Massachusetts 2024 Opioid-Involved Overdose Report

Data, Trends, and Action

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Acknowledgments

Reviewing overdose death data is critical for understanding how many people and which communities are most impacted, trend changes, and whether services are making a difference. The data summarized in this report describe community members who lost their lives to preventable overdose death. **These numbers represent real people** — friends, family, and loved ones — and every loss is deeply felt. The Department of Public Health (DPH), along with our partners and collaborators, respects and honors the humanity behind these statistics. DPH believes that all overdose death is preventable. The findings and recommendations within this report can inform our work to prevent future overdose deaths and improve health outcomes for people who use drugs (PWUD).

Thank you to the boots-on-the-ground **community workers, harm reduction staff, and treatment and recovery programs** that have committed to years of data collection on services that have contributed to and informed this report. We appreciate the work you do to dignify and value PWUD in Massachusetts. This report would not be possible without you.

We send our appreciation to other state health departments engaged in overdose prevention services for leading the way with their analysis and public reporting on overdose death trends. Much of the inspiration for this report came from their work, including the **Rhode Island Department of Health** and the **Vermont Department of Health**. We also want to acknowledge **Dr. Nabarun Dasgupta** and his dedicated team at the Opioid Data Lab in North Carolina for inspiring key elements of this report and their commitment to timely reporting and communications on the ever-changing unregulated drug supply and related impacts.

Finally, within DPH, we extend gratitude to the bureaus and offices that participated in data analysis and writing for this report. This includes staff from the Office of Health Data, Strategy, and Innovation (OHDSI), Bureau of Health Care Safety and Quality (BHCSQ), the Bureau of Infectious Disease and Laboratory Sciences (BIDLS), the Bureau of Community Health and Prevention (BCHAP), and the Bureau of Substance Addiction Services (BSAS). This report would not be possible without the past decade of leadership from **Dana Bernson**, Director of Data Science, Research, & Epidemiology at OHDSI, who provided key oversight of both the Public Health Data (PHD) Warehouse and the biannual opioid-involved overdose death reports.

2024 Overdose Deaths

DPH outlines three hypotheses for the decrease in opioid-involved overdose deaths; however, **more research is needed.** There is no single cause for the decline.

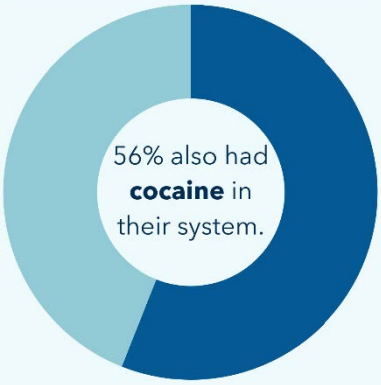
There were **1,336** opioid-involved overdose deaths in 2024, a 37% drop from 2023.

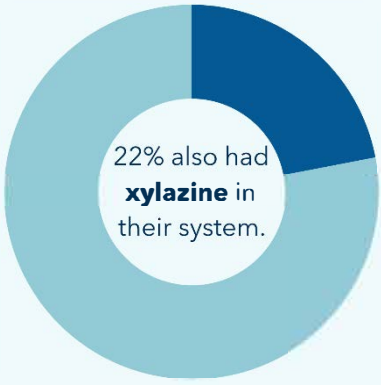
Three Hypotheses

1. **Safer Drug Supply:** The amount of fentanyl may have stabilized or reduced. Xylazine may have unexpected impacts that reduce fatal opioid overdose risk.
2. **Fewer People at Overdose Risk:** The result of fewer people using drugs, improved and longer-term recovery, and safer drug use among those who do use.
3. **Programs and Policies:** People who use drugs have improved access to harm reduction and treatment, like medications for opioid use disorder (MOUD).

Of those who died...

- **12%** were homeless
- **20%** worked in construction
- **72%** were male
- **94%** lived in an Urban area

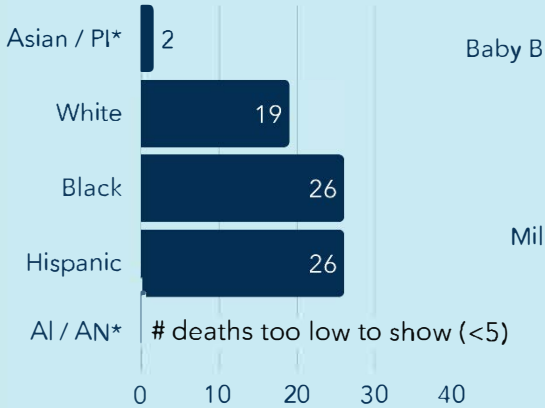


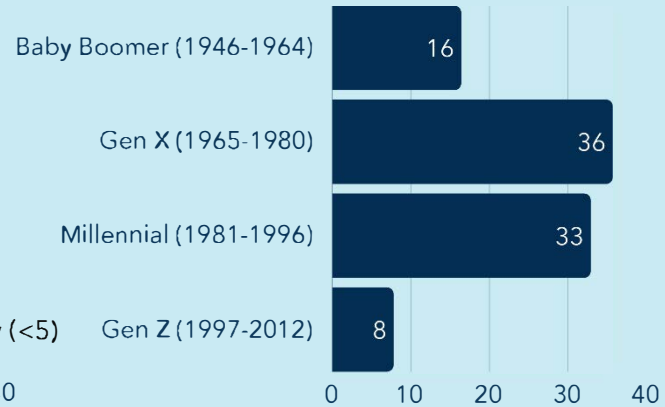


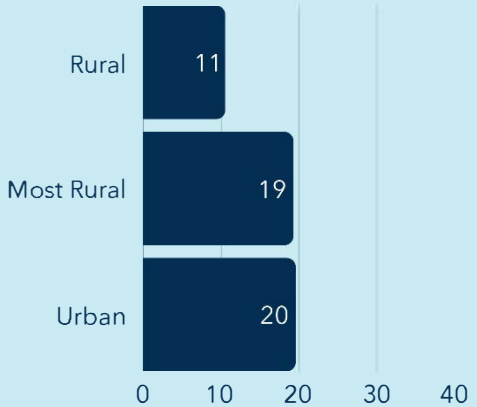
Factors that increase risk of a fatal overdose: 1) an unregulated, unpredictable drug supply, 2) using drugs alone, 3) insufficient access to MOUD when desired, 3) recent period of incarceration or inpatient treatment, and 4) prior history of overdose.

2024 Opioid-Involved Overdose Death Rates per 100k Residents

(Rates are used to compare different groups more accurately. Rates for race/ethnicity and rurality are age-adjusted).







*PI = Pacific Islander, AI/AN = American Indian / Alaska Native

Introduction and how to read this report

The purpose of this report is to provide an update on the state of the opioid overdose crisis in Massachusetts. This report reviews trends in fatal and nonfatal opioid overdoses, opioid overdose risk factors and the drug supply, and opioid overdose-related service utilization.

DPH is continuously seeking collaboration. We invite you to share your experience or work with us by emailing naloxone@mass.gov or joining the Living Expertise Advisory Pool.

In 2024, 80% of drug overdose deaths involved an opioid. This report focuses on opioid-involved overdose deaths. DPH monitors the involvement of other substances (e.g., alcohol, stimulants) in overdoses as well as non-overdose drug-involved deaths.

Throughout this report, overdose burden, or rate, is determined by comparing the number of fatal opioid overdoses to the overall population in a community. However, because different groups or geographic regions compared in this report may have higher percentages of people who use opioids or people who are diagnosed with an opioid use disorder (OUD), these comparisons have limitations. While we use estimates for the number of people with OUD on the Massachusetts BSAS Community Profile, the exact number of people with opioid-involved overdose death risk is not known.[1] People who are at risk for overdose may not be diagnosed with an OUD because they use opioids but do not meet OUD diagnostic criteria or are unintentionally exposed to opioids present in other drugs through cross-contamination within the unregulated drug supply.

Consider reviewing this report alongside the Massachusetts BSAS Community Profile Dashboard, which provides an overview of substance-use related data at the city/town, county, and statewide levels. This report focuses on high-level statewide or regional trends. Local information can be found on the Community Profile, which is updated every six months and features the most up-to-date data available. Fill out this form to ask questions about the Community Profile.

Data Sources

This report incorporates many data sources to tell a complete story of opioid-involved overdoses in Massachusetts. The information below outlines the data sources included in this report. Please visit the links to data source websites for more information on each dataset.

Overdose death data: Overdose death data included in this report comes from the Registry of Vital Records and Statistics (RVRS), which reports on information from death certificates. The State Unintentional Drug Overdose Reporting System (SUDORS) combines this death certificate data with medical examiner reports, postmortem toxicology results, and next of kin interviews to get a more detailed picture of those who died. Please note that all death data included in this report is considered preliminary until it is officially released in the Annual Death Report, which can be found here. This includes information on industry sectors and occupation. SUDORS remains preliminary until officially released by the Centers for Disease Control and Prevention (CDC).

Population data: Population estimates used to calculate rates in this report come from the UMass Donahue Institute (UMDI). UMDI produces population estimates for Massachusetts and its cities and towns using U.S. Census Bureau data. These estimates are subject to updates periodically.

Prescription data: All prescription data included in this report is sourced from the Prescription Monitoring Program (PMP). Each time a prescription for opioid agonists, benzodiazepines, stimulants, or opioid partial agonists is filled at a pharmacy, information is entered into the PMP.

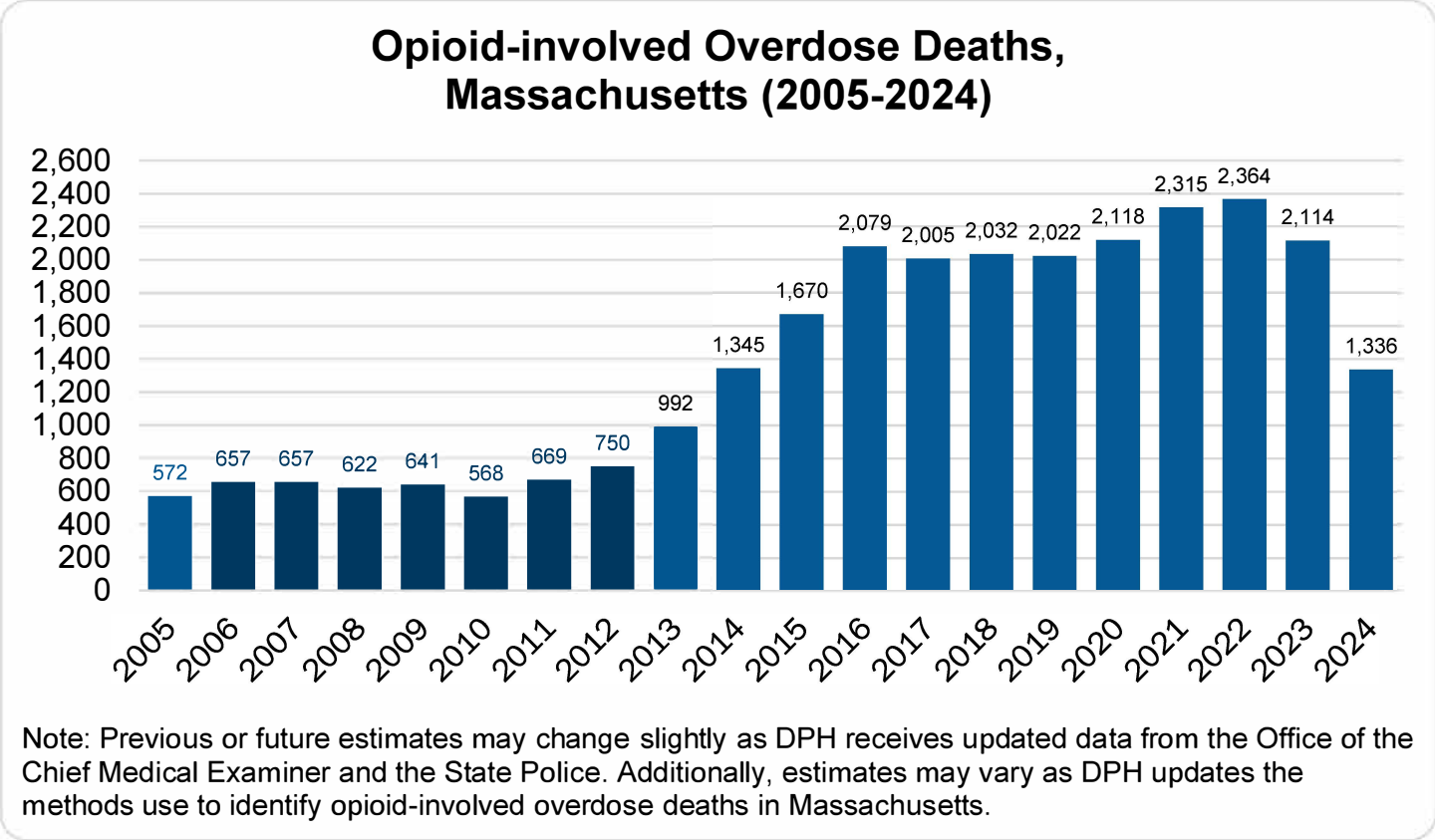
Service utilization data: This report combines service utilization data from the Bureau of Substance Addiction Services (BSAS), which collects data on treatment for substance use disorder (SUD), harm reduction, and recovery services; the Massachusetts Ambulance Trip Record Information System (MATRIS), which collects data on EMS calls; and the Syndromic Surveillance system (SyS), which collects data on emergency department (ED) visits.

Exploring Community Knowledge Study (ECKS) and Massachusetts Drug Supply Data Stream (MADDS): DPH contracts with Brandeis University to collect two forms of data used to strengthen policy decisions. MADDS is a partnership with harm reduction programs and police departments to test drug samples donated by participants. MADDS data are available at streetcheck.org. MADDS helps DPH understand trends in the drug supply. ECKS (formerly Rapid Assessment of Consumer Knowledge) surveys community members on overdose, drug use, access to harm reduction supplies, prevention practices, and treatment options on an annual basis. All quotes from community members included in this report are from ECKS.

Other data sources: Throughout this report, other data sources or journal publications may be included. When findings from external sources are referenced, citations are provided.

Overview of overdoses in Massachusetts

In 2024, 1,667 Massachusetts residents died from a drug overdose, of which 80% (1,336) were opioid-involved overdoses. This is a rate of approximately 19 fatal opioid-involved overdoses per 100,000 Massachusetts residents. On the CDC's Provisional Drug Overdose Death Count dashboard, Massachusetts ranks 21st of all reporting states for opioid-involved overdose death rate in 2024, with similar rates to neighboring states New Hampshire (17 deaths per 100k) and Rhode Island (21 deaths per 100k).[2] Opioids were involved in 2% of all deaths in 2024, comparable to diabetes-related deaths (2% of deaths) and twice the rate of motor vehicle-related deaths (1% of deaths).



Note: Previous or future estimates may change slightly as DPH receives updated data from the Office of the Chief Medical Examiner and the State Police. Additionally, estimates may vary as DPH updates the methods use to identify opioid-involved overdose deaths in Massachusetts.

In addition to overdose fatality data, Massachusetts collects overdose data via Emergency Medical Services (EMS) and Emergency Departments (EDs).[3, 4] Both datasets have shown downward trends over the past three years, totaling 14,678 opioid-involved EMS incidents (a 19% drop from 2023) and 9,529 opioid-involved ED visits (a 20% drop from 2024) in 2024. These measures do not represent the true number of non-fatal opioid-involved overdoses in the Commonwealth, as many opioid-involved overdoses are successfully managed by peer bystanders equipped with naloxone and those events are not captured in administrative datasets that require encounters with the health care system to be observed. Therefore, the EMS and ED data will be discussed in the "Overdose-related service utilization" section of this report.

From 2023 to 2024, opioid-involved overdose deaths decreased in Massachusetts by 37%. This reduction represents the cumulative work of clinicians, harm reduction workers, policymakers, researchers, and most importantly, PWUD fighting to keep each other alive. In 2024, harm reduction program staff and participants reported over 7,300 opioid overdose reversals. While data show a decrease in opioid-involved overdose deaths, community members and program staff still lose clients, friends, and family each day.

In 2024, a Massachusetts neighbor, friend, or family member died from an opioid-involved overdose every 6.5 hours. Every life matters. **Every death is one too many.**

Other opioid-involved health effects (wounds, skin and soft tissue infections, heart problems, kidney problems, brain injury, trauma, and heat- or cold-weather exposure) are not easily captured in the death and emergency datasets used for this report. This report does not investigate health harms and disease burden of other drugs, such as stimulants and alcohol without opioids. Future explorations could broaden focus to all substance related health harms and deaths. It is critical to remain vigilant in expanding services, refining research and evaluation goals, and addressing ongoing disparities.

While the drop in opioid-involved overdose deaths from 2023 to 2024 is unprecedented and promising, a resurgence could occur. Public health officials, policymakers, providers, and PWUD should remain vigilant and prepare for this possibility.

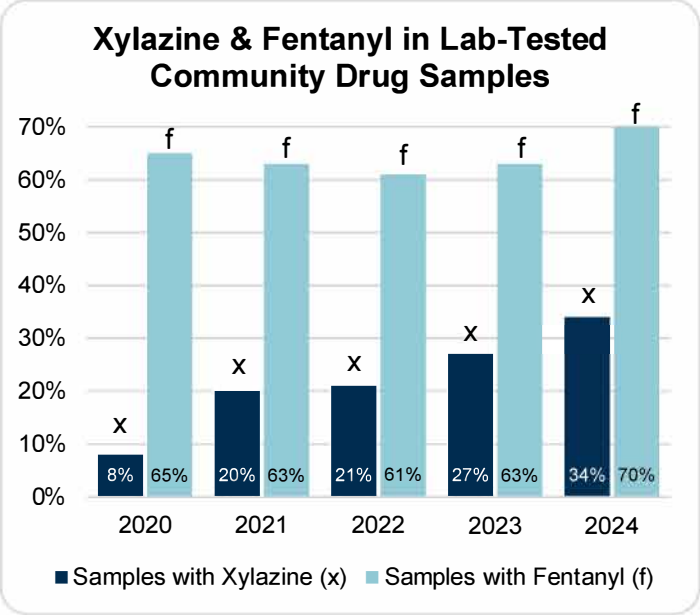
Hypotheses for the 2024 drop in overdose deaths

Below, we outline three possible hypotheses, specific to Massachusetts, that may have contributed to the 2024 decrease in opioid-involved overdose deaths observed in Massachusetts. **Where possible, we cite data to support the claims made; however, further research is needed to understand the precise causes of the 2024 drop in overdose deaths.**

Hypothesis 1: changes to the drug supply

The unregulated drug supply has continued to evolve. The shift from prescription opioids and heroin to synthetic opioids like fentanyl caused a drastic increase in fatal overdoses from the period of 2013-2022. Starting in 2019, DPH expanded drug checking services at community partner sites and worked with the Massachusetts Drug Supply Data Stream (MADDS) to document results on StreetCheck. These data are a key supplement to toxicology results from opioid-involved overdose deaths contributing to a better understanding of the unregulated drug supply in the Commonwealth.

DPH attributed the rise in overdose deaths from 2013 and 2022 to increasing and erratic fentanyl concentrations in the drug supply. Thus, a reduction in overdose deaths since then is likely due, at least in part, to decreasing and/or stabilizing concentrations of fentanyl in the drug supply overall. A recent CDC publication explores this idea, explaining that after fentanyl first appears in the unregulated opioid supply, a rise in deaths follows. Once fentanyl becomes the dominant opioid in the supply, risk of overdose death may decrease, as fewer people are newly exposed to fentanyl without having developed some level of tolerance.[5]



In addition to variance in fentanyl concentrations, the drug supply is impacted by new and emerging substances, such as xylazine. Between 2020 and 2024, xylazine was detected more commonly in the drug supply. In 2024, 34% of the drug samples (n=3,461) collected at community partner sites and tested by our laboratory partner were positive for the sedative xylazine. The role of these drug supply changes in the reduction of fatal overdoses is not yet clear. One hypothesis is that using drugs containing xylazine may protect from fatal overdose by increasing the length of time that people are sedated after using, therefore decreasing the total number of use events.

Another hypothesis is that due to the sedative effects of xylazine, suppliers may reduce the amount of fentanyl in their product. There is also speculation that xylazine-related wounds and soft tissue infections cause people to inject less frequently and opt for routes of administration that may be less likely to cause wounds, such as snorting or smoking drugs. Routes of administration other than injection may be less likely to cause overdose as well.[6] Finally, avoidance of xylazine could lead individuals to stop opioid use, seek treatment, or use other non-opioid drugs instead.

The effect of changes to the drug supply — including changes to fentanyl concentrations and the influx of sedatives into the supply — on opioid-involved overdose deaths requires further investigation and research. This topic is expanded upon in this report's "The unregulated drug supply is unpredictable and erratic" section.

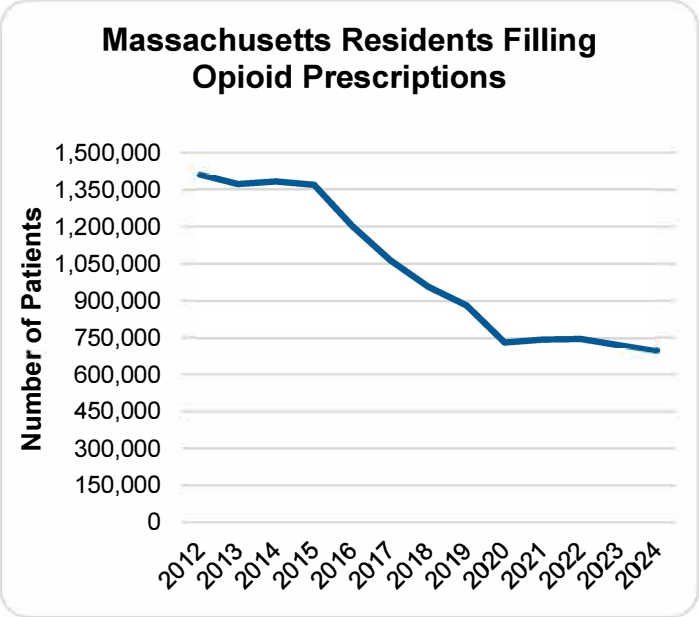
Hypothesis 2: decrease in number of people at risk for overdose

This image illustrates how people enter and exit the pool of individuals at high risk for fatal overdose. When someone initiates using opioids or other drugs that may have opioids present, they enter the risk pool of fatal opioid overdose. When someone uses drugs more safely (e.g., develops higher tolerance, uses substances with less risk, uses with a friend who has naloxone, or tests drugs prior to use) or ceases using drugs altogether, they are at decreased risk for fatal overdose. If someone dies, including from an opioid-involved overdose, they are no longer a part of the risk pool.

The UNC Opioid Data Lab described how the pool of people at high risk for opioid-involved overdose may have decreased in recent years.[7] This occurred either because PWUD have adapted to the current drug supply (e.g., tolerance to fentanyl) or because many have already died or otherwise left the risk pool through abstinence or increased use of safety practices.

There is some evidence that the number of people entering the overall risk pool (e.g., young people using opioids) is less than the number of people who are leaving the risk pool (e.g., people dying from opioid-involved overdose). This means there is not a 1:1 replacement rate of people entering the pool to those leaving the pool and the pool is getting smaller. According to the National Survey on Drug Use and Health, using two-year combined survey data, the percentage of Massachusetts young adults (ages 18-25) reporting past-year misuse of prescription pain relievers (prescription opioids) declined from 6.7% in 2015-2016 to 2% in 2022-2023, though these are likely underestimates.[8] This topic is discussed in greater detail in the "Age and generational trends" section of this report.

It is also possible that policies designed to reduce opioid prescribing had a long-term effect of reducing the number of people who started using opioids. While most individuals at risk for opioid-involved overdose death do not use prescription opioids, addressing opioid prescribing practices may have contributed in the long term to the decrease in people entering the risk pool for opioid overdose. However, abrupt discontinuations of prescription opioids (aka deprescribing) can increase fentanyl-involved deaths in the short term, as people with a relatively safe source of regulated opioids may begin using unregulated opioids.[9,10,11] This is an area that merits further research.



Hypothesis 3: expanded overdose prevention and treatment efforts

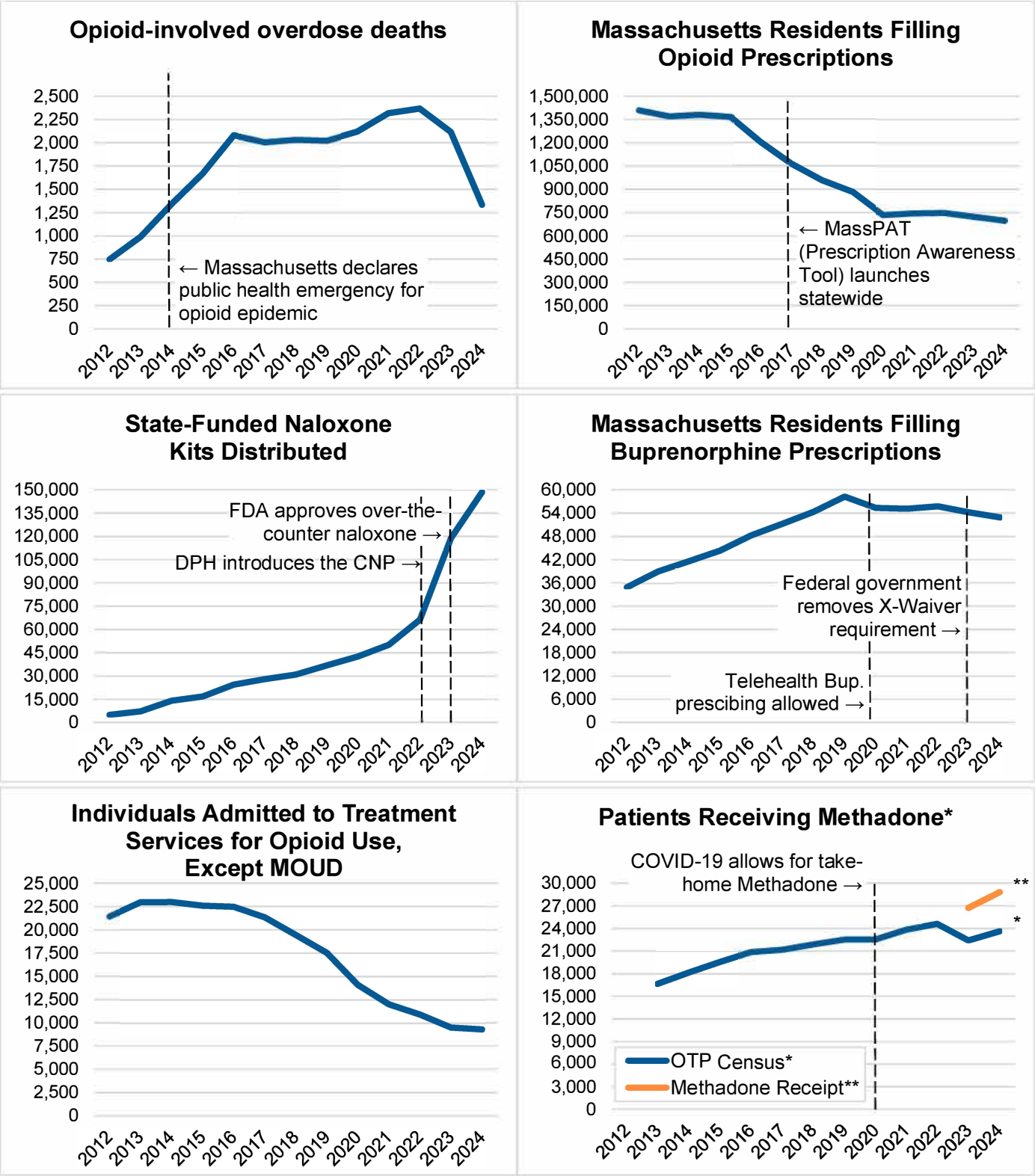
Since the onset of the overdose crisis, there has been a significant expansion of harm reduction, overdose prevention, OUD treatment, and peer recovery support services in Massachusetts that have likely had a cumulative impact on the decrease in overdose deaths. Over the past decade, the number of Massachusetts residents accessing medications for opioid use disorder (MOUD) has increased and the number admitted to intervention, engagement, and treatment services for care other than medications for opioid use disorder (MOUD) has declined.[12] Data show an increase and then a slight decrease in buprenorphine prescriptions filled, but an overall increase in clients receiving methadone treatment at Opioid Treatment Programs (OTPs) since 2015. From 2023-2024 alone, there was an 8% increase in individuals who received methadone from OTPs in Massachusetts. Compared to other states, Massachusetts has the fifth highest number OTPs per capita in the United States, with numbers increasing over the past three years.[13]

Meanwhile, innovations in MOUD treatment, such as flexible take-home medication policies and long-acting injectable formulations, may not be captured in the data but have likely contributed to improvements in patient retention and quality of care. Efforts have been made to improve accessibility to services and programs that provide wraparound care for OUD patients, allowing providers to address other health and wellness needs, such as housing, employment, food, and transportation.

DPH has also substantially expanded overdose prevention and naloxone distribution services through the Community Naloxone Program (CNP), which was introduced in the Fall of 2022. This DPH report details how state-funded naloxone was initially limited in geography and in the eligible program types for many years, and why the CNP was introduced to broaden access. In 2023, FDA approved over the counter naloxone nasal spray, which may have increased some access to naloxone as well. Increased access to naloxone likely contributes to improved consumer safety knowledge, including the importance of not using drugs alone.

Harm reduction programs have not only expanded but are reaching people who weren't previously engaged through expanded safety resources and supplies. A study conducted by the Institute for Community Health (ICH) found that providing safer smoking supplies was key to expanding overdose prevention resources in Black and Hispanic communities.[14] After a program in Boston added safer smoking supplies, they documented improved reach of people who primarily smoke drugs and Black PWUD who had not previously engaged with their program. These findings resulted in DPH allowing contracted harm reduction programs to provide a broader menu of safer consumption supplies. Better serving individuals who do not inject drugs through expanded safer consumption supplies has allowed overdose prevention strategies, including naloxone, to reach new networks.

The degree of impact that each policy or program had on the decrease in opioid-involved overdose deaths is not fully known. Some states that have not significantly expanded or improved overdose prevention programming also saw decreases, so it is hard to gauge how much the factors above contributed to the Massachusetts 2024 opioid-involved overdose death decrease. Future research is needed to assess the relative contribution of overdose prevention policies and programming on opioid-involved overdose deaths — both within Massachusetts and compared to other states.



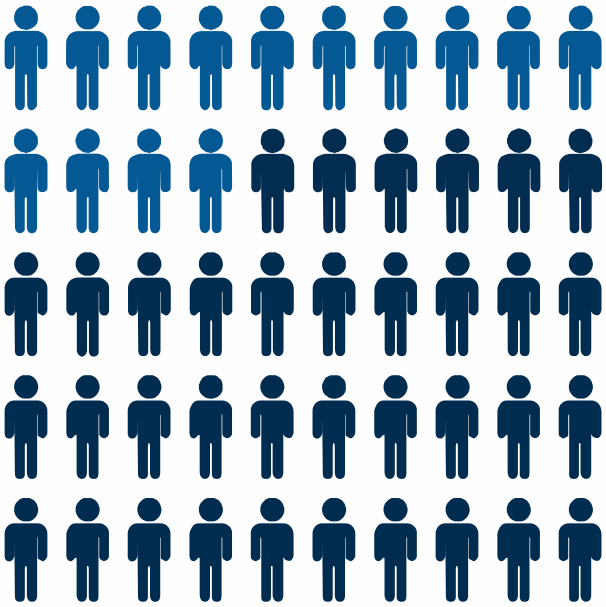
*Beginning in February 2023, DPH used a new method to track methadone receipt. The lower, blue line indicates the old method: data was taken as a census of patients enrolled at the time of survey (underestimate of number of patients receiving methadone per year). A small number of patients included in that count may have been receiving buprenorphine; however, this was a minority. The upper, orange line indicates the new method, which accurately captures the total number of patients who received methadone each year.

Demographics and social determinants of health of opioid-involved overdose decedents

In this section, we use death certificate data to describe the demographic breakdown of those who died from opioid-involved overdose in 2024 and the years leading up to 2024, as well as notable trend changes. We also provide examples of relevant activities, interventions, and research focused on the groups most impacted by opioid-involved overdose death.

Sex assigned at birth

What do the data say? In 2024, there were 964 opioid-involved overdose deaths among males and 372 opioid-involved overdose deaths among females. The sex breakdown of those dying of overdose has remained stable over the past ten years, with an approximate 3:1 split of males to females.

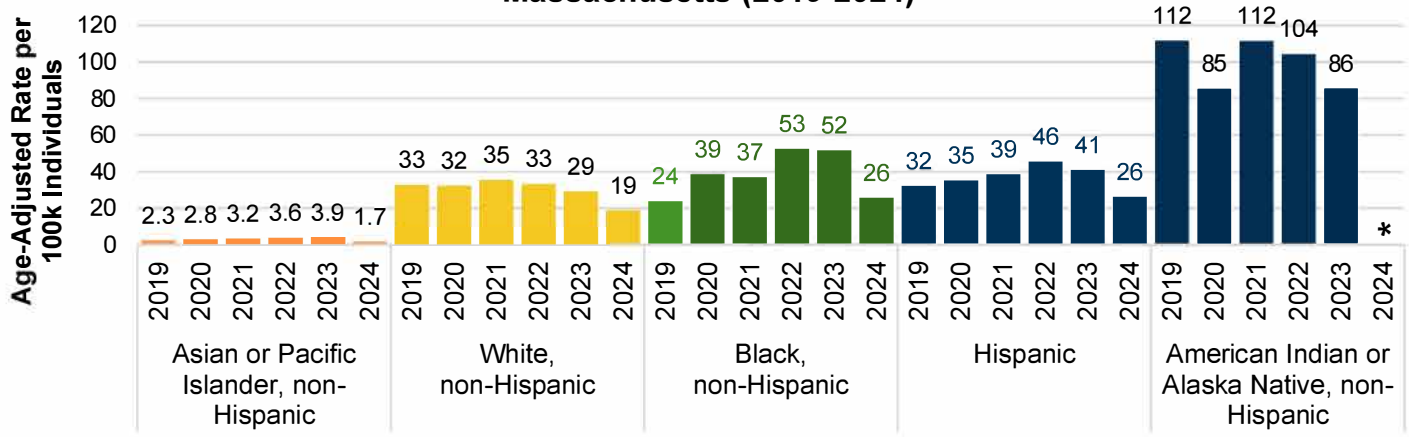


Please note: Gender identity data is not available among those who died of overdose.

What does this mean for Massachusetts? The sex breakdown of those dying of opioid-involved overdose aligns with the breakdown of people using opioids and seeking treatment.
Adult males are more likely to use drugs than females.[15] However, early research indicating sex differences in risky drug use behaviors is mixed.[16] Despite representing less than 30% of opioid-involved overdose deaths, females face unique barriers to receiving treatment and may initiate drug use at a younger age, especially in combination with existing mental health concerns.[17,18] These differences by sex may also be impacted by other identities. As explored in the "Industry and occupational health" section of this report, the skilled labor professions of construction and fishing are largely male-weighted and are also the industries with the highest rates of fatal opioid-involved overdose.

Note on Gender Identity: The state does not have detailed information on gender identity, including transgender experience, in the death data sources used for this report. Approximately 30% of enrollments to treatment programs for opioid use are for those identifying as women, and 70% are for those identifying as men. Less than 1% of treatment clients identify as a person of transgender experience; however, treatment data are representative of those who seek substance use disorder treatment services, not everyone at risk of opioid-involved overdose death.

Race and Hispanic ethnicity



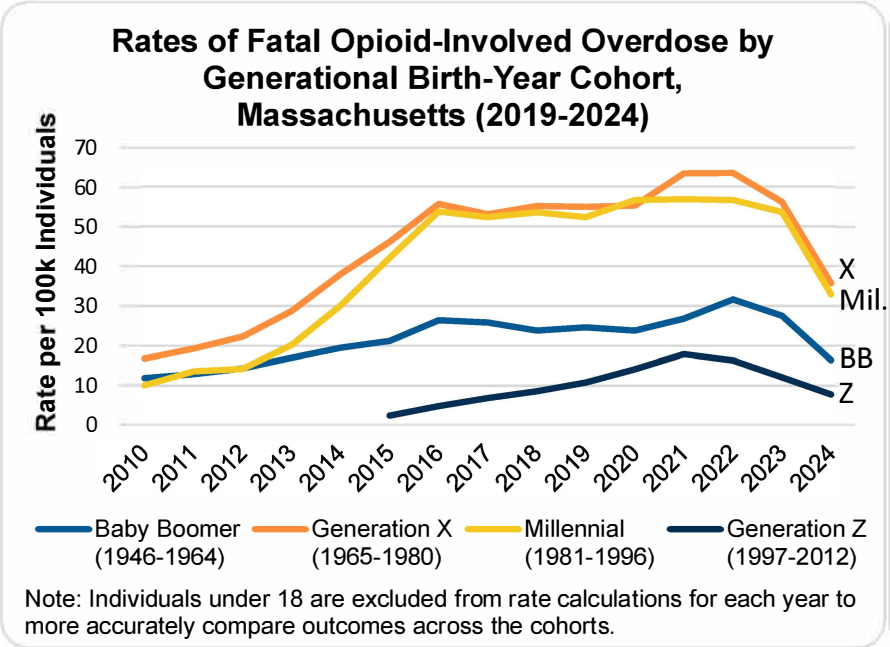
Note: Rates for American Indian or Alaska Native, non-Hispanic residents should be interpreted with caution. Small numbers in the numerator (deaths) and an irregular denominator (population) make these rates statistically unstable and subject to large year-to-year change. Population estimates used to calculate rates in this report come from the UMass Donahue Institute. *Rate is not calculated in 2024 due to low death count (fewer than 5 deaths) rendering the rate unstable.
Why use a rate? Rates allow us to make fair comparisons across communities of different sizes. Because some communities have more people than others, using raw numbers alone can be misleading. Rates standardize the data, as if every community had the same population, so we can compare outcomes more accurately and understand the true differences in impact.

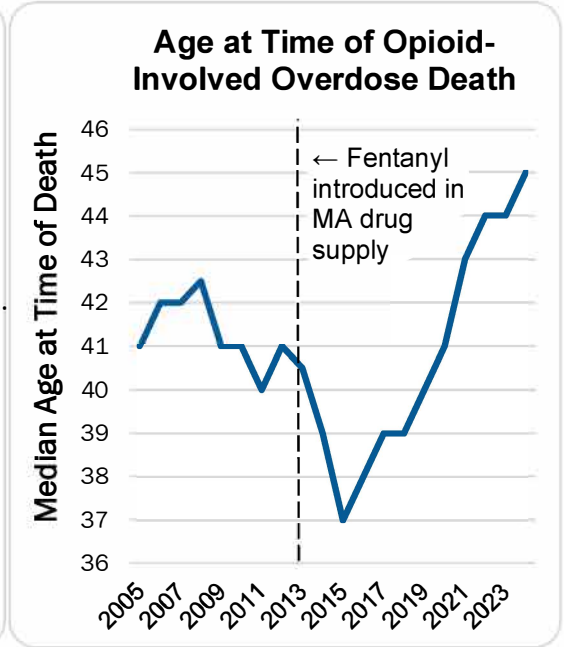
What do the data say? From 2019 to 2022, opioid-involved overdose deaths increased among Black and Hispanic residents, while overdose rates remained relatively stable and then decreased among White residents. In 2024, all groups saw a decrease in opioid-involved overdose deaths for the first time since 2010. While this collective decrease is a new and positive change, racial and ethnic inequities persist. In 2024, Black non-Hispanic residents made up 6% of all deaths in Massachusetts but represented 10% of opioid-involved overdose deaths. Similarly, Hispanic residents represented 5% of all deaths, but 17% of opioid-involved overdose deaths.

The total number of overdose deaths among American Indian, Alaska Native, Asian, and Pacific Islander residents is small, making these data more complicated to track and compare to other populations. Irregular population estimates make these rates statistically unstable and subject to large year-to-year change. While absolute counts remain low (less than 5 in 2024), opioid-involved overdose death rates among American Indian and Alaska Native residents have remained the highest of all groups in Massachusetts for over a decade. Yet, both the number and rate of opioid-involved overdoses more than halved for this group from 2023 to 2024. Although Asian and Pacific Islanders have the lowest opioid-involved overdose death rates overall, rates increased by 70% from 2019 to 2023, but then dropped again in 2024.

What does this mean for Massachusetts? The data show both progress and persistent inequities. The universal decline in overdose deaths is encouraging. However, monitoring ongoing disparities across racial and ethnic groups is key to ensuring all communities are benefiting from overdose prevention efforts. Sustaining the downward trend while closing these gaps is critical to improve health equity across Massachusetts.

Age and generational trends





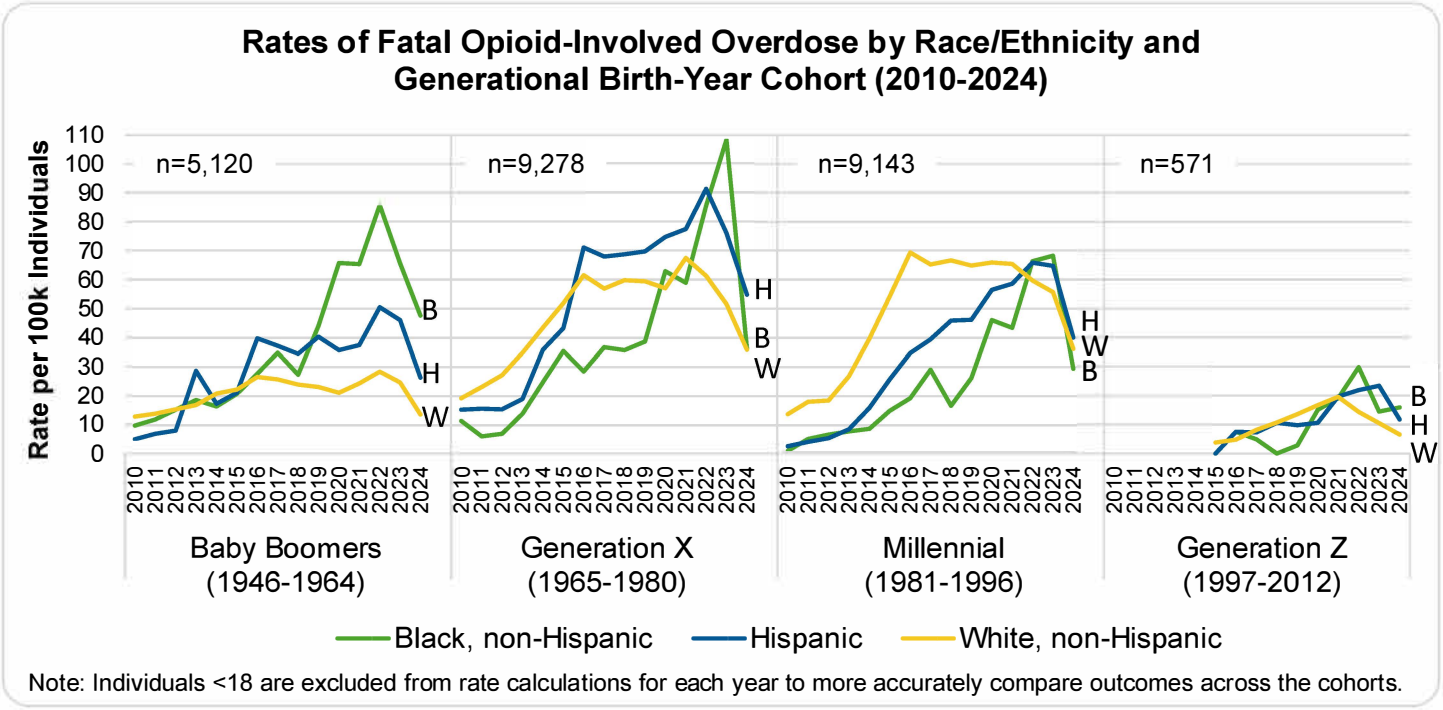
What do the data say? In 2024, opioid-involved overdose death rates were highest among Generation X and millennial cohorts at about 36 and 33 deaths per 100,000 individuals, respectively. All generational cohorts experienced a 35-40% decrease in opioid-involved overdose death rates from 2023 to 2024. Looking across a longer period of years, notable generational patterns over time emerge. For this report, generational cohorts were used instead of age-at-death groups to better represent shared lifetime exposures (e.g., policy or cultural shifts), ensuring that generational patterns are isolated from the effects of aging.

In 2024, youth and young adults (ages 0-25) experienced fewer than 50 opioid-involved overdose deaths for the first time since 2012. Additionally, the Generation Z cohort showed the greatest decrease (52%) in opioid-involved overdose death rates from 2022 to 2024, compared to all birth-year cohorts. These patterns align with data from the National Survey on Drug Use and Health, which show a decrease from 2015 to 2023 in the percentage of young adults (aged 18-25) in Massachusetts reporting prescription pain reliever use not as prescribed (7% to 2%) or any heroin use (0.7% to 0.2%).[19]

What does this mean for Massachusetts? After fentanyl entered the Massachusetts drug supply in the mid-2010s, opioid-involved death rates rose sharply among Generation X and millennials. At the same time, the median age at time of opioid-involved overdose death dropped suddenly. The drop in median age suggests that as fentanyl contamination became more common and increased the toxicity of the supply, drug use was riskier for everyone, regardless of age.

At the onset of the COVID-19 pandemic, opioid-involved overdose death rates increased across all generations, though this time the rise was most prominent among the baby boomers and Generation X cohorts, and least apparent among millennials. The following section on intersectionality begins to explore which groups were driving these trends.

Intersectionality: racial and ethnic differences among generations



Note: Individuals <18 are excluded from rate calculations for each year to more accurately compare outcomes across the cohorts.

What do the data say? Age-related trends in opioid-involved overdose deaths vary by race/ethnicity. Before fentanyl entered the drug supply in 2013 and the COVID-19 pandemic in 2020, White and Hispanic millennial and Generation X individuals faced disproportionately high rates of opioid-involved overdose deaths. However, in recent years, baby boomer and Generation X cohorts saw rapid increases in opioid-involved overdose death rates, largely driven by increases among older Black non-Hispanic and Hispanic communities. Similarly, while White millennials saw a decrease after COVID-19 began, the Black and Hispanic millennial cohorts continued to see increases.

What does this mean for Massachusetts? The opioid-involved overdose death trends explored in the "Age and generational trends" section are not experienced uniformly across racial and ethnic groups. While millennials overall saw no change during the pandemic, Black and Hispanic millennials were still experiencing increased death rates. And, while data show an increase among older generations during the pandemic, this trend was disproportionately felt by Black populations.

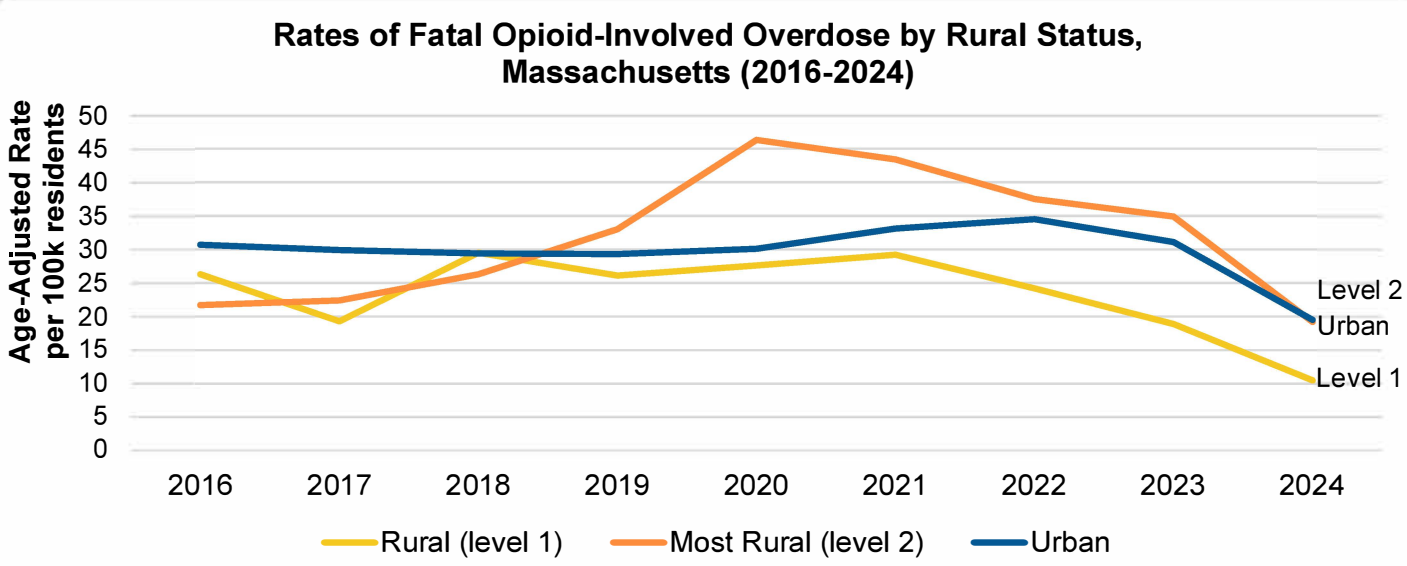
While the trends are clear, it is still difficult to tease out what caused these differences. The COVID-19 pandemic brought a host of social and political nuances that may have impacted different ages or racial/ethnic groups differently. It is also likely that the drug supply had something to do with the patterns observed. Surveys and qualitative interviews conducted by Brandeis University on behalf of DPH described how Black communities may have had delayed exposure to opioids, especially fentanyl, due to racial segregation of the drug supply and differences in drugs used across different races and ethnicities. These trends are also the long-term outcome of the War on Drugs, including inequitable incarceration rates and access to treatment services.[2]

"My last overdose was, somebody had told me it was cocaine. So I went down by Speedway down there and as soon as I started walking this way, I was feeling all right, until, like, ended up at the store and fell over… And then the next time, I did the same thing, thinking that I don't even know why I trusted the person, but I went in and did it again, and then I ended up falling in front of that building. And then I was like, forget that, I'm not sniffing no more of that stuff… Whoever's that to me, I sniff cocaine or whatever, and I know it's not cocaine."

— 56+ year-old Black Male (Brockton, 2021); Collected by Brandeis University

Geography and rurality

What do the data say? This report classifies deaths based on the residency of the decedent. The "Most Rural" towns (Rural Level 2) are less densely populated and more remote and isolated from urban core areas than "Rural" (Rural Level 1) towns. DPH standardizes geographic areas based on population size and age of the community using rates to better understand how the areas compare.



Note: please reference the State Office of Rural Health to explore rurality definitions.

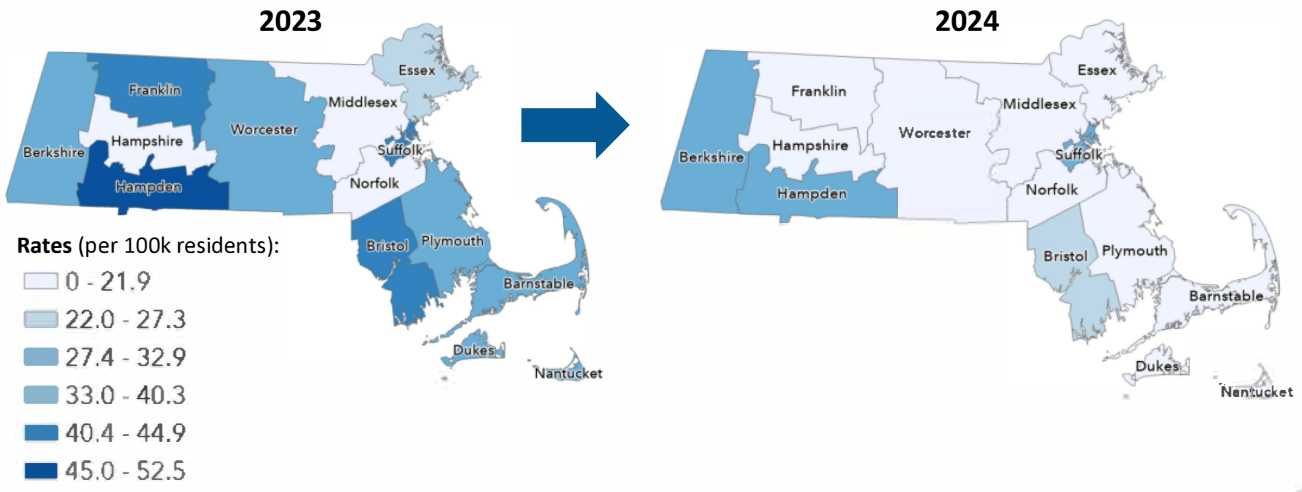
In Massachusetts, even though the large cities make up the largest absolute number of opioid-involved overdose deaths, the most rural areas continue to have rates of opioid-involved overdose deaths that are equal to or higher than those in urban areas. However, 2024 was the first year since 2018 when opioid-involved overdose death rates in rural areas dipped below rates in urban areas.

View data from this report for your County or City/Town on the **Community Profile**.

In 2024, Suffolk (212 deaths) and Middlesex (193) Counties had the highest numbers of residents who died from an opioid-involved overdose, with big cities, including Boston (171), Springfield (83), and Worcester (68) recording the highest numbers of residents who died from an opioid-involved overdose. Nantucket had no overdose deaths in 2024 for the first time in over a decade. However, as

described above, age-adjusted opioid-involved overdose death rates varied. Berkshire, Hampden, and Suffolk Counties had the highest rates of resident overdose deaths per 100,000 people, with North Adams (81.4 per 100k), Salisbury (68.2 per 100k), and Pittsfield (55.6 per 100k) holding the highest rates of opioid-involved overdose deaths when standardizing per capita.

Age-Adjusted Opioid-Involved Overdose Death Rates from 2023 to 2024

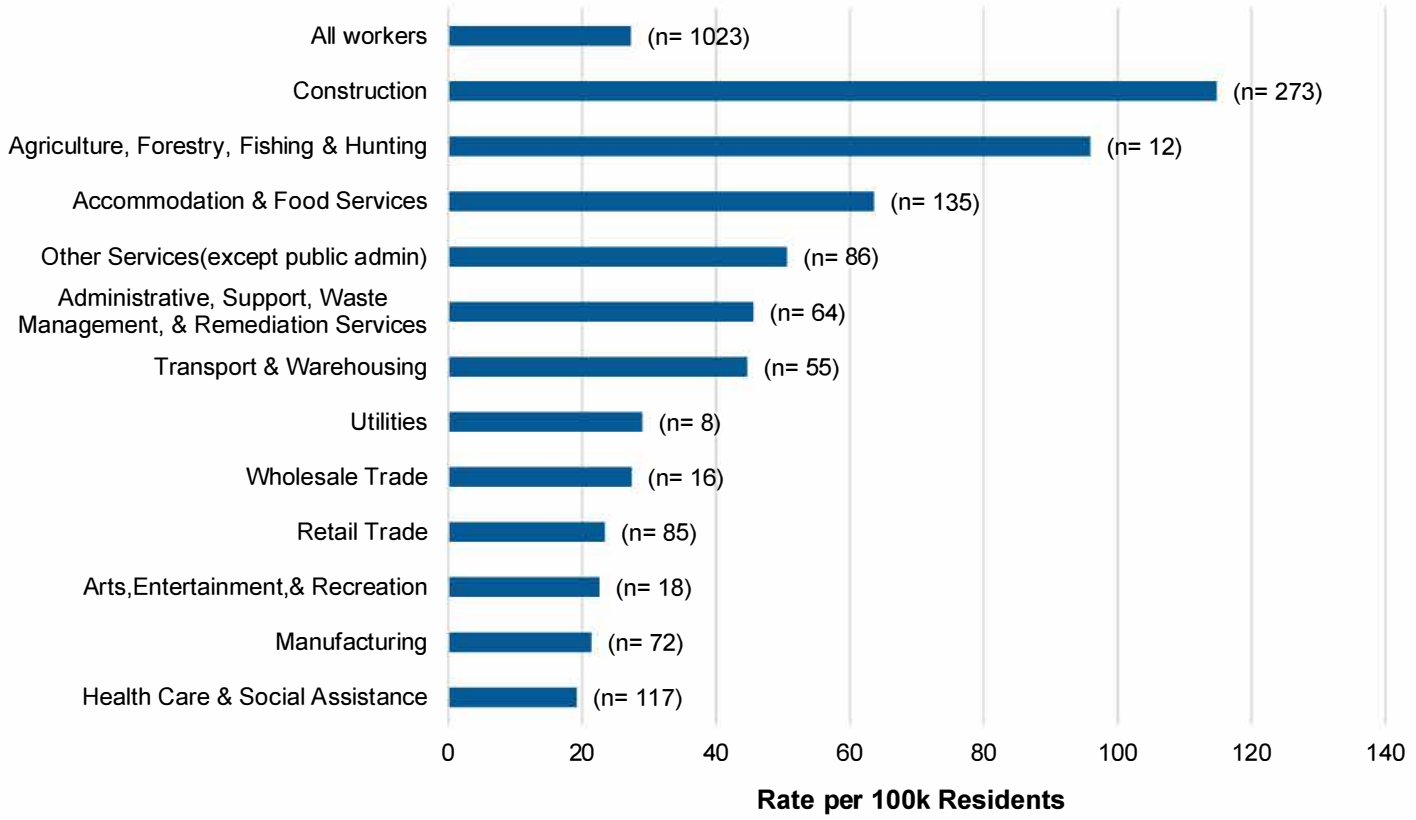


While most counties saw a decrease, the relative rankings of Massachusetts counties remained largely unchanged. Aside from Nantucket, from 2023 to 2024, Franklin, Barnstable, and Bristol Counties saw the largest decreases in age-adjusted overdose death rates, moving from above-state-average to below-state-average levels. In contrast, Berkshire County experienced only a small decline and continues to have the highest age-adjusted overdose death rate in the Commonwealth.

What does this mean for Massachusetts? The largest cities in Massachusetts have the highest numbers of opioid-involved overdose deaths, but some rural areas are more impacted by opioid-involved overdose deaths relative to their smaller populations. In Massachusetts, services tend to concentrate in cities to reach larger populations, but rural communities often have equal or higher rates of fatal overdose and may face unique needs. Even within the same region, overdose rates can vary from one county or town to another. The Community Profile is a tool that local municipalities can use to compare their data to statewide numbers and rates and uncover urgent needs specific to their community.

Research Spotlight: Access to MOUD in Rural Areas

Increasing access to Medications for Opioid Use Disorder (MOUD), specifically buprenorphine and methadone, is a critical strategy for reducing opioid-involved overdose deaths. DPH collaborated with Tufts University to produce the Geographic Access to Community-Based Opioid Treatment Programs in Massachusetts report. This report highlighted the significant barriers to methadone access in rural areas, such as Berkshire County, where long distances and drive times limit availability. This report also highlighted the socioeconomic inequities these barriers create, as low-income individuals without access to a personal vehicle face even greater challenges in reaching life-saving treatment.



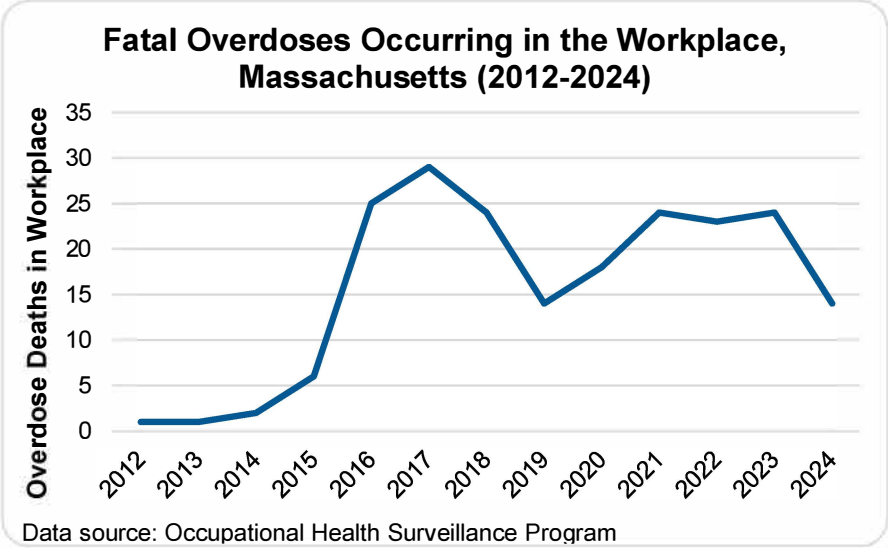
Note: Includes only MA residents ages 16+ whose death records contain information on both industry and occupation. Industry groupings are determined by North American Industry Classification System (NAICS) codes. Denominator source: American Community Survey includes only those currently employed, while numerator (deaths) is most recent occupation or industry at time of death, even if not actively employed. The (n=) indicates total number of opioid-involved overdose deaths in that sector.

What do the data say? Among working age (residents 16 years or older) decedents for whom valid industry and occupation were available, workers in the construction industry had opioid-involved overdose death rates that were 4 times higher than rate amongst workers in all industries (27.3 fatal opioid-involved overdoses per 100,000 workers). Workers in the agriculture, forestry, fishing, and hunting industry had opioid-involved overdose death rates that were 3.5 times higher than the rate amongst all workers, with most deaths in the fishing industry. These industries have consistently remained the most impacted by fatal opioid-involved overdose for the past decade (see past data).

"How I got into using Heroin? Well, I got three older brothers that are fishermen. So they were using before I was using. So that's… as soon as I was of age to go out fishing, I got introduced to heroin. Essentially, it helped with the pain."

— Fisherman (New Bedford, 2019); Collected by Brandeis University

Opioid-involved overdoses have been the leading cause of workplace death in Massachusetts since 2016, including 14 overdose deaths in 2024. In 2024, 18% of workplace deaths were from overdose. These data underscore the dramatic impact that the overdose crisis has had on workers across Massachusetts.



Previous studies in Massachusetts explored the relationship between the characteristics of certain job types and opioid-involved mortality. One study showed that between 2011 and 2020, working-age Massachusetts residents who had a prior workplace injury were 35% more likely to die from an opioid-involved overdose.[21] Overdose deaths were more common in physically demanding jobs and industries with high injury rates among workers. Limited sick leave, low wages, and unstable work (e.g., seasonal, contract, or temp jobs) further pressure workers to work while injured and delay needed medical care and/or OUD treatment.

What does this mean for Massachusetts? Over the past decade, industry and occupational differences in fatal opioid-involved overdose death rates have highlighted how different types of work carry different overdose risk. In 2024, opioid-involved overdose death rates in the top industry groups of overdose decedents dropped to levels much lower than in prior years, mirroring statewide declines. DPH supports innovative approaches to educate workers about pain management and the effects of opioid use to prevent and reduce opioid overdose risk across various worker populations, including unionized and non-unionized employees in high-risk industries (e.g., construction). In addition to engaging workers directly, DPH partners with employers and labor leaders, who play a critical role in shaping benefits, policies, and practices that promote alternatives for pain management and ensure access to evidence-based, culturally responsive treatment for OUD.

One such effort is the movement to expand recovery-supportive workplaces. This initiative equips employers and labor/workers advocates with the resources needed to foster environments that prevent occupational injury and support workers throughout all stages of recovery. Explore more information on recovery-supportive workplaces.

"You know, any job site you go on, there's just drugs everywhere. All the time. You know, 'cause a lot of guys, I mean, they need it. You know? You know, I've worked a lot overtime, like 14, 16 hour shifts and stuff like that and...Yeah, and it's hard work. But, it's fulfilling work. But, it takes a toll on you after a while."

— Construction Worker (Cape Cod, 2018); Collected by Brandeis University

Housing instability and homelessness

Drug overdose is a leading cause of death among homeless individuals, with about 1 of 4 unhoused people dying from overdose-related causes from 2003 to 2018.[22] Furthermore, Brandeis University data indicate that 59% of surveyed PWUD were unstably housed and BSAS enrollment data show that about half of enrollments to SUD treatment programs were for homeless individuals, compared to 0.4% of the general population.[23] However, the relationship between housing status and overdose is not well understood.

Despite high rates of housing instability among PWUD, SUDORS data indicated that, of people who died from opioid-involved overdose in 2024, 12.3% were experiencing homelessness and 7.9% were experiencing housing instability at the time of their death. Although these percentages may be an undercount, the majority (approximately 80%) of people who died from an opioid-involved overdose were stably housed at the time of their overdose. Despite the many negative health outcomes associated with housing instability, there may be overdose-related protective factors for unhoused individuals. For example, PWUD experiencing housing instability may use drugs in environments where peers are able to respond quickly with naloxone in case of an overdose, such as group encampments or congregate shelter settings. As explored in the "Using alone is a key risk factor for fatal overdose" section, public or communal drug use may be protective for fatal overdose.

While there are potential, unexplored benefits of being homeless related to fatal overdose risk, there are many risk factors associated with homelessness as well. While there is limited research, the stressors of homelessness and housing insecurity (e.g., exposure to extreme temperature, infections and disease, or physical/emotional trauma) may increase overdose risk. Death, including death beyond overdose, and disease risk amongst this population remains a key health priority for DPH.

Furthermore, encampment sweeps (breaking up groups of people who live in tents outside) are an example of a local practice that may have consequences on opioid-involved overdose deaths amongst people experiencing homelessness. Emerging research shows that encampment sweeps increase the number of overdose deaths, increase the number of hospitalizations, and decrease initiation of lifesaving MOUD, overall contributing to 16-24% more deaths among unhoused PWUD compared to those who were not continually involuntarily displaced.[24,25] A study in San Francisco showed that 90% of residents who were displaced remained in a public space after displacement.[26] As encampment sweeps and other local, state, and federal policies continue to impact people experiencing homelessness and housing insecurity, DPH will monitor changes in the data.

Mental health and neurodivergence

Of the people who died from opioid-involved overdose deaths in 2024, 57% had one or more mental health conditions, with depression (38%) and anxiety (38%) being the most common. In 2024, 34% of individuals who died of an opioid-involved overdose were actively receiving mental health treatment at the time of death. Additionally, 13% of people who died of opioid-involved overdose were known to be neurodivergent (includes diagnoses of ADD/ADHD, autism, OCD, TBI, Tourette's, developmental disorder, learning disabilities, or intellectual disabilities) through indicators in medical records, death records, or interviews with friends and family, although this may be under-diagnosed.

BSAS enrollment data show that 57% of enrollments to SUD treatment programs were for individuals who had previously been treated for a mental health condition. Programs serving people with depression, anxiety, and other mental health conditions offer a critical opportunity to integrate overdose prevention and connections to OUD treatment and recovery support. Future investigation should assess the degree of undiagnosed or untreated mental health conditions amongst opioid-involved overdose decedents.

Past medical history and current medical conditions

Of the people who experienced an opioid-involved overdose death in 2024, 23% had asthma, chronic obstructive pulmonary disease (COPD), or some other breathing problem; 16% had additional health conditions that contributed to their death; and 6% ever had a major injury. BSAS enrollment data show 67% of OUD enrollments also reported ever using tobacco or nicotine. While changes in route of administration of opioids (e.g., going from injecting to smoking) has been seen on the national level, that trend is not consistent on the East Coast, including Massachusetts.[27]

It is important to examine the degree to which respiratory system health contributes to overdose deaths by complicating respiratory depression during an overdose. Higher prevalence of smoking drugs (including nicotine) among people with substance use disorders indicates a continued need for smoking harm reduction practices and cessation programming.[28]

Risk factors for fatal overdose

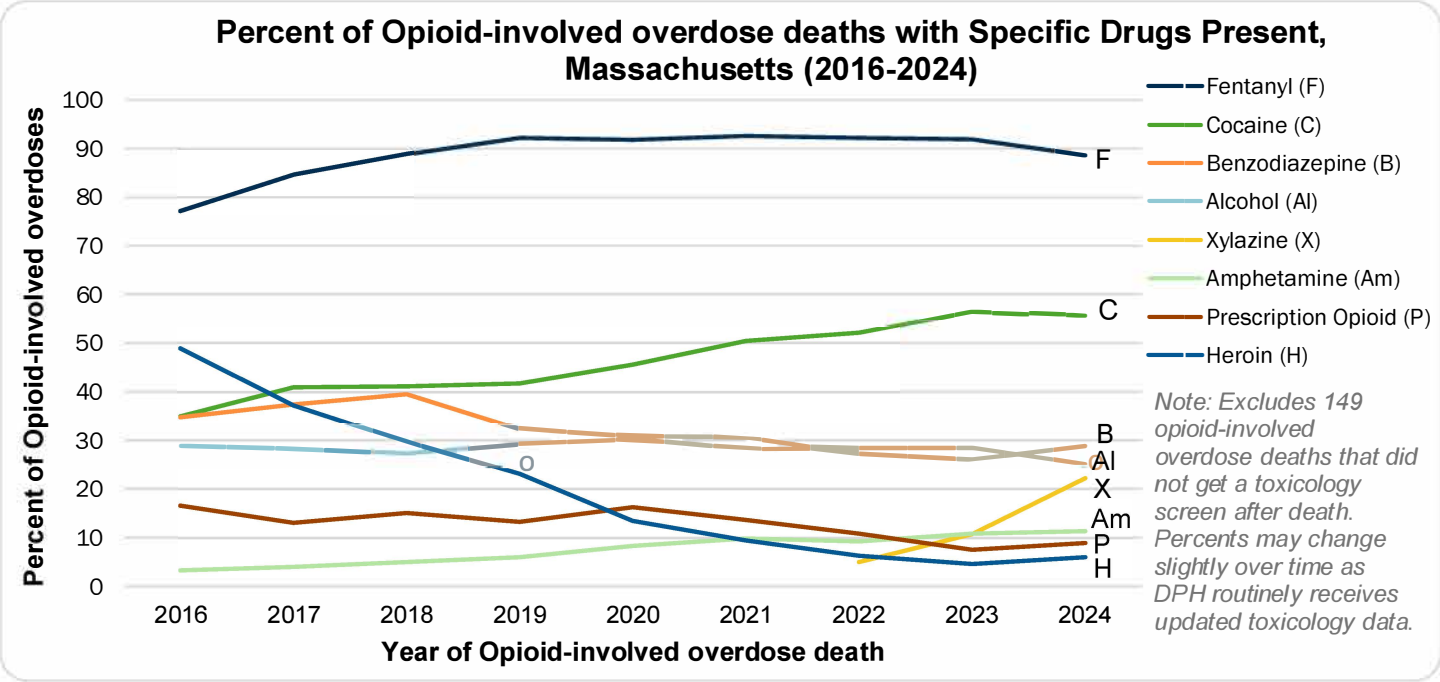
There are many factors that may increase risk of experiencing an overdose or risk of that overdose being fatal. This section highlights data from both SUDORS and data collected from community partner sites and analyzed by Brandeis University through MADDS.

The unregulated drug supply is unpredictable and erratic

After suspected overdose death, the Office of the Chief Medical Examiner runs toxicology screening tests to determine which substances were present in the individual's body at the time of death. However, these results may not represent what the person consumed in the immediate moments before the overdose or which substances specifically caused the overdose to become fatal. For instance, if someone consumed cocaine in the morning and later consumed fentanyl and fatally overdosed, both cocaine and fentanyl would show in the toxicology screening test for the decedent.

In 2015, fentanyl overtook heroin as the primary substance driving opioid-involved overdose deaths among Massachusetts residents, a trend that has remained stable ever since. Aside from fentanyl, the presence of stimulants also increased among those who died from opioid-involved overdose, with the percent positively increasing by 10% from 2020 to present. DPH continues to monitor the presence of emerging substances in opioid-involved overdose deaths.

One consequence of an unregulated drug supply is the constant fluctuation in the types of substances present (both the active drugs and inactive additives), as well as drug potency and quality. This unpredictability makes it difficult for PWUD to know exactly what or how much they are taking, increasing the risk of both fatal and nonfatal overdose.



What do the data say? In 2024, 1,187 or 89% of all opioid-involved overdose decedents received a toxicology screen during their autopsy. Of those screened, 89% were positive for fentanyl, 56% were positive for cocaine, and 11% were positive for amphetamine. An additional 22% screened positive for xylazine. The data shown above are not mutually exclusive, meaning one decedent can test positive for multiple substances.

In 2024, MADDS detected a median of 4 different active substances and 2 different inactive substances in drugs suspected to be "fentanyl."

MADDS monitors the substances present in the drug supply. MADDS releases as-needed community alerts about new substances emerging in the Massachusetts drug supply (e.g., Medetomidine, BTMPS/Tinuvin, Nitazenes) and partners with community organizations to ensure PWUD receive the most updated information about what substances may be present in the substances they have used or plan to use.

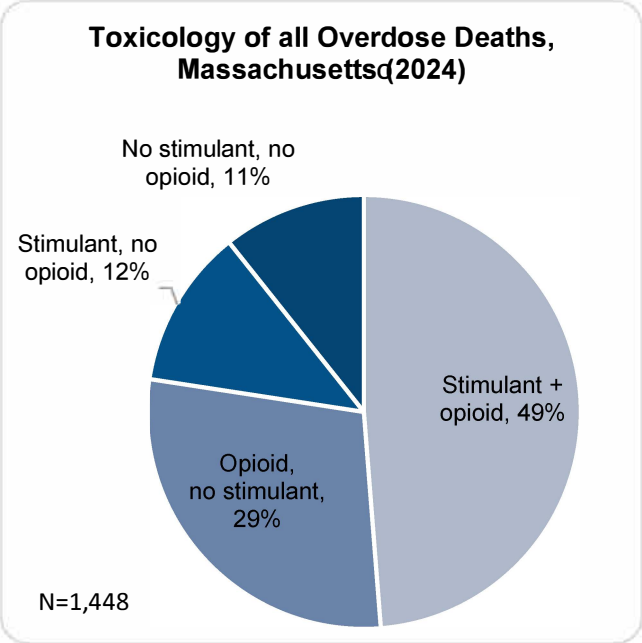
"They have the xylazine strips now, which is nice. And the Fentanyl was nice, but it's like, what are they going to start making strips for everything? That's crazy."

— 41-45-year-old Latina Female (Worcester, 2024); Collected by Brandeis University

Increased presence of cocaine in opioid-Involved overdoses

Stimulant-related overdose deaths have increased dramatically since 2013, as detailed in the DPH 2023 Stimulant Data Brief.

What do the data say? In 2024, for the first time in over ten years, the percent of opioid-involved overdose deaths with cocaine present did not increase. Among those who died of an opioid-involved overdose in 2024, 661 (56%) also had a positive toxicology screen for cocaine, and 135 (11%) also had a positive toxicology screen for amphetamine. There is no way to tell from the toxicology data if decedents were intentionally using both stimulants and opioids or if they were unknowingly using a stimulant that contained an opioid. In 2024, 22% of stimulant samples collected via MADDS tested positive for fentanyl; however, fentanyl's presence varies greatly over time and by geography.



In 2024, an additional 172 individuals died of a stimulant-related overdose that was not also an opioid-involved overdose. Recent research questions how we define stimulant "overdose," highlighting that stimulant-related deaths are more likely to present as a cardiovascular event and less likely to include recent drug use.[29] Since stimulant "overdoses" present differently, they may not always be flagged as an overdose in the death data.

While the number of overdose deaths that tested positive for an opioid on the toxicology screen decreased by 42% from 2023-2024, the number of stimulant-positive overdose deaths dropped by 38%. There was a smaller relative change in overdose deaths that tested positive for a stimulant and did not test positive for an opioid (5% decrease) compared to those that tested positive for an opioid and not a stimulant (41% decrease).

What does this mean for Massachusetts? Earlier rises in opioid-involved overdose deaths with stimulants present led to speculation around the degree of intent to use both stimulants and opioids and how much user awareness there was before the death. Cross-contamination of the unregulated cocaine and counterfeit pill drug supply with fentanyl were associated with the rise in these deaths, and thus, reductions may be due to decreased incidents of cross-contamination. The degree of cross-contamination in the unregulated drug supply remains largely unknown. Brandeis University has evaluated how stimulant supplies are contaminated with fentanyl and the level of overdose preparedness amongst people who primarily use stimulants.[30] Expanding outreach to people who primarily use stimulants, as well as expanding drug checking services through community partner sites, could help to further our knowledge of the degree of contaminants in the stimulant drug supply.

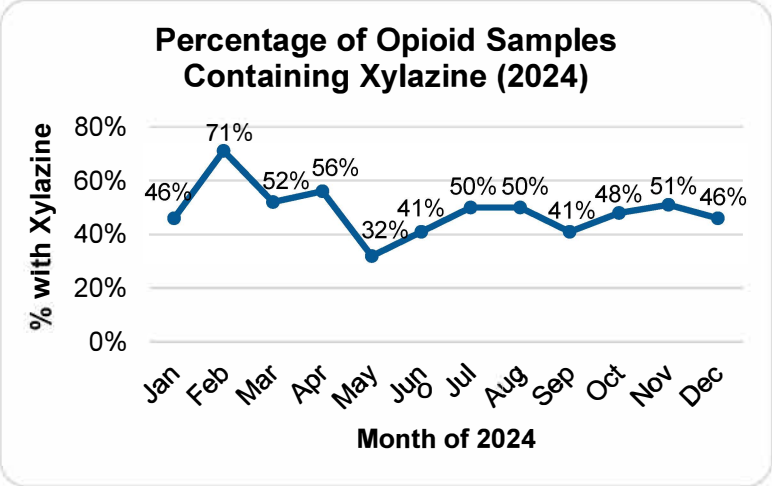
Program Spotlight: START Clinic Model

Due to the increase in stimulant-involved overdose deaths and specific treatment needs for people who are concerned about their stimulant use, including cocaine and methamphetamine. Boston Medical Center piloted a program called the Stimulant Treatment and Recovery Team (START) clinic. This unique treatment model adopts a multidisciplinary care team that uses contingency management. Based on the success of this pilot, this model has since expanded to other areas of the state.

Increased presence of sedatives in the drug supply

Sedatives cause calming effects by slowing down brain activity. The presence of sedatives in the unregulated opioid supply has increased in Massachusetts, often leading to unintended effects.

What do the data say? Xylazine was present in 22% of opioid-involved overdose deaths in 2024. In the same year, MADDS detected xylazine in 46% of opioid samples tested at community partner sites. Xylazine has been detected in the drug supply since 2021. However, as shown in the graph on the right, presence of xylazine may vary greatly over time, even month-to-month. When people notice something unusual in their drugs, they may be more likely to test them, so this is likely an overrepresentation of xylazine presence in the broader drug supply. Preliminary data



collected by Brandeis University characterized xylazine-related overdose symptoms akin to those of fentanyl overdose, with some nuance — unresponsiveness comes on faster and is longer lasting than overdoses not involving xylazine. Furthermore, 50% (n=62) of those with a drug sample that was positive for xylazine reported experiencing suspected xylazine wounds in the past 6 months.

What does this mean for Massachusetts? The presence of xylazine and other sedatives such as medetomidine in the unregulated drug supply have been documented to cause longer-lasting drowsiness and sedation. In addition, xylazine has also been linked to skin and soft tissue infections and wounds. Unique withdrawal symptoms from the sedative medetomidine have been reported and care providers are actively gaining insight into emerging symptom management practices.[31]

"[Xylazine] is a powerful high and you can't control that nod at all. Like, you can't control like, how to get up and try like you would normally do. This is a little more powerful and it just takes over pretty much."

— 31-35-year-old Female (Boston, 2024); Collected by Brandeis University

Since naloxone does not reverse the effects of non-opioid sedatives, xylazine-, medetomidine-, and benzodiazepine-involved overdoses require a primary focus on restoring and supporting breathing. The first priority for overdose response is to restore adequate breathing and oxygenation to protect the brain from hypoxia. Reversing sedation can wait to resolve naturally as long as breathing is restored. Giving more naloxone after breathing is restored may precipitate withdrawal, making the person overdosing feel very ill. After breathing is restored, individuals should be monitored and supported until their sedation has resolved.

Some research shows that xylazine increases overdose risk when combined with an opioid.[32] Other researchers hypothesize that xylazine has contributed to the drop in opioid-involved overdose deaths by reducing the number of times someone needs to use drugs daily or by driving people who inject drugs to try other routes of administration to avoid wounds.[7] Whether or not xylazine reduces opioid-involved overdose risk, the risk of wounds and subsequent infections remains high for people who use opioids that may contain xylazine.

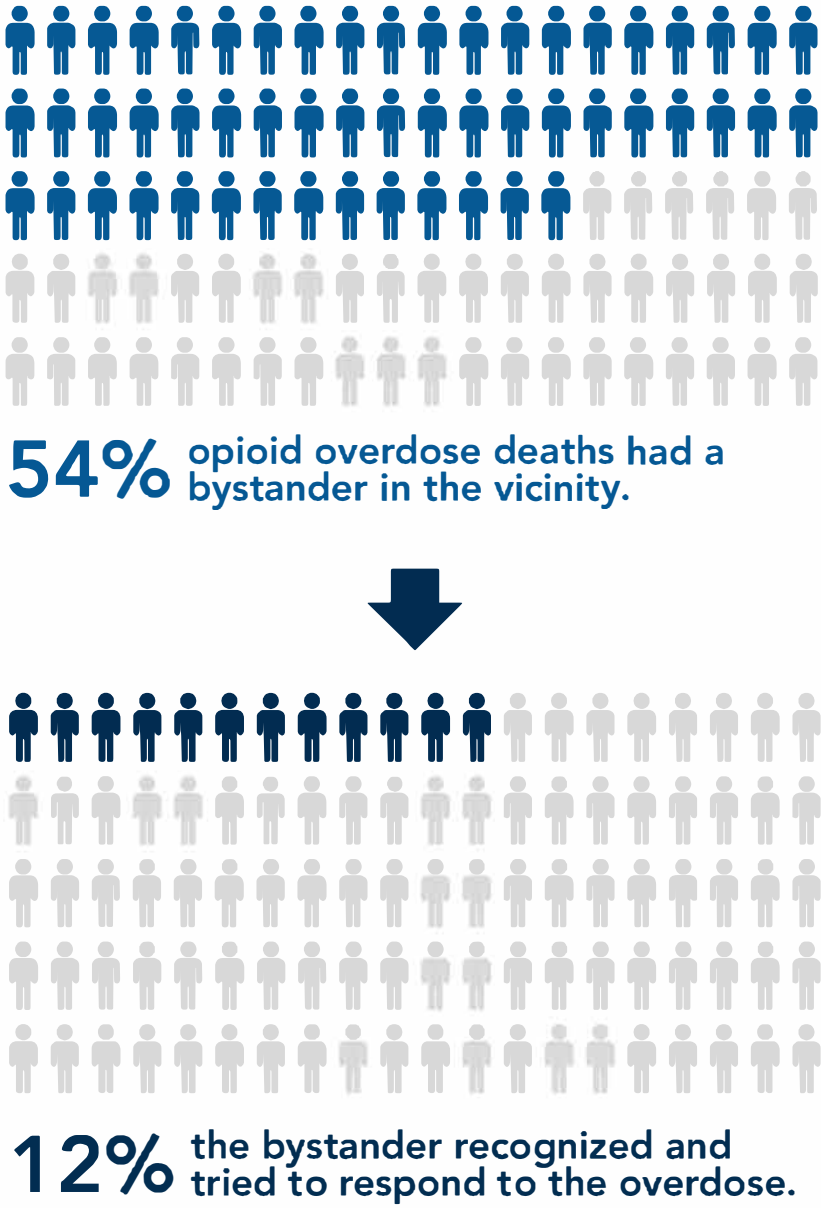
Research Spotlight: Xylazine-Related Wound Care

In 2023, a team of researchers worked with harm reduction programs in Massachusetts to better understand xylazine use, wound care practices, and treatment experiences of PWUD. The findings from this study were presented to both clinical and harm reduction program partners and have helped to contribute to ongoing services and education around xylazine use and wound care.

Using alone is a key risk factor for fatal overdose

A bystander is a person who is physically nearby, either shortly before or during an overdose, who has an opportunity to intervene and respond. A bystander may be spatially separated from the person who overdosed and/or may not know that the person used drugs in their vicinity.

What do the data say? In 2024, there was a bystander present in 54% of fatal opioid-involved overdoses. Unfortunately, in the majority (77%) of these overdoses, overdose response did not occur because the bystander was physically apart from the person overdosing (61%), didn't recognize any abnormalities (22%), wasn't aware the person was using substances (13%), or the bystander was also using substances (12%). Only 11% of opioid-involved overdose deaths had a bystander witness the drug use prior to the death. Naloxone was administered in 29% of overdoses; however, for many of these cases, it was too late. In 78% of cases where the individual did receive naloxone, it was not administered until a first responder was present.



This is a stable trend; data from the past 10 years show that every year, most overdose deaths had fatal drug use go unwitnessed with no bystander present, meaning the person who died was likely using alone with no one readily available to respond with naloxone, rescue breathing, or to call emergency services.

> "You gotta like be in a sitting position around nobody because if you do go out, the people are gonna steal all your shit, which has happened to many of the people I know. So it's like, you gotta be home and alone, you know?"
>
> — 46–55-year-old White Female (Lawrence, 2024); Collected by Brandeis University

"Just continue having conversation with folks about the using alone, man. I think the stigma, the -- the stigma that leads a person to feeling the need to have to use on their own and not -- and keep it under wraps, you know?"

— Harm Reduction Worker (Holyoke, 2024); Collected by Brandeis University

What does this mean for Massachusetts? Using alone is a key risk factor for experiencing a fatal overdose. While Massachusetts has made great strides in getting naloxone to the community and expanding access to overdose response education, there needs to be someone present and ready to respond for the medication to work. The cumulative impact of expansion to overdose education and naloxone distribution has likely contributed to an increase of PWUD spotting one another, staggering use events, and a general increased awareness of safety practices.

For those who use drugs with others, the cumulative impact of overdose awareness over the past decade has likely resulted in an increase of experienced overdose responders who are able to manage the overdose without additional medical assistance. Existing research found that overdose response hotlines have the potential to be successful fatal overdose prevention tools.[33]

Program Spotlight: SafeSpot Virtual Overdose Monitoring

In August 2023, DPH became the first state to fund a "virtual" overdose monitoring service, SafeSpot. SafeSpot is a phone-based service that PWUD can call to speak with an operator who will call first responders or a designated emergency contact if an overdose were to occur. Since 2023, SafeSpot has supervised over 29,000 drug use events and detected 31 overdoses, which have been successfully reversed. Connecticut and Maine have since joined Massachusetts to fund this important lifesaving service for their residents.

Inadequate access to MOUD

Medications for Opioid Use Disorder (MOUD), specifically buprenorphine and methadone, are lifesaving for people with OUD. The longer a person stays on these medications, the better the outcomes. The life-saving benefits of MOUD are well documented in the literature.[34] In 2024, 200,000-300,000 Massachusetts residents were estimated to have an opioid use disorder. However, 52,913 people filled buprenorphine prescriptions and 28,776 received methadone in 2024. In Massachusetts, a major gap in people receiving medications to treat their OUD remains.

"If your methadone is a medicine and it's prescribed to you as a medicine, I don't see why you have to go through so many hurdles to get a 30-day supply... So it'd be nice to see them sort of bring down the reins on that methadone treatment because you really can't have a life on the clinic."

— 41-45-year-old Black, Native American Female (2025); Collected by Brandeis University

Decedents receiving MOUD are not exempt from overdose risk. They may experience additional life stressors, under-prescribing of their medications, or barriers to consistently accessing their medications (e.g., transportation to clinics, appointment timing) that put them at risk for overdose. There is a need to integrate overdose prevention resources into OUD treatment settings, as well as address barriers to retention in MOUD.

Recent period of incarceration or inpatient treatment

In 2024, 10% of opioid-involved overdose decedents identified in SUDORS were released from an institution within a month of fatally overdosing. The SUDORS definition of institution includes prison/jail as well as SUD or mental health treatment facilities. A period of abstinence from a stay at prison/jail, psychiatric hospital, or residential treatment facility puts people at high risk for fatal opioid-involved overdose. People with OUD who experience a period of abstinence due to incarceration or entering addiction treatment will have decreased tolerance for opioids and face a greater risk of overdose from the unregulated drug supply.

In 2017, DPH's Chapter 55 Report identified high rates of opioid-involved overdose among previously incarcerated people.[35] As a result of these findings, DPH committed resources to address start-up costs and policy barriers to ensure access to OUD treatment in carceral settings. In 2019, with funding and technical assistance support from DPH, seven county jails-initiated pilot programming to provide MOUD to people with OUD in their custody. Eventually, the pilot expanded to almost all Massachusetts correctional facilities.

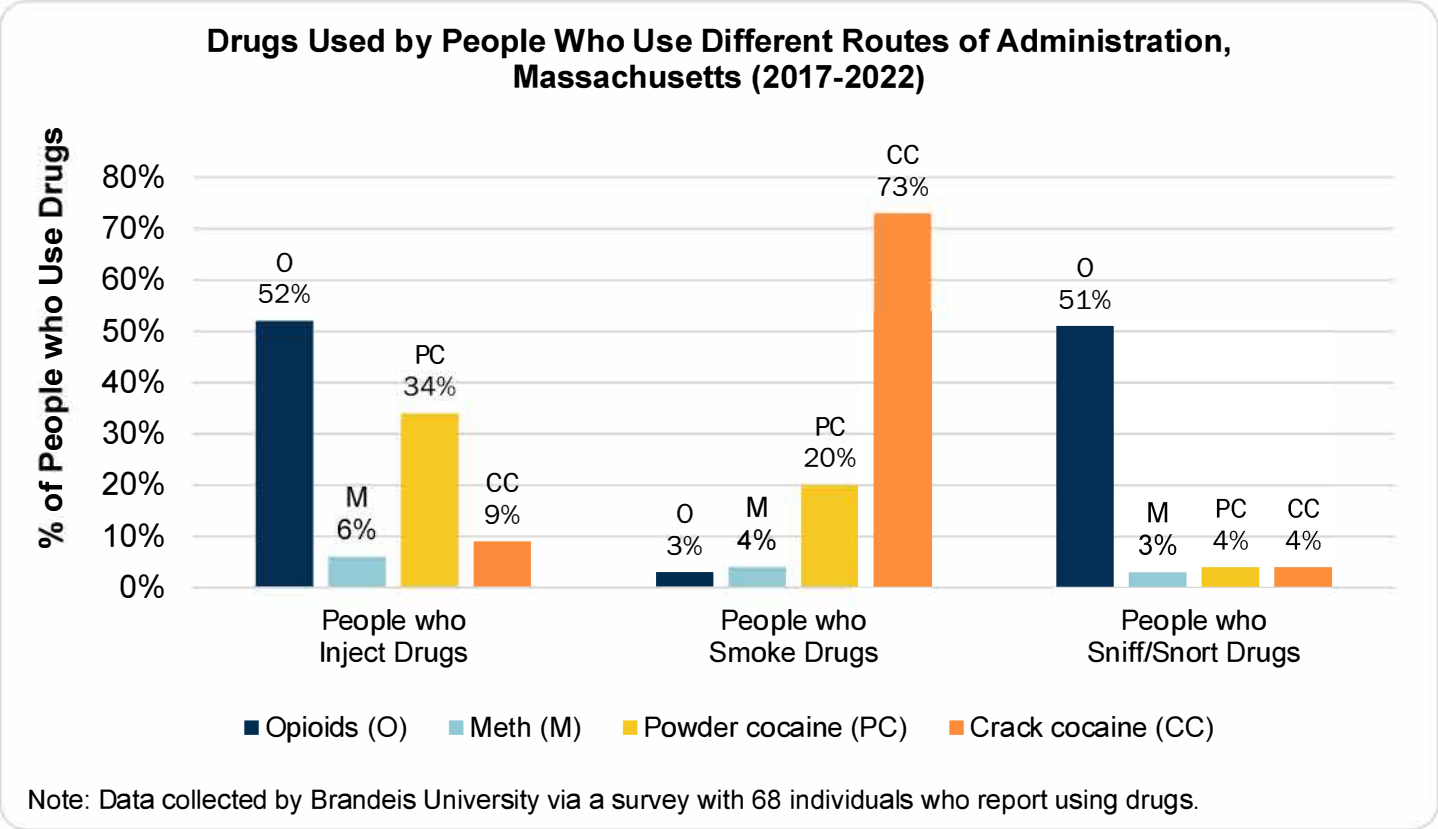
Research Spotlight: MOUD in Jails

In September 2025, the New England Journal of Medicine published an observational study, titled "Medications for Opioid Use Disorder in County Jails: Outcomes after Release" based on data collected from the MOUD in jails pilot program. Using data from DPH's Public Health Data Warehouse, the study found that receipt of MOUD during incarceration was positively associated with post-release initiation of MOUD, and with decreased risks of overdose, all-cause mortality, and re-incarceration. These initial findings are based on a 6-month period (9/1/2019-12/31/2020). Continued analysis from subsequent years, particularly 2021 to 2024 will be important to assess longer-term trends and impacts.

Routes of administration

Common routes of drug administration include injection, smoking, sniffing, boofing, and swallowing. Opioid overdose can occur with any of the routes of administration of opioids. However, how drugs are administered can affect the time to onset of effect and potency, which can affect overdose risk, along with risk of other health complications. Injection drug use is associated with bacterial infections of the skin, soft tissues, and internal organs. Smoking and sniffing can cause trauma to air passages. Research does not provide us with a clear answer about which routes of administration are safer than others, but it is important to consider route of administration in overdose safety planning.[6,36]

National research indicates that smoking and snorting opioids are trending up across the country as an alternative to injection, perhaps as a disease transmission and wound and overdose prevention strategy.[27, 37] SUDORS data reports that in 2024, among the 748 opioid-involved overdose deaths that had scene evidence of drug use, investigators were most likely to find evidence of snorting (43%), followed by smoking (38%), injection (37%), and ingestion (14%). These data only capture materials that were found at the death scene.



Note: Data collected by Brandeis University via a survey with 68 individuals who report using drugs.

ECKS data indicate that among PWUD that participated in the survey, most people injecting drugs were using opioids (52%) or powder cocaine (34%). Most people smoking drugs were using crack cocaine (73%), and most people snorting or sniffing were using opioids. Since Massachusetts has seen a striking increase in cocaine present at the time of opioid-involved overdose death, making non-injection harm reduction services available, along with stimulant-specific treatment practices, is important.

"I had a spree about four or five years ago where I was shooting a lot of cocaine with the heroin. And then I gave that up because, I didn't like it. I never knew what was in it. Reactions. It was too intense…It was hard for me to hit veins after a while too, because I was talking a lot of years of IV drug use. So yeah, I just kind of gave up on it, just ridiculous trying to get high on that. So, I started smoking."

— 36-50-year-old Hispanic Female (Western MA, 2025); Collected by Brandeis University

History of overdose

History of overdose as a risk factor for fatal overdose is well documented.[38] A previous DPH report showed that from 2019-2021, 45% of those who died of an opioid-involved overdose experienced at least one prior known non-fatal overdose in their lifetime.[39] In 2024, SUDORS data show that at least 20.8% of decedents had experienced a prior nonfatal overdose, with at least 5.3% of decedents having had a prior nonfatal overdose in the month before they died. The SUDORS percentages are minimums because the medical examiner records do not typically capture all lifetime health care utilization records and many non-fatal overdoses occur without related medical encounters.

While death is the most consequential outcome of an opioid-involved overdose, Hypoxic-Ischemic Brain Injury (HIBI)– brain damage caused by lack of oxygen and blood flow– caused by overdose is an example of overdose-related injuries that can have chronic effects on survivors.

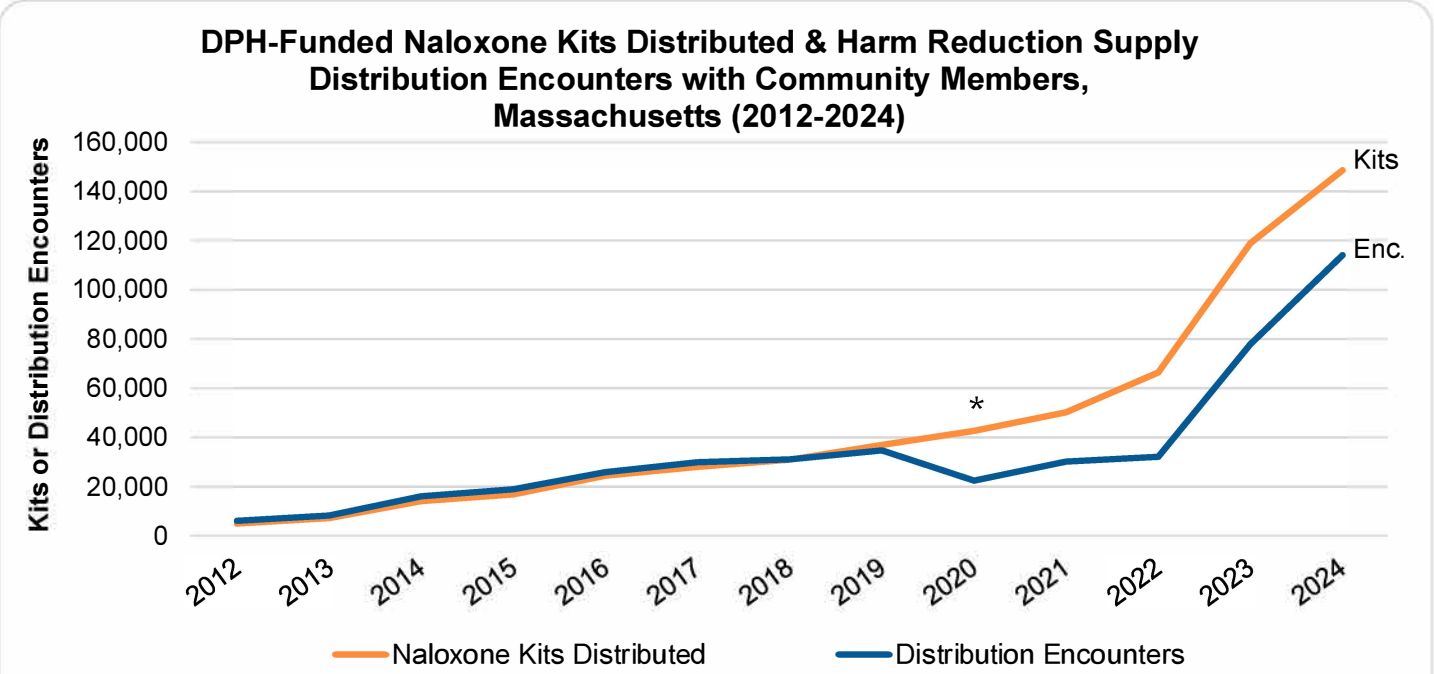
Research Spotlight: Hypoxic-Ischemic Brain Injury (HIBI)

A recent publication published in the Journal of General Internal Medicine highlights one of the life-altering impacts of surviving an overdose. This study analyzed hospital data and compared patients who overdosed and were diagnosed with a HIBI against patients who overdosed but didn't have a HIBI. HIBI occurred in 5.1% of hospitalizations for overdose. Patients with an overdose-related HIBI were most likely to be discharged to a skilled nursing facility, rather than sent home. This is likely related to the fact that 86% of overdose survivors with HIBI had extreme loss of function (e.g., coma, seizures, feeding tube, ventilator, or organ failure). However, among overdose survivors without HIBI, 34% still faced extreme loss of function.

Overdose-related service utilization

Harm reduction services

Harm reduction programs play a key role in reducing opioid-involved overdose deaths. Harm reduction programs provide safer consumption and overdose prevention supplies to people who use drugs (e.g., syringes, naloxone). They also provide access to infectious disease prevention and connect people who use drugs to substance use treatment, recovery, and mental health services. Harm reduction programs emphasize overdose prevention and safer use strategies, understanding that people who use drugs deserve access to safety and care.



** Note that encounters dropped during the COVID-19 Pandemic due to social distancing (below, blue line), but programs continued to get naloxone into the community, as indicated by the above, orange line.*

"I'm a fierce advocate that every woman, man, child, uncle, grandmother in the world should have access to it [naloxone]. It's just too many unnecessary deaths. […] Everybody should have it. They should have it for free, but in bulk on the street corners, just for people to use. It's needed, especially in my community."

— Harm Reduction Worker (Holyoke, 2024); Collected by Brandeis University

DPH funds two naloxone through two initiatives: the Community Naloxone Program (CNP) and the Overdose Education and Naloxone Distribution (OEND) program. In 2024, CNP and OEND programs distributed a combined total of 148,527 naloxone kits via 114,024 distribution encounters with community members. While the data are certainly an undercount, programs received 7,304 voluntary reports of overdoses reversed using program naloxone in 2024. The majority of OEND programs are based out of Syringe Service Programs (SSPs) and provide other lifesaving services to PWUD. SSPs provided over 5 million sterile syringes and conducted 3,325 HIV tests for program participants in 2024. The number of people who received CNP and OEND naloxone was over five times the number lost to opioid-involved overdose in Massachusetts that year. The Community Profile displays an updated naloxone saturation indicator on the Data to Action page, based on research conducted by the PROFOUND Study.[40]

Program Spotlight: Mobile Addiction Services Increase Access to Harm Reduction

In 2024, DPH contracted six Mobile Addiction Services programs in a unique public-private partnership with the Kraft Center for Community Health. This program is based on the success of an initial pilot by Boston Health Care for the Homeless. Mobile Addiction Services programs provide harm reduction, primary, and preventive care, and addiction services from mobile health units that drive around to meet participants where they are. In 2024, providers on these five vans had 18,158 encounters with over 8,000 unique clients. These vans also served 2,077 unique patients who got buprenorphine through the van.

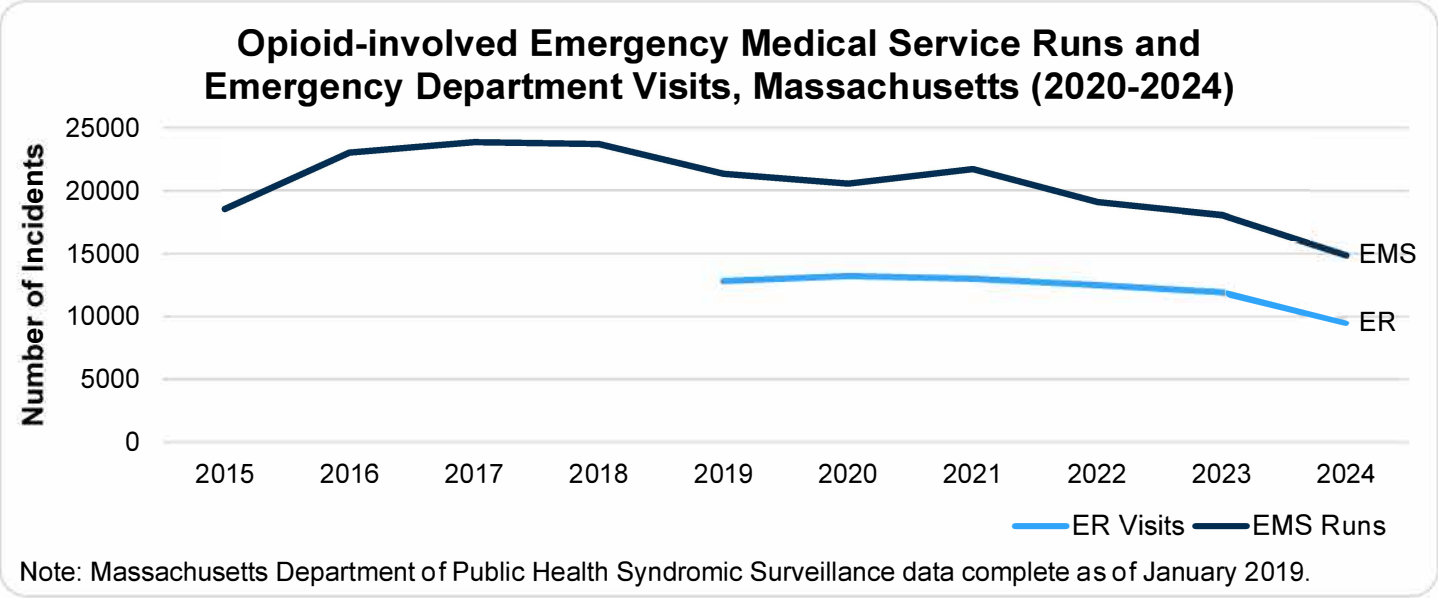
In addition to community-distributed naloxone, DPH supports naloxone distribution through first responder and pharmacy pathways. In 2024, DPH subsidized 12,838 naloxone kits for first responders (police, fire, and EMS agencies) to use for emergency overdose response. Additionally, the DPH Naloxone Standing Order acts as a statewide prescription for all residents and authorizes licensed pharmacists to dispense naloxone rescue kits to a person at risk of experiencing an opioid-related overdose, family member, friend or other person in a position to assist a person at risk of experiencing an opioid-related overdose. In 2024, 49,973 naloxone kits were received via prescriptions filled at Massachusetts pharmacies.

Emergency medical service and emergency room utilization

DPH continues to monitor non-fatal opioid-involved overdoses via Emergency Medical Service (EMS) runs and Emergency Department (ED) visits. While this service utilization allows us to estimate trends over time, it only provides data on those overdoses that result in medical encounters in Massachusetts. Typically, 50% or fewer non-fatal overdoses result in an EMS or emergency department encounter.[41] Thus, service utilization data are a good indicator of burden to EMS agencies and hospitals but do not accurately represent the number of nonfatal opioid-involved overdoses that occur each year.

In 2024, there were 14,876 EMS runs for opioid-involved incidents. This includes any 911 call where opioids were involved; not all events were clinical overdoses, and not all were nonfatal. While opioid-

involved EMS runs increased from 2020 to 2021, numbers have decreased every year since, including a 19% decrease from 2023 to 2024. In 2024, the median time for EMS to arrive at the scene of an opioid-involved incident after the EMS agency was notified was 5 minutes, and patients received naloxone from either a bystander or first responder in 67% (9,962) of responses.



Note: Massachusetts Department of Public Health Syndromic Surveillance data complete as of January 2019.

In 2024, there were 9,529 opioid-involved overdose ED visits. Part of the reason that these ED visits are lower than EMS runs is because 15% of EMS runs did not result in transport to a hospital. This may be because the patient opted out of transport, service providers determined that the patient did not require transport to the hospital (e.g., field-based care was sufficient), or the patient was dead upon EMS arrival at the scene. A limitation to interpreting the available data is that opioid-involved EMS runs include any incident involving opioids, not limited to overdoses, and ED visits are limited to opioid-involved overdose visits.

The number of opioid-involved ED visits has decreased since 2020, including a 20% drop from 2023 to 2024. In 2024, opioid-involved ED visits represented only 8% of substance-related visits. Alcohol was involved in 80% (89,480) of substance-related visits in 2024, and alcohol-involved visits have been increasing over the same period. The evolving landscape of which substances are involved in increased service utilization remains a key area of data monitoring for DPH.

Policy Spotlight: DPH Expands Treatment Options for EMS Agencies

To address barriers to accessing MOUD, there is growing interest in the expansion of pre-hospital buprenorphine to mitigate opioid withdrawal symptoms resulting from naloxone administration. While DPH's Office of Emergency Medical Services (OEMS) enacted protocol STP 6.18 in 2023, allowing ambulance services to administer buprenorphine to patients experiencing opioid withdrawal, there has been little uptake of the protocol. In the upcoming year, DPH plans to do a study with EMS providers to understand barriers to MOUD initiation in the field.

Summary and next steps

For this report, DPH has blended opioid-involved overdose death data with hypotheses for the changes, drug supply data collected by Brandeis University, qualitative data from the Exploring Community Knowledge Study, and service utilization data. Using this approach has allowed for interdisciplinary data interpretation across DPH with substantial input from our research and community partners. Below, we outline key lessons learned and areas for future action.

Key lessons learned

1. **There is no single cause for the decline in opioid-involved overdose deaths:** As detailed in the "Hypotheses for the 2024 drop in overdose deaths" section, the decline in opioid-involved overdose deaths is likely due to multiple, intersecting factors. Changes to the drug supply may have contributed to the decrease in deaths; however, the supply remains unpredictable and deadly. DPH also hypothesizes that the decline is related to changes in who is using drugs. We outlined patterns indicating fewer young people entering the risk pool and an aging population of people who use opioids. We also described how there may be less risk of death due to increased awareness of overdose safety practices. Finally, DPH points to the expansion of overdose prevention and treatment services as contributing to the 2024 decrease in opioid-involved overdose deaths. Despite this reduction, Massachusetts is still in a state of crisis as three people die from preventable opioid-involved overdose every day.

2. **Intersectional data analysis is critical to develop population-focused services**: Reviewing these data by sex at birth, race and ethnicity, age and generational cohort, geography, and occupation allows for a deeper understanding of who is dying from opioid-involved overdose. Focusing resources on geographic areas and demographics that are most impacted allows for a more precise approach to reducing opioid-involved overdose deaths. In Massachusetts, this includes males; Black, Hispanic, and Indigenous communities; those born between 1965 and 1996; those living in the most rural parts of the state; and those working labor-intensive, injury-prone jobs (e.g., construction, fishing).

3. **Integration of overdose prevention interventions into the substance use and mental health continuum of care is key to reducing opioid-involved overdose deaths:** Access to overdose prevention tools (e.g., SafeSpot, StreetCheck), drug use safety education, and MOUD prevents and reduces opioid-involved overdose deaths. Anyone who seeks support related to opioid use should be provided with overdose prevention education about the risk factors outlined in this report.

A decline in opioid-involved overdose deaths is encouraging, but to sustain the decline, the work needs to continue with the same level of creativity, innovation, and commitment as when the Commonwealth initially declared a public health emergency related to the overdose crisis.

Key areas for future research

1. **Enhance opioid-involved data:**
    a. **Timely data**: This report is focused on opioid-involved overdose deaths that occurred in 2024 and was published at the beginning of 2026. DPH will investigate how to increase timeliness of reporting and identify obstacles within our control. In 2026, DPH hopes to release an overdose alert system to notify municipalities of overdose spikes in their geographic region in a timely manner.
    b. **Geographic "clustering"**: County, city, and town lines do not reflect where people live, use substances, seek services, and travel. Refined grouping of geographic regions can provide a clearer picture of geospatial drug use and overdose dynamics. There are multiple tools available via geographic information systems (GIS) that would improve our understanding of geographic trends. Groupings based on shared demographics, proximity, and population mobility may help reveal regional "epicenters" as well as surrounding communities that experience related patterns.
    c. **Public Health Data Warehouse**: The PHD is a key tool for understanding opioid-involved overdose deaths. With new data sources coming to the PHD, the relationship between socioeconomic status and opioid-involved overdose outcomes can be further explored. DPH is actively working on incorporating expanded service utilization information into the PHD. Information on how and where overdose decedents are interacting with systems allows for an expanded understanding of opportunities to enhance overdose prevention. DPH is especially interested in those who have limited or non-traditional touchpoints with our systems prior to overdose death.[42]
2. **Expand focus beyond opioid-involved overdose deaths:**
    a. **Beyond "opioid-involved":** This report focused on opioid-involved overdose deaths. However, based on the Community Profile, alcohol and stimulants are also significant areas of morbidity and mortality concern and need to be further explored.
    b. **Beyond "overdose deaths":** This report does not address impacts of non-fatal overdose, such as HIBI, which significantly impact quality of life, and other trauma. Therefore, the true impact of opioid use is not fully represented in this report. DPH plans to explore other opioid-involved health impacts via our health care utilization datasets (EMS and ED visits), and qualitative research. Additionally, DPH will consider using alternative measures to assess the population health impacts of drug use, such as Disability Adjusted Life Years (DALYS) or Quality Adjusted Life Years (QALYS).
3. **Include cost-effectiveness analyses:** Quantifying the cost burden of opioid-involved overdoses (e.g., health care expenses, emergency response costs) and economic benefits of overdose prevention services ensures that policymakers can invest in the most efficient use of resources. Financial insights can refine our understanding of the overdose crisis beyond the health and emotional toll. This is especially important in a changing fiscal climate.

Definitions of acronyms

Acronym	Meaning of Acronym
ADD	Attention Deficit Disorder
ADHD	Attention-Deficity/Hyperactivity Disorder
BCHAP	Bureau of Community Health and Prevention
BHCSQ	Bureau of Health Care Safety and Quality
BIDLS	Bureau of Infectious Disease and Laboratory Sciences
BSAS	Bureau of Substance Addiction Services
CDC	Centers for Disease Control and Prevention
CNP	Community Naloxone Program
COPD	Chronic Obstructive Pulmonary Disease
DALYS	Disability Adjusted Life Years
DPH	Department of Public Health
ECKS	Exploring Community Knowledge Study
ED	Emergency Department
EMS	Emergency Medical Services
FDA	Food and Drug Administration
HIBI	Hypoxic-Ischemic Brain Injury
ICH	Institute for Community Health
MA	Massachusetts
MADDS	Massachusetts Drug Supply Data Stream
MATRIS	Massachusetts Ambulance Trip Record Information
MOUD	Medications for Opioid Use Disorder
NAICS	North American Industry Classification System
OCD	Obsessive Compulsive Disorder
OEMS	Office of Emergency Medical Services
OEND	Overdose Education and Naloxone Distribution
OHDSI	Office of Health Data, Strategy, and Innovation
OTP	Opioid Treatment Program
OUD	Opioid Use Disorder
PHD	Public Health Data Warehouse
PMP	Prescription Monitoring Program
PWUD	People who use Drugs
QALYS	Quality Adjusted Life Years
RVRS	Registry of Vital Records and Statistics
SSP	Syringe Service Program
START	Stimulant Treatment and Recovery Team
SUD	Substance Use Disorder
SUDORS	State Unintentional Drug Overdose Reporting System
SyS	Syndromic Surveillance System
TBI	Traumatic Brain Injury
UMDI	UMass Donahue Institute

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