Data Brief: Opioid-Related Overdose Deaths among Massachusetts Residents

This report contains both confirmed and estimated data through March 31, 2023. Figure 1 shows the month-by-month estimates for fatal opioid-related overdoses for all intents from October 2021 to March 2023. Preliminary data for 2022 shows that there were 2,310 confirmed opioid-related deaths, and DPH estimates that there will be an additional 46 to 48 deaths, totaling approximately 2,357 confirmed and estimated opioid-related overdose deaths. Preliminary data from January-March 2023 show there were 522 confirmed and estimated opioid-related overdose deaths.

Figure 1. Opioid-Related Overdose Deaths, All Intents by Month
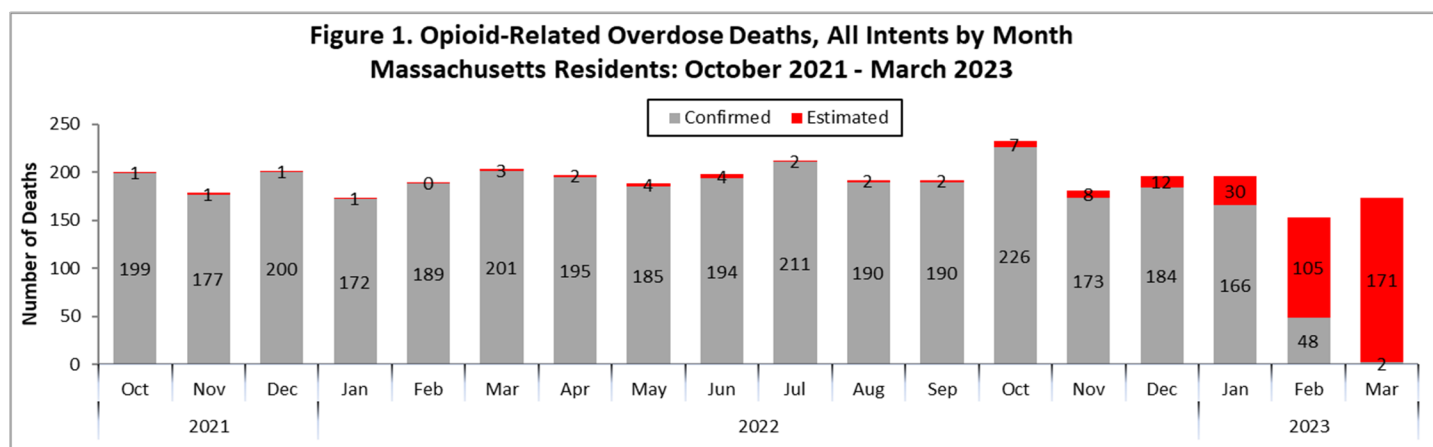Massachusetts Residents: October 2021 - March 2023

Figure 2 shows the trend in annual number of confirmed and estimated cases of opioid-related overdose deaths for all intents from 2000 to 2022. To obtain timelier estimates of the total number of opioid-related overdose deaths in Massachusetts - confirmed and estimated - DPH used predictive modeling techniques for all cases not yet finalized by the Office of the Chief Medical Examiner (OCME). Based on the data available as of April 25, 2023, there were 2,310 confirmed opioid-related overdose deaths in 2022 and DPH estimates that there will be an additional 46 to 48 deaths, totaling approximately 2,357 deaths once all cases are finalized. There were 57 more confirmed and estimated deaths in 2022 compared with 2021.

Figure 2. Opioid-Related Overdose Deaths, All Intents
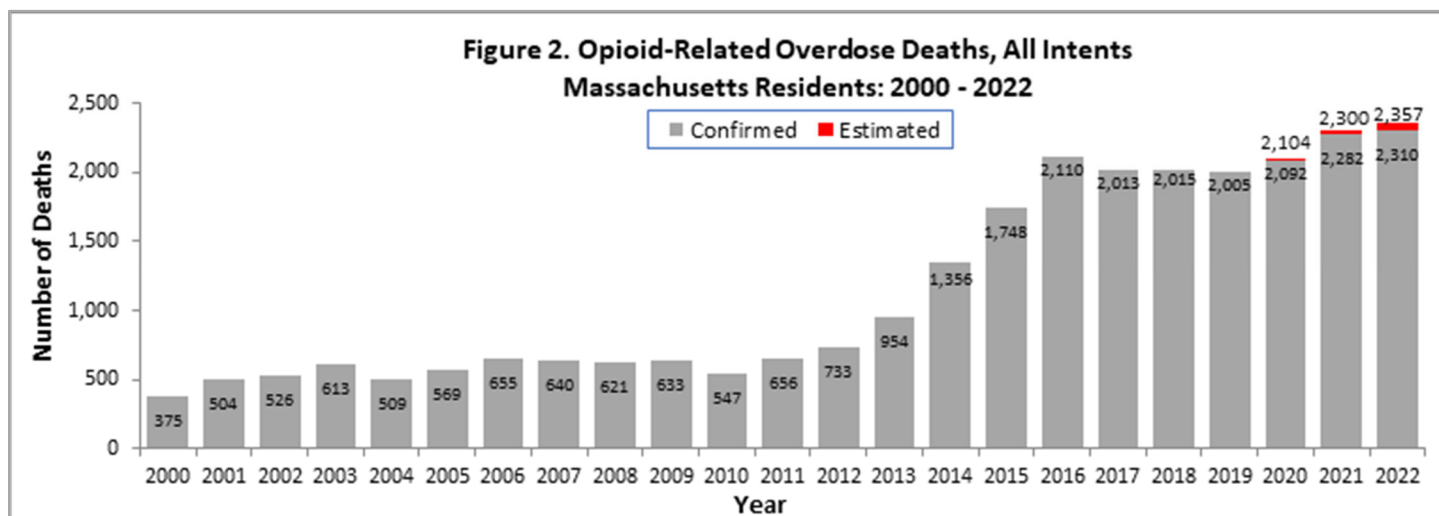Massachusetts Residents: 2000 - 2022

Figure 3 shows that the 2022 opioid-related overdose death rate (33.5 per 100,000 people) is 9% higher than in 2016 (30.7 per 100,000 people) and is a 2.5% higher than 2021 (32.7 per 100,000 people). While the increase from 2021 was not statistically significant, the increase from 2016 was. Joinpoint analysis indicated that there were statistically significant increases in opioid overdose death rates from 2012 to 2015 at a rate of 39% per year and that the rate has remained stable since 2016 (trend was not statistically significant).

Figure 3. Rate of Confirmed and Estimated Opioid-Related Overdose Deaths, All Intents
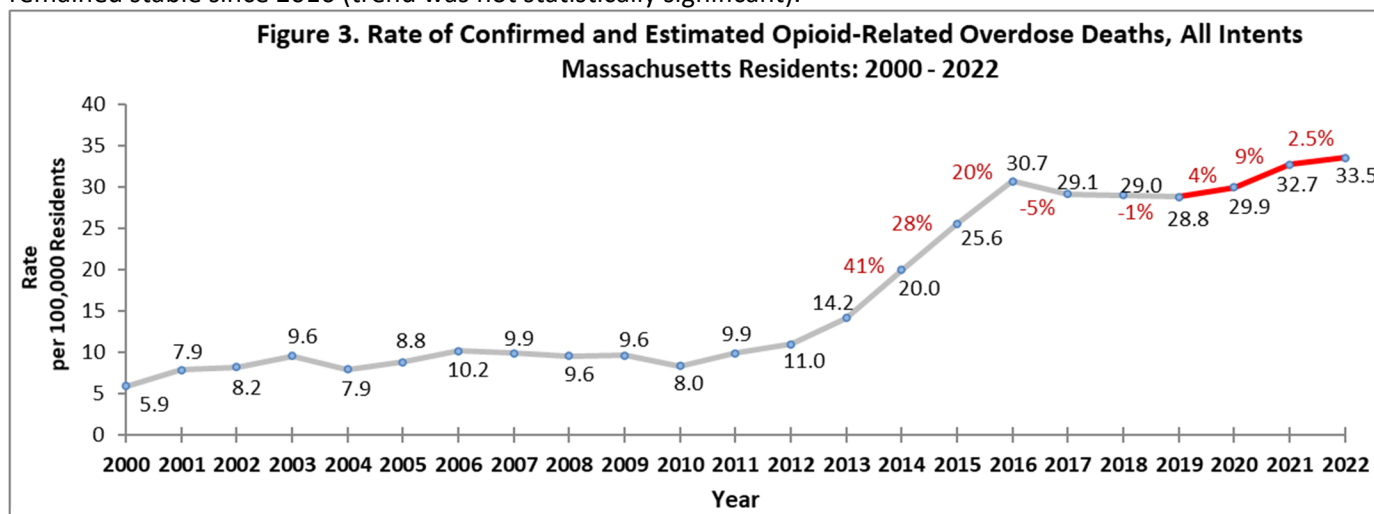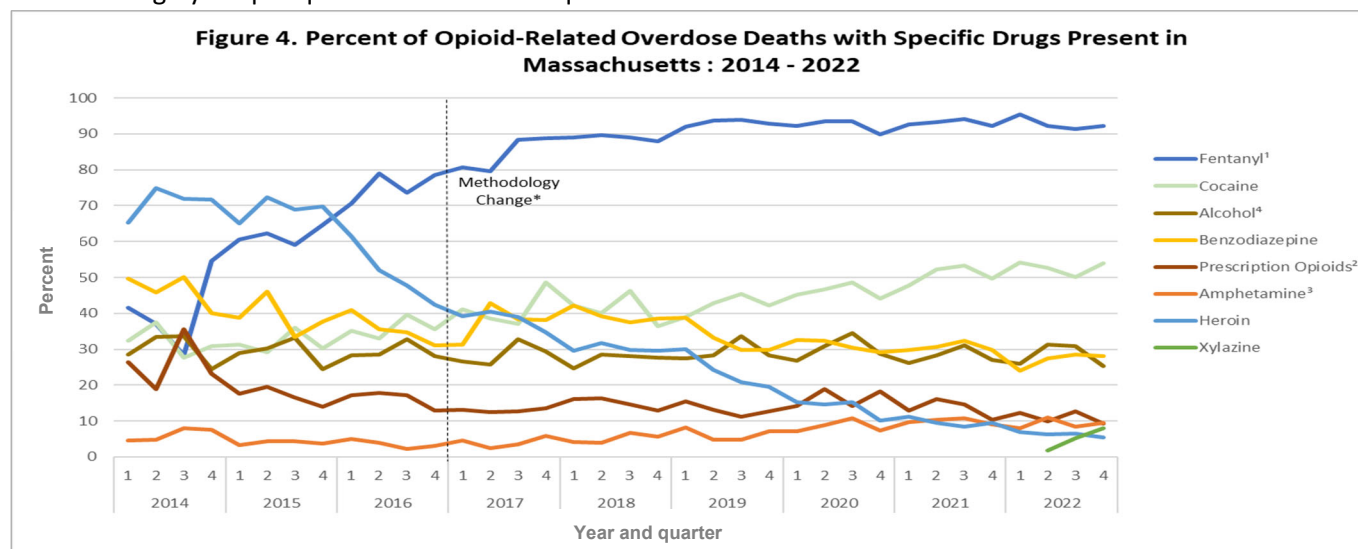Massachusetts Residents: 2000 - 2022

Figure 4 shows that in 2022 there were 2,160 opioid-related overdose deaths where a toxicology screen was also available. Among these deaths, fentanyl was present in 93%, cocaine in 53%, alcohol in 28%, benzodiazepines in 27%, prescription opioids in 11%, amphetamines in 9%, heroin in 6%, and xylazine in 5%. Fentanyl increased dramatically through the second quarter 2016 and has increased at about 1% per quarter ever since. Notably, the presence of stimulants in toxicology have increased since 2014: Cocaine has increased at about 2% per quarter since 2014, and amphetamines have increased about 5% per quarter since third quarter 2016. Heroin or likely heroin decreased by 6% per quarter between second quarter 2015 and 2019; and by 10% ever since 2019. The percentage of benzodiazepine has been declining by 2% per quarter since the last quarter in 2017.

Figure 4. Percent of Opioid-Related Overdose Deaths with Specific Drugs Present in Massachusetts : 2014 - 2022

* Beginning with the November 2019 report, DPH began to use a new method to identify substances present in the toxicology data, which can only be applied from 2017 onward; this new method cannot be applied to the older data
1. This is most likely illicitly produced and sold, **not** prescription fentanyl
2. Prescription opioids include: hydrocodone, hydromorphone, oxycodone, oxymorphone, and tramadol
3. Beginning with the February 2020 report, amphetamine includes both amphetamine and methamphetamine; methamphetamine was previously excluded
4. Beginning with the February 2021 report, a category for alcohol was added
5. Beginning with the December 2022 report, a category for xylazine was added
Please note that previous estimates may change slightly as DPH routinely receives updated toxicology data from the Office of the Chief Medical Examiner and the Massachusetts State Police.

Fentanyl is a synthetic and highly potent opioid that is in the drug supply in Massachusetts. Most of the fentanyl in Massachusetts is due to illicitly produced fentanyl, not diverted pharmaceutical fentanyl. The drug supply is volatile with variable concentrations of active substances, which can increase the risk of toxicity and overdose.

While screening tests can be used to note the rate at which certain drugs are detected in toxicology reports, they are insufficient to determine the final cause of death without additional information. The cause of death is a clinical judgment made within the Office of the Chief Medical Examiner.

New to this report, communities were classified according to the Massachusetts State Office of Rural Health's definition based on their population levels and proximity to urban areas. Towns classified as rural level 1 and rural level 2 are all rural communities, but towns in level 2 are less densely populated and more isolated from urban core areas. In 2022, rural level 2 communities had the highest age-adjusted opioid-related overdose death rate at 36.1 deaths per 100,000 residents (Figure 6). Between 2011-2016, age adjusted rates have increased at about 27% per year for urban/suburban communities and by 26% per year for communities classified as Rural Level 1. Rates for the most rural communities have been increasing by 15% since 2011.

Figure 6. Rate of Confirmed Opioid-Related Overdose Deaths by Rural Status, Massachusetts Residents: 2011 - 2022
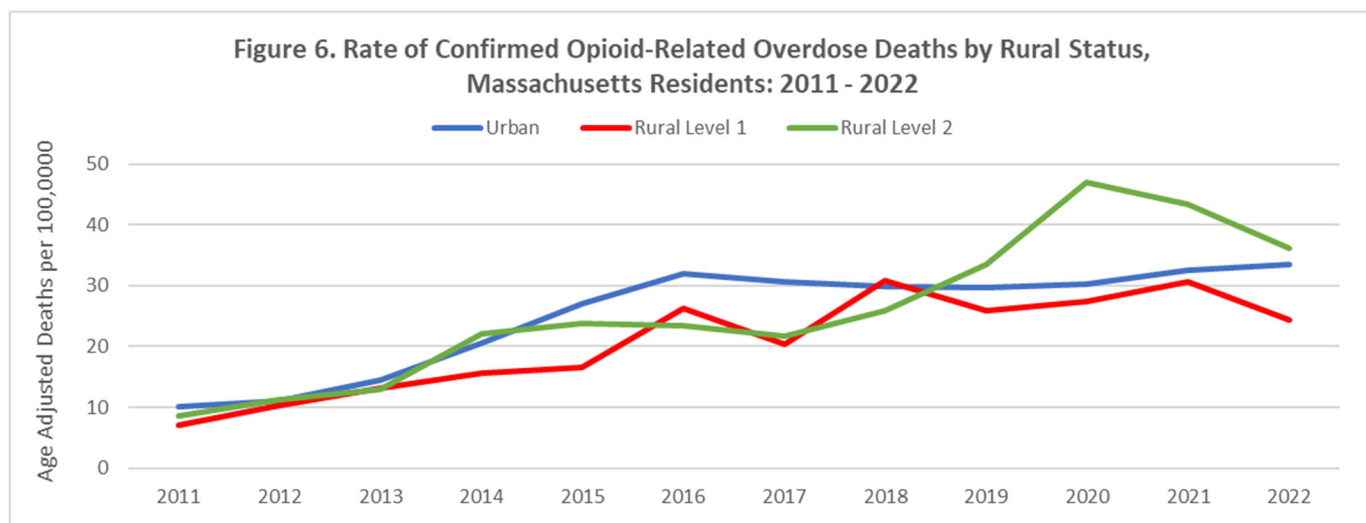
Note: For detailed information please refer to the companion data standard document and style guide located at: https://www.mass.gov/service-details/state-office-of-rural-health-rural-definition.
Rural towns are classified into two categories of rurality. Communities classified as rural level one (rural1) meet fewer rural criteria than Communities considered rural at level two (rural2).

- Communities in level two are less densely populated and more remote and isolated from urban core areas.
- Communities in level one and level two are both rural.
- Communities not in level one or two are considered urban.

Technical Notes

- Opioids include heroin, illicitly manufactured fentanyl, opioid-based prescription painkillers, and other unspecified opioids.
- Data for 2020-2022 deaths are preliminary and subject to updates.
- Beginning with the May 2017 report, DPH started reporting opioid-related overdose deaths for all intents, which includes unintentional/undetermined and suicide.
- Beginning with the August 2019 report, DPH updated the case definition used to identify opioid-related overdose deaths to match the CDC's case definition. The following International Classification of Disease (ICD-10) codes for mortality were selected from the underlying cause of death field to identify poisonings/overdoses: X40-X44, X60-X64, X85, and Y10-Y14. All multiple cause of death fields were then used to identify an opioid-related overdose death: T40.0, T40.1, T40.2, T40.3, T40.4, and T40.6.
- This report tracks opioid-related overdoses due to difficulties in identifying heroin and prescription opioids separately. The Department regularly reviews projections as more information becomes available. Information from the Office of the Chief Medical Examiner and the Massachusetts State Police are now incorporated into the predictive model. This additional information has improved the accuracy of the model that predicts the

likelihood that the cause of death for any person was an opioid-related overdose. DPH applied this model to death records for which no official cause of death was listed by the OCME. The model includes information from the death certificate, Medical Examiner's notes, and the determination by the State Police of a suspected heroin death. DPH added this estimate to the number of confirmed cases to compute the total number of opioid-related overdoses. Should new information become available that changes the estimates to any significant degree, updates will be posted.

Sources

- Massachusetts Registry of Vital Records and Statistics, MDPH
- Massachusetts Office of the Chief Medical Examiner
- Massachusetts State Police
- Population Estimates 2000-2010: National Center for Health Statistics. Postcensal estimates of the resident population of the United States, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2000-2010).
- Population Estimates 2011-2019, version 2020, Massachusetts Department of Public Health, Bureau of Environmental Health. Version 2020 years 2018-2019 apply updates from U.S. Census Bureau's County Population by Characteristics, vintage 2020; all previous years apply updates from U.S. Census Bureau's County Population by Characteristics, vintage 2019 or earlier. These estimates were developed by the University of Massachusetts Donahue Institute (UMDI) in partnership with the Massachusetts Department of Public Health, Bureau of Environmental Health.
- UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022.