The Economic Cost of the Opioid Crisis in the U.S. A State-by-State Comparison

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Executive Summary

At the closing of 2017, new research and mortality data shed additional light on the growing severity of the opioid epidemic in the U.S. In November, the White House Council of Economic Advisors published a report investigating the economic burden attributable to opioid overdose deaths, and individuals with opioid use disorder. By fully accounting for the economic value of lives lost to the epidemic, the CEA study estimated the burden of opioid use disorder and overdose deaths to be $504 billion, or 2.8 percent of gross domestic product in the U.S. during 2015. This far exceeded previous estimates.¹

The following month, the U.S. Centers for Disease Control and Prevention released the final national mortality data for 2016, finding that life expectancy in the U.S. had actually fallen for the second consecutive year. An unprecedented trend for a developed nation, the latest mortality data support previous research suggesting Americans are living shorter lives because of opioid-related “deaths of despair.” The CDC found that 67,265 Americans died from drug-induced causes in 2016, which were dominated by 41,918 opioid overdoses, marking a one-year, 29 percent increase from 2015. More recently, CDC released 2017 data that found 47,576 opioid-related deaths in the U.S. Since the CEA study was published, based on 2015 CDC data, the number of opioid-related deaths in the U.S. grew from 32,493 to 47,576 — an increase of more than 15,000 deaths, or 46 percent in a two-year period.

The CDC data also reveal significant variation in the severity of the opioid crisis between individual states. Using CEA methods and updated CDC mortality data, this policy brief estimates the economic burden of the opioid epidemic at the state-level during 2017.
The total economic cost of the opioid epidemic in the U.S. was estimated at $684.6 billion in 2017. This was 3.5 percent of the nation’s total GDP of nearly $19.5 trillion in 2017. This suggests a 35.8 percent increase over the 2015 CEA estimate of $504 billion. The increase was primarily driven by a 46 percent increase in opioid overdose deaths between 2015 and 2017.

These estimates suggest opioid use disorder and overdose deaths cost the U.S. nearly $1.9 billion every day. This equates to $78 million per hour, $1.3 million per minute, or $21,700 every second of every day during 2017.

Costs associated with overdose deaths accounted for 93 percent of the total economic burden of opioid use disorder. More than 130 Americans died each day from an opioid overdose during 2017.

The economic cost of the 47,576 opioid overdose deaths in the U.S. were estimated at $634 billion, while costs associated with non-fatal opioid use disorder totaled $50.5 billion in 2017.

The opioid overdose mortality rate in the U.S. has more than doubled throughout the last ten years. In 2008, 5.9 Americans died from an opioid overdose per 100,000 residents. By 2017 the rate had grown to 14.6, a ten-year, 147 percent increase.

The rate of opioid overdose deaths per 100,000 across states ranges from 3.1 in Nebraska to 47.3 in West Virginia, a 15.3-fold difference.
Background

The opioid crisis in the U.S. has gained considerable attention in recent years. In October 2017, President Trump declared opioid misuse a national public health emergency. Leveraging the Public Health Service Act, the declaration called for the Department of Health and Human Services as well as other federal agencies to prioritize interventions aimed at mediating the effects of the ongoing epidemic that claimed more than 47,500 lives in 2017. However, critics have suggested that the declaration in itself will produce limited results without sufficient funding, additional resources and greater attention to demand-side prevention strategies.

More recent research from the White House Council of Economic Advisors validates calls for additional resources to combat the opioid epidemic. Accounting for the full economic costs of the crisis in terms of total societal welfare — lost lives and productivity, emotional strain, as well as increased spending on health care, social services and criminal justice — the CEA study found that the opioid epidemic cost the U.S. $504 billion in 2015 alone. By comparison, the President’s request in fiscal year 2018 for drug treatment and prevention funding was $10.8 and $1.3 billion, respectively.

In light of the executive declaration on the opioid epidemic and the White House Council of Economic Advisors’ finding that the crisis cost nearly 3 percent of GDP in 2015, the President’s requested funding for drug prevention in 2018 was $200 million less than in 2017 and the requested funding for drug treatment was just 2 percent above the previous year.

Additionally, the fiscal year 2019 budget request for the National Institute on Drug Abuse to carry out section 301 and title IV of the Public Health Service Act was $1.14 billion. This was six percent higher than the Institute’s 2017 budget authority, indicating the increased funding outpaced inflation by just three percentage points during the same period.

Concurrently, new mortality data from the CDC show that the rate of opioid overdose deaths in the U.S. grew more between 2015 and 2017 than any other two-year period since reporting began in 1999 (Figure 1, middle panel).

Data and Methods

This study aims to replicate the November 2017 CEA study of the economic burden of the opioid crisis at the state-level using updated CDC mortality data from 2017. The CEA methodology accounts for two types of costs attributable to opioid use disorder: fatality costs are those associated with premature mortality, and non-fatality costs are those associated with surviving opioid dependent individuals that accrue from reduced productivity and increased consumption of health care and social services.

Fatality costs are derived by applying age-dependent estimates of the “Value of a Statistical Life” to the corresponding number of opioid overdose deaths for each age category from the CDC WONDER database, multiple cause of death files. Similar to the CEA, the number of deaths used in this analysis was adjusted to reflect new research indicating that opioid overdose deaths...
are underreported by 24 percent in the U.S. Federal agencies commonly base cost-benefit analyses on VSL measures that are designed to estimate the monetary value of the expected benefits of fatality risk-reduction associated with proposed policy and legislative changes.

The CEA’s preferred VSL estimates draw from the work of Aldy and Viscusi (2008) which presented an empirically estimated range of $3.4 million for individuals over age 55, to $9.7 million for individuals aged 35 to 44 (in 2000 dollars). The VSL estimates were adjusted for inflation in this analysis using the consumer price index for all urban consumers to reflect the societal costs of premature opioid-related deaths in 2017 dollars.

The top panel of Figure 1 contains the age distribution of opioid overdose deaths in the U.S. during 2017, as well as the inflation-adjusted age-dependent VSL estimates used in this analysis. The lowest VSL was used in cases where the decedent’s age was suppressed, and for all opioid overdose deaths by individuals over age 55. The majority of opioid overdose deaths in the U.S. occur among prime-aged individuals with higher estimated VSLs.

Our estimated opioid-related fatality cost in the U.S. totaled $634 billion in 2017. Compared to the CEA’s fatality cost estimate of $431.7 billion in 2015, our estimate marked a 46.9 percent increase, which is largely explained by the 46 percent increase in opioid overdose deaths and 3.4 percent inflation in the U.S. between 2015 and 2017.

Non-fatality costs were derived in the CEA methodology with the total number of individuals diagnosed with opioid use disorder in the U.S. (2.4 million in 2015) scaled by estimates from Florence et al. (2016) that found the average cost associated with surviving individuals with prescription opioid use disorder to be approximately $30,000 per person in the form of reduced productivity, increased consumption of health care, law enforcement and social services.

Because one aim of this study was to estimate between-state variation in the economic burden of opioid use disorder, the total number of adults with pain reliever use disorder between...
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2016 and 2017 were used to estimate non-fatality costs. These survey-generated data are reported at the state-level by the Substance Abuse and Mental Health Services Administration. The total number of American adults diagnosed with pain reliever use disorder between 2016 and 2017 was 1,599,960. This was the most significant departure from the CEA study, which included the larger number of individuals with either prescription or illicit opioid use disorder.

Compared to the 2.4 million individuals with any opioid use disorder used by the CEA, our non-fatality cost estimates are conservatively biased downward by roughly 800,000 individuals, however the non-fatality costs represented only 15 percent of the total economic costs of opioid use disorder in the CEA study. For these reasons, after adjusting the average per person cost associated with opioid use disorder for inflation to reflect 2017 dollars, our estimated non-fatality cost of opioid use disorder in the U.S. totaled $50.5 billion in 2017, compared to the CEA’s estimate of $72.3 billion in 2015.

The total economic cost of opioid use disorder and overdose deaths was estimated by this analysis to be $684.6 billion in 2017, or 3.5 percent of the national GDP of $19.5 trillion during the year. This was 36 percent higher than the CEA’s estimate of $504 billion in 2015.

### Table 1: 2017 Economic Cost of Opioids as a Percent of U.S. GDP by Sector

<table>
<thead>
<tr>
<th>Industry</th>
<th>2017 GDP (in billions)</th>
<th>$684.6b Opioid Cost (percent GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross domestic product</td>
<td>$19,485</td>
<td>3.5%</td>
</tr>
<tr>
<td>Agriculture, forestry, fishing, and hunting</td>
<td>$169</td>
<td>404.5%</td>
</tr>
<tr>
<td>Mining, quarrying, and oil and gas extraction</td>
<td>$269</td>
<td>254.9%</td>
</tr>
<tr>
<td>Utilities</td>
<td>$307</td>
<td>222.6%</td>
</tr>
<tr>
<td>Construction</td>
<td>$781</td>
<td>87.6%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>$2,180</td>
<td>31.4%</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>$1,174</td>
<td>58.3%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>$1,087</td>
<td>63.0%</td>
</tr>
<tr>
<td>Transportation and warehousing</td>
<td>$609</td>
<td>112.5%</td>
</tr>
<tr>
<td>Information</td>
<td>$1,051</td>
<td>65.2%</td>
</tr>
<tr>
<td>Finance, insurance, real estate, rental, and leasing</td>
<td>$4,057</td>
<td>16.9%</td>
</tr>
<tr>
<td>Professional and business services</td>
<td>$2,426</td>
<td>28.2%</td>
</tr>
<tr>
<td>Educational services, health care, and social assistance</td>
<td>$1,700</td>
<td>40.3%</td>
</tr>
<tr>
<td>Arts, entertainment, recreation, accommodation, and food services</td>
<td>$805</td>
<td>85.1%</td>
</tr>
<tr>
<td>Other services, except government</td>
<td>$416</td>
<td>164.5%</td>
</tr>
<tr>
<td>Government</td>
<td>$2,454</td>
<td>27.9%</td>
</tr>
</tbody>
</table>

**Total Economic Cost of Opioid Use Disorder in the U.S.: $684,586,969,782**

Findings

A wide range of variation in the economic burden of opioid use disorder was detected between states during 2017. The total economic costs of fatal and non-fatal opioid use disorder ranged from a maximum of $61.5 billion in Ohio to a minimum of $311 million in North Dakota. Evaluated as a percent of state GDP, the range was a minimum of 0.5 percent in Hawaii to a maximum of 16.5 percent in West Virginia (Figure 3).

Evaluated as a percent of GDP, the states most affected by the opioid epidemic were regionalized in New England, Maryland, North Carolina and New Mexico, as well as the rust belt states of West Virginia, Kentucky, Ohio and Michigan. In terms of equivalence, the total opioid burden in 2017 was 1.2 times the nation’s total economic activity generated by the mining and utilities sectors combined. In addition, the economic cost of the opioid crisis more than nets out contributions from entire sectors of the economy, such as agriculture, transportation and other non-governmental services (Table 1).

Conclusion

While there have been significant advances made in the U.S. to combat the opioid epidemic, these estimates suggest additional resources are needed to minimize the societal cost of opioid use disorder. With additional barriers to procuring prescription opioids, an increase of illicit opioid substitution is likely for some individuals with preexisting opioid use disorder. This could cause opioid-related mortality to increase in the short term. Advancements in detection have defined the scope of this epidemic, heightening the need for increased availability of prevention and treatment necessary to reverse its societal impact. Considering the recent proliferation of illicit opiates and other narcotics cut with highly potent synthetic opioids such as fentanyl, this substitution effect may dampen the positive impact of public health responses to curb the availability of prescription opioids. The number of deaths involving synthetic opioids in the U.S. nearly tripled between 2015 and 2017, and now they are the most prevalent type of drug present in opioid overdose deaths (Figure 1 bottom panel).

A 2017 letter published in the Journal of the American Medical Association stated that “The epidemic of opioid misuse, overdose, and death is a multifaceted crisis that requires partnership across sectors to respond with effective health care and public safety strategies.” Effectively moderating the societal costs of the opioid crisis with a cross-sector interventional strategy will require additional resources and investment in prevention and treatment, yet according to this research the benefits should far outweigh the costs.


Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2017 on CDC WONDER Online Database, released December, 2018. Data are from the Multiple Cause of Death Files, 1999-2017, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Retrieved from http://wonder.cdc.gov/mcd-icd10.html

Note: Opioid-related deaths were identified with ICD-10 Codes T40.0 (Opium), T40.1 (Heroin), T40.2 (Other opioids), T40.3 (Methadone) and T40.4 (Other synthetic narcotics).


Note: Pain Reliever Use Disorder is defined as meeting criteria for pain reliever dependence or abuse. Dependence or abuse is based on definitions found in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV).


