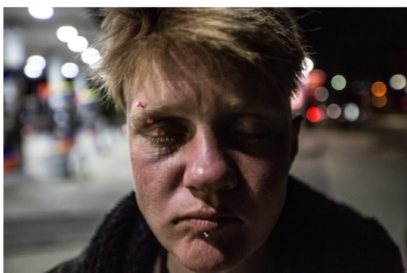




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Thaker

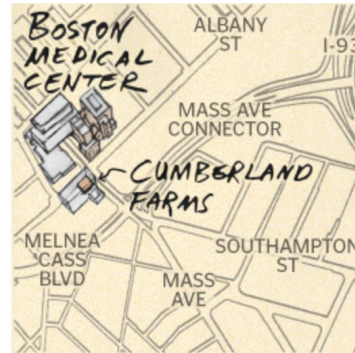
Final Project Report

Drug Addiction Crisis, Block by Block



ABSTRACT Mapping Overdose, Resource Gaps and Survival Across Boston's
Neighborhood (2015-2025)

Description



Introduction

There is a stretch of road in Boston that most people have heard about before they ever walk it. Mass Ave between the South End and Roxbury – what locals call Methadone Mile – has become one of the most visible faces of the drug addiction crisis in all of New England. On any given morning, people are sitting on curbs, leaning against walls, or being revived by strangers who carry Narcan because they have learned, the hard way, that someone will need it.

Boston recorded nearly 3,000 drug overdose emergency calls in 2023 alone. More than 200 people did not make it. And yet, when you look at where those overdoses happened versus where the city's treatment centers, Narcan distribution points, and recovery programs are located, something uncomfortable becomes clear the help is not always where the people are. Some neighborhoods have been living inside this crisis for decades. Others barely notice it exists.

This project maps that gap. It traces Boston's drug addiction crisis neighborhood by neighborhood, block by block, from 2015 to 2025 – layering overdose incidents with resource availability, income levels, and insurance coverage to show not just where the crisis lives, but who gets help and who is left to survive it on their own.

Motivation

I chose this topic because it is not something I read about from a distance. I live near and go to UMass, which sits in Dorchester — one of the neighborhoods hit hardest by this crisis. I take the train past Methadone Mile. I walk through the South End. I see the same people, the same corners, the same ambulances. And for a long time, I did not really understand the full picture of what I was seeing.

When I started pulling the data together for this project, what stopped me was not the numbers themselves — though they are staggering. It was the geography. The drug overdose death rate in Roxbury is more than four times higher than in Back Bay. Those two neighborhoods are less than two miles apart. They share the same city, the same hospitals, the same public transit. But they do not share the same chances of survival when something goes wrong at 2am.

That gap is not an accident. It follows the exact same lines as income inequality, racial segregation, and insurance coverage. The neighborhoods with the fewest resources for addiction recovery are the same ones that have been underfunded and overlooked for generations. That is the story I want to tell — not just that people are struggling, but that the struggle is not randomly distributed. It is structured. And it is visible in the data if you know where to look.

Also watching this crisis get covered in the news as if it only happened in rural America — in distant small towns, far from cities like Boston. But the data tells a different story. The addiction crisis has always been here too, on streets that students walk to class and families go to the grocery store. It just does not always get covered with the same urgency when the neighborhoods are predominantly low-income and communities of color.

More than anything, I wanted to build something that makes this personal for people. Not a wall of statistics — but something you can actually interact with. Something where you can click on your own neighborhood, or a neighborhood you know, and see exactly how far you would have to travel to find help. Because when data stops being abstract and starts feeling real, that is when people actually pay attention.

And I want to be clear: this is not only a story about tragedy. There are people who have been fighting this crisis in Boston for years — harm reduction workers, peer recovery coaches, community health workers operating out of underfunded clinics. The data shows their impact too. Since Narcan distribution expanded across Boston in 2016, thousands of lives have been saved. In fact, 2024 recorded a 38% drop in overdose deaths in Boston — the lowest number since 2015. That part of the story deserves to be told just as loudly.

Data Sources

Nine publicly available datasets form the foundation of this project. Each maps to a specific layer or chart in the visualization.

1. Boston EMS Overdose Incident Reports

<https://www.mass.gov/info-details/ems-regional-opioid-related-incident-dashboard>

The core dataset. MA DPH's EMS Regional Opioid Incident Dashboard contains coordinates, date, time, and neighborhood for every EMS drug overdose call. Data is updated through mid-2025 and is publicly downloadable. Powers the animated heatmap and timeline slider — the heart of Chapter 2.

2. Narcan (Naloxone) Distribution Sites

<https://www.boston.gov/government/cabinets/boston-public-health-commission/recovery-services/overdose-prevention>

BPHC maintains a directory of all city-funded and partner Narcan pickup locations. Used for the green point layer on the map and the 'If You Were Here' nearest-site distance calculator.

3. Drug Addiction Treatment Facilities

[Opioid Use Disorder Treatment - Find A Local OUD Provider Prescription treatment website](#)

All licensed detox facilities, methadone clinics, and addiction treatment providers in the Boston area. Bubble size on the map encodes bed capacity. Also drives the Chapter 3 resource gap bar chart.

4. Overdose-Related Emergency Department Visits

<https://www.mass.gov/info-details/bureau-of-substance-addiction-services-bsas-dashboard>

The MA BSAS Dashboard provides hospital-level drug overdose visit volume by zip code and year, updated through June 2025. Supplements EMS call data to capture overdoses that reached ERs without a prior 911 call. Used in the trend line charts in Chapter 3.

5. Fatal Overdose Death Records

<https://www.mass.gov/info-details/bureau-of-substance-addiction-services-bsas-dashboard>

The same BSAS Dashboard also contains fatal overdose death records updated through December 2024, sourced from MA Registry of Vital Records. Used to distinguish fatal vs. non-fatal dots on the map (red pulse vs. orange pulse) and to calculate the Narcan lives-saved counter in Chapter 4.

6. Recovery Support Services Directory

<https://helplineboston.org/BPHC-Recovery-Services>

Sober homes, peer support coaches, and recovery community organizations across Boston. Used in Chapter 4 to map which interventions exist and where peer coaches have been deployed.

7. U.S. Census Bureau – ACS 5-Year Estimates (2023)

<https://www.census.gov/programs-surveys/acs/data.html>

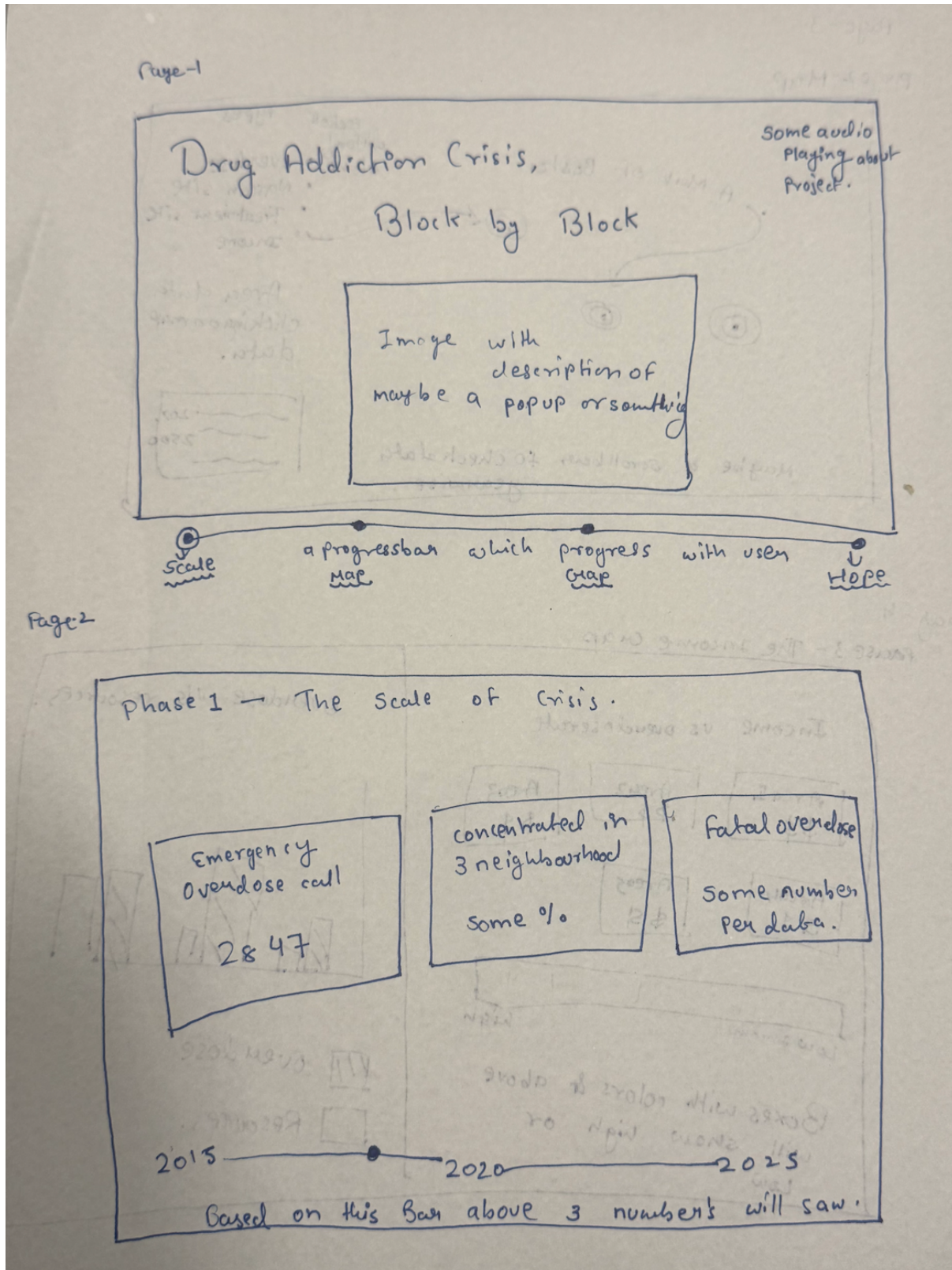
Median household income, race and ethnicity breakdown, and health insurance status by census tract. The 2023 ACS estimates are the most recently published version. The equity layer of the entire project – used in the choropleth map, donut charts, and neighborhood comparison section in Chapter 3.

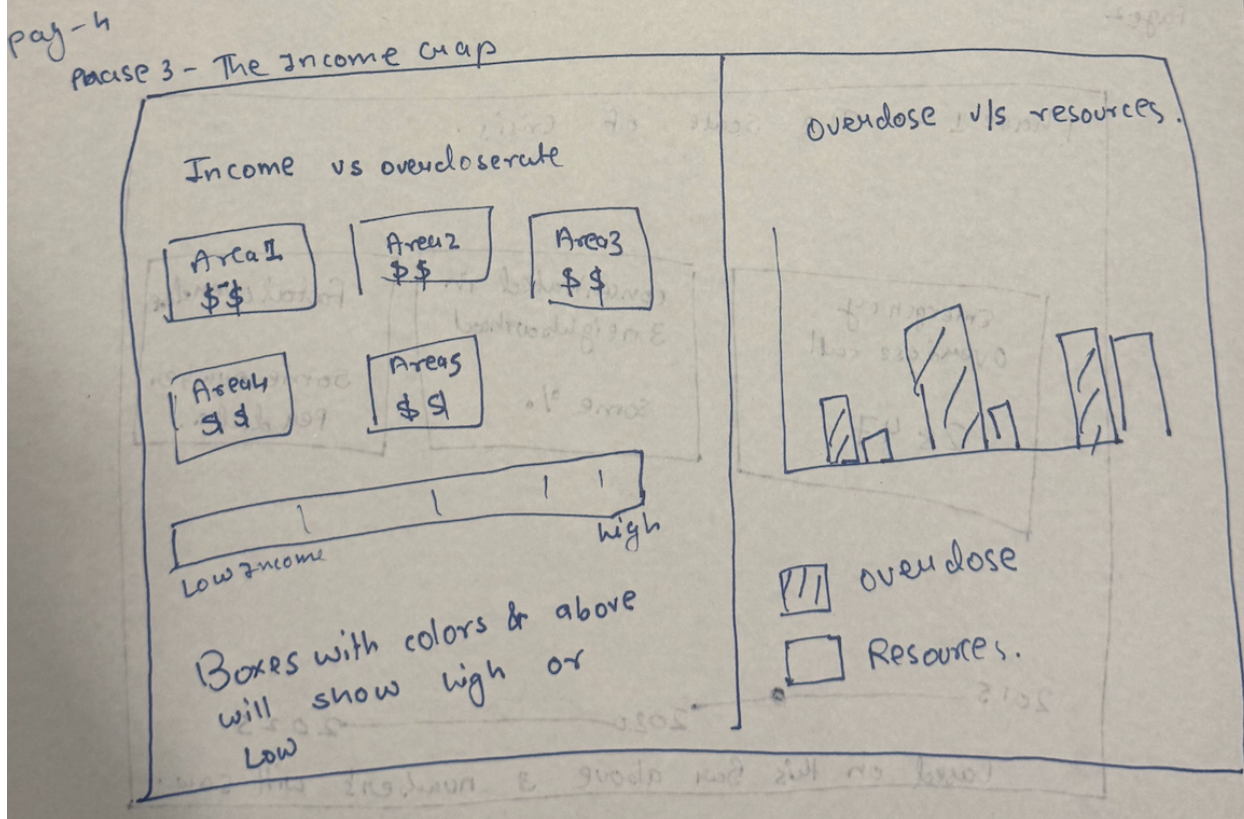
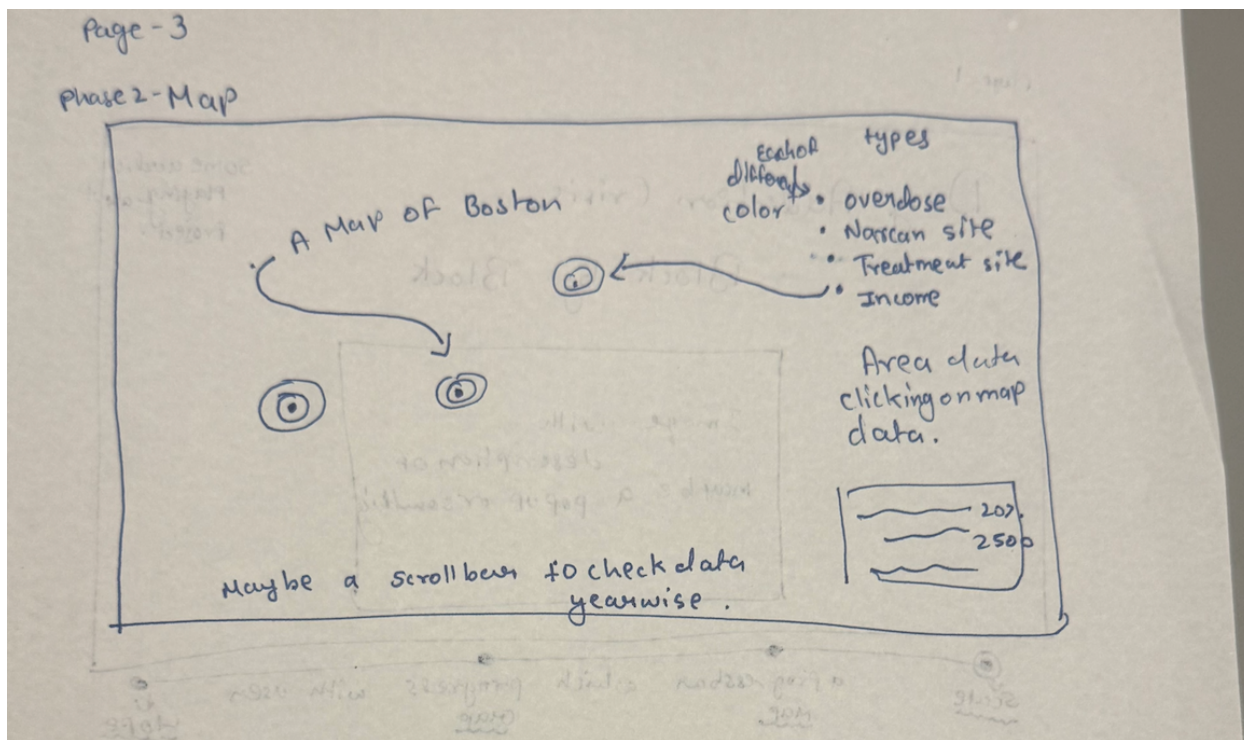
8. Boston Neighborhood Boundary Shapefiles

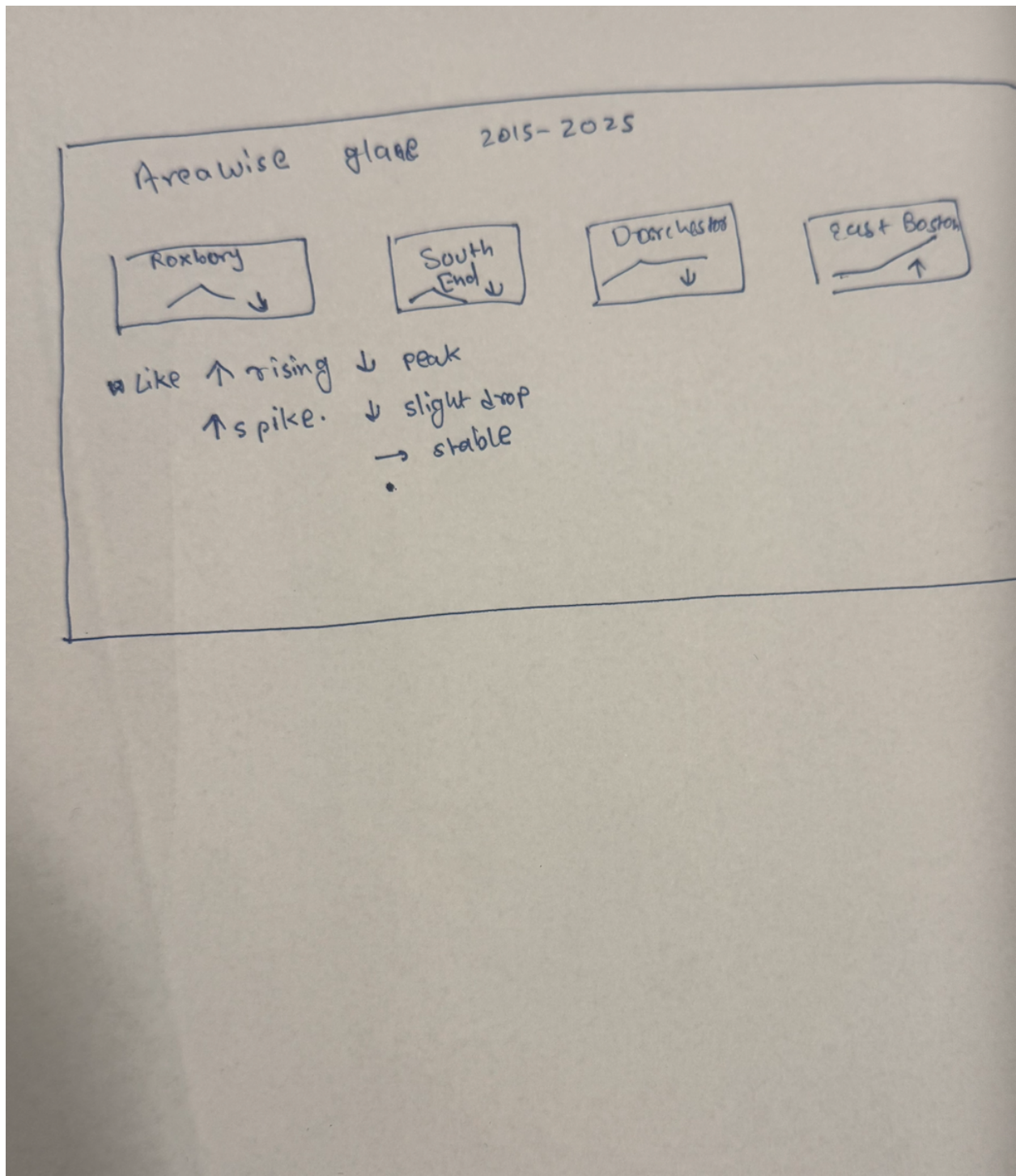
<https://data.boston.gov/dataset/boston-neighborhoods>

GeoJSON boundary files for all Boston neighborhoods. Used as the base geographic layer for the choropleth map and for assigning overdose and resource point data to their correct neighborhoods

Paper Sketches







Proposed Technologies and Plan

For this project, I want to take through Boston's drug addiction crisis as a story rather than a dashboard. Instead of one giant visualization, the project is structured as a scroll-driven narrative with four chapters, each building on the last. The main structure is as follows:

1. The Scale of the Crisis Before any map or chart appears, you can see the raw numbers. Animated statistics reveal one at a time as the user scrolls — total overdose emergency calls in Boston, the percentage concentrated in just three neighborhoods, and total deaths in the most recent year. A pictogram row puts those numbers into human scale against the broader city population.

2. The Map A full-screen interactive map built shows overdose density across Boston neighborhoods with a timeline slider running from 2015 to 2025. Users can toggle layers for Narcan distribution sites, treatment centers, and an income overlay. Clicking any neighborhood opens a sidebar showing overdose count, distance to the nearest recovery resource, and a letter grade for resource access. A unique feature lets users click anywhere on the map to instantly see how far they are from the nearest Narcan site and treatment bed.

3. The Equity Gap A choropleth map overlays neighborhood income levels with overdose rates, making the structural disparity visible in a single glance. A grouped bar chart compares overdose counts against available resources per neighborhood side by side. Small multiple sparklines display every neighborhood's trend from 2015 to 2025 simultaneously so the audience can scan and compare without clicking.

4. Hope and What Works The final chapter shifts tone entirely. The color palette transitions from dark red to teal and green. An animated counter shows lives saved by Narcan in Boston since 2016, ticking upward as the user scrolls. Three evidence cards highlight what has made a measurable difference: expanded Narcan distribution, new treatment bed openings near overdose hotspots, and peer recovery coach deployment to underserved neighborhoods.

Final Product

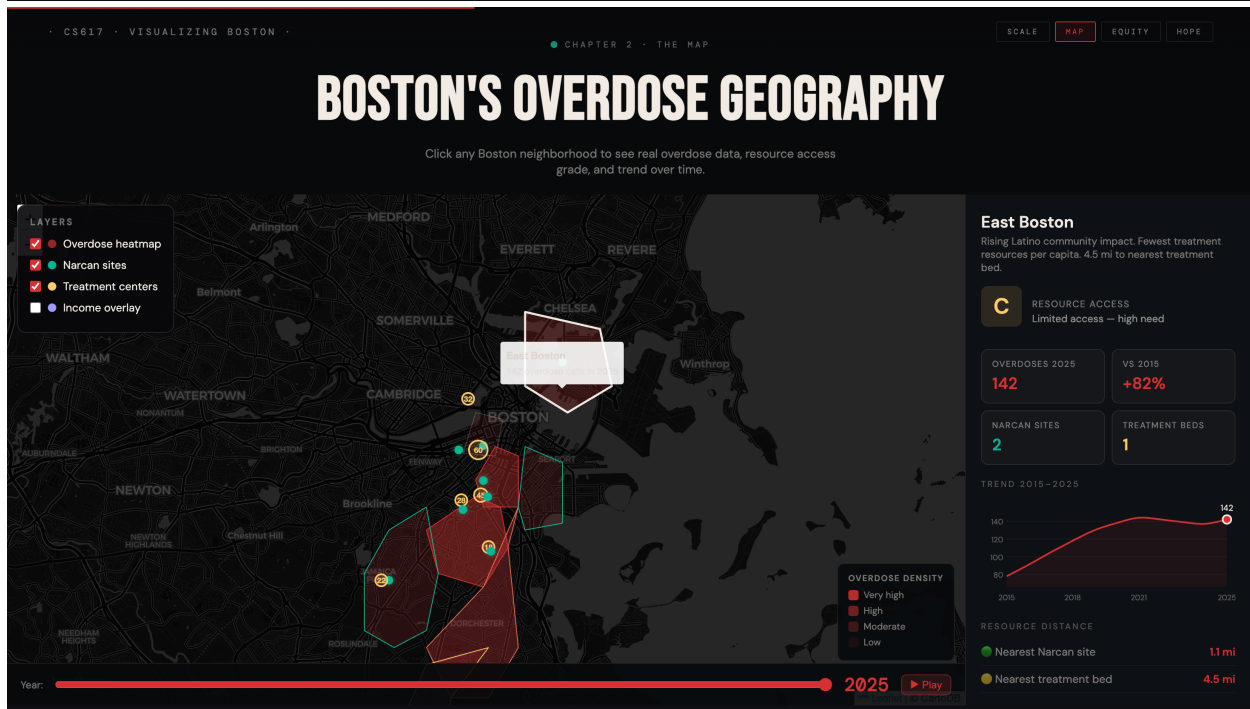
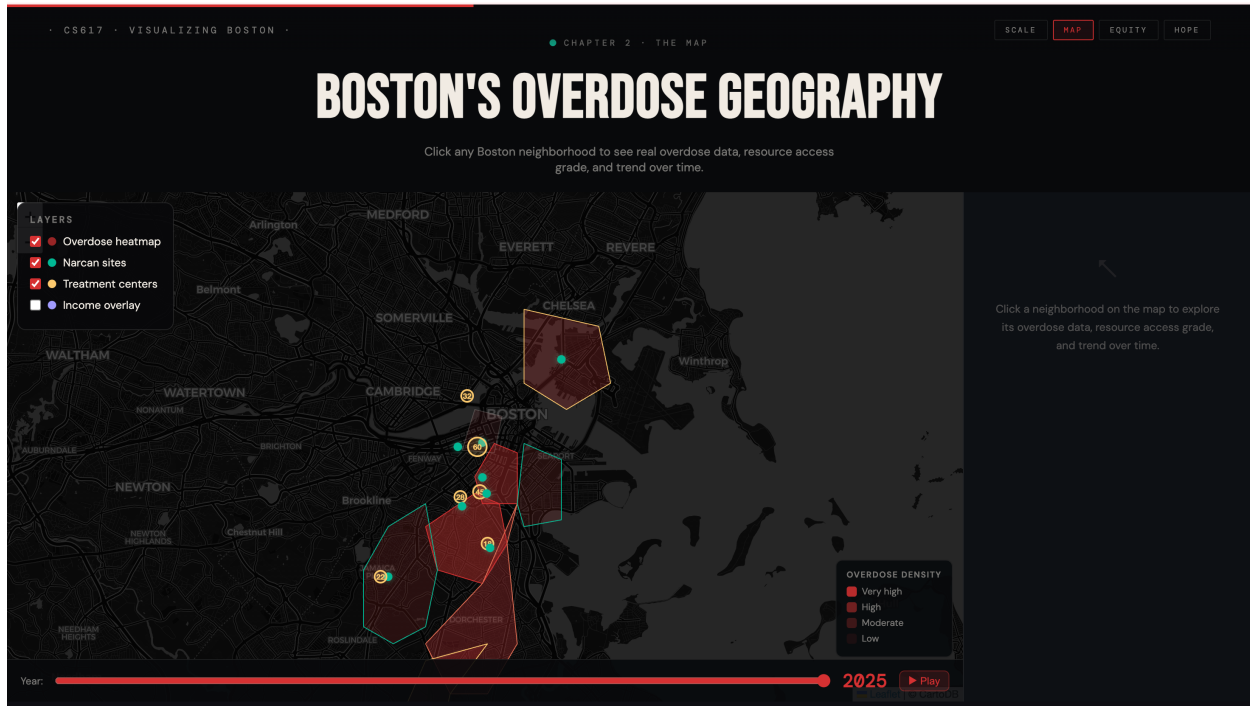
The finished project is a scroll-driven, web experience that takes the reader through Boston's drug addiction crisis in four chapters



Chapter 1 – The Scale of the Crisis opens before any map appears. A single large number fills the screen: 2,357 – opioid-related overdose deaths in Massachusetts in 2022. Below it, a pictogram grid of small squares puts that number into human scale, each square representing a person. As the user scrolls, the number and its description animate in one at a time, forcing a moment of attention before the data gets geographic. The three hero statistics from the top of the page – ~3,000 EMS calls in Boston in 2023, 214 fatal overdoses, and the 38% drop in deaths in 2024 – anchor the reader before anything else loads.

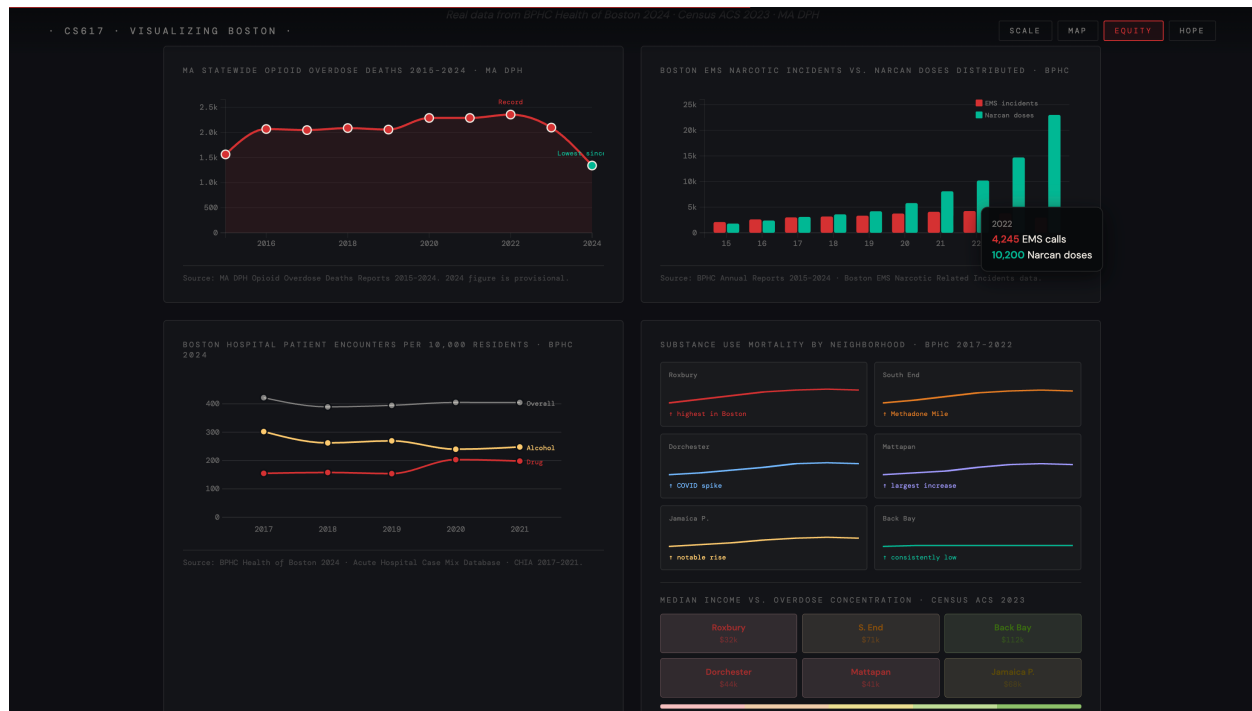


Chapter 2 – The Map is the heart of the project. It is a full interactive map of Boston built in Leaflet, with neighborhood polygons color-coded by overdose density. A timeline slider at the bottom runs from 2015 to 2025, and an auto-play button animates the entire decade in sequence so users can watch the crisis shift across the city over time. Four layer toggles let users turn on and off the overdose heatmap, Narcan distribution sites (in teal), treatment centers (in amber), and a neighborhood income overlay (in purple). Clicking any neighborhood opens a sidebar panel on the right that shows the neighborhood name, a letter grade for resource access (A through F), overdose count, distance to the nearest Narcan site and treatment bed, and a short trend note. Below the map, Leaflet popup markers show individual site details on click. A subtle "If You Were Here" block in the sidebar tells the user in plain language how far they would have to travel to find help from that location. The sidebar was designed to feel like a report card, not a database readout – the grade badge is large, the distance values are color-coded green to red, and the language stays human.



Chapter 3 – The Equity Gap presents four charts side by side in a two-column grid. The first is a grouped bar chart comparing overdose deaths with Narcan doses distributed per year from 2015 to 2024, showing how distribution ramped up even as deaths climbed – and then the dramatic drop in 2024 as both lines finally moved in the same direction. The second is a connected dot plot showing Boston hospital patient encounters per 10,000 residents across neighborhoods, overlaying the gap between where people get sick and where care exists. The third is a set of small-multiple sparklines, one per neighborhood – Roxbury, South End, Dorchester, Mattapan, Jamaica Plain, Back Bay – each plotting the overdose mortality trend from 2017 to 2022. The contrast between Roxbury's persistent peak and Back Bay's flat baseline is visible at a single glance without clicking anything. Embedded below the sparklines is a choropleth grid mapping median household income against overdose concentration for six neighborhoods, with a color scale running from deep red (low income, high overdose) to green (high income, low overdose). All four charts share a shared tooltip that appears on hover with precise values and data attribution.

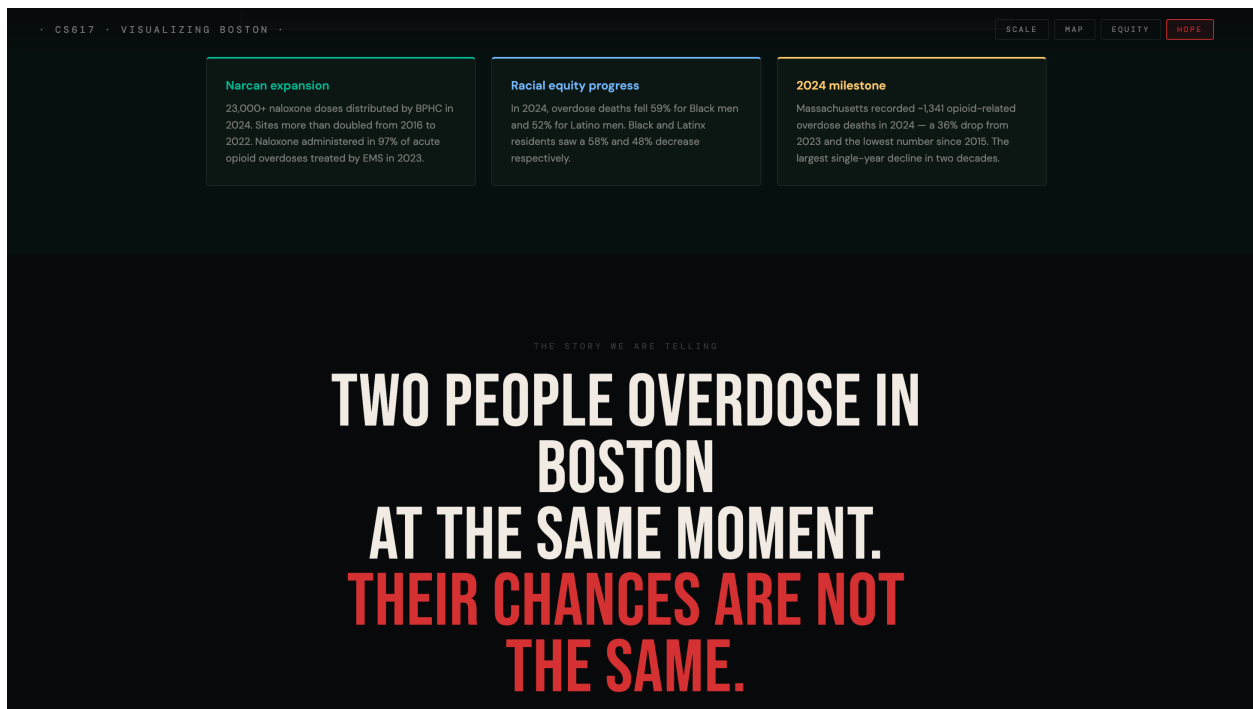




Chapter 4 – Hope shifts tone entirely. The background transitions from near-black to a deep teal-tinted dark as the section enters view, triggered by an Intersection Observer. The first thing visible is a live counter that ticks upward from 10,000 to 14,382 — lives saved by Narcan in Boston since 2016. Below it, an animated bar chart shows naloxone doses distributed by the Boston Public Health Commission each year, climbing from 2,400 in 2016 to over 23,000 in 2024. Each bar has a hover tooltip with the exact figure. Three evidence cards beneath it highlight what actually worked: the expansion of Narcan distribution sites, the racial equity progress (overdose deaths fell 59% for Black men and 52% for Latino men in 2024), and the 2024 milestone of ~1,341 statewide deaths — the largest single-year decline in two decades. The section does not end on tragedy. It ends on the fact that interventions work when they reach the people who need them.



The Closing strips everything back to a single statement in large type: Two people overdose in Boston at the same moment. Their chances are not the same. Below it, But it does not have to stay that way. Four color-coded pills — The Scale, The Map, The Equity Gap, Hope — sit as a visual recap of the journey.



Project links

Live Website- <https://janshi21.github.io/Drug-Addiction-Crisis-Boston/>

Github Repo- <https://github.com/Janshi21/Drug-Addiction-Crisis-Boston>

References

D3 Graph Gallery — <https://d3-graph-gallery.com>

Leaflet.js — <https://leafletjs.com>

Boston Globe · Methadone Mile — <https://apps.bostonglobe.com/graphics/2016/07/methadone-mile/>

MA DPH EMS Regional Opioid Incident Dashboard — <https://www.mass.gov/info-details/ems-regional-opioid-related-incident-dashboard>

Boston Public Health Commission — <https://www.boston.gov/departments/public-health-commission>

BPHC Recovery Services Annual Reports — <https://www.boston.gov/government/cabinets/boston-public-health-commission/recovery-services>

BPHC Health of Boston 2024 — <https://www.bphc.org/healthdata/health-of-boston-report/Pages/Health-of-Boston-Report.aspx>

U.S. Census Bureau · ACS 5-Year Estimates 2023 — <https://www.census.gov/programs-surveys/acs/data.html>

CHIA Acute Hospital Case Mix Database — <https://www.chiamass.gov/acute-hospital-case-mix-data>

SAMHSA National Treatment Locator — <https://findtreatment.gov>