HEALTH OF BOSTON 2024

THE SUBSTANCE USE AND DISORDERS REPORT

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FOREWORD

Welcome to the Boston Public Health Commission's (BPHC) Health of Boston 2024: The Substance Use and Disorders Report. This is one of a series of reports providing disease-specific surveillance data on the health of Boston. It aims to provide residents, medical and public health professionals, health policy makers, and community advocates with actionable information on the substance use experience of Boston residents.

The report highlights trends in rates of substance use-related hospitalizations and emergency department visits, admission to treatment for substance use disorder, substance use-related mortality, and use of substances among youth. Data sources include the US Census, death registries, hospital inpatient discharge databases, substance use disorder treatment admission databases, and surveys that describe individual health conditions and behaviors.

Individual characteristics, behaviors, experiences, and life circumstances play an important role in substance use. Substance use disorder (SUD) is a complex condition which is influenced by individual, social, economic, and environmental contexts. In addition to these determinants, lifelong exposure to racism, discrimination, and oppression may cause prolonged stress and increase the risk for substance use disorder.

For many of the data indicators that are presented in this report, trends over time are highlighted, as well as differences across neighborhoods and between sex and racial and ethnic groups. BPHC acknowledges the role of racism in creating and perpetuating systems of oppression that negatively impact social determinants of health and have resulted in the historic marginalization and subsequent inequities in health outcomes of Boston residents of color.

The state of Massachusetts issued an opioid related mortality report in December of 2023 which highlighted a number of concerns. This Health of Boston report provides an in-depth review of the state of substance use disorder in the city of Boston, from opioid-related mortality to other drug use and associated deaths, health care utilization, and treatment access.

We hope you find the information presented here useful in your own efforts to educate, inspire, advocate, and intervene in the interest of optimal health for all Boston residents.

DATA SUMMARY

Please note that the most up to date data available at the time of writing of this report were used in the analyses. For treatment admissions, hospitalizations, and the YRBS survey the most recent data year was 2021. For vital statistics (death data) the most recent data year was 2022.

Overall, from 2017 to 2021, there were increases in the rates of drug related hospital patient encounters (Figure 1) and substance use related deaths among Boston residents (Figure 12). These increases were largely driven by opioid and cocaine use.

Drug overdose mortality associated with use of fentanyl (a highly potent synthetic opioid) in combination with cocaine increased by 191% between 2012 to 2022 (Figure 20). Cocaine was present in more than half of all overdose-related deaths associated with fentanyl in 2022, and over 60% involved some combination with other opioids and/or cocaine (i.e., not fentanyl alone) (Figure 19). Fentanyl was present in 92% of all opioid overdose-related deaths and 81% of all drug overdose deaths in 2022. Boston residents who use opioids other than prescribed (excluding fentanyl and/or cocaine) are still at risk of a fentanyl overdose due to the increased presence of fentanyl in the drug supply.

From 2017 to 2022, substance use related mortality and non-fatal overdoses disproportionately impacted Black and Latinx individuals in Boston. Black residents experienced the greatest increase in substance use related mortality (alcohol and drugs) compared to other racial/ethnic groups (Figure 12). In 2021, Black residents experienced higher rates of non-fatal opioid and cocaine overdoses, and Latinx residents experienced higher rates of non-fatal opioid overdoses, compared to White residents (Figure 5). Further, in 2022, Black residents experienced the highest rate of fatal overdoses from any drug when compared to other racial/ethnic groups (Figure 22). Similarly, Latinx residents experienced significantly higher rates of fatal opioid-related and cocaine-related overdoses than White residents in 2022 (Figure 22). Of note, in 2022 the drug overdose death rate was 63% lower and the opioid related overdose death rate was 64% lower for female residents compared to male residents (Figure 23).

From 2017 to 2021, treatment admissions for all major substance types (alcohol, cocaine, opioids, and marijuana) decreased for Boston residents overall, and across all racial/ethnic groups presented in this report (Figure 8).

From 2017 to 2021, we observed three distinct trends related to substance use. Admissions to treatment for substance use increased from 2017 to 2019 and decreased from 2019 to 2021 (Figure 7); substance use related hospitalizations and ED visits slightly decreased from 2017 to 2021 (Figure 1) (though hospitalizations and ED visits related to drug use specifically slightly

increased in the same period); substance use related deaths increased from 2017 to 2022 (Figure 12). There are a few reasons why this may be the case. The COVID pandemic led to disruptions in access to harm reduction, treatment, recovery services, and general health care. In addition, the rise in substance use related deaths from 2019 to 2020 could reflect the influence of various pandemic-related factors such as increased levels of stress, changes in drug use patterns due to stay-at-home isolation orders (e.g., using alone and not having anyone around to administer overdose reversal medication), reduced access to overdose reversal interventions, and changes in the types, combinations, or purity of drugs that increased the risk of overdose.

Xylazine, a non-opioid sedative/tranquilizer, has been increasingly identified among fatal drug overdoses nationally. Routine screening for xylazine among overdose deaths in Massachusetts did not commence until June 2022. Subsequent analysis revealed fewer than five Boston resident overdose deaths associated with xylazine identified during 2022 (data not shown). The Boston Public Health Commission will continue to monitor trends in xylazine-related overdoses going forward and disseminate findings as more data are collected.

A comparison of substance use-related death before and after the COVID-19 pandemic indicates an increase in a majority of Boston neighborhoods. The highest increases were observed in Dorchester (02121, 02125), Jamaica Plain, and Mattapan. In both the 2017-2019 and 2020-2022 time periods, substance use-related mortality was disproportionately concentrated in the neighborhoods of the South End, Roxbury, and Dorchester (Figures 13 and 14). These neighborhoods border, or are in close proximity to, the street intersection of Massachusetts Avenue and Melnea Cass Boulevard (also known as “Mass and Cass”). Considered by many to be the epicenter of the state’s opioid crisis, where numerous unhoused and unsheltered individuals, many experiencing substance use and/or mental health disorders, inhabit and seek services on Mass and Cass and surrounding areas. COVID-19 and the affordable housing crisis exacerbated and made more public the presence of the opioid epidemic in Boston within the Mass and Cass area. However, it is important to note that substance use-related deaths occur in all neighborhoods of Boston, and resources aimed at helping to prevent such deaths should be devoted to neighborhoods throughout Boston.

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INTRODUCTION

Substance use disorder (SUD) is a treatable, chronic condition characterized by an ongoing pattern of use of a substance or multiple substances that can lead to a reduced quality of health, social function, and psychological well-being (1). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), a diagnosis of SUD may include 11 criteria that indicate psychological and/or physiological dependence on a substance (2). Psychological dependence is indicated by impaired personal control of usage, risky use (i.e., putting oneself in dangerous circumstances to acquire the substance), and potentially harmful interpersonal consequences. Physical dependence is indicated by the development of tolerance to the substance and physical withdrawal symptoms. Tolerance develops when an individual becomes habituated to a substance such that increased doses are needed to achieve the same effect, while withdrawal includes severe physical and mental symptoms that occur after stopping or reducing the intake of a substance (i.e., nausea, vomiting, diarrhea, seizures, and/or hallucinations). The number of criteria met from the DSM-5 diagnosis indicates the severity of the condition, which can range from mild to severe (2).

Public laws determine which drugs are legal and illegal for consumption, while cultural and societal factors determine which substances and what extent of use are acceptable (3). In general, the initial stages of SUD are characterized by more frequent use, increasing the amounts of the substance used, and instances of positive reinforcement, where a person obtains a desired experience like uplifted mood, analgesia, or sociability (4). In 2021, 46.3 million people aged 12 years or older in the US, or 16.5% of the population, met the DSM-5's criteria for having SUD (5). This included 29.5 million people who met criteria for alcohol use disorder and 24 million people who met criteria for a drug use disorder. In the same year, 61.2 million, or 21.9% of people over the age of 12 years in the US reported using an illegal drug at least once in the past year (5).

Drug Overdose and the Opioid Epidemic

An overdose can occur if a toxic level of a substance is consumed such that the overload overrides the brain and body's ability to function properly (6). Drug overdoses can be fatal, and non-fatal overdoses can result in short- and long-term health consequences (7). A wide range of drugs can cause an overdose including opioids, alcohol, benzodiazepines, and stimulants. Symptoms of overdose vary widely depending on the substance involved (6). Some risk factors for an overdose may include low drug tolerance to the substance (especially among people who have spent time in jail, in a treatment center, or who have been abstinent for a long time),

intravenous injection, mental and physical health conditions, being unaware of the potency or purity of the substance, mixing substances, or using alone (6). People who have had one overdose are more likely to have another (7).

Overdose deaths are a leading cause of injury-related deaths in the US, with most of these deaths involving opioids (8). In 2021, a record number of more than 106,000 people died from a drug-involved overdose (8). This included 70,601 deaths involving opioids and 32,537 deaths involving stimulants (8). During the ongoing opioid epidemic, opioid-involved overdose deaths have increased from 21,089 in 2010, to 47,600 in 2017, and have continued to increase (8). In recent years most opioid-related overdose deaths have involved synthetic opioids (primarily fentanyl) and stimulants (8).

From 2009 to 2019, overdose deaths involving stimulant drugs increased by a dramatic 450% (9). By 2019, more than 75% of deaths involving cocaine, and half of deaths involving methamphetamine or other stimulants also involved an opioid (9). The rise in stimulant/opioid mortality is in some cases caused by the growing contamination of non-opioid drugs by fentanyl, an extremely potent synthetic opioid, in the illegal drug supply. Some people who use drugs intentionally use stimulants and opioids simultaneously. Rates of mortality from combining opioids and the type of stimulant vary by geography in the US, with higher rates of mortality from opioid/methamphetamine combinations in western states, while in eastern states higher mortality rates from opioid/cocaine combinations are found (9,10).

The COVID-19 pandemic has been associated with a significant increase in overdose deaths nationally and in Boston. The overdose death rate during the pandemic increased by 32% from 2019 to 2020 in the US (11). The death rate continuously increased throughout the pandemic with 68,630 deaths in 2020, and 80,411 deaths in 2021 (8,11). This rise can be attributed to various pandemic-related factors such as reduced access to interventions, increased levels of stress due to stay-at-home isolation orders, and loss of mental health support (12). The increased death rate is also attributed to changes in drug types and combinations, drug purity, and patterns of drug use that increased the risk of overdose among people who use drugs (12).

In Massachusetts, the opioid-related overdose death rate was 33.5 per 100,000 people in 2022, with 2,357 confirmed and estimated deaths. This represents a 9.1% increase from the pre-pandemic peak in 2016, and a 2.5% increase from 2021 (13). Among opioid-related overdose deaths in Massachusetts in 2022, polysubstance use was frequent; 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% (13).

Systemic Racism and Oppression

BIPOC (Black, Indigenous, People of Color) communities continue to experience a disproportionate burden of risks associated with SUD. Structural racism, including adverse childhood experiences (ACEs), poverty, and intergenerational trauma, is linked with a higher risk of substance use and overdose (14). ACEs are experienced by people of color at significantly higher rates than White people (14). Communities of color, particularly Black, Latinx, and indigenous communities with high rates of poverty, do not have the same access to resources needed for health as White communities. Opioid overdoses are concentrated in neighborhoods with higher rates of poverty and unemployment, lower education, and lower median household income (15).

From 2013 to 2018, the growth of opioid overdose deaths among Black Americans increasingly outpaced that of White Americans (11). In particular, overdose deaths from opioids in combination with a stimulant have increased among non-Latinx Black Americans at more than three times the rate as non-Latinx White Americans, especially in the eastern US (9). Between 2007 and 2019, mortality from opioids with cocaine increased by 575% among Black Americans, compared to a 184% increase among White Americans. Sharp increases in opioid/stimulant overdose mortality have also been observed in Latinx and Asian American communities (9).

In Massachusetts, non-Latinx Black residents and Latinx residents experienced a 42% and 16% increase, respectively, in opioid-related overdose deaths from 2021 to 2022; in comparison, non-Latinx White residents experienced a 14% decrease in opioid-related overdose deaths during the same period (13). When stratified by gender, non-Latinx Black men had the highest opioid-related overdose death rate increase among male residents in all race/ethnicity groups with a 41% increase, in comparison to a 9% decrease among non-Latinx White men. The death rate for non-Latinx Black women increased by 47%, compared to a 7% decrease among non-Latinx White women (13).

Harm Reduction

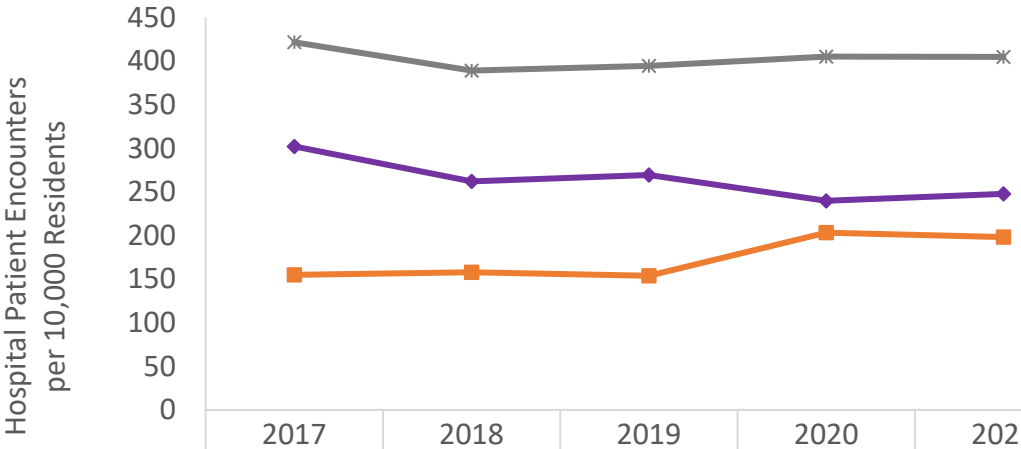
Since 2000, more than a million people have died from an opioid-related overdose in the US (16). Harm reduction is a pragmatic, compassionate, and evidence-based approach to lessening the harms associated with substance use (17). The primary goal of harm reduction is to save lives and protect the health of people with SUD and their communities.

Harm reduction practices can be implemented in a variety of settings including SUD treatment centers, support groups, and medical facilities (18). Specific practices include:

- Overdose education, risk counseling, and referral to substance use treatment
- Encouraging safer sex practices (i.e., condom use)
- Distribution of overdose reversal medications such as naloxone (*Narcan*)
- Distribution of substance test kits such as fentanyl testing kits
- Free syringe exchange programs and distribution of sterile supplies to reduce infectious disease transmission among people who use substances
- Overdose prevention centers or safer injection use spaces with the presence of medical staff
- Primary healthcare services such as sexually transmitted infection or sexually transmitted disease testing, pre-exposure prophylaxis for HIV, and dental and wound care
- Connecting people with SUD to social and healthcare services and facilitation of co-location of services as part of a comprehensive, integrated approach
- Combating stigma around people who use drugs
- Promotion of health equity to alleviate disproportionate harms experienced by BIPOC communities

SECTION 1. SUBSTANCE USE RELATED HOSPITAL PATIENT ENCOUNTERS

Figure 1. Substance Use Related Hospital Patient Encounters† by Substance Type and Year, Boston Residents, 2017-2021



	2017	2018	2019	2020	2021
Overall	421.7	389.2	394.6	405.1	404.8
Alcohol	302.2	262.2	269.5	239.9	247.9
Drug	154.8	157.9	153.9	203.3	198.2

† Age-adjusted rates per 10,000 residents
DATA SOURCE: Acute Hospital Case Mix Database, Massachusetts Center for Health Information and Analysis

2017-2021: From 2017 to 2021, the overall age-adjusted rate of hospital patient encounters associated with either alcohol or drug use per 10,000 residents dropped by 2% (**Figure 1**). During these five years, the rate of alcohol-related hospital patient encounters decreased by 18%, while the rate of drug-related encounters increased by 36%.

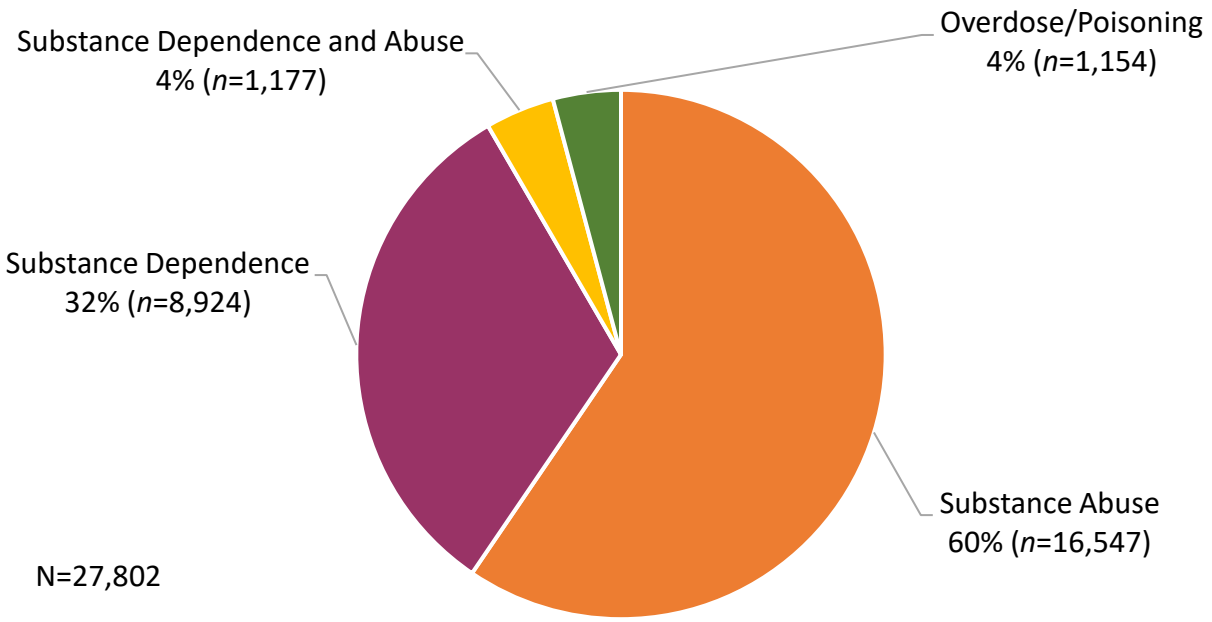
From 2017 to 2018, the rate of any drug or alcohol-related hospital patient encounter decreased by 8%. There was no significant change from 2018 to 2019. From 2019 to 2020, the rate increased by 3%; from 2020 to 2021, there was no significant change.

From 2017 to 2018, the rate of alcohol-related hospital patient encounters decreased by 13%, followed by an increase of 3% from 2018 to 2019. The rate once again decreased by 11% from 2019 to 2020, before increasing by 3% from 2020 to 2021. Rates for 2020-2021 may be underestimated due to the decrease in treatment utilization during the COVID-19 pandemic.

From 2017 to 2019 there was no significant change in the rate of drug-related hospital patient encounters. Then, from 2019 to 2020, there was a 32% increase, before the rate decreased by 3% from 2020 to 2021. Rates for 2020-2021 may be underestimated due to the decrease in treatment utilization during the COVID-19 pandemic.

2021: In 2021, the age-adjusted rate of hospital patient encounters associated with either alcohol or drug use (labeled “overall” in Figure 1) per 10,000 residents was 404.8. The rate was 22% higher for alcohol-related hospital patient encounters (247.9) than for drug-related hospital patient encounters (198.2).

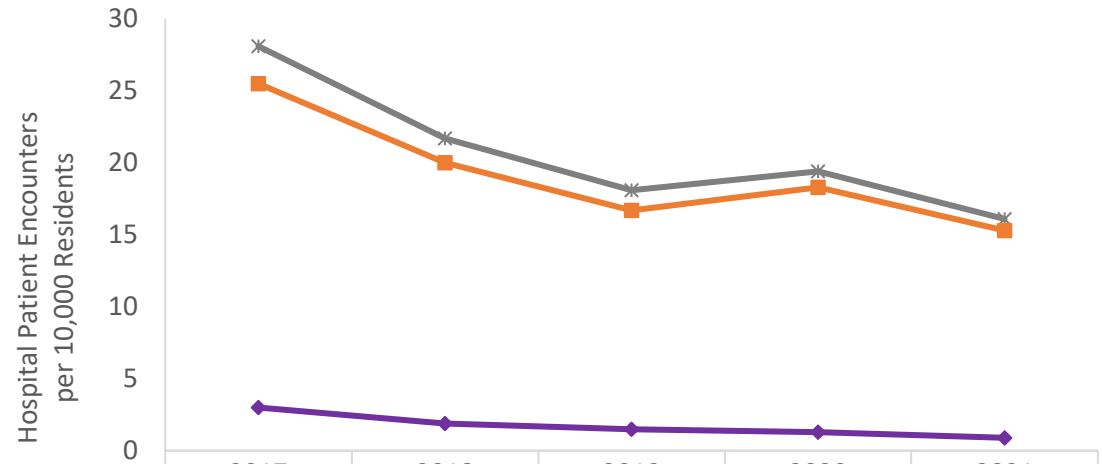
Figure 2. Substance Use Related Hospital Patient Encounters by Diagnosis Category , Boston Residents, 2021



NOTE: Use of International Classification of Diseases version 10 (ICD-10 CM) labels for substance-related diagnosis categories (i.e., Overdose, Abuse, Dependence) reflects consistency with data source definitions adopted by the World Health Organization (WHO) and US Centers for Disease Control and Prevention (CDC). BPHC does not otherwise support the use of the term "abuse" when describing drug use-related behavior and health outcomes. Further, BPHC endorses ongoing dialogue to identify, adopt, and promote nomenclature that best serves to reduce stigma, supports recovery, and advances health equity.
DATA SOURCE: Acute Hospital Case Mix Database, Massachusetts Center for Health Information and Analysis

2021: Of all substance-use related hospital patient encounters, 60% were classified as substance abuse, 32% were classified as substance dependence, 4% were classified as having to do with both substance abuse and dependence, and about 4% were classified as overdoses/poisonings (**Figure 2**).

Figure 3. Unintentional Overdose/Poisoning Related Hospital Patient Encounters† by Substance Type and Year, Boston Residents 2017-2021



	2017	2018	2019	2020	2021
Overall	28.1	21.7	18.1	19.4	16.1
Alcohol	3.0	1.9	1.5	1.3	0.9
Drug	25.5	20.0	16.7	18.3	15.3

† Age-adjusted rates per 10,000 residents
DATA SOURCE: Acute Hospital Case Mix Database, Massachusetts Center for Health Information and Analysis

2017-2021: From 2017 to 2021, the age-adjusted rate of hospital patient encounters associated with unintentional drug overdose or alcohol poisoning per 10,000 residents decreased by 40% **(Figure 3)**. For alcohol-related unintentional poisonings, the rate decreased by 69%, and for drug-related unintentional overdoses, the rate decreased by 37%. Rates for 2020-2021 may partially reflect a decrease in treatment utilization due to the COVID-19 pandemic.

From 2017 to 2018, the rate of hospital patient encounters related to any drug or alcohol-related overdoses decreased by 23%, and again decreased by another 17% from 2018 to 2019. There was no significant change from 2019 to 2020, and from 2020 to 2021, the rate once again decreased by 17%.

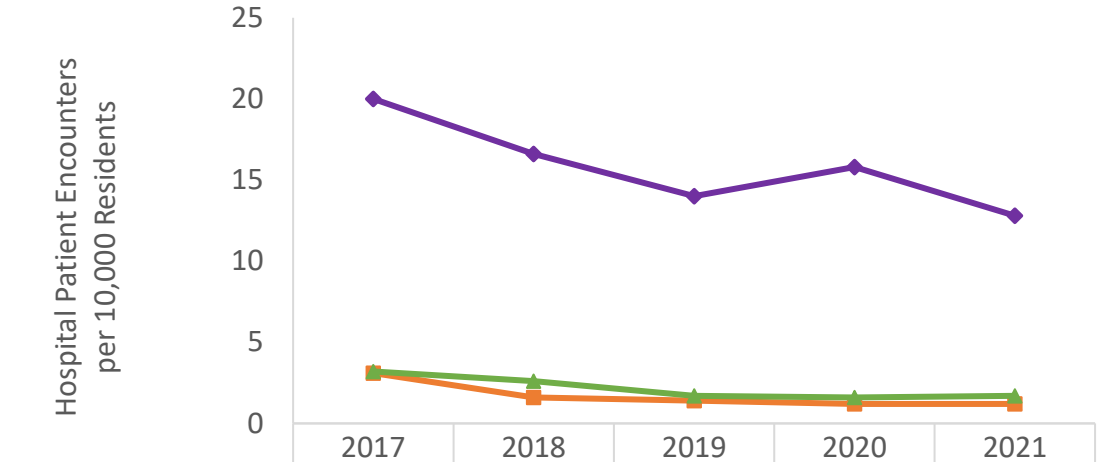
From 2017 to 2018, the rate of hospital patient encounters related to alcohol-related overdoses decreased by 36%, followed by another decrease of 17% from

2018 to 2019. There was no significant change from 2019 to 2020, and from 2020 to 2021, the rate once again decreased by another 29%.

From 2017 to 2018, the rate of hospital patient encounters related to drug-related overdoses decreased by 22%. There was no significant change from 2018 to 2019, then, from 2019 to 2020, there was a 10% increase, before the rate decreased by 16% from 2020 to 2021.

2021: In 2021, the age-adjusted rate of hospital patient encounters associated with unintentional drug overdose or alcohol poisoning per 10,000 residents was 16.1. The rate of drug-related unintentional overdoses (15.3) was 17 times the rate of alcohol-related unintentional poisonings (0.9).

Figure 4. Unintentional Overdose Related Hospital Patient Encounters† by Drug and Year, Boston Residents, 2017-2021



	2017	2018	2019	2020	2021
Opioids	20.0	16.6	14.0	15.8	12.8
Cocaine	3.1	1.6	1.4	1.2	1.2
Benzodiazepines	3.2	2.6	1.7	1.6	1.7

† Age-adjusted rates per 10,000 residents
DATA SOURCE: Acute Hospital Case Mix Database, Massachusetts Center for Health Information and Analysis

2017-2021: From 2017 to 2021, the age-adjusted rate of unintentional overdose hospital patient encounters per 10,000 residents decreased by 32% for opioid-related unintentional overdoses, 64% for cocaine-related unintentional overdoses, and 53% for benzodiazepine-related unintentional overdoses (**Figure 4**). Rates for 2020-2021 may partially reflect a decrease in treatment utilization due to the COVID-19 pandemic.

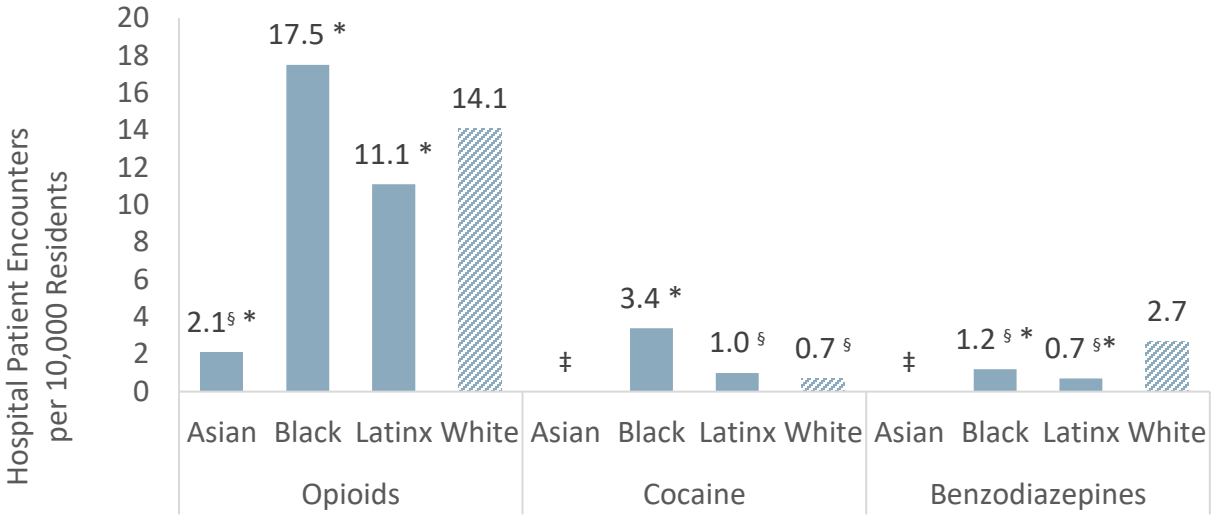
From 2017 to 2018, the rate of hospital patient encounters related to opioid-related unintentional overdoses decreased by 17%, and by another 16% from 2018 to 2019. From 2019 to 2020, however, the rate of opioid-related unintentional overdoses increased by 13% before decreasing by 19% from 2020 to 2021.

From 2017 to 2018, the rate of hospital patient encounters related to cocaine-related unintentional overdoses decreased by 48%. From 2018 to 2021, there was no significant change in the rate of cocaine-related unintentional overdoses.

From 2017 to 2018, the rate of hospital patient encounters related to benzodiazepine-related unintentional overdoses decreased by 19%, and by another 35% from 2018 to 2019. From 2019 to 2021, there was no significant change in the rate of benzodiazepine-related unintentional overdoses.

2021: In 2021, the rate of unintentional overdose hospital patient encounters per 10,000 residents was highest for opioid-related overdoses (12.8), followed by benzodiazepine-related overdoses (1.7) and cocaine-related overdoses (1.2).

Figure 5. Unintentional Overdose Related Hospital Patient Encounters† by Drug and Race/Ethnicity, Boston Residents, 2021



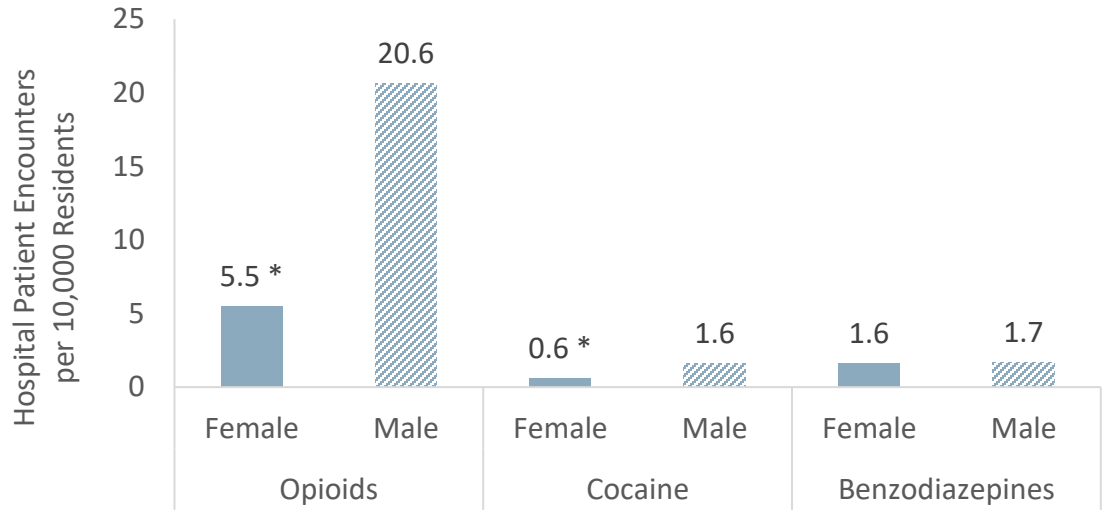
* Statistically significant difference when compared to reference group
† Age-adjusted rates per 10,000 residents
‡ Data suppressed due to too few hospital patient encounters (n < 11)
§ Rates are based on 20 or fewer cases and should be interpreted with caution.
NOTE: Bars with hatch marks indicate the reference group within each selected indicator
DATA SOURCE: Acute Hospital Case Mix Database, Massachusetts Center for Health Information and Analysis

2021: The age-adjusted rate of opioid-related unintentional overdose hospital patient encounters per 10,000 residents was 85% lower for Asian residents (2.1) and 21% lower for Latinx residents (11.1) compared to White residents (14.1) (**Figure 5**). The rate was 24% higher for Black residents (17.5) when compared to White residents.

The rate of cocaine-related unintentional overdose hospital patient encounters for Black residents (3.4) was nearly five times the rate of White residents (0.7).

The rate of benzodiazepine-related unintentional overdose hospital patient encounters was 54% lower for Black residents (1.2) and 75% lower for Latinx residents (0.7) compared to White residents (2.7).

Figure 6. Unintentional Overdose Related Hospital Patient Encounters† by Drug and Sex, Boston Residents, 2021

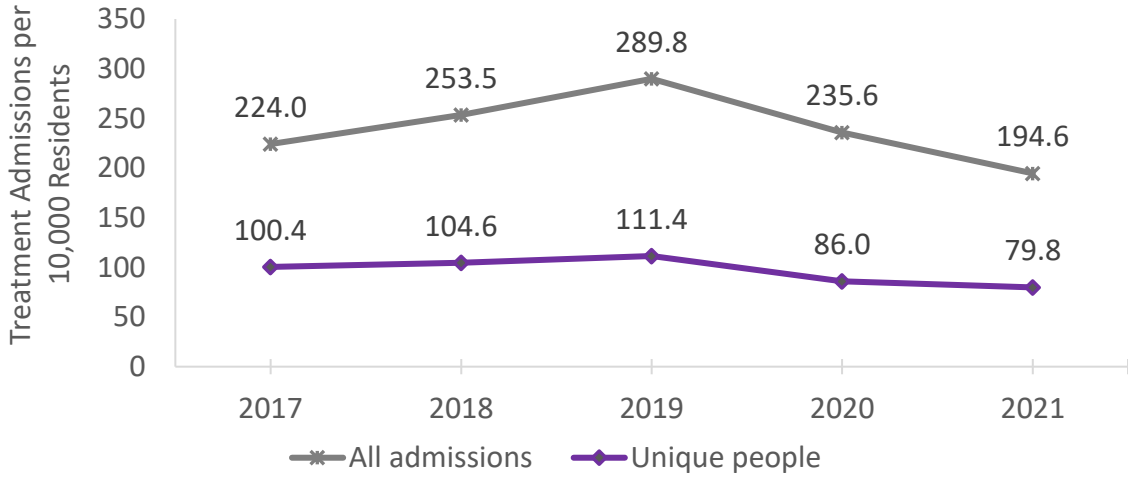


* Statistically significant difference when compared to reference group
† Age-adjusted rates per 10,000 residents
NOTE: Bars with hatch marks indicate the reference group within each selected indicator
DATA SOURCE: Acute Hospital Case Mix Database, Massachusetts Center for Health Information and Analysis

2021: In 2021, opioids accounted for the highest rate of drug-associated unintentional overdose hospital patient encounters for both female and male Boston residents (**Figure 6**). The age-adjusted rate of opioid-related unintentional overdose hospital patient encounters per 10,000 residents was 74% lower for female residents (5.5) compared to male residents (20.6). Similarly, the rate of cocaine-related unintentional overdoses was 63% lower for female residents (0.6) compared to male residents (1.6). The rate of benzodiazepine-related unintentional overdoses was similar for females (1.6) and males (1.7).

SECTION 2. SUBSTANCE USE TREATMENT

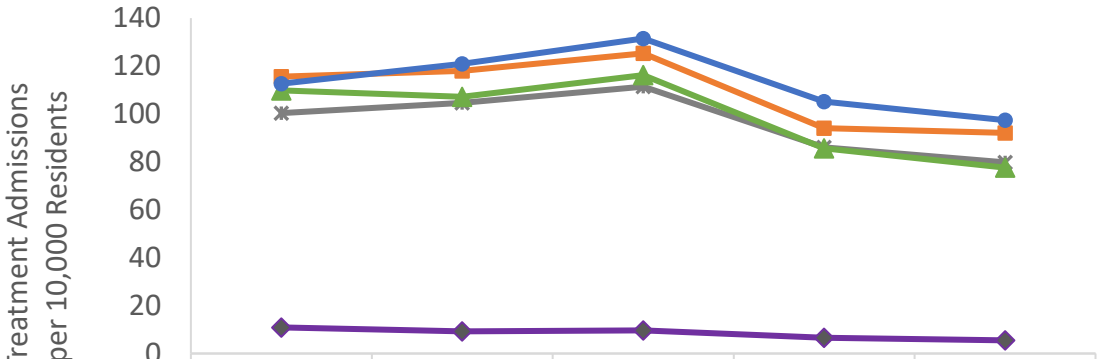
Figure 7. Treatment Admissions† and People Admitted to Treatment by Year, Boston Residents, 2017-2021



† Age-adjusted rates per 10,000 residents
NOTE: "All admissions" counts the total number of admittances to the treatment system; an individual may be counted twice or more if they accessed treatment multiple times in a given year. For more information on definitions of treatment admissions, see the Data Sources and Technical Notes section.
DATA SOURCE: Bureau of Substance Addiction Services, Massachusetts Department of Public Health

2017-2021: The age-adjusted substance use treatment admission rate per 10,000 residents decreased by 40% from 2017 to 2021, (**Figure 7**). This rate accounts for any treatment admission and may count individuals more than once. The substance use treatment admission rate increased by 13% from 2017 to 2018 and 14% from 2018 to 2019; it decreased by 19% from 2019 to 2020 and decreased a further 17% from 2020 to 2021. Rates for 2020 to 2021 likely reflect decreases in treatment utilization due to the COVID-19 pandemic. During this same time, the rate of people admitted to treatment per 10,000 residents decreased by 22%. When restricting to unique-people treatment admissions, the treatment admission rate increased by 4% from 2017 to 2018, another 6% from 2018 to 2019, and then fell 23% from 2019 to 2020 and a further 7% from 2020 to 2021.

Figure 8. People Admitted to Treatment† by Race/Ethnicity and Year, Boston Residents, 2017-2021



	2017	2018	2019	2020	2021
Boston	100.4	104.6	111.4	86.0	79.8
Asian	10.9	9.2	9.6	6.6	5.5
Black	115.6	118.0	125.3	94.1	92.1
Latinx	109.9	107.2	116.2	85.6	77.6
White	112.7	120.9	131.5	105.1	97.4

† Age-adjusted rates per 10,000 residents
DATA SOURCE: Bureau of Substance Addiction Services, Massachusetts Department of Public Health

2017-2021: All racial/ethnic groups presented experienced a decrease in the age-adjusted unique person substance use treatment admission rate per 10,000 residents (**Figure 8**). The rate decreased significantly for Asian (48%), Black (23%), Latinx (30%), and White residents (15%), and among Boston residents overall (22%).

From 2017 to 2018 the rate of substance use treatment admissions increased by 4% among Boston residents overall, and by 7% among White residents. There was no significant change for other racial/ethnic groups.

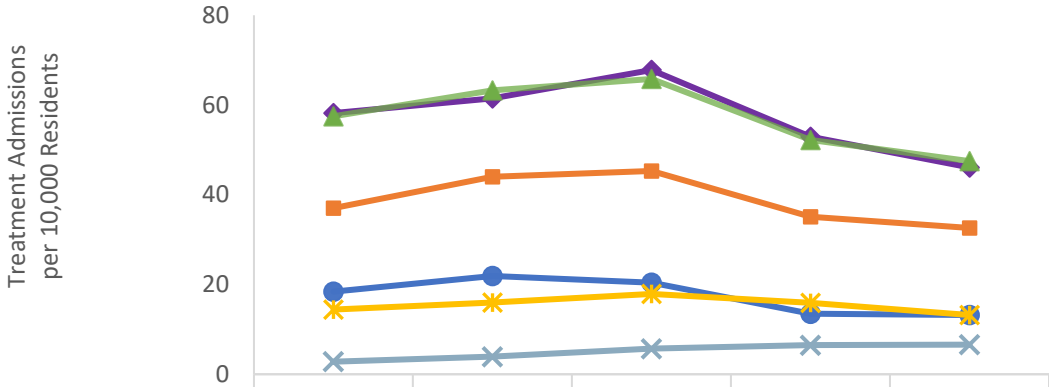
From 2018 to 2019, the rate of admissions increased a further 6% among Boston residents overall, 9% for White residents, and 8% for Latinx residents. There was no significant change for other racial/ethnic groups.

From 2019 to 2020, the rate of admissions dropped by 23% among Boston residents overall, and by 31% for Asian residents, 25% for Black residents, 26% for Latinx residents, and 20% for White residents.

From 2020 to 2021, the rate of admissions dropped by a further 7% among Boston residents overall, 9% for Latinx residents, and 7% for White residents. It did not change significantly during this time period for other racial/ethnic groups.

2021: In 2021, the age-adjusted rate of unique-person substance use treatment admissions among Boston residents was 79.8 per 10,000 residents. The admission rate per 10,000 residents was 5% lower for Black residents (92.1), 20% lower of Latinx residents (77.6), and 94% lower for Asian residents (5.5) when compared to White residents (97.4). Rates for 2020-2021 may partially reflect a decrease in treatment utilization due to the COVID-19 pandemic.

Figure 9. People Admitted to Treatment† by Substance and Year, Boston Residents, 2017-2021



	2017	2018	2019	2020	2021
Alcohol	58.2	61.5	67.8	52.9	46.1
Cocaine	37.0	44.0	45.3	35.1	32.6
Opioids	57.5	63.3	65.8	52.2	47.5
Marijuana	18.4	21.9	20.4	13.5	13.2
Benzodiazepines	14.4	16.0	17.9	15.9	13.2
Methamphetamine	2.8	3.9	5.7	6.5	6.6

† Age-adjusted rates per 10,000 residents
DATA SOURCE: Bureau of Substance Addiction Services, Massachusetts Department of Public Health
NOTE: Treatment admissions are not mutually exclusive by substance. For example, a person admitted for alcohol-related treatment may also be admitted for opioid-related treatment. This person would be accounted for in calculating the age-adjusted treatment rate for both alcohol and opioids.

2017-2021: During 2017 to 2021, the age-adjusted rate of people admitted to treatment per 10,000 residents decreased for alcohol, cocaine, opioids, and marijuana-related admissions (**Figure 9**). The rate of treatment admissions decreased by 21% for alcohol-related admissions, 17% for cocaine-related admissions, 20% for opioid-related admissions, and 35% for marijuana-related admissions. The age-adjusted rate of people admitted to treatment for methamphetamine increased by 123%. The age-adjusted rate of people admitted to treatment for benzodiazepines did not significantly change. Rates for 2020-

2021 may partially reflect a decrease in treatment utilization due to the COVID-19 pandemic.

From 2017 to 2018, the rate of treatment admissions increased by 6% for alcohol, by 19% for cocaine, by 10% for opioids, by 19%, for marijuana, by 11% for benzodiazepines, and by 38% for methamphetamine.

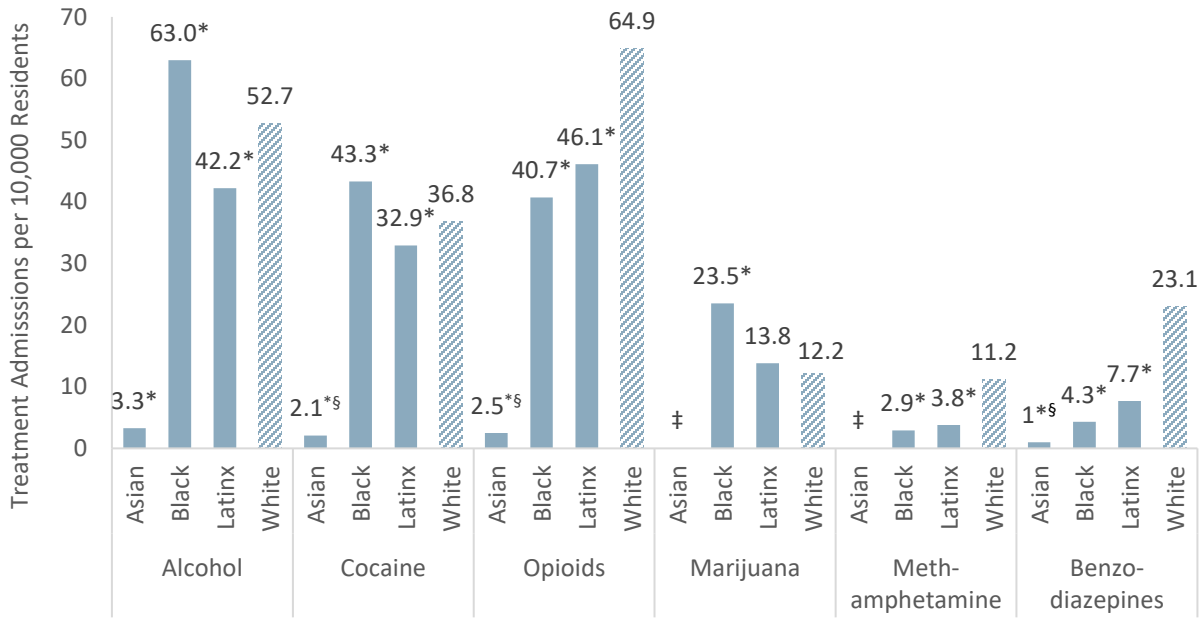
From 2018 to 2019, the rate of treatment admissions further increased by 10% for alcohol, by 12% for benzodiazepines, and by 45% for methamphetamine. There were no significant changes for cocaine, opioids, or marijuana.

From 2019 to 2020, the rate of treatment admissions dropped for alcohol by 22%, cocaine by 23%, opioid by 21%, marijuana by 34%, and benzodiazepines by 11%. The rate of treatment admissions increased by 16% for methamphetamine.

From 2020 to 2021, the rate of treatment admissions further decreased by 13% for alcohol, by 7% for cocaine, by 9% for opioids, and by 17% for benzodiazepines. There was no significant change for marijuana and methamphetamine treatment admissions.

2021: In 2021, the treatment admission rates per 10,000 residents in decreasing order were related to opioids (47.5), then alcohol (46.1), followed by cocaine (32.6), marijuana (13.2), benzodiazepine (13.2), and methamphetamine (6.6).

Figure 10. People Admitted to Treatment† by Substance and Race/Ethnicity, Boston Residents, 2021



* Statistically significant difference when compared to reference group
† Age-adjusted rates per 10,000 residents
‡ Data suppressed due to too few treatment admissions (n < 11)
§ Rates are based on 20 or fewer cases and should be interpreted with caution.
NOTE: Bars with hatch marks indicate the reference group within each selected indicator
DATA SOURCE: Bureau of Substance Addiction Services, Massachusetts Department of Public Health

2021: The age-adjusted rate of unique-person admissions per 10,000 residents for alcohol-related treatment was 20% higher for Black residents (63.0) when compared to White residents (52.7) (**Figure 10**). The rate of alcohol-related treatment admissions was 20% lower for Latinx residents (42.2), and 94% lower for Asian residents (3.3) compared to White residents.

Following similar trends, the admission rate for cocaine-related treatment was 18% higher for Black residents (43.3) compared to White residents (36.8), and 11% lower for Latinx residents (32.9) and 94% lower for Asian residents (2.1) compared to White residents.

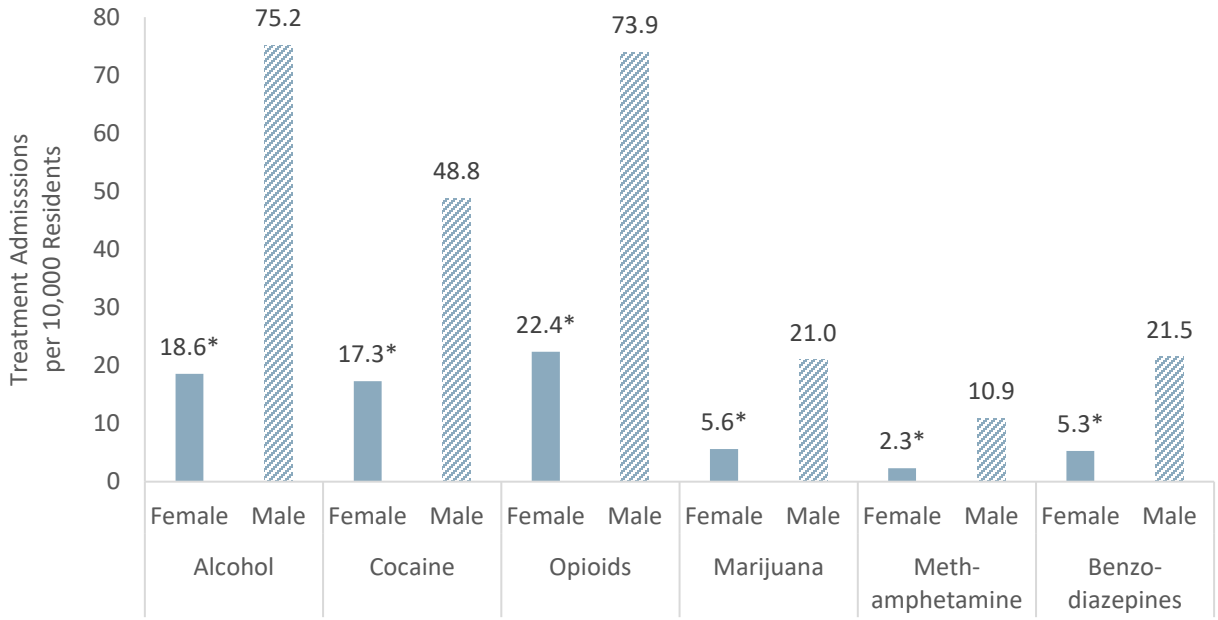
The admission rate of opioid-related treatment was 96% lower for Asian residents (2.5), 37% lower for Black residents (40.7), and 29% lower for Latinx residents (46.1) when compared to White residents (64.9).

For marijuana-related treatment admissions, Black residents had a 94% higher treatment rate (23.5) compared to White residents (12.2). There was no significant difference between Latinx residents (13.8) and White residents for marijuana-related treatment admissions.

White residents (11.2) had the highest rate of admissions for methamphetamine. Black residents (2.9) and Latinx residents (3.8) had a 74 % and 67% lower rate of admissions to treatment (respectively) compared to White residents.

White residents (23.1) had the highest rate of admissions for benzodiazepines. Black residents had an 81% lower rate of admissions to treatment (4.3) and Latinx residents had a 67% lower rate (7.7) compared to White residents (23.1).

Figure 11. People Admitted to Treatment† by Substance and Sex, Boston Residents, 2021



* Statistically significant difference when compared to reference group
† Age-adjusted rates per 10,000 residents
NOTE: Bars with hatch marks indicate the reference group within each selected indicator
DATA SOURCE: Bureau of Substance Addiction Services, Massachusetts Department of Public Health

2021: Overall, male residents had a higher rate of treatment admissions for alcohol and all the drugs examined than female residents. The age-adjusted rate of people per 10,000 residents admitted to treatment for alcohol-related treatment was 75% lower for female residents (18.6) compared to male residents (75.2) (**Figure 11**).

For cocaine-related treatment, the treatment admission rate was 64% lower for female residents (17.3) compared to male residents (48.8).

For opioid-related treatment, the rate was 64% lower for female (22.4) compared to male residents (73.9).

For marijuana-related treatment, the rate was 73% lower for female residents (5.6) compared to males (21.0).

For methamphetamine-related treatment, the rate for female residents (2.3) was 79% lower compared to males (10.9).

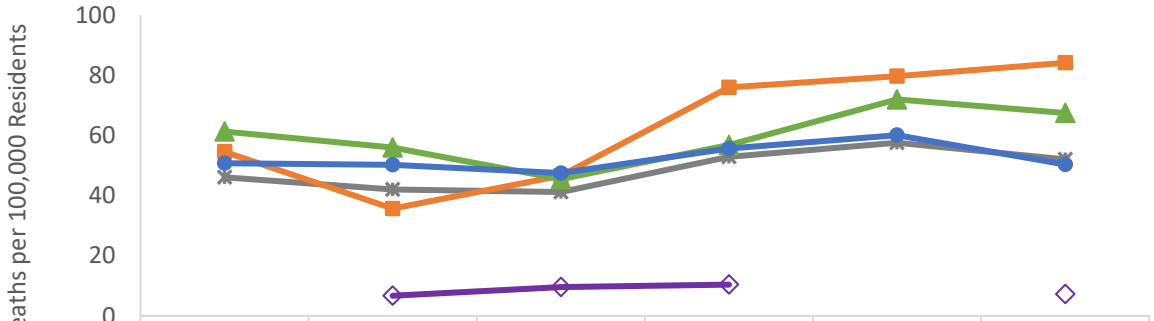
For benzodiazepine-related treatment, the rate was 76% lower for females (5.3) compared to males (21.5).

Among female residents, admission rates were highest for treatment related to opioids, followed by alcohol and cocaine, and lowest for marijuana, benzodiazepines, and methamphetamine.

Among male residents, treatment admissions were highest for treatment related to alcohol and opioids, followed by cocaine, then marijuana and benzodiazepines, and lowest for methamphetamine.

SECTION 3. SUBSTANCE USE MORTALITY

Figure 12. Substance Use Mortality† by Race/Ethnicity and Year, Boston Residents, 2017-2022



	2017	2018	2019	2020	2021	2022
Boston	46.1	42.0	41.2	52.9	57.6	52.1
Asian	‡	6.7	9.6	10.4	‡	7.2
Black	54.6	35.7	46.6	76.0	79.7	84.2
Latinx	61.3	56.0	45.5	56.8	72.0	67.5
White	50.8	50.2	47.5	55.7	60.1	50.3

† Age-adjusted rates per 100,000 residents
NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution.
‡ Rates for Asian residents in 2017 and 2021 are not presented due to a small number of cases (n<5) during these years.
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health. Please be advised that 2022 data are preliminary and subject to change. Preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

2017-2022: In this analysis, "substance use mortality" includes death associated with any drugs or alcohol. From 2017 to 2022, there was a 30% increase in the age-adjusted rate of substance use-related deaths per 100,000 residents for Boston overall. During this time, Black residents experienced the sharpest increase (104%) in substance use-related deaths. Notably, there were no other

significant changes in the rate of substance-use related deaths for other racial/ethnic groups presented (**Figure 12**).

2017-2018: The rate of substance-use related deaths for Black residents decreased by 35% and there were no other significant changes in the rate of substance-use related deaths for other race/ethnicity groups presented. Overall, from 2017 to 2018, there was no significant change in the rate of substance-use related deaths in Boston.

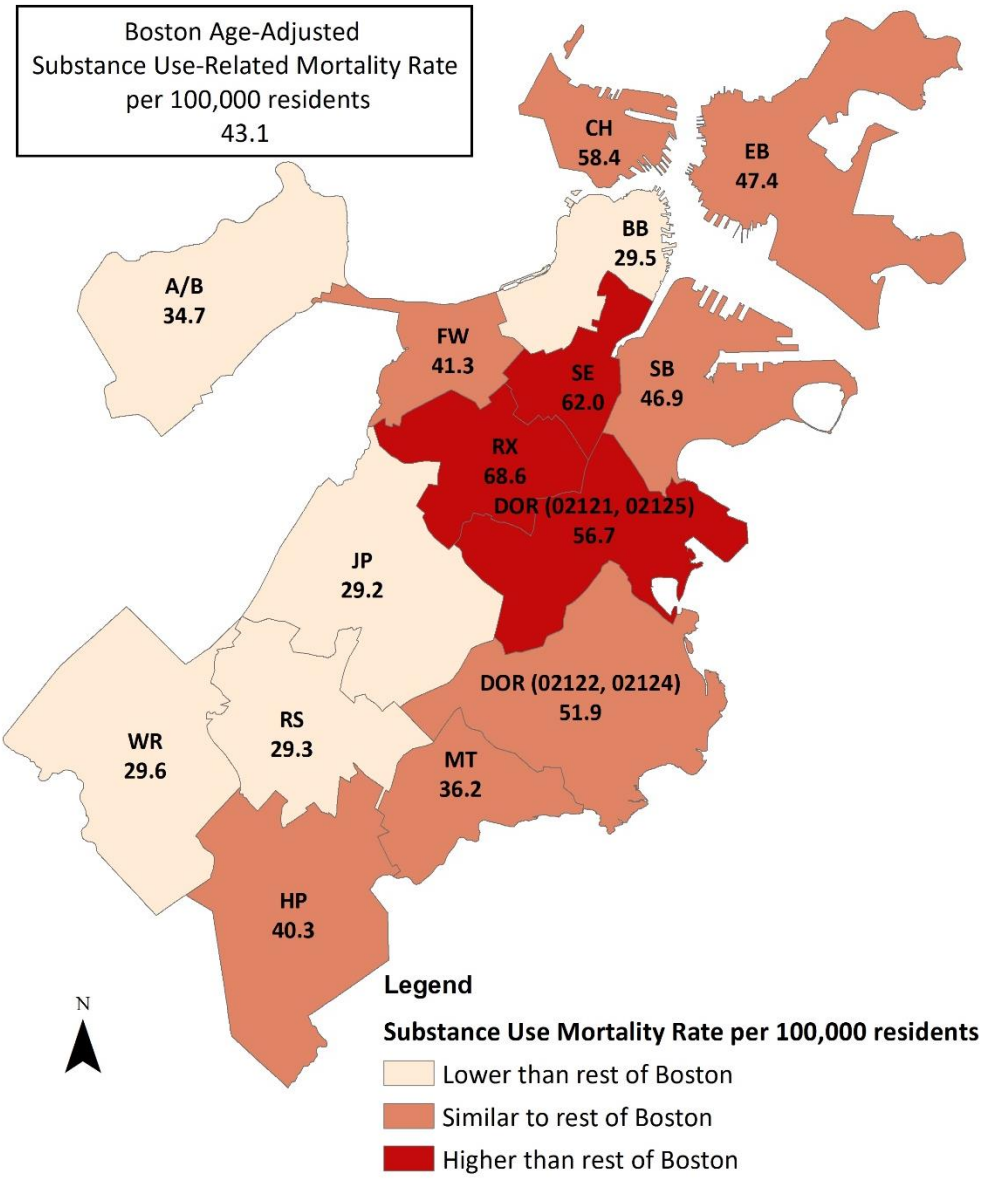
2018- 2019: The rate of substance-use related deaths was stable for Boston overall and for all the racial/ethnic groups presented.

2019-2020: The rate of substance-use related deaths for Boston overall increased by 29%. This increase was in large part attributed to the increase in the rate of substance-use related deaths among Black residents which increased by 63%. There were no other significant changes in the rate of substance-use related deaths for the other racial/ethnic groups presented.

2020-2021: Although the rate of substance-use related deaths increased among Black, Latinx, and White residents, these increases were not statistically significant. Overall, there was no significant increase in the rate of substance-use related deaths for Boston.

2022: The rate of substance use-related deaths among Black residents was the highest of all years analyzed, at 84.2 per 100,000 residents. This rate was not only the highest among Black residents, but also the highest of any racial/ethnic group over the six-year period presented here.

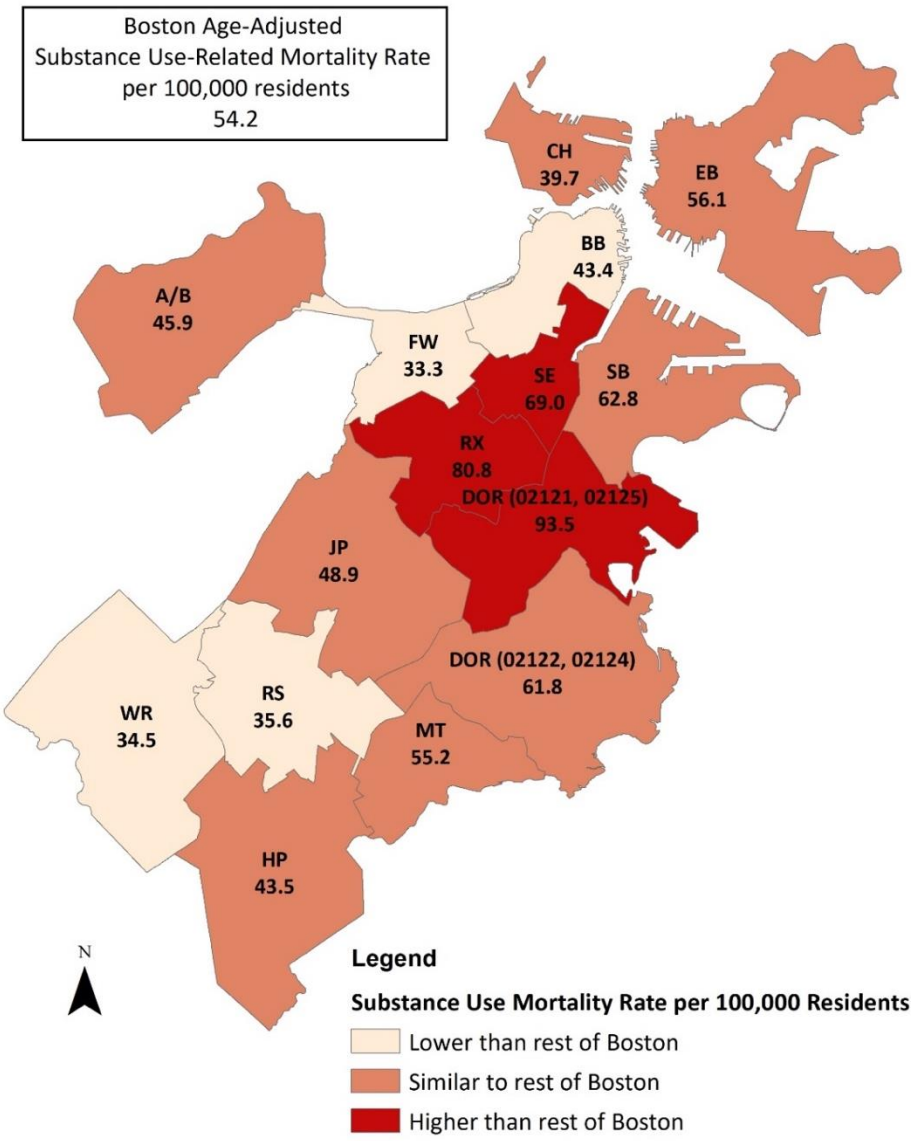
Figure 13. Substance Use Mortality by Neighborhood, 2017-2019



DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

2017-2019: The age-adjusted rate of substance use-related deaths per 100,000 residents was higher than the rest of Boston in Roxbury, the South End and Dorchester (02121, 02125) (**Figure 13**). These higher rates were approximately twice that of Allston/Brighton, the Back Bay, Jamaica Plain, Roslindale, and West Roxbury, which had rates of substance use-deaths lower than the rest of Boston.

Figure 14. Substance Use Mortality by Neighborhood, 2020-2022



NOTE: Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

2020-2022: As in previous years, the age-adjusted rate of substance use-related mortality per 100,000 residents was higher than the rest of Boston in Dorchester (02121 02125), Roxbury, and the South End (**Figure 14**).

The rate was lower than the rest of Boston in the Back Bay, Fenway, Roslindale, and West Roxbury.

The rate in Dorchester (02121, 02125) (93.5) was nearly three times that of Fenway (33.3).

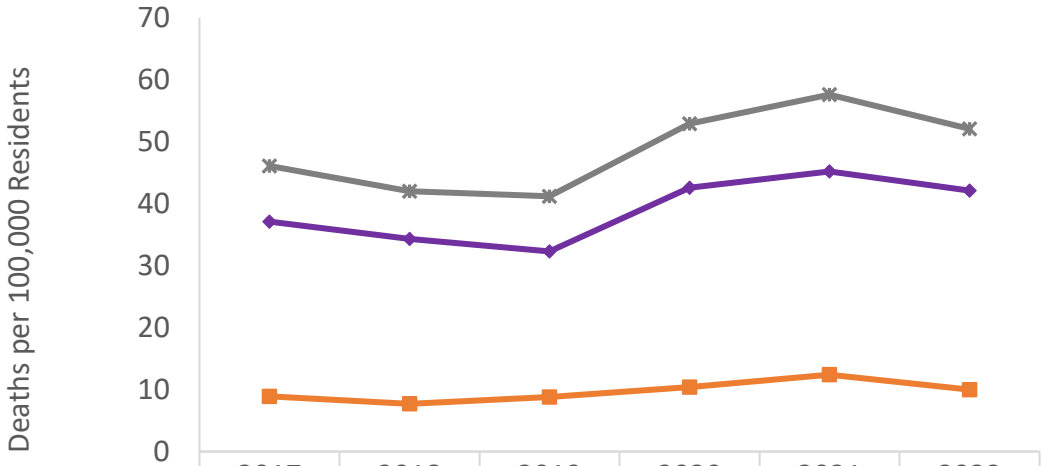
While the rate of substance use-deaths between 2017-2019 and 2020-2022 decreased in Charlestown and Fenway by 32% and 19%, respectively, there were striking increases in substance use-deaths in Jamaica Plain, Dorchester (02121, 02125), and Mattapan of 68%, 65% and 52%, respectively (**Table 1**).

Table 1. Substance Use Mortality Rates by Neighborhood, Ranked in Descending Order, Boston Residents, 2017-2019 Combined and 2020-2022 Combined

Neighborhood	AAR per 100,000 Residents (2017-2019 Combined)	AAR per 100,000 Residents (2020-2022 Combined)	Percent Change
Dorchester (DOR) 02121, 02125	56.7	93.5	64.9%
Roxbury (RX), 02119, 02120	68.6	80.8	17.8%
South End (SE), 02111, 02118	62.0	69.0	11.3%
South Boston (SB), 02127, 02210	46.9	62.8	33.9%
Dorchester (DOR), 02122, 02124	51.9	61.8	19.1%
East Boston (EB), 02128	47.4	56.1	18.4%
Mattapan (MT), 02126	36.2	55.2	52.5%
Jamaica Plain (JP), 02130	29.2	48.9	67.5%
Allston/Brighton (AB), 02134, 02135, 02163	34.7	45.9	32.3%
Hyde Park (HP), 02136	40.3	43.5	7.9%
Back Bay, Downtown, Beacon Hill, North End, West End (BB), 02108-02110, 02113-02114, 02116, 02199	29.5	43.4	47.1%
Charlestown (CH), 02129	58.4	39.7	-32.0%
Roslindale (RS), 02131	29.3	35.6	21.5%
West Roxbury (WR), 02132	29.6	34.5	16.6%
Fenway (FW), 02115, 02215	41.3	33.3	-19.4%

Note: Please note that the data in the table are sorted from highest to lowest based on the rates in the combined years of 2020-2022. AAR = Age-Adjusted Rate
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

Figure 15. Substance Use Mortality† by Type and Year, Boston Residents, 2017-2022



	2017	2018	2019	2020	2021	2022
Any substance use	46.1	42.0	41.2	52.9	57.6	52.1
Drug use	37.1	34.3	32.3	42.6	45.2	42.1
Alcohol use	8.9	7.7	8.8	10.4	12.4	10.0

† Age-adjusted rates per 100,000 residents
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

2017-2022: Substance use mortality includes deaths in which alcohol and/or drugs played an underlying causal role. From 2017 to 2022, the age-adjusted death rate per 100,000 residents increased by 30% for any substance-related deaths, 28% for drug-related deaths, and 36% for alcohol-related deaths (**Figure 15**).

From 2017 to 2018, there was no significant change in the rate of deaths due to any substance use, drug use, or alcohol use for Boston overall.

From 2018 to 2019, there was no significant change in the rate of deaths due to any substance use, drug use, or alcohol use for Boston overall.

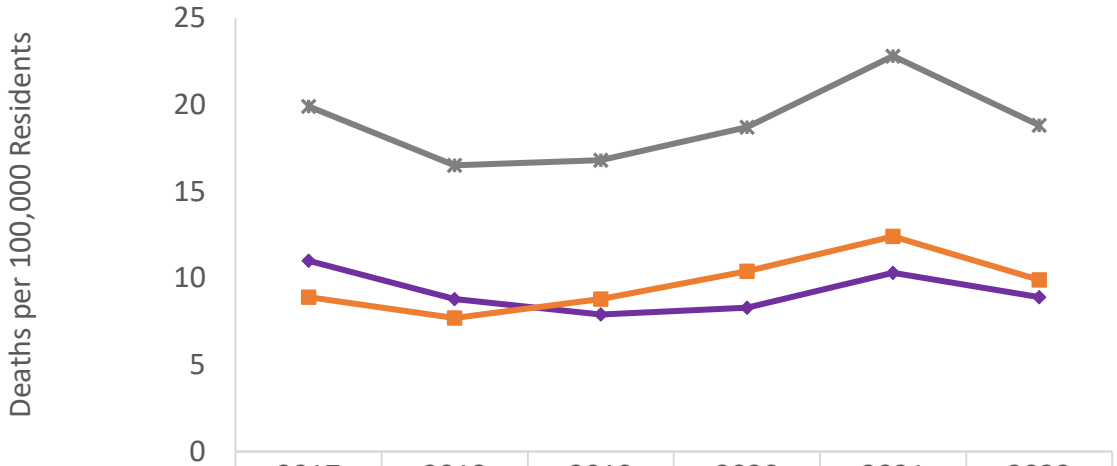
From 2019 to 2020, the rate of deaths due to any substance use increased by 29%; the rate of deaths due to drug use increased by 32%; there was no significant change in the rate of deaths due to alcohol use during this time.

From 2020 to 2021, there was no significant change in the rate of deaths due to any substance use, drug use, or alcohol use for Boston overall.

From 2021 to 2022, there was no significant change in the rate of deaths due to any substance use, drug use, or alcohol use for Boston overall.

2022: In 2022, the rate of drug-related deaths (42.1) was approximately 4.2 times the rate of alcohol-related deaths (10.0). The overall substance-related death rate (drugs or alcohol) in 2022 was 52.1 deaths per 100,000 residents.

Figure 16. Substance Use Mortality† by Type (Excluding Fentanyl) and Year, Boston Residents, 2017-2022



	2017	2018	2019	2020	2021	2022
Any substance	19.9	16.5	16.8	18.7	22.8	18.8
Drug use	11.0	8.8	7.9	8.3	10.3	8.9
Alcohol use	8.9	7.7	8.8	10.4	12.4	9.9

† Age-adjusted rates per 100,000 residents
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

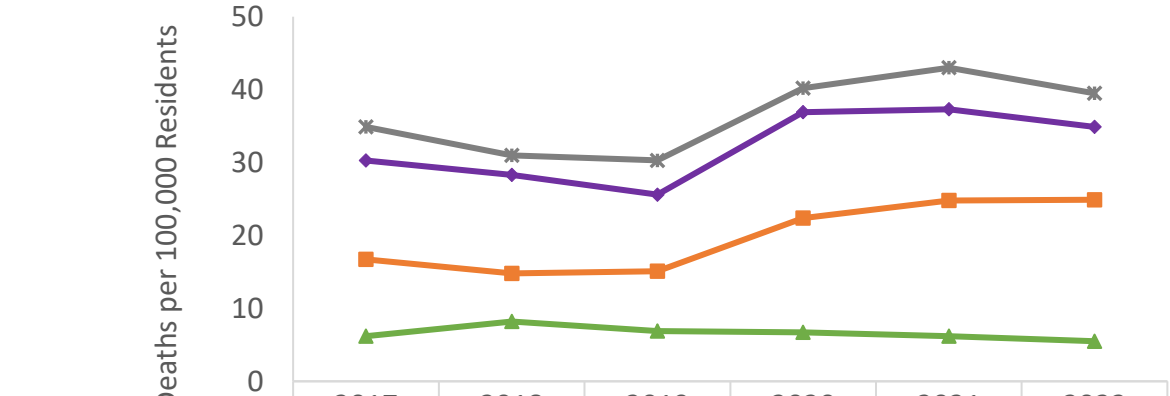
2017-2022: From 2017 to 2022, when excluding deaths associated with fentanyl from this analysis, there was no significant change in the age-adjusted rate of any substance use-related or drug use-related deaths per 100,000 residents (**Figure 16**). During this time, the age-adjusted rate of alcohol use-related deaths per 100,000 residents increased by 35%.

When excluding deaths associated with fentanyl, there was no significant change in the age-adjusted rate of any substance use-related, alcohol use-related, or drug use-related deaths per 100,000 residents in consecutive year analysis of 2017-2018, 2018-2019, 2019-2020, 2020-2021 or 2021-2022.

2022: When excluding fentanyl-related deaths, in 2022, the age-adjusted rate of deaths per 100,000 residents was 18.8 for any substance use-related death and 8.9 for drug use-related deaths.

When fentanyl-related deaths are removed from the analysis, in 2022, the rate of alcohol use-related deaths was 9.9 deaths per 100,000 residents.

Figure 17. Drug Overdose Mortality† by Drug and Year, Boston Residents, 2017-2022



	2017	2018	2019	2020	2021	2022
Any drug	34.9	31	30.3	40.2	43	39.5
Opioid	30.3	28.3	25.6	36.9	37.3	34.9
Cocaine	16.7	14.8	15.1	22.4	24.8	24.9
Benzodiazepines	6.2	8.2	6.9	6.7	6.2	5.5

† Age-adjusted rates per 100,000 residents
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

2017-2022: Drug overdose mortality includes deaths due to drug poisoning as the underlying cause of death. From 2017 to 2022, the age-adjusted rate of drug overdose deaths per 100,000 residents increased by 31% for Boston overall. The rates of cocaine and opioid-related overdose deaths increased by 77% and 31%, respectively, during these 6 years. There was no significant change in the rate of benzodiazepine-related deaths (**Figure 17**).

From 2017 to 2018 and 2018 to 2019, there were no significant changes in the rate of overdose deaths due to any drug, opioids, cocaine, or benzodiazepines.

From 2019 to 2020, the rate of overdose deaths due to any drug increased by 33%, the death rate due to opioid overdoses increased by 44%, the death rate

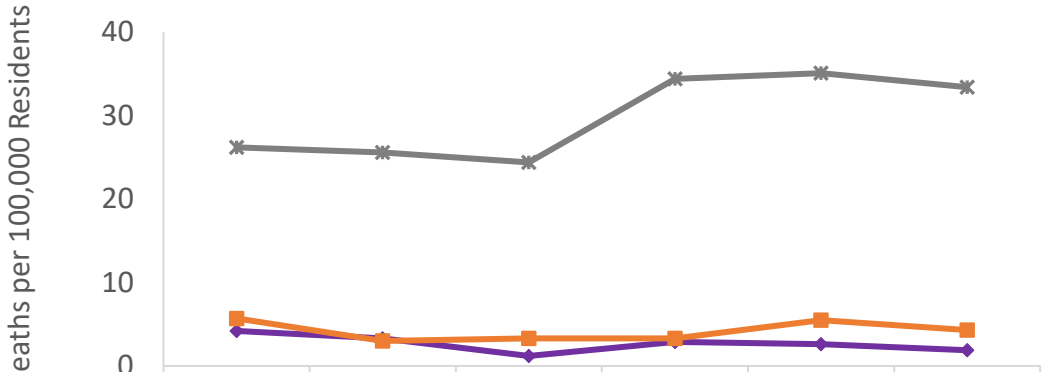
due to cocaine overdoses increased by 48%, and there was not a significant change in death rates due to benzodiazepine overdose.

From 2020 to 2021, there were no significant changes in the rates of overdose deaths due to any drug, opioids, cocaine, or benzodiazepines.

From 2021 to 2022, there were no significant changes in the rates of overdose deaths due to any drug, opioids, cocaine, or benzodiazepines.

2022: In 2022, the rate of opioid-related overdose deaths per 100,000 residents (34.9) was 1.4 times the rate of cocaine-related overdose deaths (24.9) and approximately 6.3 times the rate of benzodiazepine-related overdose deaths (5.5). The rate of any drug-related overdose death in 2022 was 39.5 deaths per 100,000 residents.

Figure 18. Drug Overdose Mortality† Due to Fentanyl and Other Drugs by Year, Boston Residents, 2017-2022



	2017	2018	2019	2020	2021	2022
Fentanyl (alone or in combination)	26.2	25.6	24.4	34.4	35.1	33.4
Other opioids (excl. fentanyl)	4.2	3.3	1.2	2.9	2.6	1.9
Cocaine (excl. fentanyl)	5.7	3.0	3.3	3.3	5.5	4.3

† Age-adjusted rates per 100,000 residents
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

2017-2022: Fentanyl, a highly potent synthetic opioid, was involved in 92% of all opioid overdose-related deaths and 81% of all drug overdose deaths from 2017 to 2022 (Data not shown). During these years, the age-adjusted rate of fentanyl overdoses per 100,000 residents increased by 43% for Boston overall (**Figure 18**). From 2017 to 2022, the rates of overdoses due to other opioids (excluding fentanyl) decreased by 47%. The rates of deaths due to cocaine overdoses (excluding fentanyl-related cocaine overdoses) did not significantly change in that same time period.

From 2017 to 2018, there were no significant changes in the rates of overdose deaths due to fentanyl (alone or in combination with drugs) or other opioids

(excluding fentanyl). The rate of overdose deaths due to cocaine (excluding fentanyl) decreased by 48% during this time period.

From 2018 to 2019, there was not a significant change in the rate of overdose deaths due to fentanyl (alone or in combination with other drugs). The rate of overdose deaths due to other opioids (excluding fentanyl) decreased by 63%. There was no significant change in the rate of overdose deaths due to cocaine (excluding fentanyl).

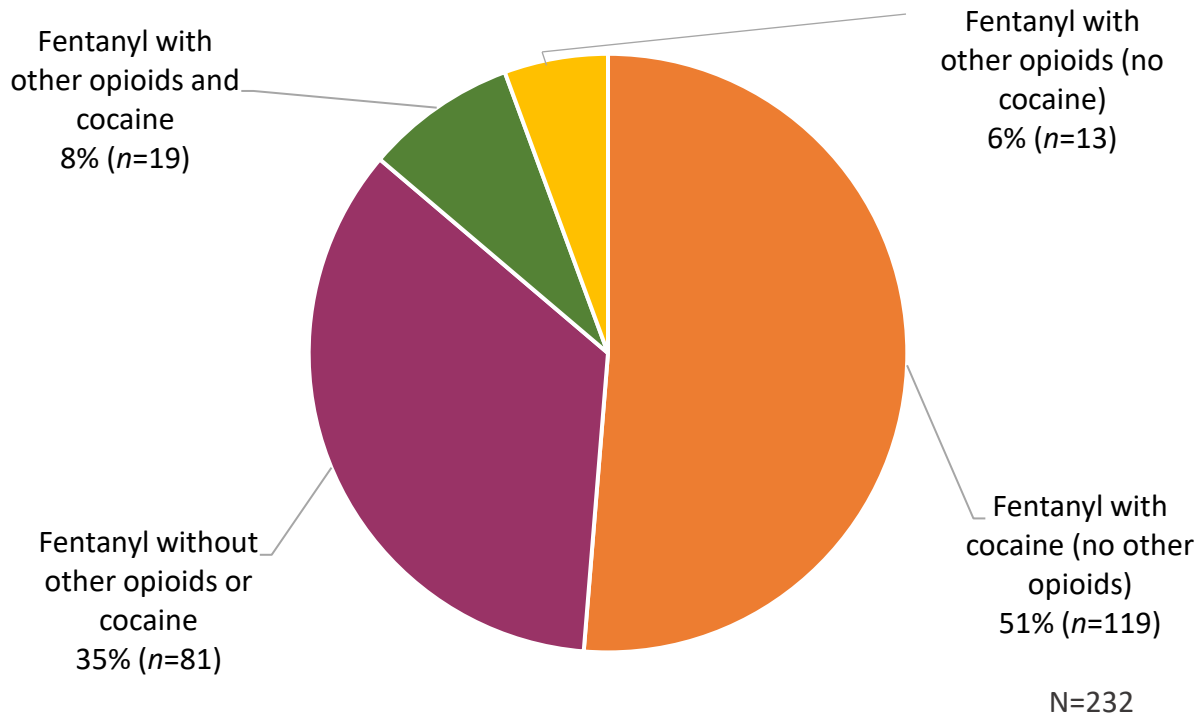
From 2019 to 2020, the overdose death rate due to fentanyl (alone or in combination with other drugs) increased by 41%, and the overdose death rate due to other opioids (excluding fentanyl) increased by 135%. There was no significant change in the rate of overdose deaths due to cocaine (excluding fentanyl).

From 2020 to 2021, there were no significant changes in overdose deaths due to fentanyl (alone or in combination with other drugs), other opioids (excluding fentanyl), or cocaine (excluding fentanyl).

From 2021 to 2022, there were no significant changes in overdose deaths due to fentanyl (alone or in combination with other drugs), other opioids (excluding fentanyl), or cocaine (excluding fentanyl).

2022: In 2022, the rate of fentanyl-related overdoses per 100,000 residents (33.4) was 17.6 times the rate of other opioid-related overdoses (1.9) (excluding fentanyl), and 7.8 times the rate of cocaine-related overdoses (4.3) (excluding fentanyl).

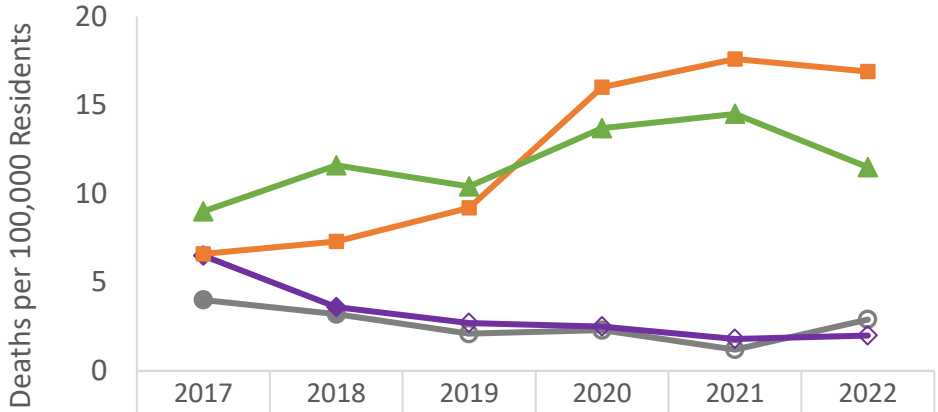
Figure 19. Drug Overdose Mortality† Associated with Fentanyl Use, Boston Residents, 2022



† Age-adjusted rates per 100,000 residents
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

2022: In 2022, when analyzing Boston resident drug overdose deaths associated with fentanyl use, over half (51%) of deaths were due to fentanyl and cocaine (without other opioids). Thirty-five percent of fentanyl-associated deaths were due to fentanyl without other opioids or cocaine, 8% were caused by a combination of fentanyl, other opioids, and cocaine, and 6% were due to fentanyl in combination with other opioids (without cocaine) (**Figure 19**).

Figure 20. Drug Overdose Mortality† Associated with Fentanyl by Year, Boston Residents, 2017-2022



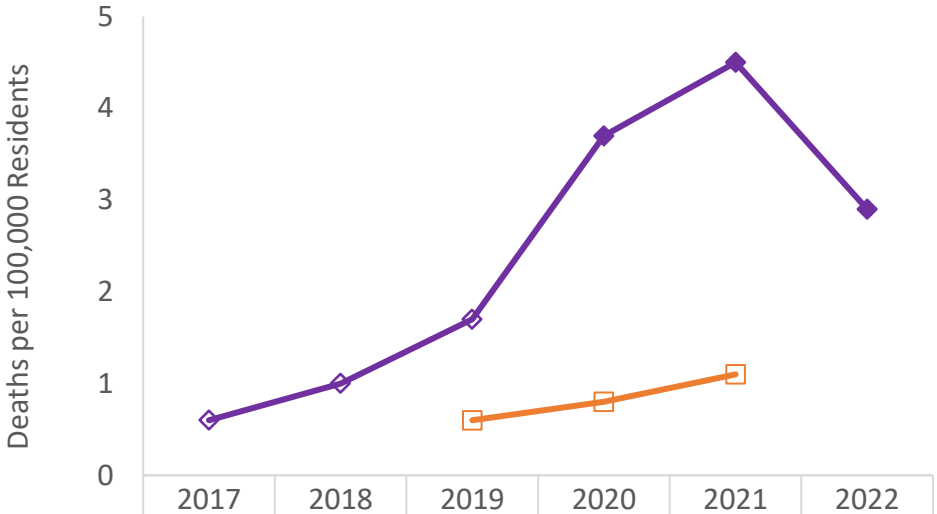
	2017	2018	2019	2020	2021	2022
Fentanyl with other opioids and cocaine	4.0	3.2	2.1	2.3	1.2	2.9
Fentanyl with other opioids	6.5	3.6	2.7	2.5	1.8	2.0
Fentanyl with cocaine	6.6	7.3	9.2	16.0	17.6	16.9
Fentanyl without other opioids or cocaine	9.0	11.6	10.4	13.7	14.5	11.5

† Age-adjusted rates per 100,000 residents
NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution.
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

2017-2022: During 2017-2022, the age-adjusted rate per 100,000 residents of overdose mortality associated with fentanyl in combination with other opioids and cocaine fell by 46%, and the rate of overdose mortality associated with fentanyl in combination with other opioids (without cocaine) fell by 73% (**Figure 20**).

The age-adjusted rate of overdose mortality associated with fentanyl in combination with cocaine (but not other opioids) rose by 191%, and the rate of overdose mortality associated with fentanyl without other opioids or cocaine rose by 34%.

Figure 21. Psychostimulant Overdose Mortality† by Year, Boston Residents, 2017-2022



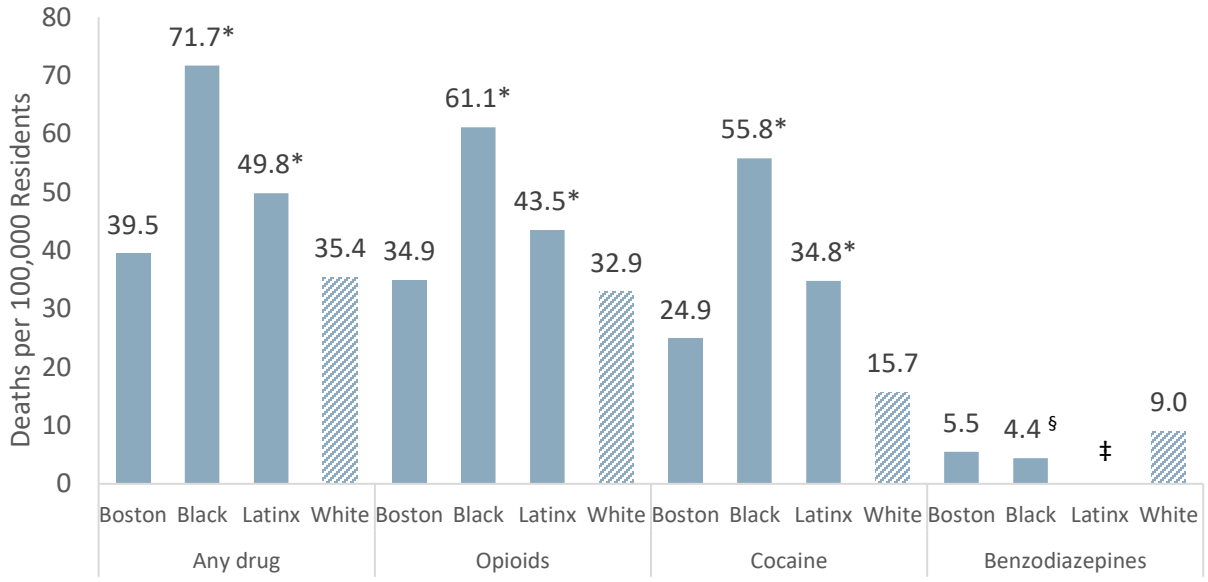
	2017	2018	2019	2020	2021	2022
Psychostimulant	0.6	1.0	1.7	3.7	4.5	2.9
Psychostimulant (excl. fentanyl)			0.6	0.8	1.1	

† Age-adjusted rates per 100,000 residents
NOTE: Hollowed-out symbols represent rates based on 20 or fewer cases and should be interpreted with caution.
‡ Data not presented due to a small number of cases (n<5).
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

2017-2022: During 2017-2022, the age-adjusted rate of fatal psychostimulant (including methamphetamine) related-overdoses per 100,000 residents increased by 353% (from a low of 5 deaths in 2017 to a high of 30 deaths in 2021). When fentanyl-related overdoses were excluded, the rate of psychostimulant overdose deaths did not significantly change from 2017 to 2022 (**Figure 21**).

From 2017 to 2022, overdose deaths attributed to methamphetamine comprised about 75% of all psychostimulant overdose deaths, with most of the remaining psychostimulant overdose deaths being comprised of overdoses involving amphetamine (data not shown in Figure 21).

Figure 22. Drug Overdose Mortality† by Drug and Race/Ethnicity, Boston Residents, 2022



* Statistically significant difference when compared to reference group
† Age-adjusted rates per 100,000 residents
‡ Rates not presented due to a small number of cases (n<5)
§ Rates are based on 20 or fewer cases and should be interpreted with caution.
NOTE: Bars with hatch marks indicate the reference group within each selected indicator; Rates for Asian residents are not presented due to a small number of cases (n<5) during these years.
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

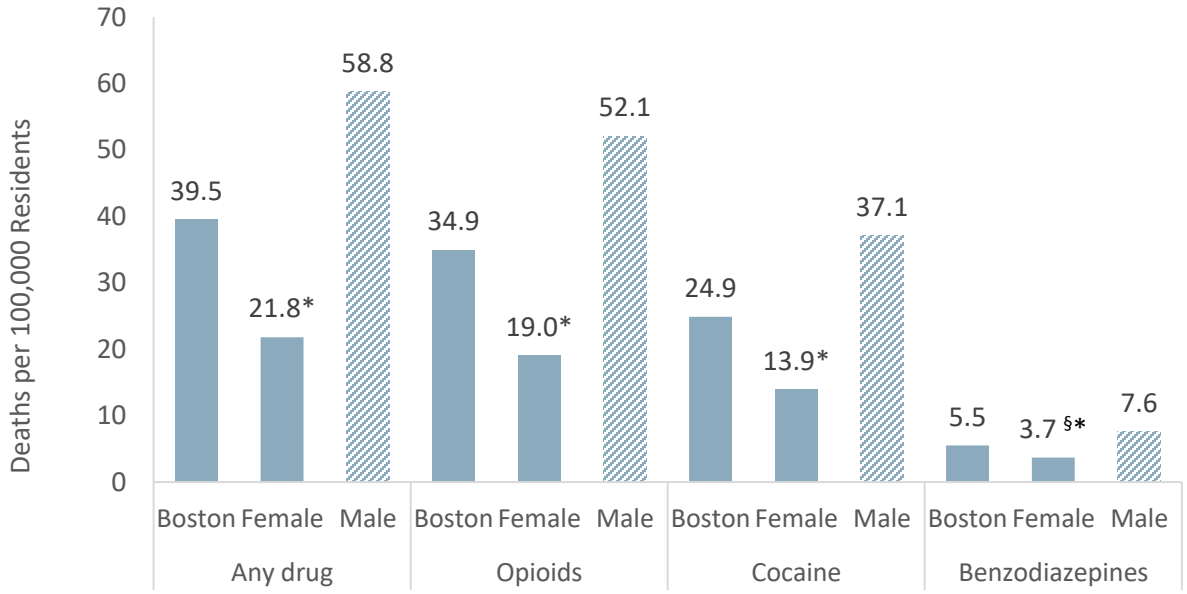
2022: In 2022, the age-adjusted drug overdose death rate per 100,000 residents for any drug was 102% higher for Black residents (71.7) and 41% higher for Latinx residents (49.8) when compared to White residents (35.4) (**Figure 22**).

For opioid-related drug overdoses, the death rate was 86% higher for Black residents (61.1) and 28% higher for Latinx residents (43.5) when compared to White residents (32.9).

For cocaine-related drug overdoses, the death rate was over 3.6 times higher for Black residents (55.8) and 2.2 times higher for Latinx residents (34.8) when compared to White residents (15.7).

There were no significant differences by racial/ethnic group in the rates of benzodiazepine-related drug overdose deaths.

Figure 23. Drug Overdose Mortality† by Drug and Sex, Boston Residents, 2022



* Statistically significant difference when compared to reference group
† Age-adjusted rates per 100,000 residents
§ Rates are based on 20 or fewer cases and should be interpreted with caution.
NOTE: Bars with hatch marks indicate the reference group within each selected indicator
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
Please be advised that 2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

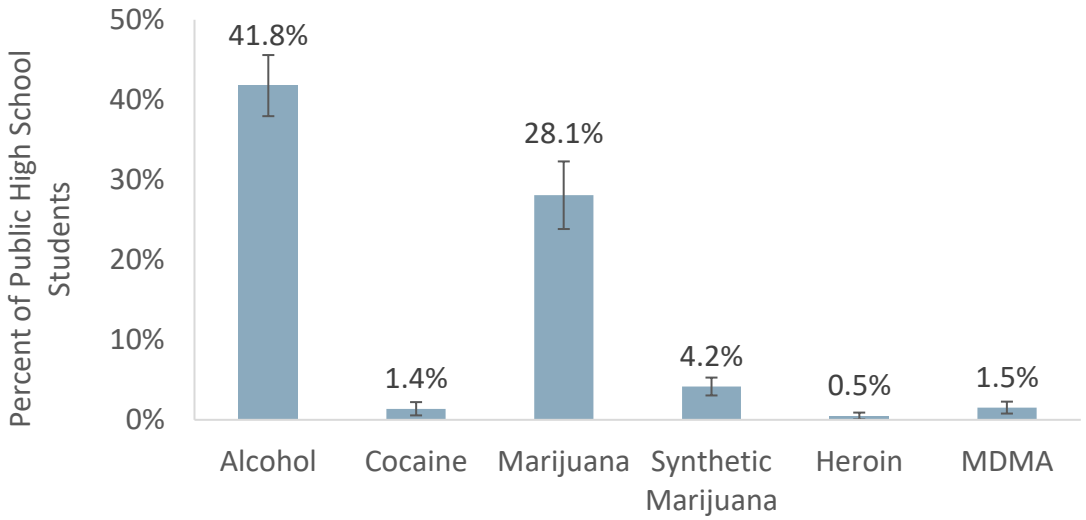
2022: In 2022, the age-adjusted drug overdose death rate per 100,000 residents was 63% lower for female residents (21.8) when compared to male residents (58.8) (**Figure 23**).

For opioid-related overdose deaths, the death rate was 64% lower for female residents (19.0) than male residents (52.1). For cocaine-related overdose deaths, the death rate was 63% lower for female residents (13.9) than for male residents (37.1).

For benzodiazepine-related overdose deaths, the death rate was 52% lower for female residents (3.7) than male residents (7.6).

SECTION 4. PREVALENCE AMONG YOUTH

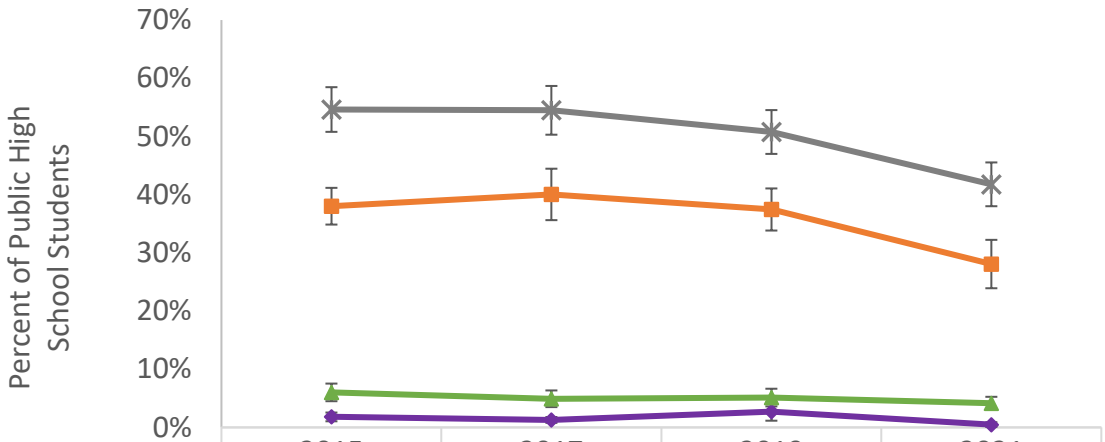
Figure 24. Lifetime Substance Use Among Boston Public High School Students by Substance Type, 2021



DATA SOURCE: Youth Risk Behavior Survey (2021), Centers for Disease Control and Prevention and Boston Public Schools

2021: In 2021, 41.8% of Boston public high school students reported ever using alcohol and 28.1% reported ever using marijuana. Comparatively, a lower proportion of students reported ever using other illegal drugs including synthetic marijuana (4.2%), MDMA or ecstasy (1.5%), cocaine (1.4%), or heroin (0.5%) (**Figure 24**).

Figure 25. Lifetime Substance Use Among Boston Public High School Students By Substance Type and Year, 2015-2021



	2015	2017	2019	2021
Alcohol	54.6%	54.5%	50.8%	41.8%
Heroin	1.8%	1.3%	2.7%	0.5%
Marijuana	38.0%	40.0%	37.4%	28.1%
Synthetic Marijuana	6.0%	4.9%	5.1%	4.2%

DATA SOURCE: Youth Risk Behavior Survey (2021), Centers for Disease Control and Prevention and Boston Public Schools

2015-2021: From 2015 to 2021, the percentage of high school students who reported ever drinking alcohol or ever using marijuana decreased (**Figure 25**). There was no significant change in the percentage of high school students who reported ever using heroin or synthetic marijuana.

MORE ON SUBSTANCE USE AND DISORDERS

Mental Illness and SUD

People who use substances may also struggle with other mental illness including anxiety disorders, depression, attention-deficit hyperactivity disorder (ADHD), bipolar disorder, personality disorders, and schizophrenia (1). However, even though a person may struggle with substance use and a co-occurring mental illness, studies have not confirmed a causal relationship between the two (1).

Studies have shown that people with mental illness may use substances to help alleviate symptoms of their mental illness (19). Approximately 29% of all people who are diagnosed with any mental illness use substances, and 50% of people diagnosed with a severe mental illness have also been diagnosed with SUD (20). Studies have also shown that SUD may lead to changes in brain structure and function that may make a person more susceptible to developing a mental illness (1). Approximately 53% of people with a drug use disorder, and 37% of people with an alcohol use disorder also have at least one serious mental illness (20).

Risk Factors

Although the exact cause of SUD is not known, SUD may develop due to a confluence of factors which include biological, environmental, socio-cultural, and psychological factors (21). People of any race, ethnicity, gender, income level, or social class can have SUD (21). Having a first-degree biological relative with SUD is associated with a 40%-60% increased risk of developing any SUD (22). Environmental factors, such as exposure, having access, or opportunity to use substances are also considered significant risks for SUD. For example, people who have access to medications prescribed by a doctor to either themselves or to a family member are at a much higher risk (22). Other environmental factors such as experiencing adverse childhood experiences, or traumatic events during childhood, have also been associated with an increased risk of developing SUD in later life (22).

Substance use among adolescents and young adults under the age of 25 years is associated with a higher risk of SUD and other adverse conditions such as having a mental illness or risk of suicide, experiencing interpersonal violence, and engaging in risky sexual behavior when compared to other age groups. The percentage of people who use substances and who are classified as having SUD is highest among young adults between the ages of 18 to 25 (5). Approximately 15% of high school students in the US have used an illegal drug, and almost half of all college students engage in substance use (23,24). In 2021, 13.5% of young adults aged 18 to 25 had both SUD and a mental illness in the US (5).

Common Substances

Substances that most commonly lead to SUD can be classified based on the effect they have on the central nervous system (21). These effects can vary significantly, from inducing a feeling of increased energy and/or a sense of well-being, to a profound sedation (21).

The most common types of substance use and SUDs in the US involve one or more substances from the following classes of drugs:

Opioids: These are natural, synthetic, or semi-synthetic chemicals that interact with receptors in the brain to lessen the intensity and experience of pain (25). In many people, they also induce feelings of heightened well-being and joy. This class of drugs includes heroin, fentanyl, opium, and prescription pain medications such as oxycodone, hydrocodone, codeine, and morphine (26). Synthetic opioids are sometimes referred to as *narcotics,* while natural opioids (derived from the poppy plant) are referred to as *opiates* (26). Opioid use can lead to opioid use disorder (OUD), severe respiratory depression, overdose, and death (26). Opioids can be obtained both legally (when prescribed by a doctor) or illegally.

Depressants: These are a class of drugs that reduce activity in the brain and nervous system. They include alcohol, barbiturates, and benzodiazepines (27). Alcohol use disorder increases the risk of health conditions such as heart disease, brain and liver damage, hypertension, physical dependence, and withdrawal (28). Long-term use of benzodiazepines can lead to dependence and cognitive decline (13). Problematic use of alcohol or benzodiazepines in combination with opioids increases the risk of fatal overdose (27,29).

Stimulants: These are a class of drugs that increase activity in the brain and nervous system. Stimulants cause increases in alertness, breathing, blood pressure, and heart rate. They include cocaine and amphetamines (e.g., methamphetamine). Problematic use of stimulants can lead to elevated body temperatures, seizures, increased hostility, and heart failure (30).

Hallucinogens: These are a class of drugs that temporarily alter a person's mood, thoughts, and perceptions, and may cause hallucinations (31). Hallucinogenic or "psychedelic" substances include lysergic acid diethylamide (LSD), mescaline, psilocybin ("mushrooms") and phencyclidine (PCP or "angel dust"), among others (31). These drugs usually do not lead to dependence (31). A growing body of research in recent years supports the use of psychedelic and dissociative drugs to treat a variety of medical conditions including mental health illnesses (31).

Marijuana: This includes the dried leaves, flowers, stems, and seeds from the hemp plant, *Cannabis sativa*, which contains the chemical delta-9-tetrahydrocannabinol (THC) and related compounds (32). These chemicals can have short-and long-term effects on memory, learning, and attention. A minority of people who use marijuana may develop a dependence on it, with higher risk among people who start using marijuana as adolescents (33). Many states allow THC to be sold for recreational use and/or to be prescribed for medical reasons. In Massachusetts a resident 18 years of age or older who has been diagnosed by a certifying physician as having a debilitating medical condition (one that does not respond to curative treatments, where reasonable estimates of prognosis suggest death may occur within two years) may become a qualifying patient. (34). Debilitating conditions include cancer, glaucoma, positive status for human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), hepatitis C, amyotrophic lateral sclerosis (ALS), Crohn's disease, Parkinson's disease, and multiple sclerosis.

Treatment and Prognosis

A variety of effective treatments are available for SUD (22). The American Society of Addiction Medicine (ASAM) criteria conceptualizes SUD treatment as a continuum that includes five basic levels of care: Level 0.5: Early Intervention; Level I: Outpatient Services; Level II: Intensive Outpatient/Partial Hospitalization Services; Level III: Residential/Inpatient Services; and Level IV: Medically Managed Intensive Inpatient Services (35). Each level has its own gradation of intensity of care which depends on an individual's unique treatment needs (35). The higher levels of care are typically administered within a combination of inpatient and outpatient clinical settings and long-term residential treatment communities, often referred to as "rehabilitation" and "sober living" facilities (22). Additionally, many forms of counseling and peer-based services or groups offer support for those pursuing recovery (22,35). Because of the complex nature of the disease, treatment is highly individualized and requires continuing care.

The primary modalities for recovery include detoxification, medications for addiction treatment, and cognitive and behavioral therapies (22). Detoxification or "detox" is the process of eliminating substances from the body—a professional detox program, also referred to as "medically managed withdrawal", entails use of medications and therapies to safely manage physical withdrawal symptoms that accompany stopping drug use (36). Detoxification is not always considered a treatment for SUD, and it is not a prerequisite to start other treatments.

Medications for addiction treatment, or "MAT", include medications which can treat opioid, nicotine, and alcohol use disorder and lessen the symptoms of other mental illness (37). Medications for opioid use disorder are referred to as "MOUDs". The three drugs approved by

the FDA as MOUDs include methadone, buprenorphine (branded as Suboxone and Sublocade), and naltrexone (Vivitrol) (38). Although MAT/MOUD is proven to be extremely effective in helping people recover from SUD, especially from opioid use disorder, this treatment remains highly underutilized (39). Fewer than half of all private treatment programs offer MOUDs, and even in treatment programs where such treatment is offered, only a third of patients who would benefit from it actually receive it (39).

Lastly, cognitive and behavioral therapies, alone or in combination with MAT/MOUD, can help people with SUD gain new perspectives and change behaviors (22). These therapies may include cognitive behavioral therapy (CBT), dialectical behavioral therapy (DBT), assertive community treatment (ACT), therapeutic communities (TC), and contingency management (CM) (1). Following acute treatment, individuals often turn to various recovery supports to maintain their trajectory of wellness and growth. These services include recovery coaches, peer-based recreations, and mutual aid groups.

The prognosis for SUD treatment depends on several factors that include the type and severity of SUD, the degree of dependence and withdrawal, the level of abstinence, treatment timeframe, genetics, and ability to cope with stress (22). Recurrence is a common characteristic of SUD (40). A recurrence occurs when a person stops maintaining their goal of reducing or avoiding the use of substances and returns to their prior levels of use (40). Much like the process of SUD and recovery, the reasons for recurrence are often highly personal, including personal or interpersonal challenges and pre-existing mental, emotional, or physical health issues (40). People in recovery have a higher chance of using substances again, and such recurrences can happen many years after a person has been abstinent from substances. As people with SUD may also have co-occurring illnesses, treating all issues together generally has better outcomes (1).

Stigma is a major barrier to overcoming the challenges of SUD and overdose in the US (41). Many people in the US believe that addiction is a personal choice reflecting moral failing and a lack of willpower, despite advances in understanding of substance use as a health condition (41). Rates of stigma are high in both the public and professional spheres. Research has shown that prejudice harbored by healthcare professionals leads to low quality of care in clinical settings and poorer health outcomes among people with SUD (41). Stigma has also led to public policies that discriminate against people with SUD, especially around policies related to housing, education, employment, voting rights, and insurance (42). Even though beliefs around substance use have shifted in recent years, stigma remains a primary barrier to effective treatment and overdose prevention strategies at all levels of society.

METHODS

This report presents data related to substance use among Boston residents from 2015 to 2022 derived primarily from four data sources:

(1) Boston resident substance-use related hospitalizations and emergency department visits are from the Case Mix Databases, Massachusetts Center for Health Information and Analysis;

(2) Substance use treatment admissions data are from the Bureau of Substance Addiction Services, Massachusetts Department of Public Health;

(3) Boston resident substance-use related mortality data are from the Massachusetts Resident Death files, Massachusetts Department of Public Health; and

(4) Data on the prevalence of lifetime use of substances among Boston students are from the Youth Risk Behavior Survey (YRBS), Centers for Disease Control and Prevention and Boston Public Schools.

Data from the Case Mix Databases, Bureau of Substance Addiction Services, and Youth Risk Behavior Survey (YRBS) are updated through 2021. Data from the Massachusetts Resident Death files are updated through 2022.

Substance use youth prevalence data from the Boston YRBS are derived from random sample surveys administered approximately every other year as specified. Data from the survey was adjusted (i.e., weighted) to generate rates (i.e., percentages) that represent the entire Boston Public High School population.

Hospitalizations/emergency department visits and mortality rates within this report are age-adjusted to permit comparisons that mitigate the impact of differences in age distributions of their respective underlying populations. The resulting comparisons allow consideration of observed differences in terms of factors other than population age differences.

For Boston hospital-patient encounters (HPE), substance use treatment admissions, and mortality comparisons, rate change over time (2017-2021) and rate differences between two demographic groups for the most recent year or time period were assessed using statistical procedures. Whether hospitalization and mortality rates increased or decreased was determined by assessing linear change across the entire five-year time period using Poisson regression ($p<.05$).

Similarly, a rate for a given demographic group is described as higher or lower than the comparison group (i.e., reference group) only when the comparison test indicated statistical significance ($p<.05$). When two rates were compared and the difference was not found to be statistically significant, the two rates are described as "similar" if mentioned in text. Demographic group differences for hospitalizations and mortality were based on a comparison of single-year rates for the most recent data year available.

Boston population data used as denominators in the rate calculations were produced internally by the BPHC Population Health and Research Boston Population Estimates Project (B-PEP). B-PEP uses 2010 and 2020 US Census data and 2019 American Community Survey (ACS) data for Boston to generate population estimates for years between the 2010 and 2021 via interpolation and extrapolation of age, race/ethnicity, sex, and neighborhood population change from 2010 to 2020. For more information on B-PEP, please contact the BPHC Population Health and Research office. Of note, B-PEP population estimates will be revised as the US Census Bureau releases further delineated 2020 Census population data.

All racial and ethnic designations except those from the death certificate, some hospital discharge data, and some emergency department data are self-reported. Several cautions should be kept in mind when using data reported by race/ethnicity. Race and ethnicity are social constructs, not biological facts. There is often more genetic variation between members of the same race than between members of different races. In addition, the meanings of these designations are highly subject to historical, cultural, and political forces. Not only do these designations change over time, but there is also a very subjective element that influences who is considered a member of one group or another. The concept of race can be notably broad: the term "Black," for example, includes people describing themselves as African American, African diaspora, or Caribbean, groups with distinct histories and differing health risks. Nevertheless, racial designations are useful in that they are nearly universally used by people in the US to describe themselves, and they allow us to identify and address health inequities that exist across racial/ethnic groups.

For racial/ethnic group comparisons we used White residents as the reference group and assessed the difference between each non-White resident group rate (e.g., rate for Black residents) and the White resident (reference group) rate. For sex-based comparisons, males were the reference group. Neighborhood comparisons involved assessing the difference between a given neighborhood's rate and the rate for the rest of Boston (those residents not living in the specified neighborhood). These comparisons are considered more accurate than comparisons to Boston overall.

Hispanic and or Latinx people can be of any race. In this report, data for persons of Hispanic and/or Latin descent are described as Latinx and presented alongside non-Latinx racial groups. Boston-specific data by race and Latinx ethnicity is presented for non-Latinx Asian residents, non-Latinx Black residents, non-Latinx White residents, and Latinx residents of any race. Few sources have data in large enough counts to allow presentation of data about smaller groups such as the many ethnicities included under the category “Asian.” Additionally, small survey sample size and case numbers limit the ability to identify and describe health disparities for Indigenous peoples.

For additional information regarding the analytical methods used within this report, please contact Boston Public Health Commission Population Health and Research (PHAR) Office at populationhealth@bphc.org.

GLOSSARY OF STATISTICAL TERMS

Age-Adjusted Rate (AAR): Age-adjustment is a statistical process applied to rates of disease and death which allows populations or groups with different age structures to be compared. The occurrence of disease and death is often associated with age, and the age distribution between populations may differ considerably. Thus, AARs are helpful when comparing rates over time and between groups or populations. An AAR is derived by: 1) calculating the age-specific rates (ASRs) across all age groups, 2) multiplying by age-specific weights that come from the proportion of the 2000 US standard population within each age group, and 3) summing the adjusted age-specific rates. In this report, AARs are used for the presentation of substance use-related hospitalizations and mortality. All AARs are based on a standard population distribution that covers all ages.

Confidence Interval: A range of values based on a chosen probability level within which the true value of a population parameter is likely found. With a 95% confidence interval, one can assume the true value has a high probability of being contained within the interval (i.e., falling between the two values that define the endpoints of the interval).

Hospital-Patient Encounter (HPE): Defined as an interaction between a patient and the hospital; includes emergency department visits, hospitalizations, and observational stays at a hospital.

Prevalence: the proportion of persons in a population who have a particular disease or attribute at a specified point in time or over a specified period of time. Prevalence differs from incidence in that prevalence includes all cases, both new and preexisting, in the population at the specified time, whereas incidence is limited to new cases only.

Rates: A rate is a measure of a type of event, disease, or condition occurring among a population per unit(s) of time, for instance, the number of deaths due to heart disease per 100,000 population for a given year or across multiple years. Two types of rates are presented in this report: crude rates and age-adjusted rates (AARs). The population denominators used for calculating rates is derived through interpolation or extrapolation using data from the 2020 and 2010 US Census. Linear interpolation/extrapolation involves the calculation of an average annual percent change for use in estimating population denominators. Linear interpolation is preferred to using a single year of US Census data when calculating rates for intercensal years.

Statistical Significance: An attribute of data based on statistical testing. A statistical test

examines differences between rates or percentages to help determine if that observed difference reflects a true difference in the actual population experience, as opposed to one observed simply due to chance. Statistical significance means that an observed difference is most likely true; it does not mean that the difference is necessarily clinically meaningful or important.

DATA SOURCES AND TECHNICAL NOTES

Acute Hospital Case Mix Databases (Hospital Inpatient Discharge, Emergency Department, and Outpatient Observational Stay Databases), Massachusetts Center for Health Information and Analysis: These hospitalization data present information on Boston resident hospitalizations to acute care hospitals in Massachusetts. All rates are based on encounter count totals covering fiscal years running October through September (e.g., year 2021 covers HPEs from October 2020-September 2021). For a given hospitalization, the patient's primary diagnosis is used for disease determination. Hospital patient encounters (HPEs) include both emergency department visits and hospitalizations of Boston residents. Rates of hospital patient encounters are not based on unique-person counts, but instead the number of visits. Therefore, an individual who visits an emergency department or is hospitalized more than once in a given year can be counted twice or more. "Substance-use related encounters" encompass visits relating to overdoses, substance dependence, and substance abuse as defined by the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM). Substance-use related overdoses include non-fatal and fatal overdoses; fatal overdoses are not fully representative of overdose mortality as hospitalization data does not include all Boston residents who died from an overdose.

Bureau of Substance Addiction Services, Massachusetts Department of Public Health: The Bureau of Substance Addiction Services at the Massachusetts Department of Public Health provides publicly supported substance use treatment admissions data for Boston resident treatment clients. These data are fiscal year-based (July-June). Treatment admissions data reflect only people who have successfully accessed the treatment system and, therefore, do not represent the whole Boston resident drug use disorder population. "All admissions" counts the total number of admissions to the treatment system; an individual may be counted twice or more if they accessed treatment multiple times in a given year. Rates of "people admitted to treatment" counts individuals only once in a given year, regardless of how many times they are admitted to treatment that year. The rates of treatment admissions for a specific drug are calculated from the number of unique individuals identifying that drug as either a primary, secondary, or tertiary substance of use in a given year. This methodology is meant to identify the extent of use of drugs that are not typically identified as a primary drug of use among people who get admitted to treatment. Treatment admissions data include both people who have and people who have not completed treatment. These data are restricted to Boston residents, regardless of the location of treatment; in other words, it counts Boston residents who have accessed treatment, **not** people who have accessed treatment within the city of Boston.

Boston Resident Deaths, Registry of Vital Records and Statistics, Office of Data Management and Outcomes Assessment, Massachusetts Department of Public Health: Death data used by the Boston Public Health Commission pertains only to Boston residents. This report used death data from 2016 to 2022. Death records are completed with the assistance of an informant, typically a family member or funeral director, which may result in errors (for example, in race/ethnicity reporting) that would not occur in self-reported data. Please be advised that 2020-2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events. In this report, "Substance Use Mortality" and "Overdose Mortality" due to use of specified substances included death caused by accidental, self-intentional, homicidal (except alcohol), as well as undetermined substance-specific poisonings, that were identified as the underlying (i.e., primary) or one of the top ten causes of death for each decedent. Additionally, "Substance Use Mortality" due to use of specified substances also included physiological causes of death such as substance-specific induced medical and mental disorders and substance-specific abnormal clinical and laboratory findings that were identified as the underlying (i.e., primary) or one of the top ten causes of death for each decedent.

Boston Youth Risk Behavior Survey, Youth Risk Behavior Surveillance System (YRBSS), Centers for Disease Control and Prevention and Boston Public Schools: The Youth Risk Behavior Surveillance System (YRBSS) is a system of national school-based surveys conducted by the Centers for Disease Control and Prevention (CDC) every other year among public high school students in grades 9-12. It is currently conducted in 47 states, 6 territories, 2 tribal governments, and 22 cities. The survey contains questions related to risk behaviors such as unintentional injuries and violence, alcohol and drug use, tobacco use, sexual behavior, unhealthy eating behaviors, physical inactivity, and the prevalence of obesity and asthma. The Boston Public Health Commission uses results from the YRBSS to identify the prevalence of health risk behaviors among Boston youth, identify racial/ethnic inequities, plan and implement health initiatives, support health-related legislative activities, and assist in obtaining grants and other funding.

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