CAMBRIDGE OPIOID OVERDOSE DATA REPORT 2019-2021

Cambridge Public Health Department

CHA Cambridge Health Alliance

2019-2021 CAMBRIDGE OPIOID OVERDOSE DATA REPORT

INTRODUCTION

Substance use disorder and its impact on individuals and communities cannot be understated. In 2021, nearly 70,000 people in the U.S. died from an opioid overdose.[1] Massachusetts currently has the seventeenth highest opioid overdose mortality rate in the country.[2] Locally, city and community partners offer a wide range of services across the continuum of care for substance use disorder prevention, intervention, treatment, and recovery support. The COVID-19 pandemic caused substantial disruption to the public health and human services landscape and likely exacerbated the effects of substance use disorder and overdoses on people locally, as well as across the state and country.

This Cambridge opioid overdose data report is a result of a multi-year surveillance effort. The report is designed to provide residents, first responders, city officials, health professionals, and the media with data to better understand how the opioid crisis is affecting Cambridge. It is hoped that this and future reports will inform the city's prevention and response strategies, and help relevant groups monitor progress in curbing the epidemic. This report, previously published annually, compiles data from a three-year period of 2019 to 2021. Several processes in program management, data collection, and reporting have changed in that time due to several factors, including adjustments to workflow during the pandemic and staff turnover. Going forward, the health department intends for this report to be published yearly.

Data is received by the Cambridge Public Health Department from several sources, including ProEMS first response services, Cambridge Health Alliance, Mount Auburn Hospital, and the Access Drug User Health Program. The data collection and analysis process is continuously reviewed for improvement opportunities.

Report Highlights

In Cambridge, there were 14 confirmed opioid-related overdose deaths among residents in 2019, 13 in 2020, and 21 in 2021. Many more lives would have been lost if not for the use of naloxone, a drug that reverses the effects of an opioid overdose.

While commercial districts in Cambridge had the highest density of opioid-related overdoses from 2019-2021, 17% of people transported by ProEMS ambulance for an opioid-related overdose during that time period were picked up at a private residence.

Opioid-related overdoses in Cambridge were almost evenly split between residents and non-residents from 2019-2021: 58% of people who overdosed in Cambridge were residents, according to ambulance data.

153 patients received care at Cambridge Health Alliance (CHA) and Mount Auburn Hospital (MAH) sites for opioid-related overdoses from 2019-2021. This group was predominantly male and white. The average age was 46.4 years.

Approximately 1 out of 5 patients who received care at CHA and Mount Auburn health care sites for opioid-related overdoses in 2019-2021 had at least one repeat visit. The total number of visits was 195.

Naloxone was administered a total of 406 recorded times to save a life in Cambridge from 2019-2021. 16% of recorded overdose reversals by naloxone were administered by bystanders.

AIDS Action Committee's Access: Drug User Health Program distributed 2,350 naloxone kits (4,700 doses) to its clients from 2019-2021, and 1,050 clients received some overdose prevention and response training.

STATE DATA

Fatal Overdoses

The Massachusetts Department of Public Health collects and analyzes data on opioid-related overdose deaths among all Commonwealth residents.

Statewide, there were 2,005 confirmed opioid-related overdose deaths among Massachusetts residents in 2019, representing a 0.5% decrease from confirmed cases in 2017 (2,015 cases) and a 4.6% decrease from 2016 (2,102 cases).[3] Deaths rose across the state in 2020 and 2021, with 2,104 confirmed and estimated deaths in 2020 (4.9% increase from 2019) and 2,300 confirmed and estimated deaths in 2021 (9.3% increase from 2020). This was the first time since 2016 that the number of deaths rose compared to previous years.

In Cambridge, there were 14 confirmed opioid-related overdose deaths among residents in 2019, 13 in 2020, and 21 in 2021.[4] Many more lives would have been lost if not for the use of naloxone, a drug that reverses the effects of an opioid overdose.

There is evidence that fentanyl, an illicitly produced synthetic opioid, is fueling the current opioid epidemic in Massachusetts. Fentanyl is a fast-acting drug with 50 to 100 times the potency of morphine, making it deadlier than other opioids. Starting in 2016, the percentage of opioid-related overdose deaths where fentanyl was present began to exceed that of heroin or likely heroin. Of the 2,156 Massachusetts residents who died from an opioid-related overdose in 2021 and received a post-mortem toxicology screening, 93% tested positive for fentanyl[5]. Similar rates were reported in 2019 (93%) and 2020 (92%).

Note: Of the 2,281 confirmed deaths in 2021, 2,156 cases received a toxicology screening. Of these cases, 2,007 (93.1%) tested positive for fentanyl, according to state data.

As depicted in **Figure 1**, the opioid overdose-related death rate in Cambridge remained below that of Middlesex County and Massachusetts in 2015 and 2016. In 2017 and 2018, the Cambridge death rates decreased steeply, while the state rate also decreased but not as sharply. Rates stayed relatively consistent from 2018 to 2020, with rates increasing again in 2021.

Figure 1. Opioid-Related Overdose Death Rate in Cambridge, Middlesex County, and Massachusetts, 2012-2021

Opioid-Related Overdose Death Rate in Cambridge, Middlesex County, and Massachusetts, 2012-2021
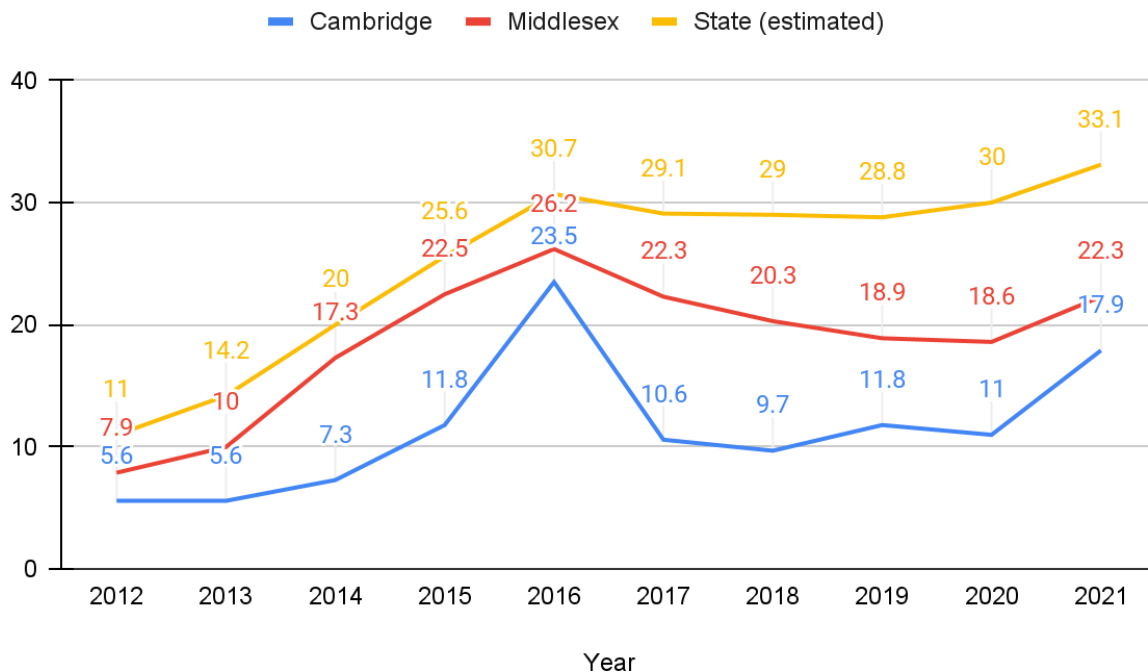
Note: Opioids include heroin, opioid-based prescription drugs, and other unspecified opioids.
Data Source: Massachusetts Department of Public Health

EMERGENCY MEDICAL SERVICES DATA

Geography of Overdoses

In Cambridge, first responders from Pro EMS ambulance service and the Cambridge Fire Department are often the first emergency personnel to arrive at the site of an overdose. Data from Pro EMS (which

includes fire department data) are invaluable for pinpointing where opioid overdoses occur in the city, determining how frequently naloxone is administered, and learning what populations are at greatest risk. From 2019-2021, Pro EMS responded to 541 overdose incidents (131 in 2019, 168 in 2020, and 242 in 2021).

Figure 2 shows the density of opioid-related overdoses in Cambridge from 2019-2021, based on spatial analysis of Pro EMS data.

[How to read the maps in this report: The heat maps are primarily intended as visual tools, and exact overdose counts should not be estimated from the results. Dark red areas indicate the highest density of overdose incidents from 2019-2021. Color categories can be interpreted relative to one another, with dark red areas having more incidents than red, red more than orange, and so on. Yellow areas indicate the lowest density of overdose incidents. Clear areas indicate no incidents.]

Figure 2. Opioid-Related Overdoses 2019-2021, Cambridge, MA
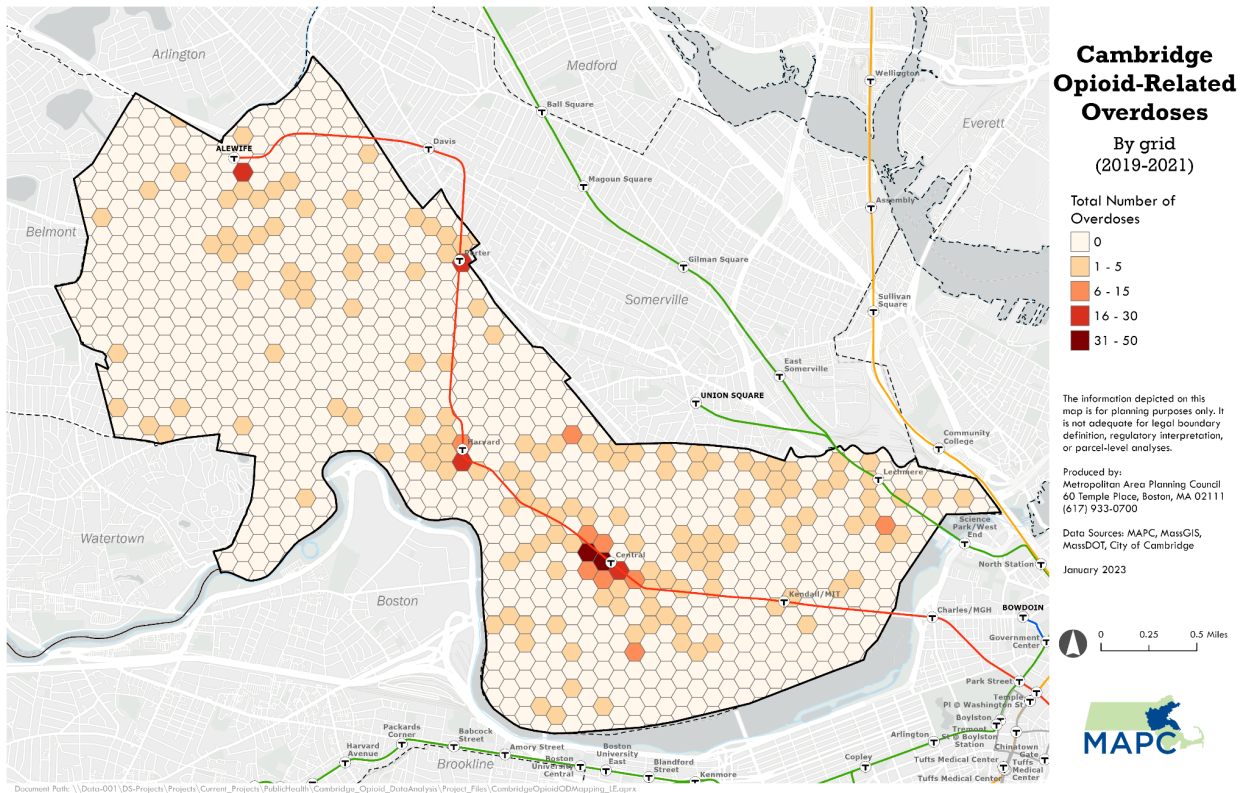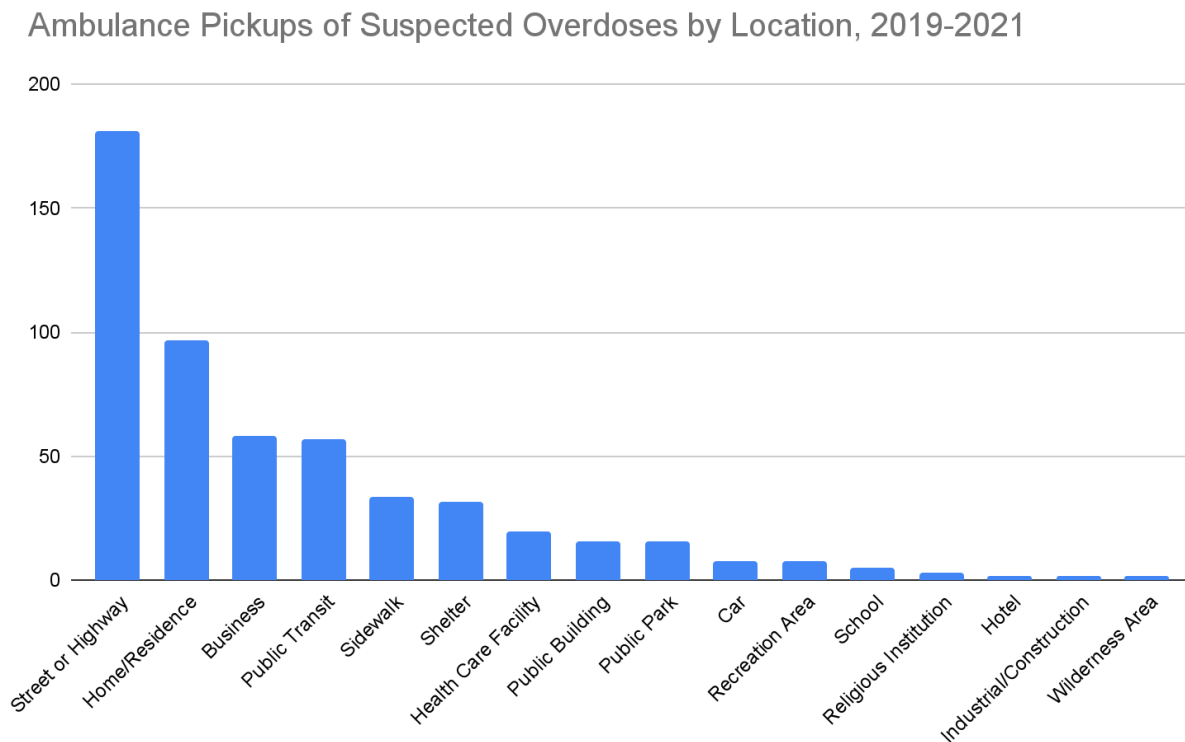

Data Source: Pro EMS Ambulance Service

Commercial districts had the highest density of opioid-related overdoses in Cambridge. These incidents were clustered in Central Square, Harvard Square, Alewife, and Porter Square on the Red Line, and near Lechmere on the Green Line. However, overdose incidents occurred in every neighborhood in Cambridge from 2019-2021.

Figure 3 shows the types of places where opioid-related overdoses occurred in Cambridge from 2019-2021, based on Pro EMS data.

Of the 541 ambulance pickups for opioid-related overdoses from 2019-2021, the majority (70%) occurred in public places, such as on the street, in a public building or park, at a business, or in a T station. About 6% of ambulance pickups were from a shelter.

Private residences made up approximately 17% of ambulance pickups. Whereas opioid-related overdoses in public spaces tended to occur repeatedly in the same locations in Cambridge—such as shelters and commercial squares—overdoses in private residences occurred in homes scattered across the city.

Figure 3. Ambulance Pickups of Suspected Overdoses by Location, 2019-2021

Ambulance Pickups of Suspected Overdoses by Location, 2019-2021

Note: There were a total of 541 ambulance pickups in Cambridge for opioid-related incidents from 2019-2021.
Data Source: Pro EMS Ambulance Service

Pickup locations shifted dramatically during the COVID-19 pandemic, with overdoses at businesses and shelters dropping significantly in 2020 and rising again in 2021. This is likely due to these locations being closed to the public to reduce the spread of the virus. Interestingly, this trend did not affect overdoses at public transit locations, which instead continued to increase over this period of time.

From 2019-2021, Pro EMS ambulance service transported the majority of opioid-related overdose cases to Cambridge Hospital (72%), followed by Mount Auburn Hospital (17%) and Emerson Hospital (9%). Pro EMS typically transports people who have experienced a suspected overdose to the nearest hospital, unless the person expresses a preference for another facility (**Table 1**).

Table 1: Cambridge Opioid-Related Overdose Cases Transported by Pro EMS by Hospital Destination, 2018

Hospital Destination	Incidents	
	Number	Percent
CHA Cambridge Hospital	390	72.1%
Mount Auburn Hospital	90	16.6%
Mass General Hospital	32	5.9%
Other Hospital	15	2.8%
No Hospital (pt refused or DOA)	14	2.6%

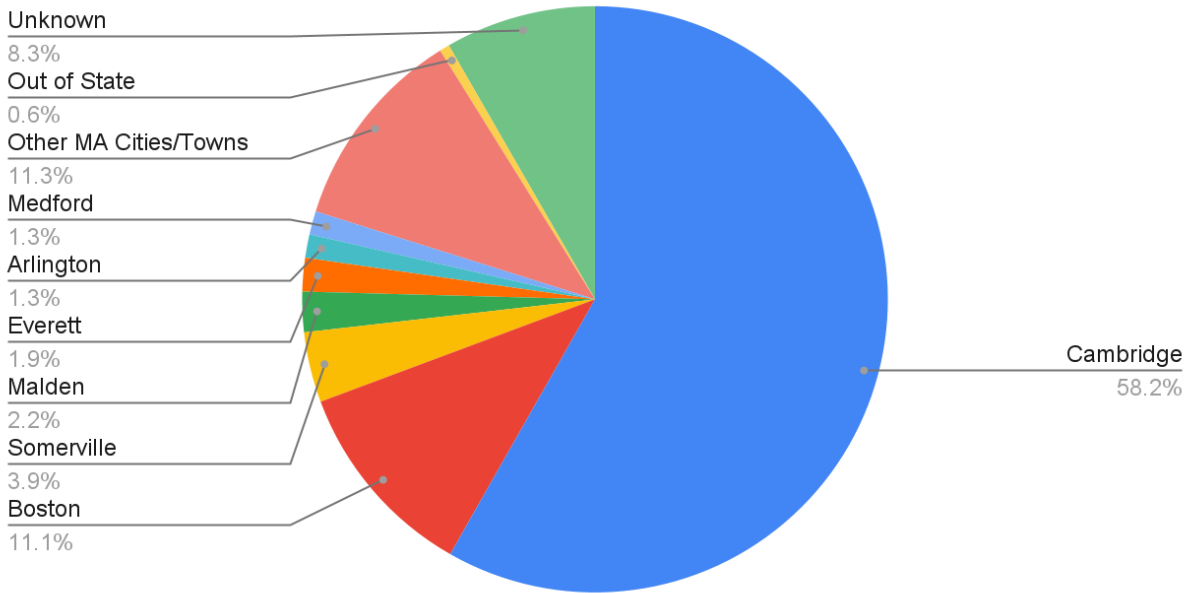Note: May not add up to 100% due to rounding.
Data Source: Pro EMS Ambulance Service

Cambridge Residency

Cambridge residents accounted for 58% of all opioid-related ambulance pickups in Cambridge from 2019-2021 (**Figure 4**).

Figure 4. Opioid-Related Overdoses in Cambridge by Residence, 2019-2021

Opioid-Related Overdoses in Cambridge by Residence, 2019-2021

Unknown
8.3%
Out of State
0.6%
Other MA Cities/Towns
11.3%
Medford
1.3%
Arlington
1.3%
Everett
1.9%
Malden
2.2%
Somerville
3.9%
Boston
11.1%

Cambridge
58.2%

Data Source: Pro EMS Ambulance Service

Opioid-related overdoses occurred among Cambridge residents in every neighborhood in the city from 2019-2021. When comparing heat maps of opioid-related overdoses by Cambridge residency status, ambulance pickups for Cambridge residents covered a broader geography than non-residents, with areas of high density among residents in the Alewife, Riverside, and Cambridgeport neighborhoods (**Figure 5**).

Ambulance pickups for non-residents were more concentrated in and around commercial districts, notably Alewife, Porter Square, Harvard Square, Central Square, and commercial areas in East Cambridge.

Figure 5. Opioid-Related Incidents by Cambridge Residency from 2019-2021, Cambridge, MA
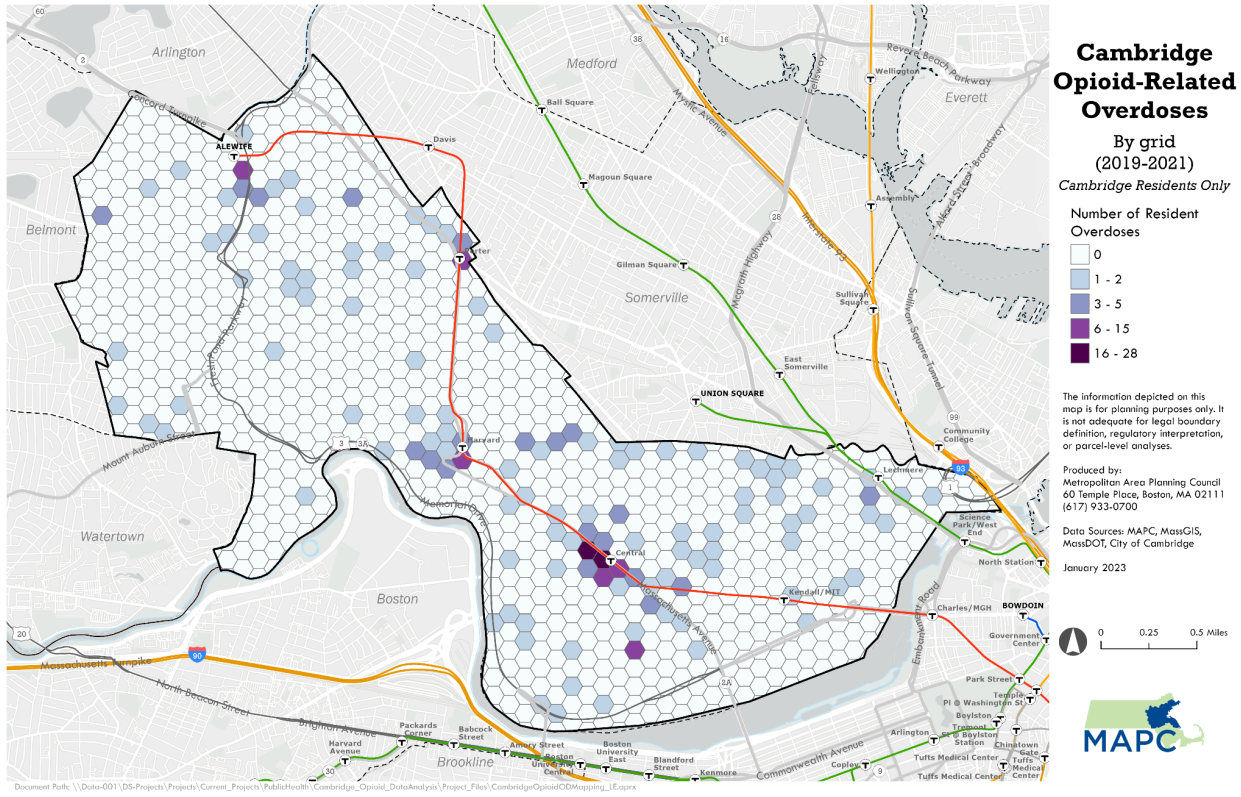
Data Source: Pro EMS Ambulance Service

Figure 6. Opioid-Related Incidents by Non-Cambridge Residency from 2019-2021, Cambridge, MA
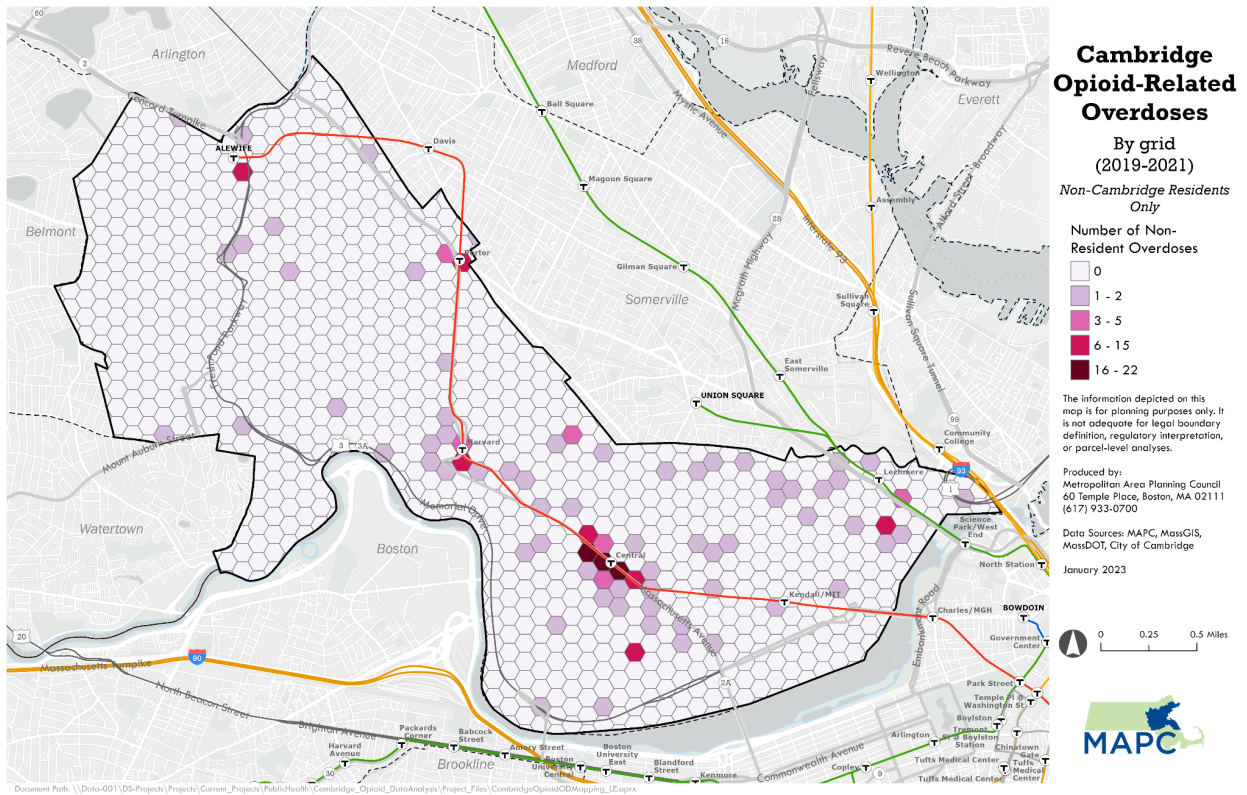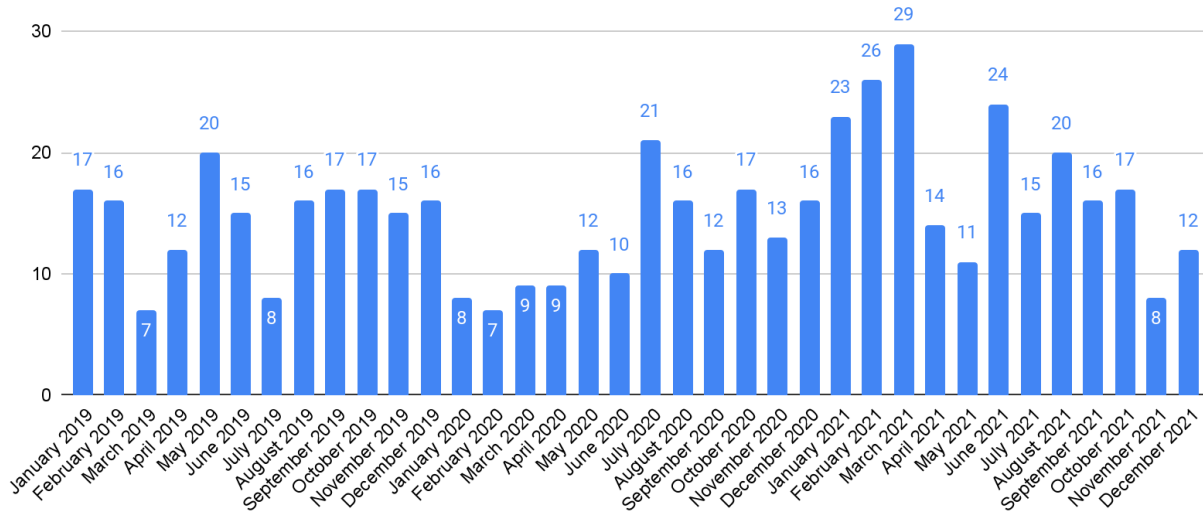
Data Source: Pro EMS Ambulance Service

<div align="center">Seasonality</div>

Time trends for opioid-related pickups (**Figure 7**) show that counts varied by month across 2019, 2020, and 2021. There was a peak in opioid-related incidents in March 2021.

Figure 7. Opioid-Related Overdoses in Cambridge by Month, 2019-2021

Opioid-Related Overdoses in Cambridge by Month, 2019-2021

Data Source: Pro EMS Ambulance Service

CAMBRIDGE HEALTH ALLIANCE AND MOUNT AUBURN HOSPITAL DATA

Hospital Visits

Cambridge Health Alliance (CHA) and Mount Auburn Hospital (MAH) are two of the primary health care systems that serve Cambridge. The data classification process was revisited and modified for this report compared to reports from previous years. To better understand the opioid crisis in Cambridge, the health department investigated opioid-related hospital visits at MAH and CHA health care sites. The classification for this category included hospital visits for which the primary diagnosis and/or the first listed secondary diagnosis were related to an opioid overdose, as well as visits for hospital and transport records indicating that the patient experienced an overdose in Cambridge. Several hospital encounters were excluded if a relevant diagnosis was otherwise listed or if the overdose happened outside of Cambridge. Additionally, hospital systems burdened by the COVID-19 pandemic may have been unable to treat opioid overdoses at their normal capacity. As a result, available data shows numbers that are significantly lower compared to previous years and may be underestimating the true number of hospitalizations.

From 2019-2021, 153 patients visited CHA or MAH health care sites for opioid-related incidents a total of 195 times (**Table 2**). Approximately 25% of these individuals had at least one repeat visit.

Table 2: Cambridge Health Alliance and Mount Auburn Hospital Encounters for Opioid-Related Overdoses, 2019-2021

|	2019	2020	2021	Total
Total Number of Opioid-Related Overdoses	85	49	61	195
Total Number of Unique Individuals	66	35	61	153
Average Number of Overdoses per Individual	1.3	1.4	1	1.3

Data Sources:

       Cambridge Health Alliance, Business Analytics Unit, 2019-2021

       Mount Auburn Hospital, Business Intelligence Unit, 2019-2021

From 2019-2021, 64% of encounters were discharged directly from the emergency department, 19% were admitted to the hospital as inpatients, and 16% were admitted to the hospital on observation status (**Figure 8**). These percentages fluctuated substantially year-to-year, as illustrated in **Table 3**. Notably, in 2020, nearly 98% of encounters were discharged directly from the emergency department, likely due to a lack of space on inpatient floors or for observation.

Figure 8. Opioid-Related Overdoses by Encounter Type at CHA/MAH, 2019-2021

Figure 8. Opioid-Related Overdoses by Encounter Type at CHA/MAH, 2019-2021
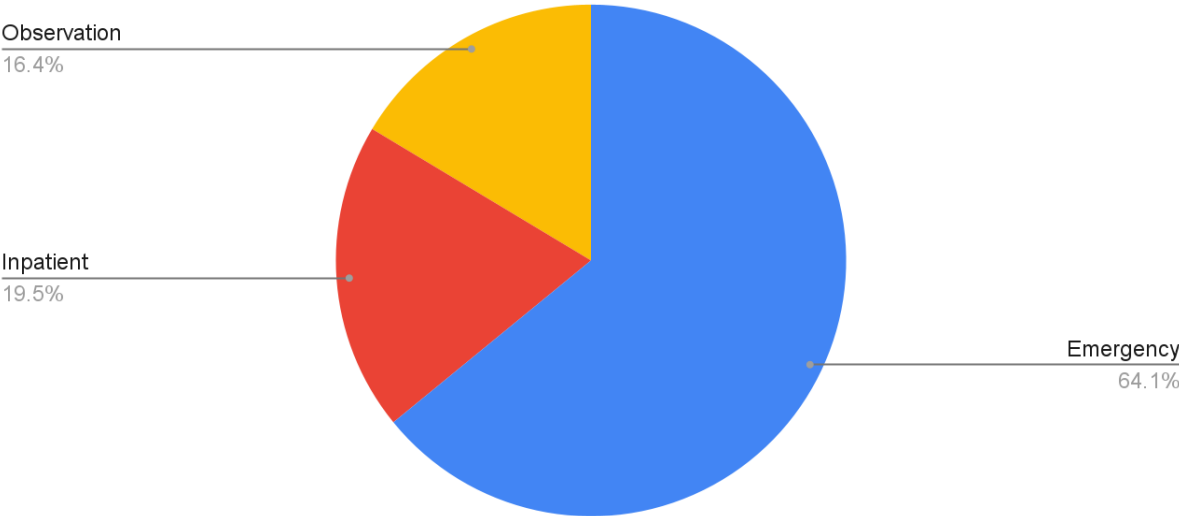
Data Sources:

       Cambridge Health Alliance, Business Analytics Unit, 2019-2021

       Mount Auburn Hospital, Business Intelligence Unit, 2019-2021

Table 3: Opioid-Related Overdoses by Encounter Type at CHA/MAH, 2019-2021

Encounter Type	Percentage (2019)	Percentage (2020)	Percentage (2021)	Percentage (Total)

Emergency	85.88%	97.96%	6.56%	64.10%
Inpatient	14.12%	2.04%	40.98%	19.49%
Observation	0%	0%	52.46%	16.41%

Data Sources:

Cambridge Health Alliance, Business Analytics Unit, 2019-2021

Mount Auburn Hospital, Business Intelligence Unit, 2019-2021

Following an emergency department visit or hospitalization, most opioid-related visits (70%) resulted in patients being discharged to "home" (**Table 4**). Notably, a high number of encounters had no documented discharge location in 2019, potentially artificially lowering the percentages for other discharge locations in that year.

Table 4: Opioid-Related Overdoses by Discharge Location from CHA/MAH, 2019-2021

Discharge Location	**Percentage (2019)**	**Percentage (2020)**	**Percentage (2021)**	**Percentage (Total)**
Home	45.88%	93.88%	83.61%	69.74%
Left Against Medical Advice	1.18%	4.08%	3.28%	2.56%
Other	1.18%	0%	3.28%	1.54%
Patient Death	1.18%	0%	3.28%	1.54%
Transferred/Admitted to Other Facility	3.53%	2.04%	6.56%	4.10%
Unknown	47.06%	0%	0%	20.51%

Note: May not add up to 100% due to rounding.
Data Sources:

Cambridge Health Alliance, Business Analytics Unit, 2019-2021

Mount Auburn Hospital, Business Intelligence Unit, 2019-2021

Demographics

Among patients who visited CHA/MAH from 2019-2021 for opioid-related overdoses:

63.6% were male
75.2% were white
Average age was 46.4

From 2019-2021, 153 people received care at CHA and MAH sites for opioid-related overdoses. This group was predominantly male and white, and disproportionately represented residents in the 25-54 age category (**Figures 10-17**)[6].

White patients were disproportionately represented among the CHA and MAH overdose cases. In 2020, White residents comprised 57.3% of the city's population, but made up 75.2% of the cases. Black residents, who comprise 10.6% of the city's population, accounted for 13.2% of the cases. Hispanic residents, who comprise 9.1% of the city's population, accounted for 3.3% of the cases.

Figure 10. Opioid-Related Overdoses by Gender at CHA/MAH, 2019-2021

Figure 10. Opioid-Related Overdoses by Gender at CHA/MAH, 2019-2021
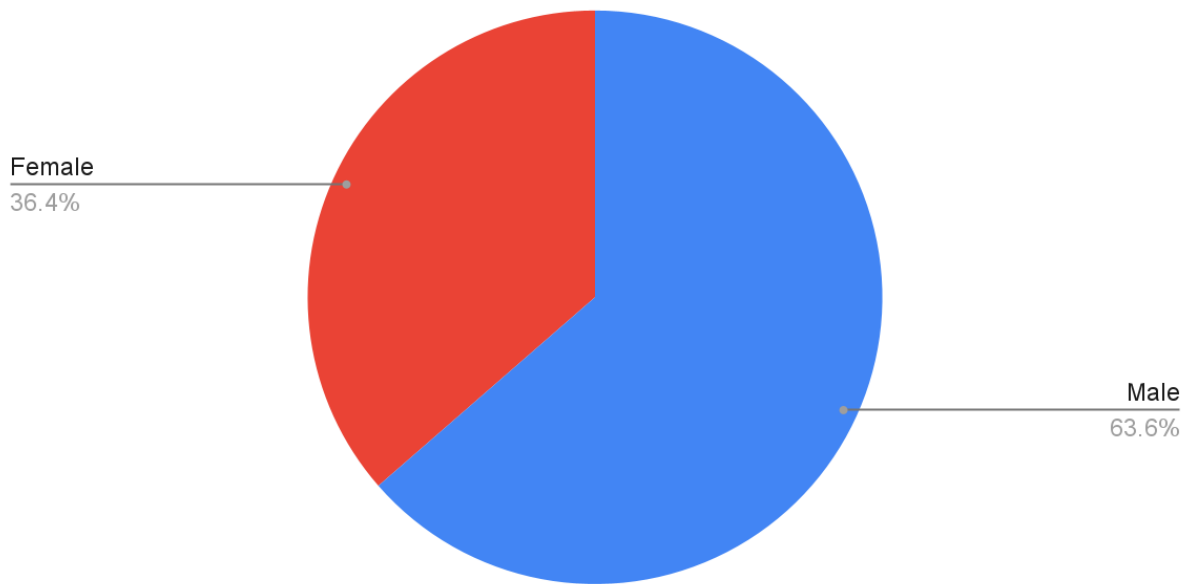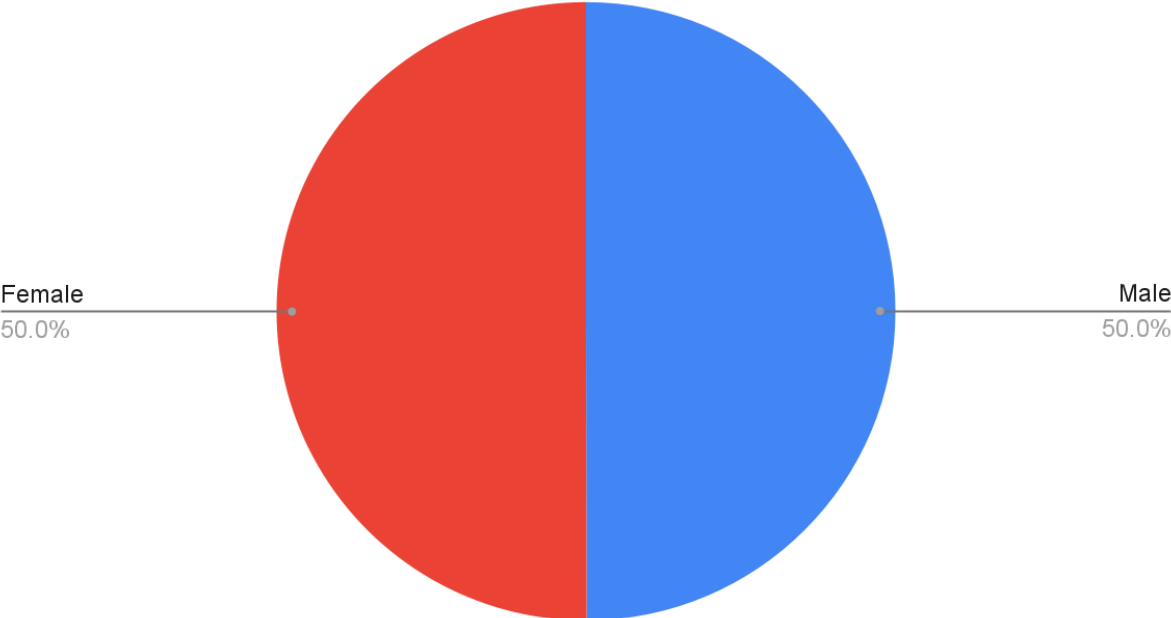
Female
36.4%

Male
63.6%

Data Sources:
    Cambridge Health Alliance, Business Analytics Unit, 2019-2021
    Mount Auburn Hospital, Business Intelligence Unit, 2019-2021
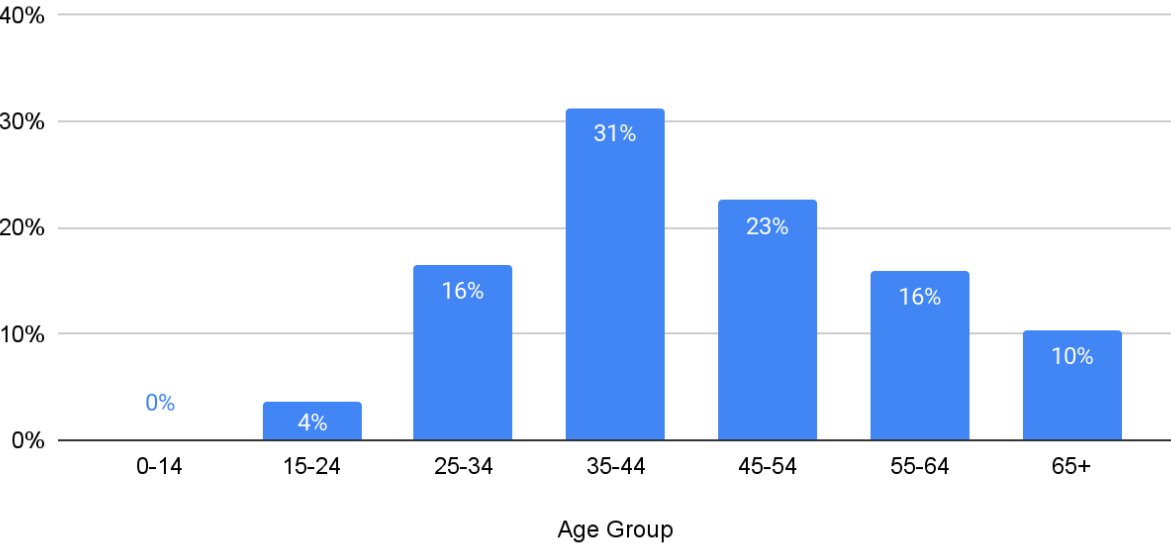
Figure 11. Cambridge Residents by Gender, 2020

Figure 11. Cambridge Residents by Gender, 2020

Note: 49.97% of Cambridge residents are male and 50.03% are female.
Data Source: United States Census, 2020

Figure 12. Opioid-Related Overdoses by Age Group at CHA/MAH, 2019-2021

Figure 12. Opioid-Related Overdoses by Age Group at CHA/MAH, 2019-2021
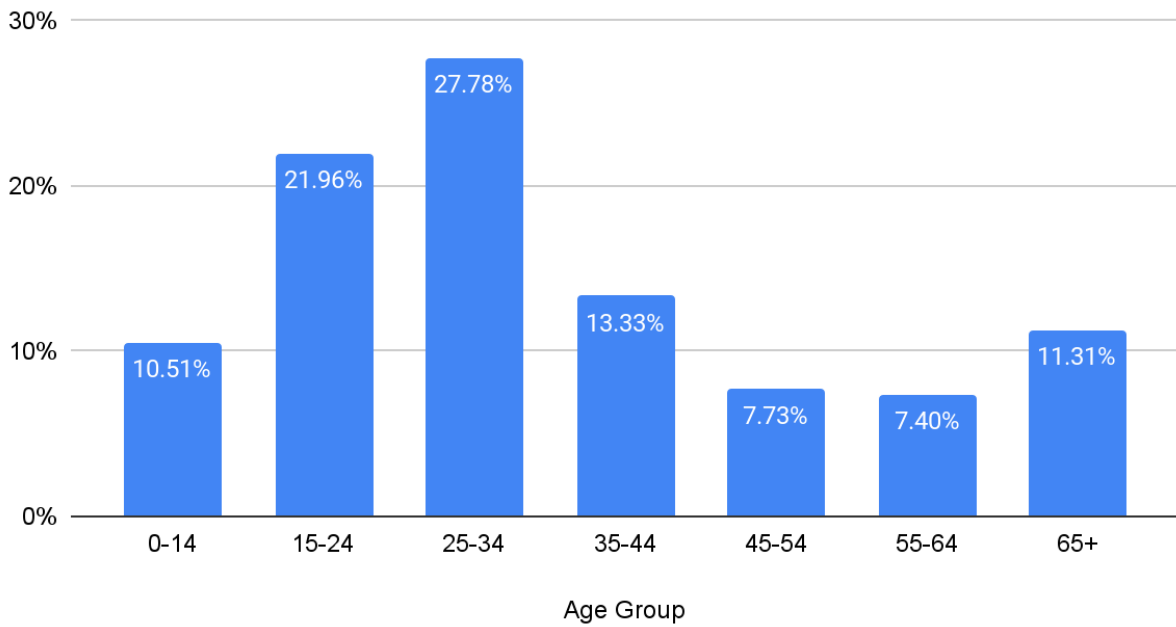
Data Sources:

        Cambridge Health Alliance, Business Analytics Unit, 2019-2021

        Mount Auburn Hospital, Business Intelligence Unit, 2019-2021

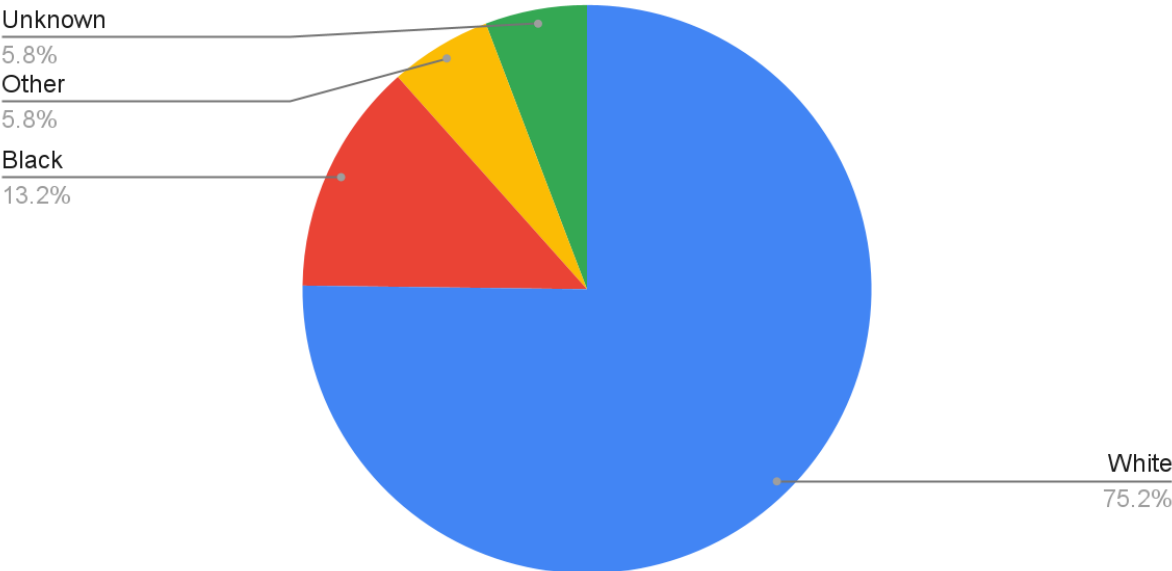Figure 13. Cambridge Residents by Age Group, 2020

Figure 13. Cambridge Residents by Age Group, 2020

Data Source: United States Census, 2020

Figure 14. Opioid-Related Overdoses by Race at CHA/MAH, 2019-2021

Figure 14. Opioid-Related Overdoses by Race at CHA/MAH, 2019-2021

Unknown
5.8%
Other
5.8%
Black
13.2%
White
75.2%

Data Sources:

       Cambridge Health Alliance, Business Analytics Unit, 2019-2021

       Mount Auburn Hospital, Business Intelligence Unit, 2019-2021

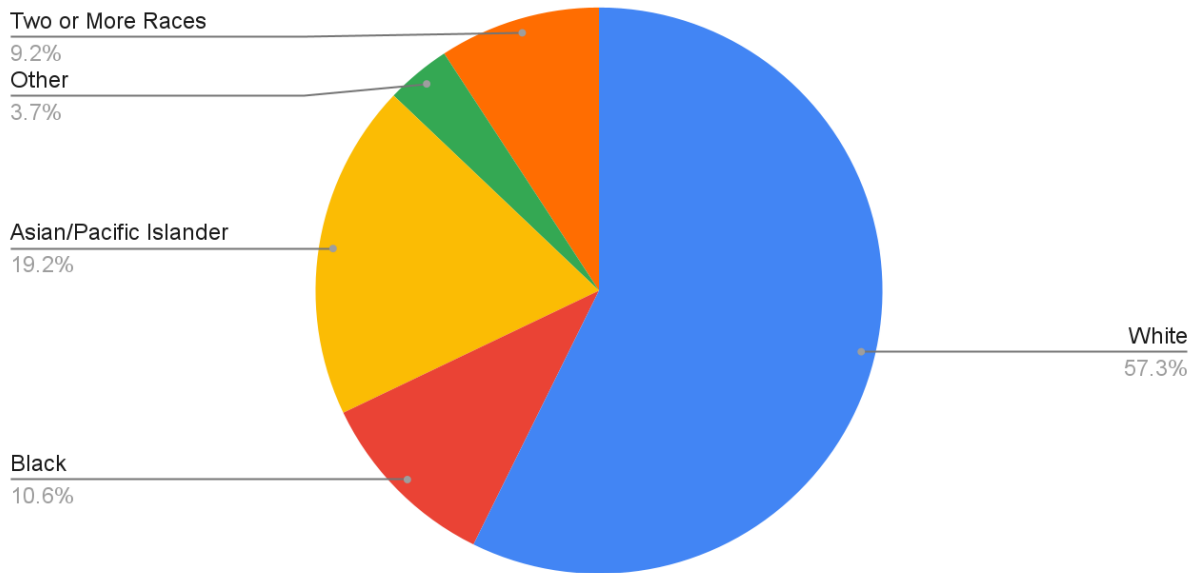Figure 15. Opioid-Related Overdoses by Hispanic Ethnicity at CHA/MAH, 2019-2021

Figure 15. Opioid-Related Overdoses by Hispanic Ethnicity at CHA/MAH, 2019-2021

Yes
3.3%

No
96.7%
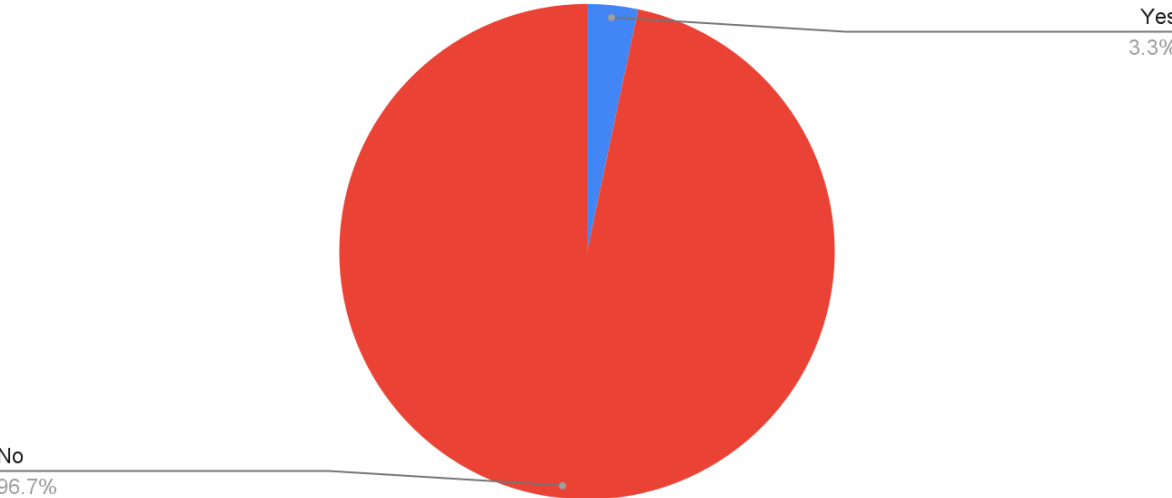
Data Sources:

Figure 16. Cambridge Residents by Race, 2020
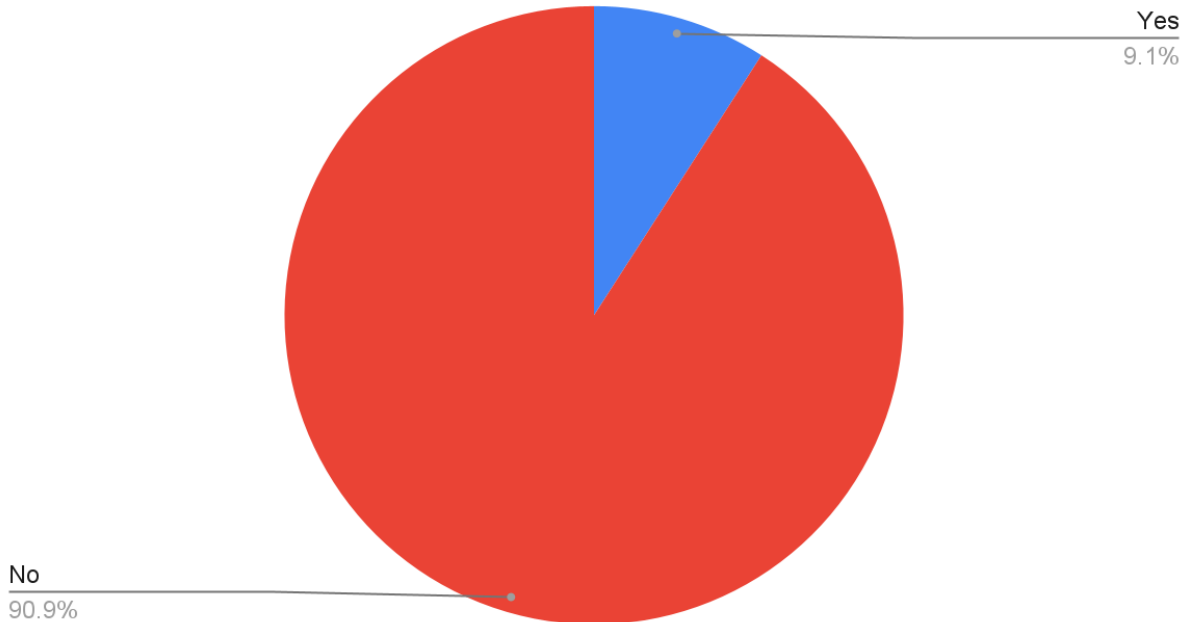
Figure 16. Cambridge Residents by Race, 2020

Two or More Races
9.2%

Other
3.7%

Asian/Pacific Islander
19.2%

Black
10.6%

White
57.3%

Data Source: United States Census, 2020

Figure 17. Cambridge Residents by Hispanic Ethnicity, 2020

Figure 17. Cambridge Residents by Hispanic Ethnicity, 2020

Data Source: United States Census, 2020

MASSACHUSETTS OVERDOSE EDUCATION AND NALOXONE DISTRIBUTION PROGRAM DATA

What is Naloxone? Naloxone (also known by its brand name, Narcan) is a medication that can reverse an opioid overdose. It blocks opioids from attaching to opioid receptors in the brain.

Naloxone is active for about 30 to 90 minutes in the body. If you give someone naloxone to reverse an opioid overdose, it may wear off before the effects of the opioids wear off. The person could overdose again. This depends on several things, including:

- The person's metabolism (how quickly the body processes things).
- How much drug the person used in the first place.
- If the person uses it again.

Naloxone cannot be used to get high and cannot be misused. If you give naloxone to someone who is not overdosing, there are no ill effects.

Cambridge is fortunate to have an Overdose Education and Naloxone Distribution (OEND) site. AIDS Action Committee's Access: Drug User Health Program, located in Central Square, offers a variety of services, including HIV/HCV/STI testing and overdose response training sessions for individuals who

are likely to experience or witness an overdose. Training includes how to prevent and recognize an opioid overdose, what to do if one occurs, the importance of calling 911, how to perform rescue breathing, and how to administer naloxone. Participants who complete this training are eligible to receive a free naloxone kit. 1,050 Access clients received some level of overdose prevention education from 2019-2021.

As of July 2020, the Cambridge Public Health Department (CPHD) and Somerville Health and Human Services (HHS) collaborated with Access (as well as the Somerville Homeless Coalition) on expanding overdose prevention education with the support of the federal Overdose Data to Action (OD2A) grant program. Using this grant funding, Access provided training attendees with gift cards and backpacks containing several supplies, including hygiene products, weather-appropriate gear, and portable phone chargers. From July 2020 through the end of 2021, Access instructors led 58 OD2A overdose prevention training sessions for 96 total participants. Of these 96 participants, 60% received this education for the first time and the remaining 40% were repeat participants.

2,350 Naloxone kits (4,700 doses) were distributed by Access from 2019-2021
76% of kits were refills

Access staff encourage clients to inform them of overdoses that they responded to, and remind them of the importance of contacting 911 if they witness someone experiencing an overdose. It is critical that people who have overdosed receive medical attention—even if they have received naloxone—because there is a chance they could re-overdose if the dose of opioid was too strong. The Massachusetts Good Samaritan Law protects people who call 911 to report an overdose from being charged with possession of a controlled substance. Many potentially fatal overdoses can be prevented if the victim receives timely and appropriate medical attention.

What the law does:
● Increases the likelihood that witnesses will call 911 during an overdose.
● Protects people from prosecution for possession of controlled substances when calling 911.
● Saves lives and gives people who use opioids a chance to get help for their addiction.
● Provides legal protection for medical professionals who prescribe naloxone, or people who possess and/or administer naloxone to someone appearing to have an opioid overdose.

What the law does not do:
● Does not interfere with law enforcement securing the scene at an overdose.
● Does not prevent prosecution for drug trafficking.
● Does not prevent prosecution for outstanding warrants.

For more information, please visit http://www.mass.gov/MakeTheRightCall.

Administration of Naloxone

Table 5 lists known naloxone administrations at opioid-related incidents in Cambridge. When responding to a suspected opioid-related incident, Pro EMS records whether naloxone was administered

during a suspected overdose incident and who administered it. If known, Pro EMS also records whether a bystander administered naloxone to someone experiencing a suspected overdose prior to EMS arrival.

Table 5: Known Naloxone Administrations for Opioid-Related Overdoses in Cambridge when 911 was called, 2019-2021

Administrator	Total #	% of Total
Pro EMS	194	47.78%
First Responder	71	17.49%
Fire Department	66	16.26%
Bystander	66	16.26%
Other Healthcare Professional	9	2.22%
Total	406	100%

Note: May not add up to 100% due to rounding.
Data Source: Pro EMS Ambulance Service

RESOURCES

Everyone has a role to play when it comes to preventing death from overdose. Depending on your role in the community, there are different ways you can help stem the tide of the opioid epidemic.

The Massachusetts Substance Use Helpline: Provides free, confidential information and referrals to over 600 treatment programs funded or licensed by the state. (800) 327-5050 | helplinema.org

Learn to Cope: A support group for parents and other family members coping with a loved one addicted to opioids or other drugs. (508) 738-5148 | www.learn2cope.org

Access Drug User Health Program: Free, safe, and confidential space for drug users to access resources and services, including free naloxone. (617) 470-6547 | fenwayhealth.org/aac/programs-services

PAATHS: One-stop shop for information about or access to addiction treatment services. (855) 494-4057 | boston.gov/government/cabinets/boston-public-health-commission/recovery-services/find-your-path-recovery

Cambridge Police Special Investigations Unit: Conducts investigations and assists overdose victims seeking treatment and recovery services. (617) 349-3360

Narcotic Anonymous: Support meetings (866) 624-3578 | nerna.org

Alcoholics Anonymous: Support meetings (617) 426-9444 | aaboston.org

Behavioral Health Treatment Services Locator (800) 662-4357 |
mass.gov/community-behavioral-health-centers

Cambridge Public Health Department: Free overdose prevention training and harm reduction services,
including Narcan and fentanyl test strips |
cambridgepublichealth.org/services/opioid-abuse-prevention

METHODS

The Cambridge Public Health Department assessed existing community-level data sources to develop
a timelier, more comprehensive overdose surveillance system.

All EMS incidents that were likely related to opioids were pulled from the Pro EMS FirstWatch
system. Epidemiologists at the Cambridge Public Health Department used narrative reports for each
incident, as well as documented vital signs and naloxone response, to categorize each incident by
overdose status. This method of classification was used from January 1, 2017 to May 17, 2017.

Classification Algorithm

From May 17, 2017 to December 2019, a machine learning algorithm was used to classify EMS
incidents. Using natural language processing models in the programming language R,[7] the narrative text
of new incidents were compared to previously manually classified data. In December 2019, it was
discovered that data formatting changes required system revisions, prompting a return to manual labeling
until February 2020. From February 2020 to present, the system revisions were completed and automatic
reporting resumed on a weekly basis.

A corpus of approximately 1,500 manually classified incidents were used to generate a document
matrix to train a Support Vector Machine (SVM), which is a type of supervised learning model.[8] New data
were classified using this model. Epidemiologists at the Cambridge Public Health Department verified
incidents that were not conclusively labeled. The current algorithm has an accuracy of 87.56%, a
sensitivity of 68.75%, and a specificity of 95.04%. For more information, please contact the Division of
Epidemiology and Data Services.

MAPC Data Analysis

MAPC prepared the following deliverables for CPHD:
- A memorandum, which summarizes the project, its deliverables, and the methodology, and
provides recommendations for data analysis supporting future OSD reports,

- Tables with summary data on non-fatal opioid-related overdoses by primary diagnosis, by type of encounter (emergency, inpatient, and observation), by month, by location (hospital destination, discharge location), and across demographic characteristics (age, race, gender),
- Maps depicting the number of non-fatal opioid-related overdoses across various geographies (grid cells, Census Blocks, and Cambridge neighborhoods), and
- A GitHub code repository with the R scripts used to generate the tabular data.

CPHD provided MAPC with data from three local sources: CHA, MAH, and Pro EMS. This data arrived as a set of CSVs, one for each source and for each calendar year. MAPC added a year field to each CSV and then combined the tables by source.

Next, MAPC combined the hospital data (CHA and MAH) into a single table and matched fields across the data sources. MAPC also added a discharge location field to the MAH data, as one had not been present in the original data. As needed, MAPC also matched the variables within the Race, Hispanic, and patient status fields. For example, in the Race field, the values "African American," "BlackCK" and "Bla" were all reclassified to "Black." The Pro EMS dataset, which describes transportation of a portion of individuals suffering from opioid-related incidents to hospitals, was kept separate to avoid double-counting.

Finally, MAPC filtered the processed data to only those hospital and transport records pertaining to opioid incidents in Cambridge. The combined CHA and MAH dataset was reduced to records with Cambridge-area zip codes (using the Zip Code field) and with a primary or secondary diagnosis relating to opioids. The Pro EMS data set was reduced to records from the years 2019 to 2021. For some maps, Pro EMS was additionally filtered by Cambridge residency.

ACKNOWLEDGMENTS

Danielle McPeak, MPH

Pro EMS Ambulance
Bill Mergendahl, JD, EMT-P
Keri Cook, NRP

FirstWatch
Janet Baker

Cambridge Health Alliance
Alice Knowles, MS
Vivian Li

Mount Auburn Hospital
Andrew Gardner

Bureau of Substance Addiction Services
Sarah Ruiz, MSW

Cambridge Police Department
Rebecca Leonard

Access Drug User Health Program
Brian Sink

Metropolitan Area Planning Council
Barry Keppard, AICP
Alyssa Kogan
Claire Hoffman
Lily Perkins-High

Institute for Community Health
Julia Curbera, MCP

ENDNOTES

1 Centers for Disease Control and Prevention. The Drug Overdose Epidemic: Behind the Numbers. Retrieved August 4, 2023. https://www.cdc.gov/opioids/data/index.html

2 Kaiser Family Foundation. Opioid Overdose Death Rates and All Drug Overdose Death Rates per 100,000 Population (Age-Adjusted). Retrieved August 4, 2023. https://www.kff.org/other/state-indicator/opioid-overdose-death-rates/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Opioid%20Overdose%20Death%20Rate%20(Age-Adjusted)%22,%22sort%22:%22desc%22%7D

3 Massachusetts Department of Public Health. (June 2023). Data Brief: Opioid-Related Overdose Deaths Among Massachusetts Residents. Retrieved August 4, 2023. https://www.mass.gov/doc/opioid-related-overdose-deaths-among-ma-residents-june-2023/download

4 Massachusetts Department of Public Health. (June 2023). Number of Opioid-Related Overdose Deaths, All Intents by City/Town 2015-2022. Retrieved August 4, 2023. https://www.mass.gov/doc/opioid-related-overdose-deaths-by-citytown-june-2023/download

5 Massachusetts Department of Public Health. (December 2022). Data Brief: Opioid-Related Overdose Deaths Among Massachusetts Residents. Retrieved August 4, 2023. https://www.mass.gov/doc/opioid-related-overdose-deaths-among-ma-residents-december-2022/download

6 Cambridge Community Development Department. Demographics and Statistics FAQ. Retrieved August 18, 2023. https://www.cambridgema.gov/cdd/factsandmaps/demographicfaq

7 R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org

8 Max Kuhn. Contributions from Jed Wing, Steve Weston, Andre Williams, Chris Keefer, Allan Engelhardt, Tony Cooper, Zachary Mayer, Brenton Kenkel, the R Core Team, Michael Benesty, Reynald Lescarbeau, Andrew Ziem, Luca Scrucca, Yuan Tang, Can Candan and Tyler Hunt