Avalere Health™

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May 2025

The cost of addiction: Opioid use disorder in the United States

An Avalere Health Document
for Indivior

Table of Contents

Funding for this research was provided by Indivior. Avalere Health retained full editorial control.

Executive summary

In 2022, over six million people in the United States reported having an opioid use disorder (OUD). Past research has not yielded comprehensive estimates of the full societal burden of OUD or the impact of OUD treatments in limiting associated costs. To evaluate the costs of OUD and the benefits and cost savings associated with OUD treatment, Avalere Health conducted secondary research and modeled the costs as well as the savings associated with treatment of OUD, nationally and by state. This research (1) characterized the prevalence of OUD, (2) modeled the costs of OUD, and (3) modeled the net cost impact of four ambulatory OUD treatments: (a) behavioral therapy alone, (b) behavioral therapy plus methadone, (c) behavioral therapy plus transmucosal buprenorphine, and (d) behavioral therapy plus long-acting injectable (LAI) buprenorphine.

Key findings:

1. **OUD prevalence:** OUD cases per capita (the percentage of individuals per state with OUD) ranged among states from 0.75% to 2.99%. New Hampshire, Nevada, Massachusetts, and Kentucky had the highest rates of OUD (greater than 2.5%), while Wyoming, Hawaii, Washington DC, and Minnesota had the lowest (less than 1.0%).

2. **Cost burden of OUD:** The average annual total cost per OUD case OUD is approximately $695,000 across all stakeholders analyzed. The annual cost per OUD case, excluding the patient burden to the individual with OUD, is approximately $163,000, spread across public and private stakeholders. Including lost quality and length of life, the patient burden of OUD is approximately $532,000 per year.

3. **Costs to external stakeholders:** The costs to the federal government, state/local government, private businesses, and society are driven by lost productivity for employers ($438 billion), employees ($248 billion), and households ($73 billion). Health insurance and uninsured costs were $111 billion, criminal justice costs are $52 billion, and other substance use treatment costs are $12 billion.

4. **Treatment benefits of OUD:** Medications and behavioral therapy to treat OUD are associated with significant average cost savings per case. Estimated annual per-case savings net of treatment cost from ambulatory treatments are estimated to be:
   - $144,000 for behavioral therapy alone
   - $271,000 for behavioral therapy plus methadone
   - $271,000 for behavioral therapy plus sublingual buprenorphine
   - $295,000 for behavioral therapy plus LAI buprenorphine

Introduction

Background on OUD

In 2022, approximately 6.1 million people in the United States reported having an opioid use disorder (OUD), which is defined as the chronic use of opioids causing clinically significant distress or impairment.[1] OUD is diagnosed when individuals meet several indicators, including craving opioids, using opioids even when the individual is aware it is a problem, or taking larger amounts of opioids than intended.[2]

Deaths related to opioid use have increased since 1999, as have case counts and costs associated with OUD. The OUD epidemic has evolved in three waves. The first wave began in the 1990s and involved the use of prescription opioids (e.g., oxycodone and morphine). The second wave began around 2010 with a rapid increase in the use of heroin. The third wave began in 2013 with the increase in overdoses linked to synthetic opioids, especially illegally manufactured fentanyl and fentanyl analogs. Today, opioid-related deaths often involve other drugs such as stimulants.[3]

The OUD epidemic affects individuals, families, and society more broadly. Opioid use can lead to adverse health consequences, absenteeism, and death.[4,5] Substance use disorders such as OUD can lead to the disruption of social life and of family finances, routines, and relationships.[6] Some individuals face greater risks and are more likely to be affected by OUD, including lower-income individuals, the uninsured, and Medicaid beneficiaries.[7] Hispanic and Latin American communities have the highest rates of youth OUD and Black Americans are more likely to face legal consequences of OUD. White Americans are more likely to receive pain management treatment and are at a higher risk of developing OUD than other racial groups.[8] Racial, ethnic, and demographic disparities and differences are also often considered when managing OUD treatment and prevention.

Evidence suggests that appropriate treatment decreases rates of financially motivated and violent crimes among individuals with OUD.[9] A systematic review of the impacts of medication

[1] CDC. "Medications for Opioid Use Disorder (MOUD) Study." (accessed April 18, 2025).
[2] CDC. "Opioid Use Disorder: Diagnosis." (accessed April 18, 2025).
[3] CDC. "Understanding the Opioid Overdose Epidemic." (accessed April 18, 2025).
[4] Fairley, M, et al. "Cost-Effectiveness of Treatments for Opioid Use Disorder." *JAMA Psychiatry* 2021;78(7):767-777. doi:10.1001/jamapsychiatry.2021.0247.
[5] Morgan, Jake R, et al. "Estimating Absenteeism Related to Nonalcohol Substance Use in a US National Cohort of Full-Time Employees" Journal of Occupational and Environmental Medicine 64(11) (November 2022): 899-904. DOI: 10.1097/JOM.0000000000002612.
[6] Lander, Laura, Janie Howsare, and Marilyn Byrne. "The Impact of Substance Use Disorders on Families and Children: From Theory to Practice." *Social Work in Public Health* 28 (3-4) (June 2013): 194–205. https://doi.org/10.1080/19371918.2013.759005.
[7] HHS ASPE. Ghertner, Robin and Lincoln Groves. "Economic Opportunity and the Opioid Crisis: Geographic and Economic Trends." 2018. (accessed April 18, 2025).
[8] Siddiqui, Neha, and Richard D. Urman. "Opioid Use Disorder and Racial/Ethnic Health Disparities: Prevention and Management." Current Pain and Headache Reports 26 (February 2022): 129-137. https://doi.org/10.1007/s11916-022-01010-4.
[9] NBER. Maclean, Johanna, Justine Mallatt, Christopher Ruhm, and Kosali Simon. 2022."The Opioid Crisis, Health, Healthcare, and Crime: a Review of Quasi-Experimental Economic Studies." (accessed April 18, 2025).

for OUD (MOUD) for justice-involved populations found that treating substance use disorder in criminal justice settings reduces non-fatal overdose in prison and upon release.[10]

Healthcare costs associated with OUD include health insurance, the cost of healthcare services (e.g., physician or hospital), and the cost of OUD treatment. Costs to the individual with OUD (i.e., patient burden) include decreased quality of life (e.g., as a result of severe health problems), disability, criminal justice involvement, and failure to meet responsibilities at work, school, or home.[11] Substance abuse issues, especially OUD, are often ongoing for individuals in the criminal justice system.[12] Correctional populations also face increased risks of drug-related mortality upon release from incarceration—the risk of opioid overdose post release is much higher than the risk of overdose for individuals who have not been incarcerated.[13] In addition, lost productivity associated with OUD increases costs for employers. A 2018 study that examined the impact of substance abuse found that in a hypothetical firm of 10,000 employees, $232,000 in wages was lost annually from illicit substance use.[14]

Despite the well-established benefits of OUD treatment, individuals with OUD face significant barriers to treatment that may hinder access and adherence. Barriers to care include physicians' stigmatizing attitudes and reluctance to treat OUD, inadequate provider training, geographic distances between patients and treatment settings, and social stigma associated with accessing treatment. The geographic distances between patients and treatment centers can make it difficult and time consuming for patients to access care, especially if they have limited access to transportation. Stigma toward patients with OUD has led to lower quality of care including shorter visits with physicians and medical teams as well as impersonal approaches to patient care. These factors may contribute to patients with OUD feeling hesitant to receive care.[15] Further barriers to care include the direct and indirect costs of treatment (e.g., cost of treatment and time required).[16] Treatment barriers and accessibility may also vary by setting of care. Healthcare professionals are able to prescribe buprenorphine in their offices, while methadone is only available in regulated OTPs that may be more complex to access due to the need for daily visits.[17]

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[10] Strange CC, et al. "Opioid-specific medication-assisted therapy and its impact on criminal justice and overdose outcomes." *Campbell Syst Rev*.18(1):e1215 (January 7, 2022). doi: 10.1002/cl2.1215.

[11] SAMHSA. "Substance Use Disorders Recovery with a Focus on Employment and Education." (accessed April 18, 2025).

[12] Murphy, S. M. "Leveraging Extended-Release Buprenorphine to Improve Care for Opioid Use Disorder in the Criminal-Legal System." *The American Journal of Drug and Alcohol Abuse* 50 (5) (October 2024): 619–22. https://doi.org/10.1080/00952990.2024.2401980.

[13] Russell, C., et al. "Feasibility and Effectiveness of Extended-Release Buprenorphine (XR-BUP) among Correctional Populations: A Systematic Review." *The American Journal of Drug and Alcohol Abuse* 50 (5) (June 2024): 567–86. https://doi.org/10.1080/00952990.2024.2360984

[14] Morgan, Jake R, et al. "Estimating Absenteeism Related to Nonalcohol Substance Use in a US National Cohort of Full-Time Employees" Journal of Occupational and Environmental Medicine 64(11) (November 2022): 899-904. DOI: 10.1097/JOM.0000000000002612.

[15] Patel, Karan, et al. "Opioid Use Disorder: Treatments and Barriers." Cureus Vol. 13 (2) (February 6, 2021). DOI: 10.7759/cureus.13173.

[16] Anyanwu, P, et al, "Understanding the Financial Barriers to Treatment among Individuals with Opioid Use Disorder: A Focus Group Study." *Harm Reduction Journal* Vol. 21 (1) (December 20, 2024). https://doi.org/10.1186/s12954-024-01133-4.

[17] NBER. Maclean, Johanna, Justine Mallatt, Christopher Ruhm, and Kosali Simon. 2022."The Opioid Crisis, Health, Healthcare, and Crime: a Review of Quasi-Experimental Economic Studies." (accessed April 18, 2025).

Contextualizing the cost burden of OUD

Economic and public health research has attempted to estimate the total cost of the opioid crisis to the United States. The Council of Economic Advisers estimates that the opioid crisis cost the United States $504 billion in 2015.[18] Other estimates range from $1.02 trillion in 2017 to 1.5 trillion in 2020.[19,20] By comparison to other chronic conditions, the Centers for Disease Control and Prevention (CDC) estimates that the economic toll of heart disease and stroke totals $254 billion in healthcare costs and $168 billion in lost productivity per year.

OUD treatments

Treatment for OUD has been shown to reduce cravings, increase abstinence from opioids, and reduce morbidity and mortality, thereby making it a key component for addressing the economic and public health consequences of OUD. Treatment for OUD typically includes a combination of behavioral or cognitive therapy with medication.[21] Treatment settings include outpatient opioid treatment clinics, physician offices, inpatient (residential) addiction treatment centers, hospitals, and correctional facilities.

The US Food and Drug Administration has approved three MOUDs: methadone, buprenorphine, and naltrexone.[22] MOUDs can support an individual's recovery by helping to normalize brain chemistry, relieve cravings, and in some cases prevent withdrawal symptoms. Each MOUD presents different considerations related to treatment setting, ease of use, frequency of administration, and patient profile.[23]

Methadone requires daily use and can only be provided in the setting of a certified opioid treatment program (OTP). Methadone treatment therefore requires daily transportation to an OTP and other disruptions such as childcare and adjustment of other responsibilities.[24]

Buprenorphine is available as a transmucosal tablet or film that is dissolved under the tongue or as an LAI. It may be prescribed by a clinician for outpatient use. The transmucosal products must be used daily, whereas injectable formulations are administered weekly or monthly.[25] Buprenorphine has been shown to lower all-cause mortality and opioid overdose risk by 60%, increase treatment retention, reduce opioid use, reduce hepatitis C and human immunodeficiency virus risk, and treat opioid craving and withdrawal.[26] A small study in the

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[18] White House; The Council of Economic Advisers. "The Underestimated Cost of the Opioid Crisis." 2017. (accessed April 18, 2025).
[19] Florence, Curtis, Feijun Luo, and Ketra Rice. "The Economic Burden of Opioid Use Disorder and Fatal Opioid Overdose in the United States, 2017." *Drug and Alcohol Dependence*. Vol. 218 (January 1, 2021): 108350. https://doi.org/10.1016/j.drugalcdep.2020.108350.
[20] Beyer, Don. Joint Economic Committee Democrats. "The Economic Toll of the Opioid Crisis Reached Nearly $1.5 Trillion in 2020." (accessed April 18, 2025).
[21] McCarty, D. et al "Treatment and Prevention of Opioid Use Disorder: Challenges and Opportunities*" Annual Review of Public Health.* Vol. 39 (April 1, 2018): 525-541. doi: 10.1146/annurev-publhealth-040617-013526.
[22] SAMHSA. "Sublingual and Transmucosal Buprenorphine for Opioid Use Disorder: Review and Update". 2016. (accessed April 18, 2025).
[23] SAMHSA. "Substance Use Disorder Treatment Options." (accessed April 18, 2025).
[24] SAMHSA. "Federal Guidelines for Opioid Treatment Programs." 2024. (accessed April 18, 2025).
[25] Heidbreder C. et al. "History of the discovery, development, and FDA-approval of buprenorphine medications for the treatment of opioid use disorder." *Drug and Alcohol Dependence Reports* Vol. 6 (2023):100133 https://doi.org/10.1016/j.dadr.2023.100133.
[26] SAMHSA. "Sublingual and Transmucosal Buprenorphine for Opioid Use Disorder: Review and Update". 2016. (accessed April 18, 2025).

United Kingdom evaluated the impact of daily transmucosal buprenorphine or methadone as standard of care versus monthly LAI buprenorphine and found that LAI buprenorphine resulted in greater patient abstinence from opioids over six months and had a comparable safety profile to the daily treatments; more research is needed to evaluate the clinical outcomes over longer periods.[27]

Naltrexone is an LAI that can only be used by people who have not used opioids for at least 7 days because it blocks opioid receptors and can cause withdrawal if the patient has used opioids recently. Naltrexone is available as a monthly injection.[28] However, it is indicated for preventing relapses into opioid dependence, not for treating OUD.[29]

Research suggests that LAI buprenorphine may be a particularly effective MOUD for high-risk populations. An article reviewing 10 studies on LAI buprenorphine in correctional populations found that it is a feasible treatment for carceral use and may decrease drug use within prisons and after release.[30] In the Medicaid population, use of LAI buprenorphine for at least 15 months was associated with reduced opioid-related hospital use, emergency department use, and overdose events, as well as lower rates of prescription overdose use.[31]

Methodology

This research involved a targeted literature review that was used to inform inputs to model the costs and treatment savings associated with OUD at the national and state level. Avalere Health focuses on outpatient care (i.e., ambulatory settings), modeling the costs of OUD for the following stakeholders:[32]

- Government (federal, state/local)
- Private businesses
- Individuals and households
- Society at large
- Patient burden to individuals with OUD

OUD costs were estimated across four categories:

1. **Healthcare costs**
    - Costs of OUD and fatal overdoses to public and private insurance payers
    - Substance use treatment funded by grants and non-insurance payers

[27] Marsden, John, et al. “Superiority and Cost-Effectiveness of Monthly Extended-Release Buprenorphine Versus Daily Standard of Care Medication: A Pragmatic, Parallel-Group, Open-Label, Multicentre, Randomised, Controlled, Phase 3 Trial.” *EClinicalMedicine* 66 (December 2023): 102311–11. https://doi.org/10.1016/j.eclinm.2023.102311.

[28] Singh, Dharminder and Abdolreza Saadabadi. StatPearls. “Naltrexone.” 2023. (accessed April 18, 2025).

[29] Kang, Seema. "Long-acting naltrexone injection for opioid use disorder." Lancet Psychiatry 5, no. 12 (2018): 967-967. doi.org/10.1176/appi.ajp.2018.17070732.

[30] Russell, C., et al. “Feasibility and Effectiveness of Extended-Release Buprenorphine (XR-BUP) among Correctional Populations: A Systematic Review.” *The American Journal of Drug and Alcohol Abuse* 50 (5) (June 2024): 567–86. https://doi.org/10.1080/00952990.2024.2360984.

[31] Samples, Hillary, Arthur Robin Williams, Stephen Crystal, and Mark Olfson. “Impact of Long-Term Buprenorphine Treatment on Adverse Health Care Outcomes in Medicaid.” *Health Affairs* 39 (5) (May 2020): 747–55. https://doi.org/10.1377/hlthaff.2019.01085.

[32] Florence, Curtis, Feijun Luo, and Ketra Rice. “The Economic Burden of Opioid Use Disorder and Fatal Opioid Overdose in the United States, 2017.” *Drug and Alcohol Dependence* Vol. 218 (January 1, 2021): 108350. https://doi.org/10.1016/j.drugalcdep.2020.108350.

- Neonatal abstinence syndrome

2. **Criminal justice costs**
    - Investments in community safety associated with OUD
    - OUD-associated costs to police departments, courts, and correctional facilities
    - Property lost due to OUD-associated crime
3. **Lost productivity**
    - Lost employer productivity
    - Lost employee productivity
    - Lost household productivity
4. **Patient burden costs**
    - Reduced quality of life due to OUD
    - Life years lost

Cost savings from OUD treatment were estimated across four treatment options:

- Behavioral therapy alone
- Behavioral therapy plus daily methadone at an OTP
- Behavioral therapy plus daily transmucosal buprenorphine
- Behavioral therapy plus weekly or monthly LAI buprenorphine

Model to estimate and project net costs of OUD and treatment

Avalere Health significantly leveraged two prior 2017 studies to project 2024 net costs of OUD and treatment savings: a CDC report containing broad state-level costs for 38 states and Washington, DC,[33] and a national economic cost study that analyzed the same cost categories at a more detailed level.[34]

1. State-level statistics for cost model

This cost model included both overdose costs and costs associated with the long-term, chronic management of OUD. Using the CDC report on 2017 state-level costs of OUD, Avalere Health identified state-level data on total healthcare costs, criminal justice costs, lost employer productivity due to OUD, lost employee wages due to fatal overdose, and patient burden (i.e., intangible costs to the individual with OUD including reduced quality of life and value of statistical life lost).

For the 12 states not included in the CDC data, Avalere Health estimated the number of opioid cases based on the 2020 decennial census population by state and the Agency for Healthcare

[33] Luo F, Li M, Florence C. State-Level Economic Costs of Opioid Use Disorder and Fatal Opioid Overdose — United States, 2017. *MMWR* 2021;70:541–546. DOI: http://dx.doi.org/10.15585/mmwr.mm7015a1

[34] Florence, Curtis, Feijun Luo, and Ketra Rice. "The Economic Burden of Opioid Use Disorder and Fatal Opioid Overdose in the United States, 2017." Drug and Alcohol Dependence. Vol. 218 (January 1, 2021): 108350. https://doi.org/10.1016/j.drugalcdep.2020.108350.

Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP) 2017 data on hospitalizations for opioid misuse.[35,36]

2. Cost category estimates by state

In addition to the broad CDC state-level statistics, Avalere Health used the economic study to look at these categories more granularly.

a. Healthcare costs
- Cost of OUD and fatal overdoses to public and private payers
- Substance use treatment funded by public and private entities

b. Criminal justice costs
- OUD-associated costs to police departments, courts, and correctional facilities
- Property lost due to OUD-associated crime

c. Lost productivity
- Costs to employers associated with OUD, included reduced productive time and increased disability, along with reduced production due to incarceration
- Costs to individuals and households associated with lost productivity from fatal overdoses

In addition to the categories of cost listed above, Avalere Health identified additional cost categories not included in the studies, including neonatal abstinence syndrome (NAS) and lost productivity costs to employees and households associated with OUD and fatal overdoses.

d. NAS costs

NAS costs were calculated using 2021 HCUP data that included cost per NAS case relative to other newborn hospitalization costs as well as total case counts and expected payer mix by state. Avalere Health used these metrics to calculate NAS cost per case and case counts by payer type for each state, using regional averages for missing states. 2021 costs were deflated to 2017 using Consumer Price Index (CPI) inflation data.[37]

e. Additional lost productivity costs

Prior studies identified lost employer productivity costs due to OUD and lost productivity to individuals and households due to fatal overdoses. Avalere Health extrapolated these lost productivity metrics to (1) identify lost productivity to individuals and households due to OUD, (2) identify lost employer productivity costs due to fatal overdose, and (3) separate lost productivity costs to individuals and households into lost household productivity and lost wages. Lost productivity costs to individuals and households from OUD were extrapolated by multiplying lost employer productivity costs due to incarceration by a US Bureau of Labor Statistics (BLS) ratio.[38] This ratio was used to calculate lost productivity costs to individuals and households due to OUD as a portion

[35] US Census Bureau. "2020 Decennial Census Data Tables." (accessed April 18, 2025).
[36] AHRQ HCUP. Fingar, Kathryn, and Pamela Owens. "Opioid-Related and Stimulant-Related Adult Inpatient Stays, 2012–2018." February 2021. (accessed April 18, 2025).
[37] US Bureau of Labor Statistics. "Consumer Price Index (CPI) Databases." (accessed April 18, 2025).
[38] US Bureau of Labor Statistics. "Looking at the Growing Productivity of American Workers for Labor Day." 2023. (accessed April 18, 2025).

of lost employer productivity, and the inverse ratio was used to calculate lost employer productivity costs due to fatal overdose.

Avalere Health used a 2011 Department of Justice National Drug Intelligence Center report[39] that identifies the ratio of lost household productivity due to illicit drug use to assign a portion of lost productivity costs to lost household productivity. The remaining portion was defined as lost wages.

3. Stakeholder cost estimates

Costs were grouped into the following stakeholder categories: (1) federal government, (2) state/local government, (3) private businesses, (4) individuals and households, (5) society, and (6) patient burden for individuals with OUD. Full and partial costs were assigned to stakeholders by category (e.g., Medicaid costs were proportionally assigned to federal government and state/local government to reflect the joint funding of the program). After calculating total costs, Avalere Health analyzed all costs of OUD and tangible economic costs (which exclude the value of statistical life lost and reduced quality of life) separately.

Avalere Health used various data sources for costs by state as described in Table 1, "Cost components included for each OUD stakeholder." Healthcare costs were assigned to payers based on the 2017 HCUP inpatient data. Using the national-level mix of payer types and national cost share by payer,[40] Avalere Health estimated a projected cost per case by payer type at the national level. Portions of Medicaid costs were assigned to either federal or state/local government based on federal fiscal year 2026 Federal Medical Assistance Percentages.[41] Substance use treatment costs not associated with payers were assigned to the federal government, state/local governments, or private businesses.

Criminal justice costs were assigned to either federal or state/local government based on a 2017 US Department of Justice report that distinguishes costs by category for federal as opposed to state/local government.[42]

Portions of lost wages and lost employer output costs were assigned to either federal or state/local government based on the most recent publicly available average income and state/local tax rates.[43]

[39] US Department of Justice National Drug Intelligence Center. "The Economic Impact of Illicit Drug Use on American Society". 2011. (accessed April 18, 2025).
[40] Florence, Curtis, Feijun Luo, and Ketra Rice. "The Economic Burden of Opioid Use Disorder and Fatal Opioid Overdose in the United States, 2017." *Drug and Alcohol Dependence*. Vol. 218 (January 1, 2021): 108350. https://doi.org/10.1016/j.drugalcdep.2020.108350.
[38] Kaiser Family Foundation. "Federal Medical Assistance Percentage (FMAP) for Medicaid and Multiplier." (accessed April 18, 2025).
[42] US Department of Justice. Buehler, Emily. "Justice Expenditures and Employment in the United States, 2017." July 2021. (accessed April 18, 2025).
[43] Tax Foundation. York, Erica. "Summary of the Latest Federal Income Tax Data, 2025 Update." November 19, 2024. (accessed April 18, 2025).

Table 1. Cost components included for each OUD stakeholder

Stakeholder	Components
Federal Government	Medicare, other payers (Tricare, US Department of Veteran's Affairs), federal Medicaid contribution; substance use treatment, federal criminal justice costs, lost federal tax revenue
State/Local Government	State Medicaid contribution; substance use treatment, state and local criminal justice costs, lost state/local tax revenue
Private Businesses	Private insurance, lost employer productivity (minus taxes); substance use treatment
Individuals and Households	Lost employee productivity (minus taxes), lost household productivity, out of pocket healthcare costs
Society	Lost property from crime
Patient Burden	Costs to quality of life and the value of statistical life lost

All costs were calculated using 2017 dollars and inflated to 2024 dollars using a CPI inflation estimate from BLS.[44] OUD case counts in 2024 were inflated from 2017 numbers using the US Substance Abuse and Mental Health Services Administration (SAMHSA) National Survey on Drug Use and Health (NSDUH) surveys from 2017 and 2023.[45,46] Avalere Health used National Safety Council injury facts data to calculate a similar 2017 to 2023 ratio for OUD overdose mortalities.[47]

4. Savings from OUD treatment

Avalere Health estimated savings, relative to costs of OUD with no treatment, for four treatment scenarios:

- Behavioral therapy alone
- Behavioral therapy plus daily methadone at an OTP
- Behavioral therapy plus daily transmucosal buprenorphine
- Behavioral therapy plus weekly or monthly LAI buprenorphine

[44] US Bureau of Labor Statistics. "Consumer Price Index (CPI) Databases." (accessed April 18, 2025).
[45] SAMSHA Bose, J., et al. "Key Substance Use and Mental Health Indicators in the United States: Results from the 2017 National Survey on Drug Use and Health." 2018. (accessed April 18, 2025).
[46] SAMSHA "Key Substance Use and Mental Health Indicators in the United States: Results from the 2023 National Survey on Drug Use and Health." 2024.(accessed April 18, 2025).
[47] National Safety Council. "Drug Overdoses." 2018. (accessed April 18, 2025).

Estimates of cost savings for OUD treatments are not readily available in existing literature. Drawing from two studies that include comparative effectiveness of MOUDs in prevention of overdose,[48,49] savings were estimated for each treatment scenario. Overdose reduction was used to estimate an expected decrease in the likelihood of negative outcomes. Hazard ratios are used to compare the likelihood of an event happening in one group compared to another group. The model used hazard ratios for overdose relative to a no-treatment scenario at 3-month and 12-month intervals. Based on these two intervals Avalere Health calculated average and 95% confidence interval (CI) hazard ratios for each treatment option.

These hazard ratios were used to calculate cost reductions relative to Avalere Health's base cost model. It was assumed that cost reductions were distributed proportionately among stakeholders and cost categories, and that individuals remained on treatment for the entire 12-month period. Avalere Health also included the annual costs of medication (if applicable) and intensive behavioral health treatment when estimating cost reductions.[50,51]

5. Assumptions and limitations

The changing role of fentanyl and stimulants in the opioid crisis may not be reflected in this cost model. In this analysis, Avalere Health used 2023 NSDUH case counts and mortality statistics, which reflect the increased role of fentanyl. However, certain cost inputs were based on 2017 data, so any increased fentanyl-specific enforcement or criminal justice costs may not be fully accounted for in this analysis.

The treatment savings model assumed full adherence to each treatment option for a full year. In practice, different treatment options may be associated with different adherence barriers (e.g., frequency of treatment, setting of care, willingness to be treated, cost sharing, persistence on treatment). The model also assumes cost savings for each treatment option were equally distributed across stakeholders and cost categories. For any individual treatment, cost savings across stakeholders and cost categories may be different.

Results and key findings

National-level OUD cost results

This analysis assessed the total financial impact of OUD in 2024 at the national and state level. The national cost of OUD was estimated to be approximately $4 trillion. The average cost per case of OUD to external stakeholders (federal and state/local government, individuals and households, private businesses, and society overall) was $163,000. When patient burden to the

[48] Wakeman, SE et al. "Comparative Effectiveness of Different Treatment Pathways for Opioid Use Disorder." *JAMA Netw Open*. Vol. 3(2) (2020 Feb 5): e1920622. doi: 10.1001/jamanetworkopen.2019.20622.

[49] Marsden, John, et al. "Superiority and Cost-Effectiveness of Monthly Extended-Release Buprenorphine Versus Daily Standard of Care Medication: A Pragmatic, Parallel-Group, Open-Label, Multicentre, Randomised, Controlled, Phase 3 Trial." *EClinicalMedicine* 66 (December 2023): 102311–11. https://doi.org/10.1016/j.eclinm.2023.102311.

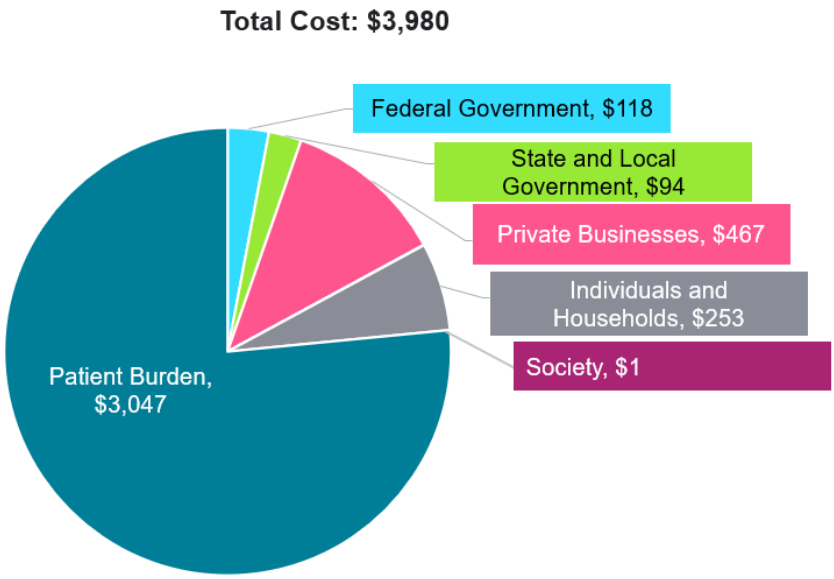
[50] CMS. "Final Rule Payment Rates for Opioid Treatment Programs, 2025 Payment Rates." (accessed March 20, 2025).

[51] Drug costs for brand products (LAI buprenorphine) retrieved from Navlin by Eversana Price & Access Data. Drug costs for generic products (transmucosal buprenorphine) retrieved from CMS National Average Drug Acquisition Cost. (accessed March 20, 2025).

individual with OUD (i.e., quality of life and value of lost life) is included, the national average OUD per case was $695,000. A breakdown of costs by state is shown in the Appendix: “2024 Estimated cost of OUD by state and stakeholder.”

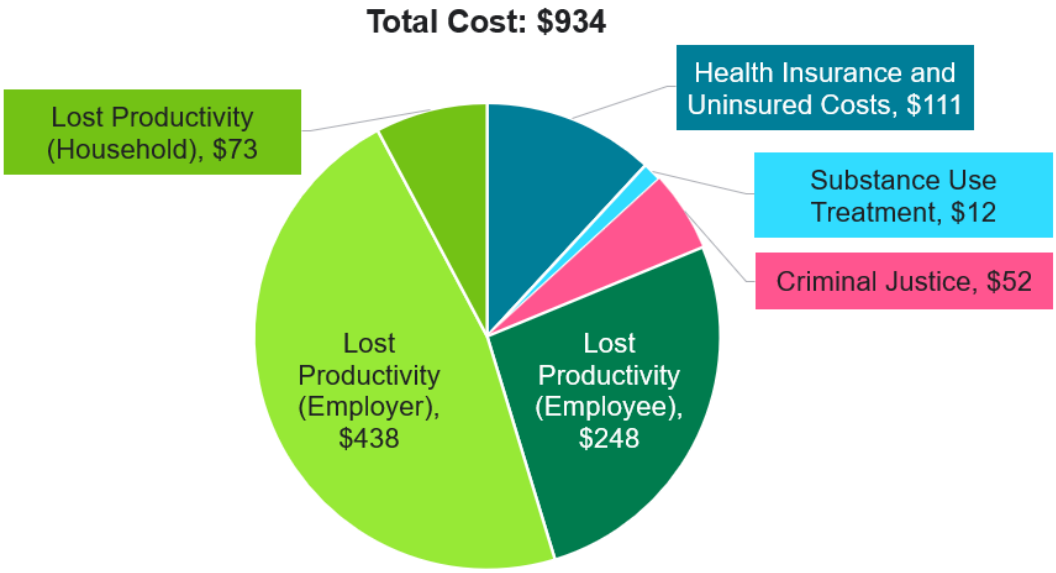
Nationally, the cost to the federal and state/local government, including costs to Medicare and other payers, lost taxes, Medicaid, criminal justice, and OUD treatment was $118 billion and $94 billion, respectively. The projected national total cost to private businesses (including private insurance, employer lost productivity, and OUD treatment) was $467 billion. The total national cost for individuals and households (including costs of lost household productivity, out of pocket healthcare costs, and lost wages) was $253 billion. Society overall incurred approximately $1 billion in OUD costs, including the value of lost property, in 2024. Finally, the national total patient burden to individuals with OUD (including the value of lost life and lost quality of life) was $3.047 trillion. These costs are reported in Figure 1, “Annual national cost of OUD across all stakeholders, 2024 ($ Billion).”

Figure 1. Annual national cost of OUD across all stakeholders, 2024 ($ Billion)



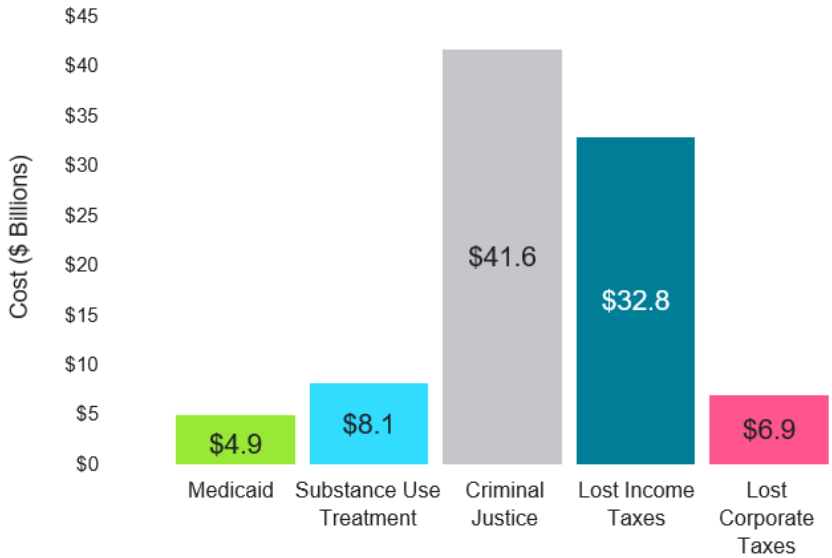
Costs to external stakeholders (i.e., excluding patient burden) were driven by lost productivity for employers ($438 billion), employees ($248 billion), and households ($73 billion). Health insurance and uninsured costs were $111 billion, criminal justice costs were $52 billion, and other substance use treatment costs were $12 billion. These costs are shown in Figure 2, “Annual national cost of OUD excluding patient burden, 2024 ($ Billion).”

Figure 2. Annual national cost of OUD excluding patient burden, 2024 ($ Billion)



National OUD costs to state and local government totaled $94.3 billion in 2024. Figure 3, "Breakdown of state and local government cost components of national OUD costs, 2024 ($ Billion)," shows a breakdown of the costs of OUD borne by state/local government. Criminal justice costs, at $41.6 billion (including police protection, legal and adjudication costs, and correctional facilities), were the greatest cost borne by state and local government, followed by lost income taxes ($32.8 billion) and substance use treatment costs ($8.1 billion).

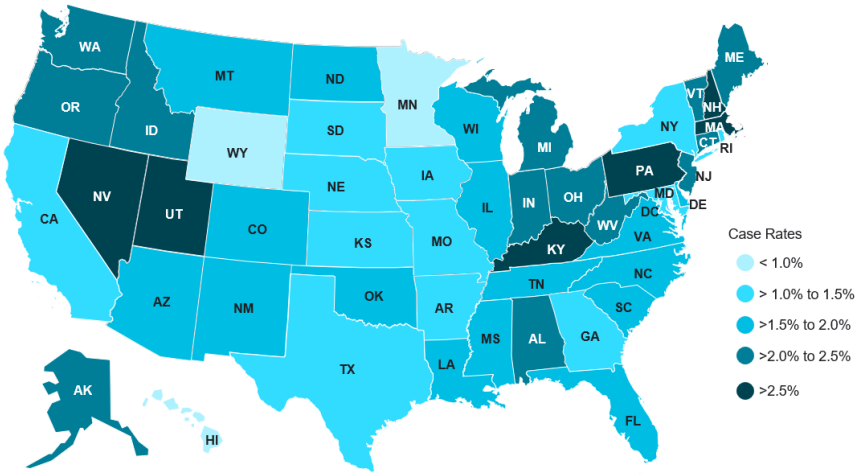
Figure 3. Breakdown of state and local government cost components of national OUD costs, 2024 ($ Billion)



State-level OUD cost results

OUD cases per capita (the percentage of people with OUD) by state range across the United States from 0.75% to 2.99%. New Hampshire, Nevada, Massachusetts, and Kentucky had the highest rates of OUD (over 2.5%), whereas Wyoming, Hawaii, Washington DC, and Minnesota had the lowest rates (under 1.0%). Regionally, OUD appears clustered in states surrounding Nevada, Kentucky, and New Hampshire (Figure 4, "Projected Case Rates of OUD Across US States, 2024").

Figure 4. Projected case rates of OUD across US states, 2024



This analysis also measured differences in costs across states (Figure 5, "State and local cost of OUD per capita"). The burden of state and local costs per capita (per state resident) across states ranges from $137 to $524, with West Virginia, Kentucky, Ohio, and New Hampshire having the highest per capita state/local cost burden. For reference, per capita state/local expenditures on public health range from $151 in Missouri to $967 in California.[52]

[52] Urban Institute. "US Census Bureau Annual Survey of State and Local Government Finances, 1977-2022." (accessed April 29, 2025).

Figure 5. State and local government cost of OUD per capita, 2024

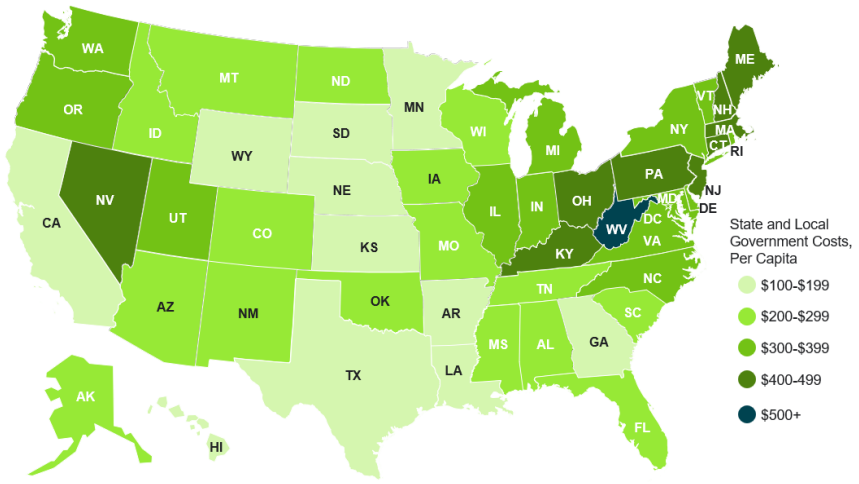
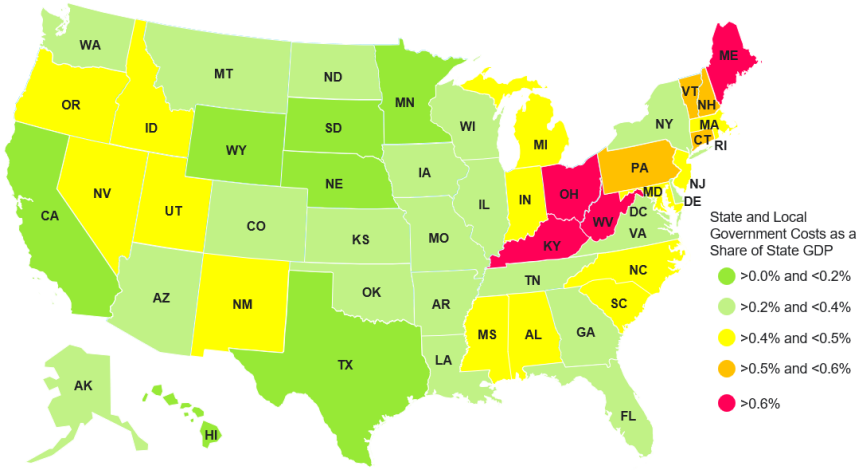


Figure 6, "State and local costs of OUD as a percentage of state GDP, 2024" shows a heatmap of the state and local financial cost of OUD relative to economic productivity per state (using gross domestic product [GDP] per state as a proxy).[53] Compared to other states, West Virginia, Ohio, Kentucky, and Maine had the highest state and local spending on OUD as a proportion of state GDP.

Figure 6. State and local costs of OUD as a percentage of state GDP, 2024



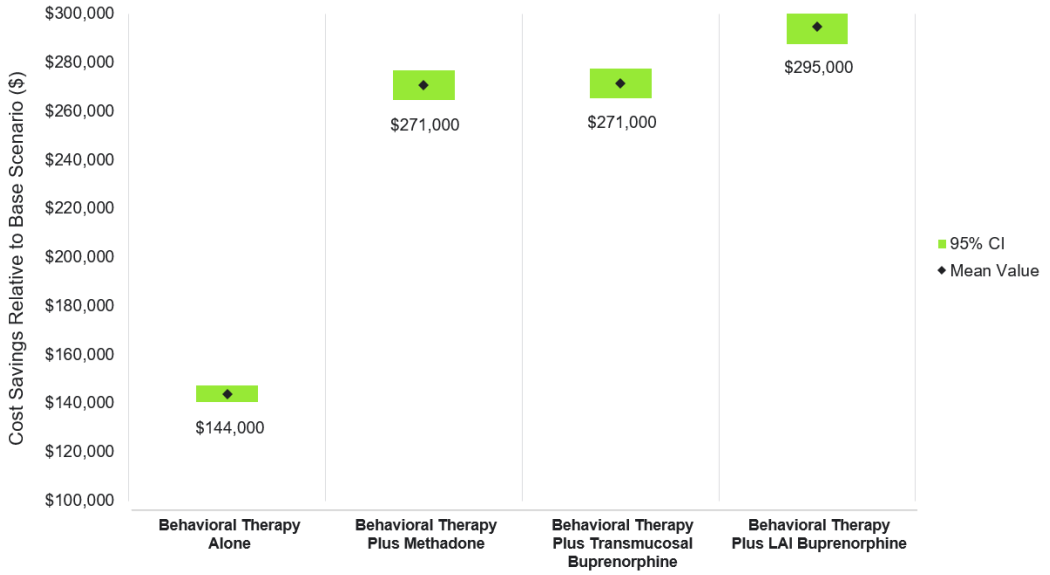
[53] US Bureau of Economic Analysis. "GDP by State, 2024." (accessed April 18, 2025).

Treatment savings

This modeling study compared the cost of no treatment to savings from four treatment options for OUD: (1) behavioral therapy alone, (2) behavioral therapy plus methadone, (3) behavioral therapy plus transmucosal buprenorphine, and (4) behavioral therapy plus LAI buprenorphine.

Behavioral therapy plus LAI buprenorphine led to greater treatment savings compared to the other treatment options assessed. Projected per-case savings net of treatment cost from ambulatory treatments were estimated to be $271,000 for behavioral therapy plus methadone, $271,000 for behavioral therapy plus transmucosal buprenorphine, and $295,000 for behavioral therapy plus LAI buprenorphine. Behavioral therapy alone saved $144,000.

Figure 7. Cost savings per OUD case, by OUD treatment (95% CI)



Discussion

Case counts, mortality, and the associated costs of OUD are increasing over time and remain a key issue for governments, policymakers, public health professionals, and healthcare providers. Similar to the distribution of OUD case rates by state, the states with the highest cost per capita to state and local governments are clustered around New Hampshire, West Virginia, and Nevada, as shown in Figure 5. Results of the modeling analysis showed that the burden of OUD, in terms of both the rates and the costs of OUD, varied regionally across the United States. State and local government impacts of OUD are significant, with a large portion of the state costs attributable to criminal justice, lost tax revenue, and OUD treatment costs.

When considering savings across all stakeholders including the patient burden to the individual with OUD, the savings associated with behavioral therapy plus LAI buprenorphine were greater than the next most cost-saving treatment option, even with the higher costs of LAI buprenorphine compared to other treatment options. All treatment options reduced costs relative

to no treatment. The four treatments studied saved between $144,000 and $295,000 per OUD case.

In comparison to other studies, this study focused on the overarching impact of OUD and cost for both external stakeholders and the patient burden for individuals with OUD. Avalere Health evaluated OUD case counts and costs for 2024 by state, updating prior estimates of ambulatory treatment benefits, including additional cost inputs such as NAS and lost employer productivity.

Evidence indicates a positive impact of outpatient treatment modalities both to individuals with OUD and other stakeholders. This points to the significant potential to reduce the total national cost burden of OUD by increasing treatment rates. Given the variety in the types of barriers to treatment uptake, this will take a multi-pronged approach, including a variety of federal and state policies.

Avalere Health™

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Appendix

2024 Estimated cost of OUD by state and stakeholder

State	Total Cost Per State ($)	Total Cost per Case ($)	Federal Government	State/Local Government	Private Businesses	Society	Individuals and Households	Patient Burden
			Full (Medicare, Other Payers, Federal Taxes); Partial (Medicaid, Criminal Justice, Substance Use Treatment)	Full (State Taxes); Partial (Medicaid, Criminal Justice, Substance Use Treatment)	Full (Private Insurance, Employer Lost Productivity); Partial (Substance Use Treatment)	Full (Lost Property from Crime)	Full (Lost Household Productivity, Uninsured Costs, Lost Wages (Lost Productivity minus taxes))	Full (Reduced Quality of Life, Statistical Life Lost)
National	**$3,980,521,643,085**	**$694,664**	**$118,426,281,987**	**$94,343,569,382**	**$467,239,734,247**	**$1,214,121,754**	**$252,657,083,582**	**$3,046,640,852,133**
Alabama	$56,891,687,832	$559,899	$1,700,172,309	$1,344,959,527	$6,293,139,217	$21,531,060	$3,735,570,318	$43,796,315,401
Alaska	$9,697,011,449	$600,478	$386,726,444	$192,025,355	$1,055,021,033	$3,424,677	$609,584,977	$7,450,228,962
Arizona	$84,513,317,912	$628,009	$2,956,068,723	$2,006,259,445	$9,511,658,824	$28,511,665	$5,170,069,687	$64,840,749,569
Arkansas	$23,331,151,994	$551,462	$717,811,107	$593,622,977	$2,691,856,222	$8,965,237	$1,348,399,491	$17,970,496,959
California	$238,045,368,593	$536,027	$8,144,787,758	$6,983,729,232	$26,284,222,522	$94,096,689	$13,074,938,482	$183,463,593,910
Colorado	$55,756,970,194	$591,891	$1,729,459,134	$1,384,168,357	$6,422,052,564	$19,958,166	$3,343,183,963	$42,858,148,009
Connecticut	$67,910,837,422	$901,139	$1,894,422,390	$1,776,107,473	$8,234,846,114	$15,968,171	$4,295,897,853	$51,693,595,422
Delaware	$13,260,394,897	$728,511	$457,855,685	$325,155,898	$1,529,440,579	$3,856,874	$810,097,493	$10,133,988,368
District of Columbia	$13,186,277,311	$2,449,643	$278,829,730	$239,109,462	$1,786,630,444	$1,138,828	$976,204,444	$9,904,364,403
Florida	$267,174,242,093	$709,050	$7,122,803,281	$5,942,265,616	$31,311,430,498	$79,840,856	$18,315,431,211	$204,402,470,630
Georgia	$81,257,583,350	$736,361	$2,292,408,074	$1,714,742,844	$9,574,463,468	$23,382,843	$5,541,686,097	$62,110,900,024
Hawaii	$6,566,141,750	$487,922	$263,571,786	$199,325,488	$685,152,792	$2,851,167	$337,622,395	$5,077,618,123
Idaho	$17,743,959,353	$419,527	$793,632,619	$531,279,738	$1,731,036,811	$8,962,017	$886,412,547	$13,792,635,620
Illinois	$163,431,180,005	$831,807	$4,524,747,842	$3,905,098,345	$20,002,481,057	$41,628,670	$10,355,092,532	$124,602,131,559
Indiana	$101,098,917,965	$670,763	$3,276,697,902	$2,261,589,794	$11,670,472,420	$31,936,343	$6,408,450,142	$77,449,771,365

State	Total Cost Per State ($)	Total Cost per Case ($)	Federal Government	State/Local Government	Private Businesses	Society	Individuals and Households	Patient Burden
			Full (Medicare, Other Payers, Federal Taxes); Partial (Medicaid, Criminal Justice, Substance Use Treatment)	Full (State Taxes); Partial (Medicaid, Criminal Justice, Substance Use Treatment)	Full (Private Insurance, Employer Lost Productivity); Partial (Substance Use Treatment)	Full (Lost Property from Crime)	Full (Lost Household Productivity, Uninsured Costs, Lost Wages (Lost Productivity minus taxes))	Full (Reduced Quality of Life, Statistical Life Lost)
Iowa	$23,545,541,843	$514,601	$824,357,866	$653,543,048	$2,596,190,011	$9,692,328	$1,285,971,060	$18,175,787,531
Kansas	$19,410,614,546	$551,464	$536,267,191	$520,238,423	$2,220,221,940	$7,458,711	$1,175,710,014	$14,950,718,269
Kentucky	$95,471,988,174	$709,441	$3,233,361,824	$2,086,744,658	$11,025,404,439	$28,511,665	$6,059,269,999	$73,038,695,588
Louisiana	$31,479,339,230	$432,034	$1,342,229,087	$883,399,520	$3,137,178,823	$15,439,037	$1,660,872,604	$24,440,220,160
Maine	$26,773,618,736	$828,965	$702,601,907	$634,935,022	$3,209,788,831	$6,841,161	$1,806,811,151	$20,412,640,664
Maryland	$118,271,336,561	$1,464,768	$2,914,636,439	$2,245,461,336	$15,303,956,393	$17,106,999	$8,417,168,584	$89,373,006,810
Massachusetts	$144,895,949,191	$803,511	$4,255,634,513	$3,359,009,934	$17,465,195,024	$38,212,186	$9,233,686,382	$110,544,211,152
Michigan	$161,936,940,321	$742,799	$4,969,141,795	$3,413,861,910	$19,292,532,408	$46,192,175	$10,457,367,445	$123,757,844,588
Minnesota	$32,957,204,217	$765,316	$867,257,229	$804,455,672	$4,047,617,807	$9,127,010	$2,061,087,209	$25,167,659,289
Mississippi	$24,987,178,885	$464,192	$778,039,174	$679,234,872	$2,625,630,970	$11,404,666	$1,536,549,453	$19,356,319,749
Missouri	$72,639,786,874	$793,791	$1,934,186,276	$1,512,161,570	$8,691,262,697	$19,392,848	$5,049,553,104	$55,433,230,379
Montana	$10,336,857,358	$479,238	$479,665,082	$289,418,982	$994,463,386	$4,569,941	$571,966,281	$7,996,773,686
Nebraska	$12,316,159,277	$551,451	$336,843,795	$337,790,420	$1,438,418,224	$4,732,712	$711,822,539	$9,486,551,587
Nevada	$47,118,796,683	$514,904	$1,784,369,907	$1,245,128,525	$5,062,620,119	$19,392,848	$2,656,060,113	$36,351,225,171
New Hampshire	$31,426,088,773	$834,013	$908,004,006	$660,008,220	$3,786,619,042	$7,979,989	$2,107,140,852	$23,956,336,664
New Jersey	$142,513,401,283	$646,109	$4,565,401,238	$3,735,718,488	$16,441,077,492	$46,736,327	$8,453,677,456	$109,270,790,282
New Mexico	$25,456,783,042	$788,194	$848,402,301	$554,714,856	$2,971,189,119	$6,841,161	$1,652,486,676	$19,423,148,929
New York	$236,142,479,378	$851,819	$7,143,545,587	$6,290,195,612	$28,281,150,715	$58,735,669	$14,423,411,842	$179,945,439,953
North Carolina	$154,093,308,179	$753,322	$3,974,383,691	$3,331,851,335	$18,779,116,718	$43,341,009	$10,238,541,705	$117,726,073,720

State	Total Cost Per State ($)	Total Cost per Case ($)	Federal Government	State/Local Government	Private Businesses	Society	Individuals and Households	Patient Burden
			Full (Medicare, Other Payers, Federal Taxes); Partial (Medicaid, Criminal Justice, Substance Use Treatment)	Full (State Taxes); Partial (Medicaid, Criminal Justice, Substance Use Treatment)	Full (Private Insurance, Employer Lost Productivity); Partial (Substance Use Treatment)	Full (Lost Property from Crime)	Full (Lost Household Productivity, Uninsured Costs, Lost Wages (Lost Productivity minus taxes))	Full (Reduced Quality of Life, Statistical Life Lost)
North Dakota	$7,164,855,329	$479,203	$239,433,086	$193,536,068	$796,393,740	$3,167,828	$389,057,799	$5,543,266,808
Ohio	$287,527,156,264	$1,027,203	$8,294,061,209	$5,563,515,256	$35,521,556,354	$59,309,180	$19,726,992,487	$218,361,721,777
Oklahoma	$39,464,047,363	$563,948	$1,222,734,489	$963,120,777	$4,435,026,043	$14,829,343	$2,452,899,848	$30,375,436,863
Oregon	$46,310,418,347	$465,037	$1,936,429,957	$1,372,652,253	$4,657,619,052	$21,096,994	$2,451,445,365	$35,871,174,725
Pennsylvania	$232,194,690,008	$728,202	$6,552,183,691	$5,299,730,658	$28,152,036,966	$67,563,949	$14,597,984,033	$177,525,190,713
Rhode Island	$17,977,897,381	$1,113,264	$462,686,670	$368,707,309	$2,265,614,103	$3,424,677	$1,243,262,211	$13,634,202,412
South Carolina	$65,470,460,360	$657,437	$1,711,426,656	$1,457,726,195	$7,605,396,214	$21,096,994	$4,492,048,198	$50,182,766,104
South Dakota	$4,656,984,659	$479,197	$158,233,198	$123,714,931	$516,008,301	$2,059,040	$253,930,067	$3,603,039,122
Tennessee	$95,762,231,285	$808,634	$2,633,242,487	$1,844,730,327	$11,531,855,813	$25,095,181	$6,682,313,852	$73,044,993,626
Texas	$187,513,403,595	$477,189	$5,086,338,969	$4,952,410,878	$20,671,363,050	$83,257,340	$11,619,187,949	$145,100,845,408
Utah	$45,931,737,682	$568,856	$1,186,619,197	$1,212,879,450	$5,364,865,240	$17,106,999	$2,807,777,365	$35,342,489,431
Vermont	$9,451,223,377	$702,310	$330,905,845	$245,595,398	$1,077,610,040	$2,851,167	$561,314,273	$7,232,946,654
Virginia	$109,855,751,262	$647,877	$2,923,927,694	$2,853,309,958	$12,735,594,875	$35,926,337	$7,073,534,416	$84,233,457,981
Washington	$90,320,575,468	$493,501	$3,055,165,091	$2,548,323,886	$9,927,831,915	$38,777,504	$4,945,823,953	$69,804,653,118
West Virginia	$52,401,209,154	$1,216,836	$1,451,860,357	$939,533,256	$6,605,168,536	$9,127,010	$3,704,235,383	$39,691,284,611
Wisconsin	$73,033,719,354	$753,757	$2,141,159,467	$1,686,487,880	$8,755,137,550	$20,531,676	$4,633,635,658	$55,796,767,123
Wyoming	$3,846,867,529	$714,641	$101,550,232	$80,282,946	$467,117,734	$1,138,828	$253,844,627	$2,942,933,161