Figure 4a. Opioid overdose deaths by age group, 1999 and 2015**
Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>. Deaths by aggregated five-year age groups.

- **Figure 4b. National opioid overdose deaths by age group, 1999-2016**
Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.
- **Figure 4c. Opioid overdose deaths in Utah by age group, 1999-2016**
Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.
- **Figure 5. Opioid overdose deaths by type of opioid and gender**
Crude rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.
- **Figure 6a. Opioid overdose deaths by race, by educational attainment, and by marital status, 1999 and 2015**
Social Capital Project staff calculations, crude rates shown. CDC. Includes all deaths, unintended or otherwise. Mortality files accessed at https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm. Deaths among age 25 and older by race and opioid overdose type aggregated from CDC's mortality flat files for 1999 and 2015. To obtain the rates for each specific group, death rates were calculated per 100,000 by comparing total deaths age 25 and older in each group against the total population of each group as measured by CDC's bridged-race population estimates: Bridged-Race Population Estimates, United States July 1st resident population by state, county, age, sex, bridged-race, and Hispanic origin. Compiled from 1990-1999 bridged-race intercensal population estimates (released by NCHS on 7/26/2004); revised bridged-race 2000-2009 intercensal population estimates (released by NCHS on 10/26/2012); and bridged-race Vintage 2015 (2010-2015) postcensal population estimates (released by NCHS on 6/28/2016). Available on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/bridged-race-v2015.html> on Aug 8, 2017.

Deaths among age 25 and older by educational attainment and marital status aggregated from CDC's mortality flat files for 1999 and 2015. To obtain the rates for each specific group, death rates were calculated per 100,000 by comparing total deaths in each group against the total population age 25 and older of each group as measured by Census population estimates from July 1st of 1999 and 2015, which were cross tabulated in DataFerrett to isolate specific subgroups by educational attainment and marital status. Educational attainment and marital status were pulled from the Current Population Survey Basic Monthly Survey for July. Accessed at <http://dataferrett.census.gov/>.
- **Figure 6b. Opioid overdose deaths by race, Utah vs U.S., 1999-2016**
Age-adjusted rates shown. Includes all deaths, unintended or otherwise. CDC, Multiple Cause of Death (MCD) 1999-2016 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>.
- **Figure 7. Opioid overdose death rates by gender, educational attainment, and marital status, 2015**
See note for Figure 6a.
- **Figure 8. Source of pain relievers among prescription abusers in the past year, 2005-2014**
Social Capital Project analyses of the National Survey on Drug Use and Health (NSDUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>. Some of the variables shown are combinations of the options for responses.

"Unknown" and "other" were combined into a single category; "one doctor" and "more than one doctor" were combined into a single category; "wrote fake prescription" and "stole from doctor office" were combined into one category.

The NSDUH is one of the few surveys that asks individuals to self-report their illicit drug use and prescription misuse, and is likely undercounting the population of drug users for a number of reasons, including that transient populations are excluded from the survey. Yet it remains one of the only sources of data on the current population of drug users.

Prior to the 2015 survey, NSDUH used the term “nonmedical pain reliever use,” but more recent surveys use the term “misuse of pain relievers,” a concept more relevant to opioid use disorder. From 2015 to 2016, NSDUH data show that among those aged 12 or older, estimates of opioid misuse declined from 4.7 percent to 4.4 percent (see Table A. 11B). The majority of that decline is due to a decline in pain reliever misuse; the difference between the 2015 and 2016 estimate for heroin use in the past year was not statistically significant.

- **Figure 9. Opioid overdose deaths by number of drugs involved, 2014**
CDC, National Vital Statistics Reports, Vol. 65, No. 10, December 20, 2016, Table 5 (https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_10.pdf). Includes all deaths, unintended or otherwise. Data pulled from the text on death certificates to identify specific drugs. The source above notes that: “Drug overdose deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Deaths may involve other drugs in addition to the referent drug (i.e., the one listed). Deaths involving more than one drug (e.g., a death involving both heroin and cocaine) are counted in both totals (i.e., as a referent drug and as an “other” drug).”
- **Figure 10. Type of nonmedical opioid use in the past year, ages 18 and older, 2002-2014**
Social Capital Project analyses of the National Survey on Drug Use and Health (NSDUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>. Prescription pain reliever abuse in this period is technically nonmedical pain reliever use which is used to describe individuals who use prescription pain relievers in an amount or method not prescribed by physicians. From 2002-2014, NSDUH asked questions related to nonmedical pain reliever use before switching in 2015 to identifying “misuse of pain relievers.” Illicit opioid use other than heroin use is unavailable. See note for Figure 8 for additional information.
- **Figure 11. Opioid prescriptions per 100, 2006-2016**
“Table 1. Total number and rate of opioid prescriptions dispensed, United States, 2006-2016,” U.S. Prescribing Rate Maps, CDC, last modified July 31, 2017, <https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html>.
- **Figure 12a. Opioid prescriptions per 100, by county, 2016.**
“U.S. County Prescribing Rates, 2016,” CDC, last modified July 31, 2017, <https://www.cdc.gov/drugoverdose/maps/rxcoun-ty2016.html>.
- **Figure 12b. Opioid prescriptions per 100 in Utah, by county, 2016**
“U.S. County Prescribing Rates, 2016,” CDC, last modified July 31, 2017, <https://www.cdc.gov/drugoverdose/maps/rxcoun-ty2016.html>.
- **Figure 13. Total expenditures for opioid prescriptions by insurance type, 1999-2012**
Chao Zhou, Cutis S. Florence, and Deborah Dowell, “Payments for Opioids Shifted Substantially to Public and Private Insurers While Consumer Spending Declined, 1999-2012,” Health Affairs 35, no. 5 (May 2016): 827, <https://doi.org/10.1377/hlthaff.2015.1103>.

The Medical Expenditure Panel Survey (MEPS) pharmaceutical price index uses 2009 as the base year. Self or family includes out of pocket spending. Other private insurance includes worker’s compensation or other unclassified insurance, such as automobile, homeowner’s, and liability insurance; and insurance from other miscellaneous or unknown sources. This chart was reproduced using data provided to the Social Capital Project by the authors of the original study.

- **Figure 14. Total morphine milligram equivalents (MME) by payer type, 1999-2012**
Chao Zhou, Cutis S. Florence, and Deborah Dowell, “Payments for Opioids Shifted Substantially to Public and Private Insurers While Consumer Spending Declined, 1999-2012,” *Health Affairs* 35, no. 5 (May 2016): 827, <https://doi.org/10.1377/hlthaff.2015.1103>. See figure 13 for additional information.
- **Figure 15. Opioid expenditures by age group and Medicare or Medicaid reciprocity, 1999-2012**
Chao Zhou, Cutis S. Florence, and Deborah Dowell, “Payments for Opioids Shifted Substantially to Public and Private Insurers While Consumer Spending Declined, 1999-2012,” *Health Affairs* 35, no. 5 (May 2016): 827, <https://doi.org/10.1377/hlthaff.2015.1103>. See figure 13 for additional information.
- **Figure 16. Licit and illicit opioid deaths, by county, 1999-2003 and 2011-2015.**
CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>. Includes all deaths, unintended or otherwise.

County-level estimates show crude opioid death rates for the 1999-2003 and 2011-2015 periods, as broken down in our previous post on the opioid crisis. By combining years, rates are suppressed for fewer counties. Unlike the previous post, all intents—suicide, homicide, accident, and undetermined—are included. The data for many counties are suppressed for confidentiality reasons when the number of opioid deaths is small for a given county. As such, when breaking down licit and illicit opioid overdose deaths, some data are lost. The data also exclude MCD code T40.6 for unspecified opioids, as it is unclear whether the death resulted from a licit or illicit opioid. MCD codes T40.0, T40.1, and T40.4 are categorized as illicit opioids, including opium and heroin, and other synthetic opioids like fentanyl, increasingly manufactured and distributed illegally. MCD codes T40.2 and T40.3 are categorized as licit opioids, including prescription pills like oxycodone, and methadone. The categorizing of fentanyl as licit or illicit is indeterminable from death certificate data.

- **Figure 17. Opioid overdose deaths by type by state, 1999 and 2015**
CDC, Multiple Cause of Death (MCD) 1999-2015 on CDC Wonder Online Database. Accessed at <http://wonder.cdc.gov/mcd-icd10.html>. For state-level data, it is possible to narrow in on single-year estimates, in this case 1999 and 2015, for different types of opioid-related overdose deaths without loss of much data to suppression. All intents—suicide, homicide, accident, and undetermined—are included. Overdose deaths by type are broken down by MCD codes T40.1 (heroin), T40.2 (natural/semi-synthetic opioids), T40.3 (Methadone), T40.4 (synthetic opioids other than methadone), and T40.6 (unspecified narcotics).
- **Figure 18. Heroin use in the past year by gender, ages 18 and older, 2002-2014**
Social Capital Project analyses of the National Survey on Drug Use and Health (NSDUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>. Illicit opioid use other than heroin use is unavailable. See note for Figure 8 for additional details.
- **Figure 19. Heroin use in the past year by race, ages 18 and older, 2002-2014**
Social Capital Project analyses of the National Survey on Drug Use and Health (NSDUH-2002-2014), Substance Abuse and Mental Health Data Archive, accessed September 5, 2017, <https://datafiles.samhsa.gov/study/national-survey-drug-use-and-health-nsduh-2002-2014-nid16959>. Illicit opioid use other than heroin use is unavailable. See note for Figure 8 for additional details.
- **Figure 20. Fentanyl exhibits, 2004-2016**
Data was provided to the Social Capital Project by Drug Enforcement Agency staff.

The National Forensic Laboratory Information System (NFLIS) collects data on these exhibits from the network of forensic laboratories across the country. The Drug Enforcement Administration (DEA) and other agencies then use the data to identify key threats. The data

are regularly revised as more exhibits are tested by laboratories and results are reported to NFLIS; in some cases the testing requires a significant amount of time. Ultimately, measuring illegal drug trafficking based on NFLIS exhibits likely understates the magnitude of the fentanyl trade.

- **Figure 21. Fentanyl exhibits by state, 2016.**

"2017 National Drug Threat Assessment," Drug Enforcement Agency, (2017): 59, accessed October 18, 2018, https://www.dea.gov/docs/DIR-040-17_2017-NDTA.pdf.

- **Figure 22. Emergency room visits, by metropolitan area by drug type: heroin and opioid medications, 2004-2011**

Drug Abuse Warning Network (DAWN) 2004-2011, Substance Abuse and Mental Health Services Administration (SAMHSA). Accessed at <https://www.datafiles.samhsa.gov/study-series/drug-abuse-warning-network-dawn-nid13516>.

Emergency department visits are specifically drawn from the subgroup of ER visits based on drug misuse and abuse, including illicit drug visits, nonmedical use of pharmaceuticals, alcohol-related visits, and underage drinking. Rates per 100,000 are based on the population of the national and selected metropolitan statistical areas for each respective year.

Between 2004 and 2011, DAWN collected information about emergency department visits, and particularly for drug misuse. A redesign spearheaded by the National Center for Health Statistics combining several hospital, ambulatory, and discharge surveys into one dataset called the National Hospital Care Survey is expected in the future.

- **Figure 23. Opioid-related inpatient hospital stays per 100,000, 2014**

"HCUP Fast Stats National and State-Level Trends in Opioid-Related Hospital Use, Rate of Inpatient Stays and Emergency Department Visits by Discharge Year," Healthcare Cost and Utilization Project (HCUP), accessed October 20, 2017, <https://www.hcup-us.ahrq.gov/faststats/OpioidUseServlet>.

- **Figure 24. Opioid-related inpatient hospital stays per 100,000, 2005-2014**

"HCUP Fast Stats National and State-Level Trends in Opioid-Related Hospital Use, Rate of Inpatient Stays and Emergency Department Visits by Discharge Year," Healthcare Cost and Utilization Project (HCUP), accessed October 20, 2017, <https://www.hcup-us.ahrq.gov/faststats/OpioidUseServlet>.

Community level income is based on the median household income of the patient's ZIP Code of residence. HCUP defines quartiles so that the total U.S. population is evenly distributed

Patient location is determined based on the National Center for Health Statistics (NCHS) six-category, county-level scheme. Large central metropolitan: Counties in metropolitan statistical areas (MSAs) of 1 million or more population that contain the entire population of the largest principal city of the MSA, have their entire population contained in the largest principal city of the MSA, or contain at least 250,000 inhabitants of any principal city of the MSA. Large fringe metropolitan (suburbs): Counties in MSAs of 1 million or more population that did not qualify as large central metropolitan counties. Medium metropolitan: Counties in MSAs of populations of 250,000 to 999,999. Small metropolitan: Counties in MSAs of population less than 250,000. The rural category is a combination of micropolitan and noncore counties. Micropolitan: Counties in micropolitan statistical areas. Noncore: Nonmetropolitan counties that did not qualify as micropolitan. See the "Data Notes & Methods" link in the source for more information.

- **Figure 25. Percent of children with parental alcohol or drug use as factor in out-of-home placement, 2009-2014**

"Examining the Opioid Epidemic: Challenges and Opportunities," 114th Congress (2016) (statement of Nancy K. Young, Director, Children and Family Futures, Inc.): 7, <https://www.finance.senate.gov/imo/media/doc/23feb2016Young.pdf>.

- **Figure 26. Incidence of neonatal abstinence syndrome (NAS) per 1,000 hospital births, 2009-2012**
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- **Figure 27. Incidence of neonatal abstinence syndrome (NAS) per 1,000 hospital births by region, 2012**
Stephen W. Patrick et al., “Increasing Incidence and Geographic Distribution of Neonatal Abstinence Syndrome: United States 2009-2012,” *Journal of Perinatology* 35, no. 8 (August 2015): 650-655, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4520760/pdf/nihms672061.pdf>.

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