Testimony of the United Hospital Fund to the Joint Senate Task Force on Opioids, Addiction and Overdose Prevention
Suzanne Brundage, MSc, Director, Children’s Health Initiative
November 15, 2019

The United Hospital Fund (UHF) is an independent nonprofit organization dedicated to building a more effective health care system for every New Yorker. Since 1879 UHF has helped solve vexing problems in the health care system and collaborated on addressing critical health issues facing New Yorkers. We analyze public policy, find common ground among diverse stakeholders, and develop and support innovative programs that improve the quality, accessibility, affordability, and experience of patient care.

We thank the Joint Senate Task Force for the opportunity to testify on the impact of the opioid epidemic on children. We appreciate the Senate’s support for programs such as the CHARM project aimed at coordinating care for expectant mothers with opioid use disorder.

Childhood Adversity Due to The Opioid Epidemic

While the opioid epidemic is a major threat to the health and well-being of New Yorkers, we are particularly concerned by the long-lasting and profound impact the epidemic has on children of parents suffering from opioid use disorder. Growing up in a household with substance use exposure is classified by experts as an Adverse Childhood Experience (ACE) and can make children vulnerable to additional ACEs, such as loss or separation from a parent. As the Centers for Disease Control and Prevention reaffirmed last week, ACEs have been strongly linked to poor school performance, chronic illness, and premature death. These potential outcomes can threaten the health, vitality, and productivity of the next generation. Countering that threat requires a comprehensive public strategy focused on supporting families with substance use disorders and investing in the healthy development of their children.

National and New York Estimates of the Opioid Epidemic’s Impact on Children

To aid policymakers in developing these strategies, UHF partnered with Boston Consulting Group to estimate, by state, the number of children affected by the opioid epidemic and to project the additional societal cost. UHF published this analysis, The Ripple Effect: National and State Estimates of the U.S. Opioid Epidemic’s Impact on Children, on Wednesday, November 13, 2019. A copy of the report is attached to our written testimony for your reference. This analysis builds upon a March 2019 report, The Ripple Effect: The Impact of the Opioid Epidemic on Children and Families, which outlines mitigation strategies that emerged from a two-day convening of numerous New York State Commissioners and experts.

We estimate that, in 2017, 2.2 million children nationwide had a parent with opioid use disorder or had OUD themselves. That is 28 out of every 1,000 children. Most were under the age of 12.
While New York State's rate of affected children is on par with the national rate, the number of children is staggering: 125,000. Only California, Texas, and Florida have higher totals. The breakdown of the NY estimate is:

- 90,000 children were residing in a household with a parent with OUD
- 13,500 lost a parent due to an opioid-related death or incarceration
- 10,500 were removed from home for kinship or foster care
- 11,000 children had OUD themselves or had accidentally ingested opioids

These are nonduplicative estimates.

Despite promising signs that the opioid epidemic has hit an inflection point, the number of children affected will continue to grow. If current trends continue, the number of children affected by opioid use will rise to a projected 4.3 million by 2030. That will cost the nation $400 billion in additional spending on health care, special education, and other expenses over the lifetimes of these children. We estimate the cost to New York State will reach $22.5 billion by 2030, not counting lost productivity or missed opportunities.

State Strategy

We urge the Senate to pursue a comprehensive strategy to mitigate the effects of the opioid epidemic on parents and children. There are already a range of tested interventions, including funding youth development programs, increasing the availability of family-based mental health services, and expanding supports for foster and kinship caregivers. Federal supports, including the CDC’s Preventing Adverse Childhood Experiences guide and new funding through the Family First Prevention Services Act, can help the state. The report outlines 10 priority strategies the Senate should consider as it continues its policy making to address the opioid crisis:

- Reduce stigma and misunderstanding of opioid use and treatment, particularly among people interacting with pregnant women and parents
- Coordinate the response across health care, law enforcement, child welfare agencies, and schools, so families struggling with substance use disorder receive a “no-wrong-door” approach to evidence-based services
- Create protocols for emergency responders to connect children on the scene of potentially traumatic events to appropriate recovery services
- Provide kinship caregivers and foster parents with tools for responding to trauma in children
- Encourage schools to practice trauma-informed care
- Research the needs of youth caregivers and develop programs to support them
- Increase the availability of family-based mental health services
- Invest in evidence-based programs for youth development
- Encourage integrated health and social services that simultaneously meet the needs of parents and children
- Reduce geographic and racial/ethnic disparities in access to services

We have the tools—we just need to put them in place.
The Ripple Effect
National and State Estimates

Impact on Children of the U.S. Opioid Epidemics
Acknowledgments

This chartbook was authored by Suzanne C. Brundage, director of United Hospital Fund's Children's Health Initiative; Adam Fifield, UHF's director of communications; and Lee Partridge, UHF senior fellow. The analysis was produced as a collaboration between UHF and Boston Consulting Group through a pro-bono engagement. Special thanks to Boston Consulting Group's Edoardo Cavallazzi, Leonardo Fascione, and Jacob Luce, working under the direction of Christophe Durand and Bob Lavoie, for creating the analytic model and providing their expertise.

This chartbook also benefited from the insights of UHF colleagues Carol Levine, senior fellow; Chad Shearer, director of Children's Health Initiative; Chad Shearer, director of Children's Health Initiative; and Laura Douglas designed the chartbook. UHF's Children's Health Initiative is supported in part by the Ira W. and Dorothy Frank O'Neill Family Foundation. The chartbook could not have been produced without the support of the United States Children's Health Care Systems Project, which is supported by a grant from the American Medical Association. This work was made possible by the support of the United Hospital Fund. We are especially grateful to Carol Levine, senior fellow, Chad Shearer, director of Children's Health Initiative, and Laura Douglas designed the chartbook. UHF's Children's Health Initiative is supported in part by the Ira W. and Dorothy Frank O'Neill Family Foundation.

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Overview
The opioid crisis is the deadliest drug epidemic in U.S. history, leaving virtually no community unscathed. The immense toll of opioids has been well-documented by media organizations and researchers, but one aspect that has received little attention or study is the long-lasting impact on children of people suffering from opioid use disorder as well as their families. Based on comprehensive interviews, literature reviews, and data analysis, UHF’s 2019 report provided a comprehensive look at the epidemic’s impact on children and families. Based on the Opioid Epidemic on Children and Families: The Impact of Opioid Use Disorder on Children and Adolescents, the report concludes that the epidemic has a profound impact on children, adolescents, and their families. The report highlights the importance of understanding the impact of the epidemic on children and the need for targeted interventions and support. The report also calls for increased funding for research and treatment programs to address the needs of children affected by opioid use disorder.
In this report, "children" are individuals under the age of 18.

Definitions:

**Children:** Individuals under the age of 18.

**People with "CUD" or "opioid use"** refers to those diagnosed with an opioid use disorder due to prescription-based opioids (like Oxycontin or morphine) or those using any non-prescription-based opiate (like heroin or street fentanyl).

**People who report misusing a prescription-based opiate but are not considered to have an OUD** are not considered to have an opioid use disorder.

**Families with substance use other than opioids** could be equally effective for support families with OUD could be equally effective.

**Families with substance use other than opioids, some of the strategies discussed at the conference,** can be effective.

**Non-OUD** refers to those diagnosed with an opioid use disorder due to prescription-based opioids but who do not meet the criteria for OUD.

**Opioid Epidemic** refers to the ongoing crisis involving prescription opioid misuse and overdose, as well as heroin and synthetic opioid misuse.

**Policies and programs that promote the healthy development of children and adolescents adversely affected by family substance use: exclusion of treatment development of children and adolescents adversely affected by family substance use:**

**Significant local, state, and federal funding streams have been dedicated to combating the opioid epidemic.**

**Foster and Kinship caregivers:**

**Families with OUD:**

**Strategies in use:**

**Terminology:**
In 2017, an estimated 2.2 million children—approximately 2.8% of the 743 million children in the United States—were directly affected by the opioid epidemic. Children affected by the opioid epidemic in 2017

Figure 1
Despite promising signs that the opioid epidemic is turning a corner, the number of children affected by the crisis will continue to climb. As of 2017, over 22 million children have been exposed to opioids, and this number is projected to rise to over 4.3 million children by 2030.

Three Scenarios

**Number of children affected by the opioid epidemic by 2030:**

- **Base Scenario**: 3.2 million additional children will be affected by 2030.
- **Optimistic Scenario**: 1.2 million additional children will be affected by 2030.
- **Pessimistic Scenario**: 4.5 million additional children will be affected by 2030.

Notes:

1. Included in the 2030 estimates are additional children born to people with OUD in 2017, children of people who will have developed an OUD between 2018 and 2030, and children who will have developed an OUD between 2018 and 2030.
2. Individuals are no longer age out of the predictive model. For example, childern in foster care due to parental opioid use who turn 18 before 2030 are still counted in the 2030 estimates because they were affected by the opioid epidemic during childhood.

2030

- 3.2 Million
- 4.5 Million
- 4.3 Million

2017

- 22 Million
- 3.3 Million
- 4.3 Million
Opioidepidemic's impact on children in 2017 compared to common childhood health conditions

To put the "ripple effect" in perspective, in 2017, the opioid epidemic affected 1.9M children, which is about one-third the number with asthma, and was about one-third the number with diabetes, exceeded the number with autism, and was 11 times higher than the number of children affected by the opioid epidemic in 2017.

The presence of other major childhood health conditions in the United States is helpful to compare it to the opioid epidemic's impact on children.
In 2017, 28 out of every 1,000 children in the United States were affected by opioids. West Virginia had the highest rate of children affected, with 54 out of 1,000—more than twice the rate of 20 children per 1,000. California had the lowest rate, with 20 children per 1,000. The map illustrates the rates per state, with the highest rates in the darkest blue and the lowest in the lightest blue. The United States as a whole had 28 children per 1,000 who were affected by the opioid epidemic in 2017.
### Figures

**State Rankings by Rate of Children Affected by the Opioid Epidemic**

<table>
<thead>
<tr>
<th>State</th>
<th>Total Number per State in 2017</th>
<th>Total Children Affecteed</th>
<th>Rate per 1,000</th>
<th>State</th>
<th>Total Number per State in 2017</th>
<th>Total Children Affecteed</th>
<th>Rate per 1,000</th>
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<td>13</td>
<td>South Dakota</td>
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<td>100</td>
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<td>31</td>
<td>23</td>
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<td>0</td>
<td>Washington</td>
<td>7,000</td>
<td>31</td>
<td>23</td>
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</tbody>
</table>

Although the rates of children affected in the four most populous states (California, Texas, Florida, and New York) are all below the national median, the highest per capita rate was home in West Virginia, a small rural state with nearly 10% of the 22 million children together these four states account for 22% of the total U.S. opioid epidemic impact on children. Wyoming and the lowest children per state in 2017.
Figure 6

Number of children affected by the opioid epidemic in 2017 by age

- Ages 0-5: 610,000
- Ages 6-11: 662,000
- Ages 12-17: 610,000

Most children affected by opioids

Families receiving appropriate support can be prevented or their impact reduced. However, early intervention and prevention can be especially harmful to young children. The presence of such experiences can make children vulnerable to additional ACEs, such as abuse and neglect. Loss of a parent or exposure to violence or separation from a parent can make children more susceptible to adverse childhood experiences (ACE). The presence of such experiences can make children more susceptible to adverse childhood experiences (ACE).
Children affected by the opioid epidemic will likely incur higher expenses during childhood, a trend that persists into adulthood. This lifetime societal cost is estimated to be $180 billion for the 22 million children affected in 2017. This cost has two components: $117.5 billion incurred during childhood, with children at greater risk for additional general healthcare and special education services.

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Average Cost per Child</th>
<th>Total in Billions</th>
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</thead>
<tbody>
<tr>
<td>Higher overall health care expenses</td>
<td>$74K</td>
<td>$1.75</td>
</tr>
<tr>
<td>Additional special education services</td>
<td>$37K</td>
<td>$621</td>
</tr>
<tr>
<td>Child welfare and social programs</td>
<td>$3.2K</td>
<td>$44K</td>
</tr>
<tr>
<td>Adolescents treated for OUD</td>
<td>$6K</td>
<td>$125K</td>
</tr>
<tr>
<td>Children born with NAS each year</td>
<td>$16K</td>
<td>$3K</td>
</tr>
<tr>
<td>Treatment</td>
<td>$80</td>
<td>$1.25</td>
</tr>
<tr>
<td>More likely to need special education</td>
<td>75%</td>
<td>$186K</td>
</tr>
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</table>

Societal cost during childhood (based on 22 million children affected in 2017)
The effects of adverse childhood experiences (ACEs) can be long-lasting and extend into adulthood. It is estimated that children of parents with substance use disorders have an average of 2.1 ACEs. A greater number of ACEs during childhood is associated with increased risk for depression, anxiety, and substance use disorders. The long-term cost due to adverse childhood experiences accounts for more than $62 billion over the lifetime of these children. All told, the long-term cost due to adverse childhood experiences includes depression, anxiety, substance use disorders, and chronic diseases, including diabetes and obesity. The two sets of estimates—per-child and total for the population—are intended to assist policymakers in shaping appropriate interventions.
Figure 9: Lifetimes societal cost of the opioid epidemic's impact on children.

By 2030 the societal cost of the opioid epidemic's impact on children could increase to $400 billion. This includes parental SUD; tailored SUD programs for adolescents; and expanded opioid treatment programs that meet the needs of parents. The ripple effect: national and state estimates of the U.S. opioid epidemic's impact on children.

NOTES:

1. Estimated costs in 2030 are derived from the "base scenario" assumptions from Figure 2.

1. The state costs in 2030 are based on the national average cost in 2018. They do not consider regional variances in healthcare.

**THE RIPPLE EFFECT:** National and State Estimates of the U.S. Opioid Epidemic’s Impact on Children

Projected 2030 costs are attributed to states based on each state’s proportion of estimated children affected as of 2030.

**NOTES:**
- $0-$3 Billion
- $3-$6 Billion
- $6-$12 Billion
- $12-$25 Billion
- $25-$50 Billion
- $50-$75 Billion
- $75-$100 Billion
- $100-$200 Billion
- $200-$400 Billion
- $400 Billion

Total cost

A state is projected to be $5 Billion.

The average cost of $5.5 Billion is projected to face a state with the largest number of affected children in 2017.

States based on each state’s proportion of estimated children affected as of 2030.
The estimates presented in this report suggest that the opioid epidemic's costs are substantial and wide-ranging. These include financial consequences, of course, but they also include a steep human toll—lives cut short and families disrupted. The ripple effect of the opioid epidemic on children and families is starkly clear.

Fortunately, there are solutions. The bipartisan SUPPORT Act of 2018 and the Family First Prevention Services Act both include resources and programsthat policymakers and community leaders can draw upon to minimize the impact of the epidemic on children.

Below is a list of 10 priority strategies* that can help children affected by opioids:

- Reduce the stigma and misunderstanding of opioid use and treatment, particularly among people interacting with pregnant women and parents
- Provide kinship caregivers and foster parents with tools for responding to trauma
- Promote equitable and accessible health care in various settings
- Increase the availability of family-based mental health services
- Create protocols for emergency responders to connect families to care
- Develop community-led programs that provide comprehensive, child-focused services to families and children
- Support trauma-informed care for children
- Connect families to evidence-based programs that meet the needs of parents and children
- Encourage schools to practice trauma-informed care
- Reduce geographic and racial/ethnic disparities in access to services

* These strategies are described in greater detail in *The Ripple Effect: The Impact of the Opioid Epidemic on Children and Families* by Suzanne Brundage and Carol Levine.
## Appendix A. Detailed state estimates for 2017 and projected state costs for 2030

<table>
<thead>
<tr>
<th>State</th>
<th>Rate per 1,000</th>
<th>Total number of children affected</th>
<th>Residing in household with parent with OUD</th>
<th>Loss of parent due to death or incarceration</th>
<th>Removal from home for foster or kinship care</th>
<th>OUD as adolescent or accidental ingestion as child</th>
<th>Cost in 2030 ($B)</th>
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<tr>
<td>Alabama</td>
<td>37</td>
<td>42,000</td>
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## Appendix A. Detailed state estimates for 2017 and projected state costs for 2030 (continued)

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**NOTE:**
Figures might not add up to total due to rounding.
Appendix B. Data sources

**Figure 1**


**Figure 2**
Appendix B. Data Sources (continued)

National Survey on Drug Use and Health (NSDUH) from 2015-17. (See Figure 1.)

Figure 3


Figure 4
State-level data from sources in Figure 1.


Figure 5
State-level data from sources in Figure 1.


Figure 6
National Survey on Drug Use and Health (NSDUH) from 2015-17; Adoption and Foster Care Analysis and Reporting System (2017). (See Figure 1.)

Figures 7 and 8


**Figure 9**
Same sources as Figures 2, 7, and 8.

**Figure 10**
Same sources as Figures 1, 7, and 8.
Appendix C. Methodology

**METHODOLOGY OVERVIEW**

Boston Consulting Group (BCG) constructed the following model, informed by peer-reviewed literature (key sources listed below) and expert interviews to develop the estimates in this chartbook.

BCG began by creating a “snapshot” of children under age 18 in 2017 who had been affected by the opioid epidemic. To do this, they developed estimates of the number in each of five different categories:

1. Those living with a parent with OUD
2. Those who had a parent die due to an opioid overdose ever in their lifetime
3. Those with a parent in prison due to a heroin-related offense
4. Those removed from home and living in foster care or with relatives due to household opioid use
5. Adolescents (ages 12–17) with OUD and children (ages 0–12) who accidentally ingested an opioid

These estimates were then adjusted (lowered by 30%) to remove double-counting between the categories. BCG further increased the estimates for categories 1 and 5 to reflect known undercounting in these two groups because the data is self-reported. The resulting estimates were summed across the five groups to reach the 2017 2.2 million figure.

Second, 10 types of costs associated with the different ways a child may be affected by the opioid epidemic were identified and an average cost per person calculated for each.

The average per-person costs were multiplied by the estimated number of children to whom the costs would apply (roughly aligning with the five categories listed in step 1). These costs were summed to calculate the total lifetime cost for children affected in 2017.

BCG then estimated what the total number of affected individuals would be by 2030 under three different scenarios: base, pessimistic, and optimistic.

Using the base-year case assumption for the total number of affected individuals, the average per-person cost for each of the 10 cost types was multiplied by the new projected numbers as of 2030. The sum of those numbers is the 2030 cost estimate.

To calculate the state estimates for the number of children affected in 2017, the same steps were followed, substituting state-specific data for the numbers affected. State variation in health care or other sector costs was not taken into account. The state-by-state cost projections for 2017 and 2030 were derived by using each state’s percentage of the national number of children affected in 2017 and multiplying that share by the estimated national cost for the respective year.
Key academic literature:


**DETAILED METHODOLOGY**

Figure 1. Children affected by the opioid epidemic in 2017

The total figure is the sum of estimates in five categories:

1. Children residing in a household with a parent with opioid use disorder. A national estimate of the number of parents living with OUD was obtained from Lisa Clemans-Cope et al., and the NSDUH 2015-2017 three-year average was used. Using NSDUH 2017 state-level demographic data on the age of parents with OUD and the average number of children per age bracket, a preliminary estimate of the number of children was calculated. Using U.S. Census Bureau data, this figure was adjusted to account for household composition, taking into account the probability of households being a single-parent female-led household, a single-parent male-led household, or a two-parent household, and also considering the average number of children per household type. The estimate of the number of children residing in a household with a parent with OUD was then corrected downward to account for potential co-occurrence of OUD in two-parent households (estimated to be 15% based on expert interviews). The estimate was then adjusted upward by 30% to account for underreporting in NSDUH data (based on Biemer and Brown's *Model-based Estimation of Drug Use Prevalence Using Item Count Data* which reviewed underreporting in the NSDUH of cocaine use prevalence). Research on underreporting of self-reported opioid use suggests underreporting could be as high as 57%, so 30% is a conservative assumption.

State-based estimates were calculated by multiplying the national estimate (1.44 million) by the state’s share of national prescription-based OUD and non-prescription opioid use.

2. Have a parent who died due to opioids. National and state-level data on opioid overdose deaths between 1999 and 2017 were obtained from the CDC. Based on *The Effect of Incomplete Death Certificates on Estimates of Unintentional Opioid-Related Overdose*...
Deaths in the United States, 1999-2015, opioid overdose deaths were corrected for underreporting on death certificates by adding a percentage of “non-specified” drug overdose deaths to the opioid-overdose deaths. The percentage of non-specified drug deaths attributed to opioids was the same percentage, at national and state-levels, of opioid-related deaths attributed to overall drug overdose deaths. By comparing the total number of adults with OUD to the number of parents with OUD in the NSDUH 2015–2017, it was estimated that 35% of overdose deaths were of parents. The number of children affected was calculated using the average fertility rate, adjusted for demographic data (age and gender) of the overdose population. The figure was corrected to exclude an estimated 40,000 children who were counted in categories 1 or 4 based on likely household composition.

3. Have a parent who has been incarcerated due to opioids. The current national inmate population for drug possession offenses with sentences greater than one year was obtained from the Bureau of Justice Statistics. Based on Uniform Crime Reporting statistics, an estimated 3% of these were related to heroin possession. The percentage of this population estimated to be parents, and therefore the number of children affected, was calculated using methods comparable to categories 1 and 2. To avoid potentially double-counting children who would likely appear in categories 1 or 4, only criminal sentences greater than 12 months were included in this estimate. State-level estimates were derived by applying the state share of the national correctional population to the national estimate of children who have a parent incarcerated due to opioids.

4. Have been removed from home due to household opioid misuse. The number of children in foster care because of parental drug use on September 30, 2017, was obtained from the 2018 Adoption and Foster Care Analysis and Reporting System (AFCARS) report using state-level data. The share of these cases with opioid involvement was estimated to be 31%, based on prevalence of opioid use compared to all substance use in NSDUH results. To account for children living in unofficial kinship care, state-level ratios of unofficial kinship care to foster care were applied, resulting in a national average ratio of six children in unofficial kinship care for every one child in foster care (2009-2018 Current Population Survey Annual Social and Economic Supplement). The figure was corrected to account for children who enter and exit foster care during the same year to avoid double-counting with category 1.

5. Have OUD or have accidentally ingested opioids. The number of adolescents ages 12–17 with OUD was obtained from NSDUH 2015–2017 (three-year average) and corrected for an estimated 30% in underreporting. The estimate was also corrected for double-counting with category 1 by factoring in the percentage of adolescents who sourced their opioids from relatives (30%) or who have relatives with OUD (20%). The number of children ages 0–12 hospitalized for opioid ingestion in 2015, obtained from Prescription Opioid Exposures Among Children and Adolescents in the United States: 2000–2015, was added to the figure.
Figure 2. Number of children affected by opioid epidemic by 2030: Three scenarios

2030 estimates were developed using a dynamic system model that simulates year-by-year changes in nonmedical opioid use in the United States. Using methods from Chen et al., Prevention of Prescription Opioid Misuse and Projected Overdose Deaths in the US, 2019, the model consisted of three subgroups of the population: those using prescription opioids nonmedically without an OUD; those with prescription-based OUD; and those using illicit opioids. Individuals can enter and exit the model based on changes in their opioid use. New entrants include individuals who go from misusing prescription drugs to developing a prescription-based OUD; individuals who go from misusing prescription drugs to misusing illicit opioids; and those who go directly to misusing illicit opioids. Individuals can exit the model if they stop using opioids or die from an overdose. Since the most recent data from Chen et al. was from 2015, the model was adjusted to include observed trends in prescription-based OUD and non-prescription-based OUD up to 2017.

Three future scenarios were simulated to arrive at an estimate of total new cases of OUD between 2018 and 2030.

- **Base case**: assumes prescription-based OUD incidence is decreasing based on current trends and assumes illicit OUD reached inflection point in 2016–2017.

- **Pessimistic case**: assumes prescription-based OUD is decreasing at half the rate of current trends and illicit OUD reaches an inflection point in 2020.

- **Optimistic case**: assumes prescription-based OUD is decreasing at twice the rate of current trends and illicit OUD also decreases at twice the rate of current trends.

Each of these scenarios resulted in an estimated number of new OUD cases between 2018 and 2030. Using a method similar to that used in Figure 1 and drawing upon NSDUH 2017 data, BCG calculated how many of the new OUD cases would likely be among parents and how many children they have (a weighted average fertility rate of 1.9 was used). Added to this estimate was the number of additional children born to parents with OUD in 2017 (estimated to be 146,000) and children who themselves are projected to develop an OUD between 2018 and 2030 (estimated to be 115,000).

Figure 3. Opioid epidemic's impact on children in 2017 compared to common childhood health conditions

Figure compares estimates to existing data sources. No methods to report.

Figure 4 (Rate of children affected by the opioid epidemic in 2017 by state) and Figure 5 (State rankings by rate of children affected by the opioid epidemic and total number per state in 2017)

The total number of children affected in each state is the sum of state-level estimates for Figure 1. The state rate was calculated by dividing this total by the state’s under age 18 population as reported in the American Community Survey’s “Demographic and Housing Estimates 2013–2017 5-year Estimates.”

Figure 6. Number of children affected by the opioid epidemic in 2017 by age

Estimated age ranges for categories 1–3 were calculated using household demographic data from the NSDUH 2015–2017. These estimates: 42% of children of parents
Appendix C. Methodology

with OUD are ages 0–5; 34% are 6–11; and 24% are 12–17. Age ranges for children in category 4 were calculated using AFCARS data. Category 5 age ranges only include children ages 12–17 with OUD, sourced from the NSDUH 2015–2017. These numbers were adjusted for underreporting and double-counting between categories, as they were in Figure 1.

Figure 7. Societal cost during childhood (based on 2.2 million children affected in 2017)

Incremental health care costs during childhood refer to the health care costs resulting from parental OUD that occurs in childhood. Costs were calculated drawing upon the work of Fang et al. 2012 and an analysis by Peterson et al. of the economic burden of child maltreatment. For this cost analysis, which used an adverse childhood experiences perspective, the effects of parental opioid use disorder on a child are assumed to be similar to the effects of child maltreatment. Child maltreatment results in additional health care costs during childhood, including additional inpatient and outpatient visits, prescription medications, and counseling. For a full list of included costs, see Florence et al., 2012. Fang et al. estimated a $33,000 incremental cost (2010 dollars) for health care received between ages 6 and 17. This estimate was adjusted to 2018 dollars using the personal consumption expenditure (PCE) price index. These costs are applied to children in categories 1–4.

NAS-related treatment costs. The source is Winkelman et al., Incidence and Costs of Neonatal Abstinence Syndrome Among Infants With Medicaid: 2004–2014, which found that the average Medicaid cost of hospitalizing an infant with NAS was approximately $19,000 (vs. about $4,000 without) due to longer stays post birth; this resulted in an incremental additional birth cost of approximately $15,000. These costs apply only to children born with NAS, estimated to number 32,000 in 2017.

OUD treatment-related costs for adolescents include medication and office visits. The source for cost data is Medications to Treat Opioid Use Disorder: How Much Does Opioid Treatment Cost?, NIH National Institute on Drug Abuse. It assumes 75% of teenagers with OUD are treated every year from now until 2030 and an average length of treatment that is 6–8 years, with 97% of adolescents on Buprenorphine, 2% on Naltrexone, and 1% on Methadone. These costs only apply to children in category 5.

Child welfare costs. A total child welfare system cost of approximately $30 billion in 2017 (to serve 680,000 children) was used to calculate a per-child/per-year cost. This figure was multiplied by 73,000, which is the estimated number of children entering child welfare annually due to opioids. The source was AFCARS state foster care data from 2008–2017. These costs only apply to children in foster care and do not include costs of kinship care.

Special education costs. This analysis is based on literature suggesting that child maltreatment is associated with increased entry into special education systems. For this cost analysis, using an adverse childhood experiences perspective and limited additional research, it was assumed the effects of parental opioid use disorder on a child would be similar to the effects of child maltreatment. In a study examining the economic burden of child maltreatment, Fang et al. 2012 assumes a 10.5% incremental increase in special education use due to child maltreatment (24.2% of maltreated children received special education at a mean
age of 8 years, compared with 13.7% of children with no maltreatment record).

Translating this incremental increase in special education use into cost, similar to Fang et al., BCG drew upon Reynolds et al. (2002), who estimated that the average annual cost per child for special education services above and beyond regular instruction was $7,791 in 1998 dollars. This figure was adjusted upward by 4% per year to an incremental, per-year, per-pupil cost of $16,000 in 2018 dollars, based on historical education cost data. Assuming twelve years of instruction, the present value of lifetime special education costs per pupil is $186,000. Assuming a 10.5% incremental increase in special education due to parental opioid use, the per-pupil cost is estimated to be $19,511. This distributed per-child cost is applied to children in categories 1–4.

Figure 8. Long-term societal cost (based on 2.2 million children affected in 2017)

These costs were calculated on the percent likelihood of increased at-risk behavior over a lifetime (50 years) based on a blended adverse childhood experience score of 2.1 for people affected by parental substance use, the number estimated by Felitti et al. Costs do not account for productivity losses. These costs, because they take into account increased risk across a population, apply to children in categories 1–5.

Criminal justice-related costs. Cost estimate is based on the incremental effect of child maltreatment on criminal justice involvement, using methods from Fang et al., 2012, and Widom and Maxfield, 2001. Widom and Maxfield reported that child maltreatment increases the likelihood of having a juvenile arrest by 10.2 percentage points, based on a longitudinal analysis of 1994 arrest data from a Midwestern metropolitan area. (That analysis found that 27.4% of maltreated children had a juvenile arrest compared to 17.2% of children in the comparison group.) Using the cost methods of Fang et al., BCG calculated a blended cost in 2018 dollars for juvenile and adult arrests (including expenses for arrests, treatment, probation services, and release) of $7,732, an amount that was distributed across the 2.2 million affected children.

Depression-related health care costs. The analysis assumes a 14% depression prevalence among individuals with no adverse childhood experiences and a 16 percentage-point increase above that rate among affected children (based on blended ACE scores from Felitti 1998). The cost analysis assumes one counseling session per month at a cost of $100 per session (the national average). The estimate is the lifetime cost of 50 years in present value.

Smoking-related health care costs. The analysis assumes a 7% smoking prevalence among individuals with no adverse childhood experiences and a 4 percentage-point increase above that rate among affected children (based on blended ACE scores from Felitti 1998). It also assumes an average marginal lifetime health care cost of a smoker to be $200,000 (source: CDC). The estimate is the lifetime cost of 50 years in present value.

Obesity-related health care costs. The analysis assumes a 5% obesity prevalence among individuals with no adverse childhood experiences and a 4 percentage-point increase above that rate among affected children (based on blended ACE scores from Felitti 1998). Obesity-related costs are estimated to be $1,980 per year per person in 2015 dollars. The cost was adjusted for PCE inflation. The estimate is the lifetime cost of 50 years in present value.
Increased alcohol and drug use-related health care costs. The analysis assumes a 3% prevalence of alcohol and drug use disorders among individuals with no adverse childhood experiences and an 11 percentage-point increase above that rate among affected children (based on blended ACE scores from Felitti 1998). Blended alcohol- and drug-related costs are estimated to be $3,000 per person per year, according to a report from the U.S. Surgeon General’s office. The estimate is the lifetime cost of 50 years in present value.

Figure 9. Lifetime societal cost of the opioid epidemic’s impact on children in 2030

The cost was calculated by summing the totals for each cost category. The total for each cost category is the result of multiplying the per-person costs in each category by the estimated number of attributable lives in 2030. 2030 cost estimates take into account inflation and are reported as the net present value in 2018 dollars.

Figure 10. Projected societal cost of the opioid epidemic by state (based on estimated 43 million children affected as of 2030)

All cost estimates are based on national average cost in 2018 and do not take into account variances in health care, social service, or other sector costs. Costs are attributed to states based on their proportion of affected children in 2017. Cost estimates take into account future discounting.