



The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
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September 26, 2023

Steven T. James
House Clerk
State House Room 145
Boston, MA 02133

Michael D. Hurley
Senate Clerk
State House Room 335
Boston, MA 02133

Dear Mr. Clerk,

Pursuant to Section 138 of Chapter 126 of the Acts of 2022, the Fiscal Year 2023 General Appropriations Act, please find enclosed a report from the Department of Public Health entitled "*An Examination of Opioid-Related Overdose Deaths among Massachusetts Residents: 2019-2020.*"

Sincerely,

A handwritten signature in cursive script, appearing to read "R. Goldstein".

Robert Goldstein, MD, PHD
Commissioner
Department of Public Health

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MAURA T. HEALEY
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LIEUTENANT GOVERNOR



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SECRETARY

ROBERT GOLDSTEIN, MD, PhD
COMMISSIONER

An Examination of Opioid-Related Overdose Deaths among Massachusetts Residents: 2019-2020

July 2023

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Legislative Mandate

The following report is issued pursuant to Section 138 of Chapter 126 of the Acts of 2022, the Fiscal Year 2023 General Appropriations Act as follows:

(a) Notwithstanding any general or special law to the contrary, the secretary of health and human services, in collaboration with the commissioner of public health, shall conduct or provide for an examination of the prescribing and treatment history, including court-ordered treatment or treatment within the criminal legal system, of persons in the commonwealth who suffered fatal overdoses in calendar years 2019 to 2021, inclusive, and annually thereafter, and shall report in an aggregate and de-identified form on trends discovered through the examination. The secretary of health and human services may contract with a nonprofit or educational entity to conduct data analytics on the data set generated in the examination; provided, however, that the executive office shall implement appropriate privacy safeguards consistent with state and federal law.

(b) To facilitate the examination pursuant to subsection (a), the department of public health shall request, and the relevant offices and agencies shall provide, information necessary to complete the examination from the division of medical assistance, the executive office of public safety and security, the center for health information and analysis, the office of patient protection, the department of revenue and the chief justice of the trial court, which may include, but shall not be limited to, data from the: (i) prescription drug monitoring program established in [section 24A of chapter 94C](#) of the General Laws; (ii) all-payer claims database established in [section 12 of chapter 12C](#) of the General Laws; (iii) criminal offender record information database established in [section 172 of chapter 6](#) of the General Laws; and (iv) court activity record information system established in [section 9 of chapter 258E](#) of the General Laws. To the extent feasible, the department of public health shall request data from the Massachusetts Sheriffs Association, Inc. relating to treatment within houses of correction.

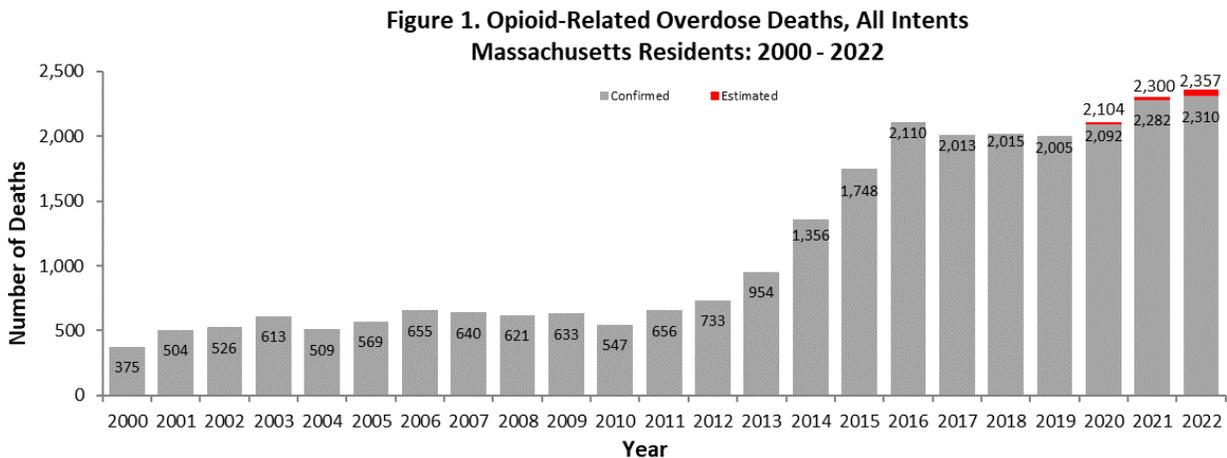
(c) Not later than July 1, 2023, and annually thereafter, the secretary of health and human services shall publish a report on the findings of the examination including, but not limited to: (i) the overall prescription history of the individuals, including both agonist and antagonist medications for opioid use disorder; (ii) the mental and behavioral health and substance use treatment history of the individuals, including an outcome comparison of voluntary versus involuntary treatment, controlling for other factors; (iii) structural factors that contribute to heightened risk of overdose including, but not limited to, employment status, housing status, criminal legal involvement, income, medical comorbidities including, but not limited to, bacterial or viral infections and substance use sequelae and other demographic markers including, but not limited to, race, ethnicity, age, gender identity, sexual orientation and immigration status; (iv) trends in the substances observed in overdose events; (v) whether the individuals had

attempted to enter but were denied access to mental or behavioral health or substance use treatment; (vi) whether the individuals had received past treatment for a substance overdose; and (vii) whether any individuals had been previously detained, committed or incarcerated and, if so, whether they had received treatment and treatment type during the detention, commitment or incarceration.

The reports shall be filed with the clerks of the house of representatives and senate, the house and senate committees on ways and means, the joint committee on mental health, substance use and recovery, the joint committee on public health and the joint committee on health care financing.

Executive Summary

Fatal drug overdoses, driven in Massachusetts by opioids, remain a persistent public health problem. From 2019 through 2021, 89% of all drug overdoses were opioid-related in Massachusetts. In 2022, an estimated record high 2,357 Massachusetts residents died of an opioid-related overdose.¹



The Public Health Data warehouse (PHD), which combines individually linkable data across 24 state and county data sources combined with three community level datasets, has been critical for generating insight on public health priorities not available from single sources of data. The PHD includes data related to public health, health care, public safety, criminal justice, and the Social Determinants of Health.

Contained in this report are the results of preliminary analyses that are responsive to the reporting requirements outlined in the legislation.

Continuing to provide accurate and detailed data analyses related to the opioid crisis in Massachusetts is critical to ensuring ongoing appropriate allocation of resources and access to care. We present this report so approaches to end the epidemic can continue be targeted effectively.

¹ [Massachusetts Department of Public Health. \(2023 June\). Data Brief: Opioid-Related Overdose Deaths among Massachusetts Residents. Mass.gov.](https://www.mass.gov/info-details/data-brief-opioid-related-overdose-deaths-among-massachusetts-residents)

Introduction

Section 138 of Chapter 126 of the Acts of 2022 requires an examination of the prescribing and treatment history, including court-ordered treatment or treatment within the criminal legal system, of persons in the commonwealth who suffered fatal overdoses in calendar years 2019 to 2021.

To facilitate this examination, the legislation specifies six agencies who shall provide data:

1. Division of Medical Assistance
2. Executive Office of Public Safety and Security
3. Center for Health Information and Analysis
4. Office of Patient Protection
5. Department of Revenue
6. Chief Justice of the Trial Court

It further specifies four datasets/databases to be included:

1. Prescription Monitoring Program
2. All-Payer Claims Database
3. Criminal Offender Record Information Database
4. Court Activity Record Information System.

It goes on to specify that to the extent feasible, the Department of Public Health (DPH) shall request data from the Massachusetts Sheriffs Association, Inc. relating to treatment within Houses of Correction.

Additionally, it directs reporting on this examination including, but not limited to seven areas:

1. the overall prescription history of the individuals, including both agonist and antagonist medications for opioid use disorder;
2. the mental and behavioral health and substance use treatment history of the individuals, including an outcome comparison of voluntary versus involuntary treatment, controlling for other factors;
3. structural factors that contribute to heightened risk of overdose including, but not limited to, employment status, housing status, criminal legal involvement, income, medical comorbidities including, but not limited to, bacterial or viral infections and substance use sequelae and other demographic markers including, but not limited to, race, ethnicity, age, gender identity, sexual orientation, and immigration status;
4. trends in the substances observed in overdose events;
5. whether the individuals had attempted to enter but were denied access to mental or behavioral health or substance use treatment;
6. whether the individuals had received past treatment for a substance overdose;
7. whether any individuals had been previously detained, committed or incarcerated and, if so, whether they had received treatment and treatment type during the detention, commitment, or incarceration.

The examinations required by this legislation are a natural extension of work that was initially conducted pursuant to Chapter 55 of the Acts of 2015 as amended by Chapter 133 of the Acts of 2016 and which is presently conducted utilizing the Public Health Data Warehouse (PHD) pursuant to Chapter 111 Section 237 of the General Laws.^{2,3,4} As such, DPH has determined that these examinations can best be accomplished by using and expanding the already existing PHD.⁵

This first report made pursuant to Section 138 will include a brief update on what data are currently included in the PHD, limitations of those data related to the Section 138 reporting requirements, details on what data need to be added to respond to the reporting requirements, and results where possible.

² [Massachusetts Department of Public Health. \(2016, September 15\). *An Assessment of Opioid-Related Deaths in Massachusetts \(2013 – 2014\)*. Mass.gov.](#)

³ [Massachusetts Department of Public Health. \(2017, August 16\). *An Assessment of Fatal and Nonfatal Opioid Overdoses in Massachusetts \(2011 – 2015\)*. Mass.gov.](#)

⁴ [Massachusetts Department of Public Health. \(2019, November\). *Impact of the Opioid Epidemic on High-Risk Populations and Maternal Health: Results from the Public Health Data Warehouse*. Mass.gov.](#)

⁵ [Massachusetts Department of Public Health. \(2023, January 19\). *Modernizing the Public Health Data Warehouse: Tracking Public Health Trends 2021*. Mass.gov.](#)

Background on the Public Health Data Warehouse

The [Public Health Data Warehouse \(PHD\)](#) is authorized by Section 237 of Chapter 111, and provides access to timely, linkable, longitudinal data from across state and local government agencies to enable secure analysis of priority population health trends. The PHD is a nationally recognized innovation, proven as an effective tool for accelerating data analysis and dissemination of actionable information to guide the Commonwealth’s response to priority public health issues. Section 237 mandates that the Department prioritize analyses of fatal and non-fatal opioid overdoses. Since the examination required by Section 138 aligns with the mandate in Section 237 and the PHD already includes much of the data – although not all -- needed to conduct the required examination for Section 138, DPH determined that this evaluation can best be accomplished by using and expanding the PHD instead of building a new system. The table below lists all datasets and years included in the PHD.

Table 1: PHD Datasets by Agency and Years of Data Available			
Datasets	State Agency	Years of data available	
1. Acute Care Hospital Discharge Data (Case Mix)	CHIA	2011-2021	
2. All Payer Claims Database	CHIA	2014-2020	
3. Bureau of Family Health and Nutrition: Early Intervention	DPH	2011-2017	
4. Bureau of Family Health and Nutrition: WIC Program	DPH	2011-2020	
5. Bureau of Infectious Diseases and Laboratory Sciences: Hepatitis A Surveillance Data	DPH	2011-2020	
6. Bureau of Infectious Diseases and Laboratory Sciences: Hepatitis C Surveillance Data	DPH	2011-2020	INDIVIDUAL LEVEL DATA
7. Bureau of Infectious Diseases and Laboratory Sciences: HIV Surveillance Data	DPH	2013-2020	
8. Bureau of Substance Addiction Services Treatment Data	DPH	2011-2020	

9.	Executive Office of Housing and Livable Communities: Emergency Assistance Program Data	EOHLC	2010-2021
10.	Department of Industrial Accidents: Workers Compensation	DIA	2011-2020
11.	Department of Mental Health: Treatment Data	DMH	2011-2020
12.	Department of Correction: Prison Data	DOC	2011-2020
13.	Department of Transitional Assistance: SNAP Benefits Data	DTA	2011-2020
14.	Essex County Jail Data	MSA	2011-2020
14.	Executive Office of Veterans' Services: Benefits Data	EOVS	2011-2020
16.	Franklin County Jail Data	MSA	2011-2020
17.	Hampden County Jail Data	MSA	2011-2021
18.	Hampshire County Jail Data	MSA	2011-2020
19.	HOC MOUD Program	DPH	2019-2020
20.	Massachusetts Cancer Registry: Cancer Incidence Data	DPH	2011-2019
21.	Middlesex County Jail Data	MSA	2011-2020
22.	Norfolk County Jail Data	MSA	2011-2021

	23.	Office of the Chief Medical Examiner: Circumstances of Death Data	OCME	2014-2020
	24.	Office of the Chief Medical Examiner: Postmortem Toxicology Data	OCME	2014-2020
	25.	Office of Emergency Medical Services: Massachusetts Ambulance Trip Record Information System	DPH	2013-2020
	26.	Prescription Monitoring Program	DPH	2011-2020
	27.	Registry of Vital Records and Statistics Dataset: Birth Certificates	DPH	2011-2021
	28.	Registry of Vital Records and Statistics Dataset: Death Certificates	DPH	2011-2020
	29.	Registry of Vital Records and Statistics Dataset: Fetal Death Certificates	DPH	2011-2021
	30.	Suffolk County Jail Data	MSA	2011-2021
COMMUNITY LEVEL DATA	31.	High Intensity Drug Trafficking Areas Drug Seizure Data	HIDTA	2019-2021
	32.	Index of Concentration at the Extremes Measures (spatial social polarization metric)	ACS (US Census)	2014-2018
	33.	Overdose Education and Naloxone Distribution Program: First Responder Naloxone Data	DPH	2011-2020
	34.	Overdose Education and Naloxone Distribution Program: Naloxone Enrollments	DPH	2011-2020
	35.	Overdose Education and Naloxone Distribution Program: Naloxone Refills	DPH	2011-2020
	36.	Overdose Education and Naloxone Distribution Program: Naloxone Rescues	DPH	2011-2020

37.	UMASS Donahue Institute and American Community Survey: Population Estimates	ACS (UMass)	2011-2019
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Of the data-providing *agencies* outlined in the legislation, the PHD does not currently include data from the Office of Patient Protection, the Department of Revenue, or the Chief Justice of the Trial Court. Of the specific *datasets* outlined in the legislation, the PHD does not currently include the Criminal Offender Record Information database or the Court Activity Record Information System. Bringing data into the PHD for the first time is a significant process that requires coordination among legal, program, data, and IT staff from DPH and that data-providing agency. At the time of this report, DPH is still working to bring these new datasets into the PHD. The impact of not yet having these datasets in the PHD will be discussed separately in the seven areas of examination.

Complete 2021 data were not yet available at the time of this report, so all analyses are focused on 2020 and earlier. The 2021 data will be included in next year's report.

Analysis #1: Examination of the overall prescription history of the individuals, including both agonist and antagonist medications for opioid use disorder

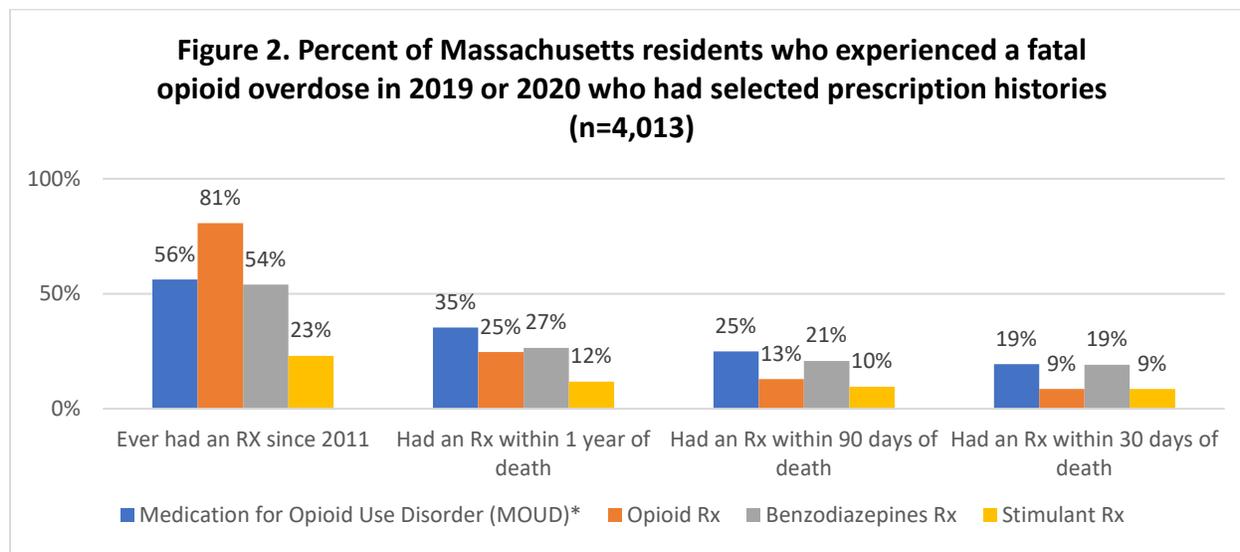
By linking Death Certificate Records with Prescription Monitoring Program data, All Payer Claims Data, the Bureau of Substance Addiction Services Treatment Data, and the Department of Corrections Prison Data, we can look back at the prescription histories of people who died of an opioid-related overdose.

- In 2019 - 2020, a total of 4,013 Massachusetts residents died of an opioid-related overdose and had a record in the PHD.
- Looking back to 2011 (the first year available in the PHD), over 80% had at least one opioid prescribed to them during that time.
- Within one year leading to their death, 25% had an opioid prescription, and within the 30 days leading to their death, 9% had an opioid prescription.
- In comparison, only slightly more than half of these individuals (56%) had methadone, buprenorphine, and naltrexone - collectively known as medications for opioid use disorder (MOUD)- prescribed to them since 2011.
- MOUD were only prescribed to 19% of individuals who died of an opioid overdose within the 30 days leading to their death.
- More than one third (37%) of those who had a fatal opioid overdose had a benzodiazepine prescription within one year of their death, and within the 30 days leading to their death, 19% had a prescription for a benzodiazepine.

Concurrent benzodiazepine prescriptions increase the risk of complications among individuals with opioid use disorder. Benzodiazepines are a class of depressant drugs used to treat conditions such as seizures, anxiety, and insomnia; however, when combined with opioids, they

increase the odds of a fatal opioid overdose as medications increase sedation and reduce respirations⁶.

The data show that the use of Medications for Opioid Use Disorder (MOUD) goes down as time between receipt of MOUD and opioid-related overdose narrows. While just over half of people received at least one MOUD looking back to 2011, this dropped to 35% at one year before death, 25% at 90 days before death, and 19% within 30 days of death. This shows a need for greater use of and retention in MOUD.



*MOUD includes buprenorphine, methadone, or naltrexone

Analysis #2: Examination of the mental and behavioral health and substance use treatment history of the individuals, including an outcome comparison of voluntary versus involuntary treatment, controlling for other factors

This is a complicated analysis, which requires the linkage of many datasets, some of which are already included in the PHD and some of which DPH is working on adding. Additionally, while the PHD includes some of the datasets required for this analysis, they do not include all the variables that are needed. DPH plans to begin conducting this analysis in 2024, once the additional datasets identified above including all the needed variables are included in the PHD. Without the full datasets and variables outlined below, the data may show a skewed understanding of involuntary versus voluntary treatment.

Specifically, as it relates to the comparison of voluntary versus involuntary treatment (i.e., “Section 35”), there are four agencies who have oversight of Section 35 facilities (the

⁶ [Reduce Risk of Opioid Overdose Deaths by Avoiding and Reducing Co-Prescribing Benzodiazepines. \(2019\). Medicare Learning Network \[White paper\]. Centers for Medicare and Medicaid Services.](#)

Department of Public Health (DPH), the Department of Mental Health (DMH), the Department of Correction (DOC), and Hampden County Sheriff’s Department (HCSD)), and the data on Section 35 commitments are in three different datasets and outlined in Table 2, below. Using the PHD for this analysis is critical, as it is the only place where data on Section 35 commitments from all these oversight agencies can be analyzed together with outcomes data (i.e., fatal overdoses).

Table 2. Data Sources by Agency	
Oversight Agency	Dataset
DPH	BSAS ¹ Treatment Dataset
DMH ²	DMH Mental Health Treatment Dataset
DOC ³	DOC Prison Release Dataset
HCSD ⁴	BSAS Treatment Dataset (data forthcoming)
1 Bureau of Substance Addiction Services 2 Department of Mental Health 3 Department of Correction 4 Hampden County Sheriff’s Department (HCSD)	

DPH was unable to report relevant information from the Hampden County Sheriff’s Department (HCSD) due to an anticipated lag between data submission and data integration into the PHD. DPH anticipates that next year’s report will be inclusive of necessary HCSD data.

DPH has been working diligently with the Department of Mental Health (DMH) to incorporate the relevant data that is needed to fulfill the reporting requirements of Section 138. The original DMH data submitted to the PHD related to Section 35 commitments was incorrect and to correct it necessitated updating the Data Use Agreement and associated documentation. Necessary DMH data will be incorporated into the PHD for next year’s report.

When data are received and linked in the PHD, DPH will conduct a comprehensive evaluation of outcomes for individuals who receive voluntary vs involuntary treatment, controlled for additional factors that may contribute to opioid-related overdose death.

Analysis #3: Structural factors that contribute to heightened risk of overdose including, but not limited to, employment status, housing status, criminal legal involvement, income, medical comorbidities including, but not limited to, bacterial or viral infections and substance use sequelae and other demographic markers including, but not limited to, race, ethnicity, age, gender identity, sexual orientation, and immigration status

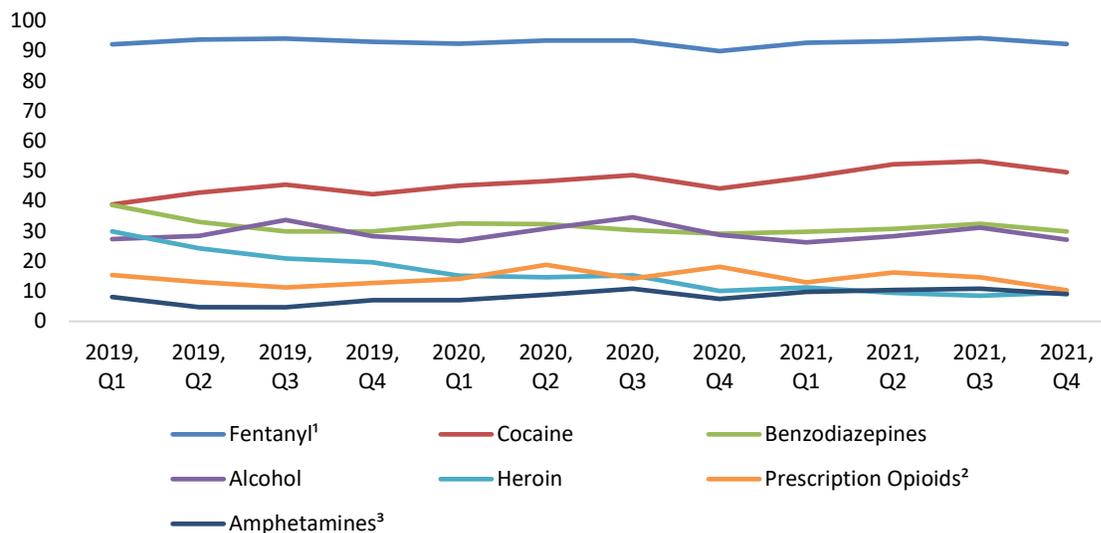
This analysis requires the linkage of many datasets, some of which are already included in the PHD and some of which DPH is working on adding. DPH plans to conduct this analysis in 2024, once the additional datasets identified above are included in the PHD.

Analysis #4: Trends in the substances observed in overdose events

By linking Death Certificate Records with Postmortem Toxicology results, we can analyze the trends related to what substances are present in opioid-related overdose deaths.

- In 2021, there were 2,119 opioid-related overdose deaths where a toxicology screen was also available.
- Among these deaths, fentanyl was present in 93%, cocaine in 51%, benzodiazepines in 31%, alcohol in 28%, prescription opioids in 14%, heroin in 10%, and amphetamines in 10%.
- The presence of fentanyl has remained high at over 90% since 2019.
- Notably, the presence of stimulants in toxicology has increased since 2019 - the presence of cocaine has increased by 2% per quarter, and the presence of amphetamines has increased 6% per quarter since 2019.
- The percentage of heroin or likely heroin present in opioid-related overdose deaths decreased by 11% per quarter since 2019.

Figure 3: Percent of Opioid-Related Overdose Deaths with Specific Drugs Present in Massachusetts: 2019 2021



1. This is most likely illicitly produced and sold, **not** prescription fentanyl

2. Prescription opioids include: hydrocodone, hydromorphone, oxycodone, oxymorphone, and tramadol

3. Amphetamine includes both amphetamine and methamphetamine

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.

Analysis #5: Whether the individuals had attempted to enter but were denied access to mental or behavioral health or substance use treatment

DPH cannot conduct this analysis with the data that are currently in the PHD and there are no data sources available that include information on people who were denied access to mental or behavioral health or substance use treatment.

Analysis #6: Whether the individuals had received past treatment for a substance overdose

By linking Emergency Medical Services (EMS), Hospitalization, Death, and BSAS records through the PHD, we can identify who had received medical treatment for a past overdose and who had received any treatment within the BSAS system.

- In 2019 and 2020, a total of 4,013 Massachusetts residents died of an opioid-related overdose and had a record in the PHD.
- Of these, 47% (1,855) had at least one prior opioid-related overdose before the fatal opioid-related overdose and 53% (2,158) had enrolled in BSAS treatment prior to their fatal overdose.

Figure 4: Percent of Massachusetts residents who experienced a fatal opioid overdose in 2019 or 2020 who experienced Medical Treatment for Past Opioid Overdose

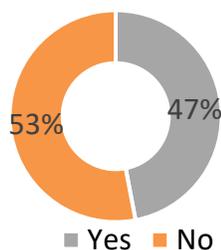
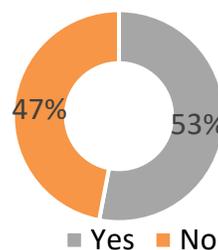


Figure 5: Percent of Massachusetts residents who experienced a fatal opioid overdose in 2019 or 2020 who were enrolled in BSAS Treatment Prior to Overdose



Analysis #7: Whether any individuals had been previously detained, committed or incarcerated and, if so, whether they had received treatment and treatment type during the detention, commitment, or incarceration.

Chapter 208 of the Acts of 2018 required DPH and the following five county houses of correction (HOCs) to participate in a pilot program offering broad access to FDA-approved medications for opioid use disorder (MOUD) to individuals housed within their facility:

1. Franklin County House of Correction
2. Hampshire County House of Correction
3. Hampden County House of Correction
4. Middlesex County House of Correction
5. Norfolk County House of Correction

As a part of this legislation, DPH must report annually on the outcomes for the MOUD programs that were established.

The following two additional HOCs were later added to this requirement in the Fiscal Year 2019 supplemental budget:

6. Essex County House of Correction
7. Suffolk County House of Correction

DPH is currently conducting an in-depth evaluation of these treatment programs and will be able to report on outcomes in 2024.

Conclusion

While the in-depth analyses required by this legislation could not be conducted in time for this first report, DPH leveraged the data already available in the PHD to conduct the preliminary analyses presented herein.

In summary:

- Results show that people who died of an opioid-related overdose in 2019 or 2020 were more likely to have had a prescription for certain drugs (MOUD, opioid, benzodiazepine, or stimulant) the further away in time from the death. Looking back to 2011, people were most likely to have had a prescription for an opioid, compared to the other drugs.
- From 2019 through 2021, people who died of an opioid related overdose most frequently had fentanyl present in their postmortem toxicology. This ranged from 90-95% by quarter.
 - The presence of heroin decreased from 30% in the first quarter of 2019 to 10% in the fourth quarter of 2021.

- Prescription opioids were present in 10-19% of these deaths.
 - Benzodiazepines were present in 29-39% of these deaths.
 - Cocaine was present in 39-53% of these deaths.
 - Amphetamines were present in 5-11% of these deaths.
 - Alcohol was present in 26-34% of these deaths.
- From 2019 through 2020, 47% of people who had died of an opioid-related overdose had received prior treatment (either by EMS or in the hospital) for a nonfatal opioid-related overdose.
 - Among those who died of an opioid-related overdose from 2019 through 2020, 53% had at least one enrollment in a program licensed or funded by BSAS since 2011.

In the next year, DPH will continue work to bring into the PHD the additional datasets needed to begin or refine the requested analyses.

###