



Brockton Neighborhood Health Center

Community Health Needs Assessment 2023

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Brockton Neighborhood Health Center Community Health Needs Assessment

Executive Summary

Brockton Neighborhood Health Center's 2022 Community Health Needs Assessment is a document intended to provide a snapshot of health in and around Brockton during the five-year time period 2017 to 2022. Data and findings from this assessment are intentionally focused on the broader Brockton and Greater Brockton region, rather than the granular BNHC patient population. BNHC's goal in commissioning this report is to provide insight into the health needs of the Brockton area in order to guide program development, funding priorities, and establishment of new services by local organizations.

Background and Purpose

In accordance with the Health Resources and Services Administration (HRSA) Health Center Program requirements, health centers must complete a community health needs assessment every three (3) years in order to improve the delivery of health care services in their area [*Section 330(k)(2) and Section 330(k)(3)(J) of the PHS Act; and 42 CFR 51c.104(b)(2-3), 42 CFR 51c.303(k), 42 CFR 56.104(b)(2), 42 CFR 56.104(b)(4), and 42 CFR 56.303(k)*]. Compliance with this standard must be demonstrated during a health center's HRSA Operational Site Visit (OSV).

In addition to meeting HRSA requirements, Brockton Neighborhood Health Center's mission highlights its dedication to providing services that are responsive to community need. In alignment with its mission and values, BNHC conducts its needs assessment to inform health programming, quality improvement, and equitable delivery of health care for its patients and community.

Approach

Quantitative Methods

Quantitative data describing the health and disease burden for Brockton and the greater BNHC Catchment Area were collected from publicly available data sources. Prominently referenced quantitative data sources include: the United States Census, the Uniform Data System (UDS) Mapper, Massachusetts Department of Public Health Registry of Vital Records and Statistics (RVRS), Massachusetts Department of Public Health Bureau of Infectious Diseases and Laboratory Sciences (BIDLS), Massachusetts Department of Environmental

Protection (MDEP), City of Brockton Municipal Reports, U.S. Centers for Disease Control and Prevention PLACES: Local Data for Better Health, and the National Oceanic and Atmospheric Administration (NOAA). Data have been arranged in tables, graphs, and summary statistics to best highlight their meaning. Data from BNHC's electronic medical record, Epic, have been excluded from this needs assessment report in order to ensure representation of health needs across the broader community, as opposed to BNHC's patient population.

Qualitative Methods

In order to better elicit community feedback and community identified needs, BNHC conducted Key Informant Interviews (KII). KII's were completed with individuals identified as community leaders with either personal or professional experience working with the Brockton community. KII's were completed between June 2023 and August 2023. Results were analyzed using the software Dedoose, where emergent themes and concepts could be identified and coded.

Community Profile

While most patients served by BNHC (59.6%) are residents of Brockton, the service area of the health center is considerably larger than the municipal boundaries of the city. Patients and community members from throughout Southeastern Massachusetts access services via BNHC, with 75% of health center patients being residents of Brockton, Stoughton, Randolph, or Taunton. For the purposes of this Community Health Needs Assessment, data from the following communities were examined due to their proximity to Brockton and/or inclusion in BNHC's Service Area from where 90% of BNHC's patient are represented from: Abington, Avon, Bridgewater, Brockton, East Bridgewater, Easton, Holbrook, Randolph, Rockland, Stoughton, Taunton, West Bridgewater, and Whitman.

Key Findings

1. Brockton disproportionately experiences mortality compared to statewide rates. This is especially pronounced in racial/ethnic groups identified as predominantly of Cape Verdean and Haitian ancestry, Hispanic/Latino heritage, and those identifying as Black/African American.
2. Cancer, cardiovascular disease, and diabetes mellitus are the chronic medical conditions of most concern in the Brockton population. The effects of these chronic illnesses are not distributed equally throughout different racial and ethnic groups in the city, with Black/African American, Cape Verdean, Haitian, and Hispanic/Latino groups disproportionately impacted.

3. HIV and tuberculosis are infectious diseases of greatest concern in Brockton and the Catchment Area.
4. Environmental factors are significant impactors of health in Brockton and the surrounding communities.
5. Behavioral health needs related to mental health and substance are of significant concern and more granular information is needed to adequately address them in the community.
6. Needs related to social drivers of health (SDOH) are vast in Brockton and the surrounding community. Addressing issues such as education, transportation, socioeconomic status, housing insecurity, and food insecurity are essential to promoting health in the Catchment Area.
7. Racism and discrimination at all levels (interpersonal, institutional, systemic, structural) impact access to health services and negatively impact health outcomes, particularly in Brockton.

Recommendations

1. Engage epidemiological and community support to further define inequities in mortality and chronic disease outcomes among Brockton's Black/African American, Cape Verdean, and Haitian groups.
2. Prioritize greater access to local-level mental health data, especially among youth, young adults, and by racial and/or ethnic groups.
3. Promote disaggregation of health outcomes data whenever possible to identify potential health inequities and disparities and better tailor health interventions, programs, and services.
4. Engage epidemiological and community support to better understand maternal and child health outcomes in the Catchment Area.
5. Health care organizations should seek mechanisms for meaningful feedback from patients of historically marginalized groups to improve access to acceptable health care services.
6. Enhancing services to prevent, diagnose, and treat HIV and tuberculosis is a key need derived from quantitative infectious disease data.

7. Epidemiological support and community for a comprehensive assessment of behavioral health needs and outcomes at the community-level should be prioritized.

1. Background and Purpose

Background

In accordance with the Health Resources and Services Administration (HRSA) Health Center Program requirements, health centers must complete a Community Health Needs Assessment (CHNA) every three (3) years in order to improve the delivery of health care services in their area [*Section 330(k)(2) and Section 330(k)(3)(J) of the PHS Act; and 42 CFR 51c.104(b)(2-3), 42 CFR 51c.303(k), 42 CFR 56.104(b)(2), 42 CFR 56.104(b)(4), and 42 CFR 56.303(k)*]. Compliance with this standard must be demonstrated during a health center's HRSA Operational Site Visit (OSV). CHNAs are helpful tools for identifying and defining preeminent health concerns in a community and serve as a resource for community members, service delivery organizations, and local government to make informed choices on priority health outcomes and effective means of addressing them.

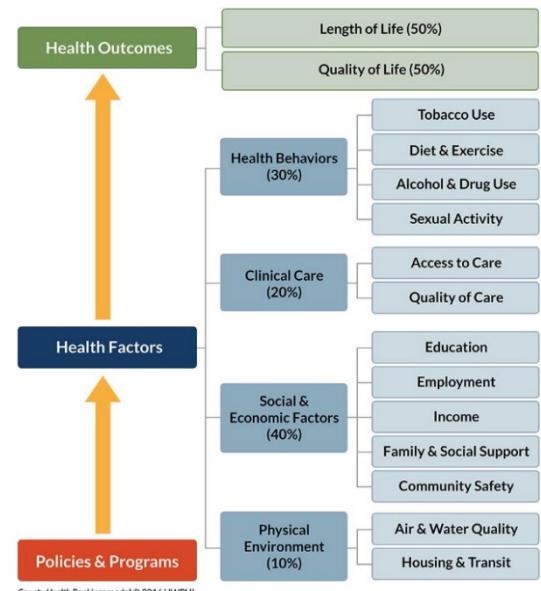
Purpose

In addition to meeting HRSA requirements, Brockton Neighborhood Health Center's mission highlights its dedication to providing services that are responsive to community need. In alignment with its mission and values, BNHC conducts its needs assessment to inform health programming, quality improvement, and equitable delivery of health care for its patients and community. BNHC's intention is to promote community ownership of the CHNA and that the community can use this document to help describe health needs for its own use.

2. Approach

A. Theoretical Model

BNHC's Community Health Needs Assessment builds upon the County Health Rankings Model, which assesses community health outcomes alongside external factors and policies that influence quality and length of life (County Health Rankings, 2023).



B. Data Collection

Quantitative Data Collection

Quantitative data describing health and disease burden for Brockton and the greater BNHC Catchment Area were collected from publicly available data sources. Prominently referenced quantitative data sources include: the United States Census, the Uniform Data System (UDS) Mapper, Massachusetts Department of Public Health Registry of Vital Records and Statistics (RVRS), Massachusetts Department of Public Health Bureau of Infectious Diseases and Laboratory Sciences (BIDLS), Massachusetts Department of Environmental Protection (MDEP), City of Brockton Municipal Reports, U.S. Centers for Disease Control and Prevention PLACES: Local Data for Better Health, and the National Oceanic and Atmospheric Administration (NOAA). Data from BNHC's electronic medical record, Epic, have been excluded from this needs assessment report in order to ensure representation of health needs across the broader community, as opposed to BNHC's patient population.

When available, data from the overall Catchment Area municipalities are included for comparison to the city of Brockton. Additionally, when available, disaggregation by race and ethnicity is made for quantitative measures. Overall, analysis for statistically significant differences between municipalities, statewide measures, or different demographic groups is not made, as it is out of scope for this CHNA given the extraordinary variation of data sources. Standardization across data sets to produce valid comparisons would encompass extensive time and resources that are beyond that of this CHNA.

Qualitative Data Collection

Qualitative data were collected using Key Informant Interviews (KIs), which were conducted from June-August 2023.

The interview guide was developed by BNHC's Director of Substance Use Services, Allyson Pinkhover, and Public Health Research Assistant (PHRA) Jane Hwang. A sample of the interview guide is included as *Appendix 2*. Prior to initiating KIIs, several BNHC staff served as auditors of the interview guide by providing mock interviews with the PHRA. Feedback from auditors guided revisions to the interview guide.

Upon finalization of the interview guide, a list of Key Informants (KIs) was drafted based upon institutional knowledge and suggestions provided by both interview auditors and snowball recruitment from KIs. A total of seventeen (n=17) KIIs were completed by the PHRA over the course of two months, with most interviews occurring over Zoom (n=15) and some in-person (n=2). With the consent of KIs, audio recordings of interviews were collected to support data analysis.

Concurrent to KII completion, audio recordings were uploaded to the qualitative data analysis software Dedoose. Audio recordings were thematically coded by the PHRA with guidance from the Director of Substance Use Services. Review of the literature guided the goal number of KIIs to be completed (goal n=16) and indicates that thematic saturation is most times reached after sixteen interviews and the emergence of no new codes. A total of seventeen completed KIIs fulfilled this data collection objective.

C. Data Analysis

Quantitative Data Analysis

Most quantitative data were publicly available in pre-analyzed formats, such as crude rates, age-adjusted rates, and comparison for statistical significance from statewide measures. For ease of reading, many quantitative metrics were formatted in graphs and/or tables to visualize changes over the needs assessment timeframe. Data were analyzed and graphed using Microsoft Excel and Microsoft PowerPoint. Several graphs and charts are reproduced from publicly available data sources. Analysis for differences in health outcomes among different geographic areas or demographic groups is out of scope for this needs assessment, however projects or initiatives specifically targeting these topics should prioritize further quantitative data analysis to ensure appropriate assessment of health-related phenomena.

Qualitative Data Analysis

Data analysis software Dedoose was used to thematically code all KIIs. A total of 152 unique codes were applied 444 times throughout the 17 KIIs, with a mean of 27.75 codes (median=26.38) per interview audio file. The most frequently applied codes appeared in 17/17 interviews (100%), while the least applied codes appeared only once (5.9%). Codes appearing 9 or more times in the KIIs were considered emergent themes in the analysis. Results of the qualitative data analysis are discussed throughout applicable topic areas in this report as well as in the *Qualitative Results* section.

3. Data and Report Limitations

In order to accurately interpret results from the CHNA, it is important to understand some of the limitations of report data and its analysis. Quantitative CHNA data are limited to publicly available data sources, which may not be designed to capture nuanced phenomena. For some data sources, numbers are small and subject to a high degree of variability and should be interpreted with caution. In other places, data are suppressed due to very small numbers and interpretation is not possible. While individual data sets are standardized within themselves, they are not across external data sets. This means that there are discrepancies in how demographic features are recorded and reported across different measures.

While methodologically, qualitative saturation was designed to be reached with key informant interviews there is always a possibility of error. Additionally, qualitative data collection was limited to key informants and not health care consumers or other community members. Therefore, community-defined or prioritized health topics may have been missed. Future iterations of the CHNA should prioritize the addition of community focus groups to improve these limitations.

The goal of the CHNA is to provide broad, high-level overviews of health trends and outcomes for a community. When designing and implementing programming to address certain health areas or outcomes, further investigation and data collection should be performed to provide further clarity and validity.

4. Community Profile

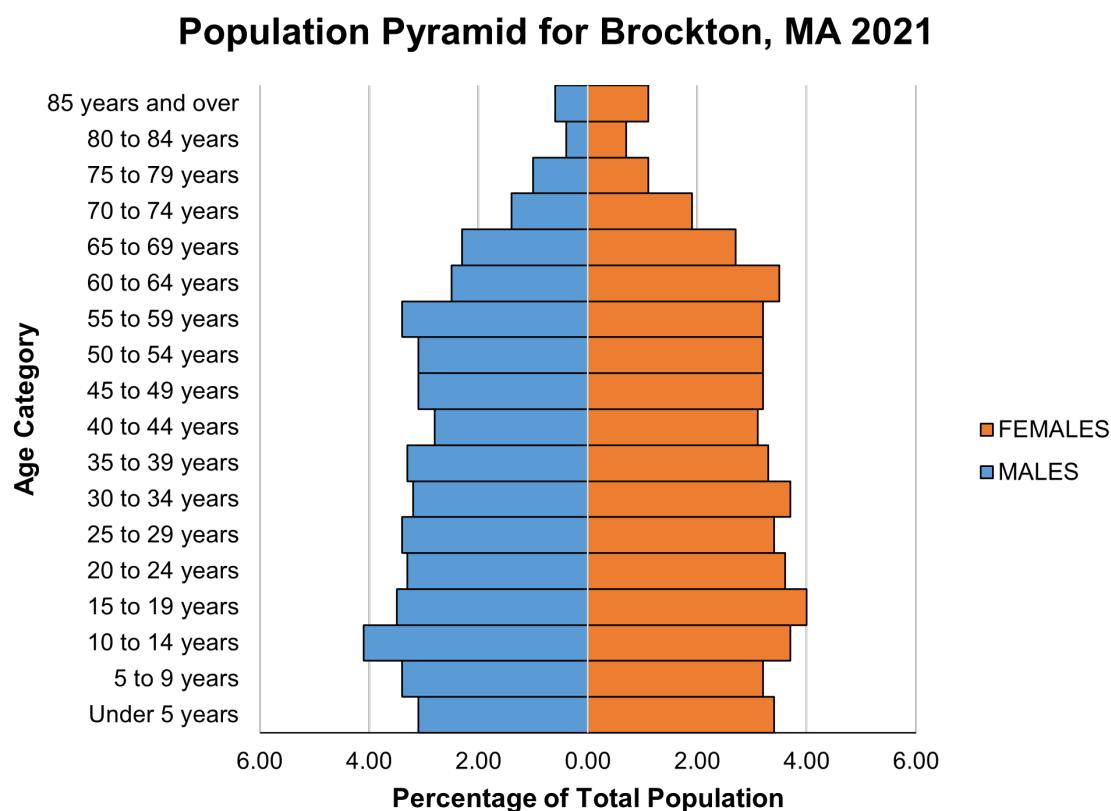
A. City of Brockton

Brockton, Massachusetts is an urban community located in southeastern Massachusetts, approximately 25 miles south of Boston. As of the 2020 U.S. Census, the population of Brockton was 105,643 with a median age of 39.5 years. More than 46% of individuals speak a language other than English at home, with prominent spoken languages being Cape Verdean Creole, Haitian Creole, Portuguese, and Spanish. Nearly one-third of Brocktonians are foreign born, nearly double the statewide average of 18% (US Census, 2020).

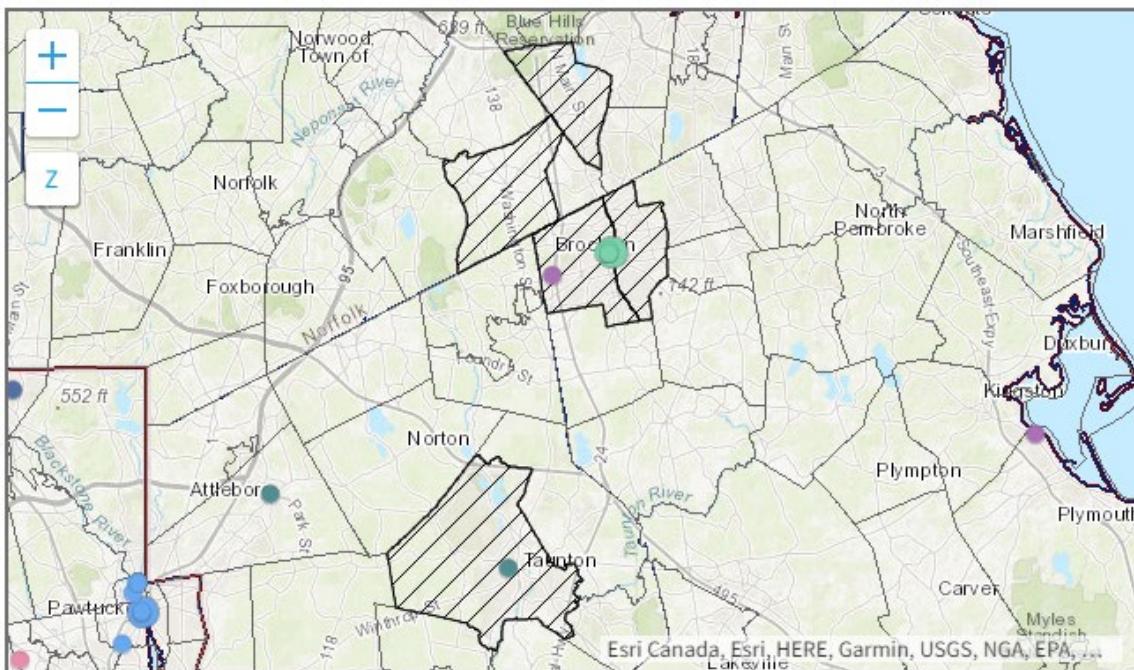
Racial or Ethnic Group	Number in Population	Percent of Population
American Indian and Alaska Native	492	0.47%
Asian	2,278	2.2%

Black or African American	36,951	35%
Hispanic or Latino (of any racial group)	12,762	12%
Native Hawaiian and Other Pacific Islander	29	0.03%
Some Other Race	13,003	12%
Two or More Races	21,816	21%
White	31,074	29%

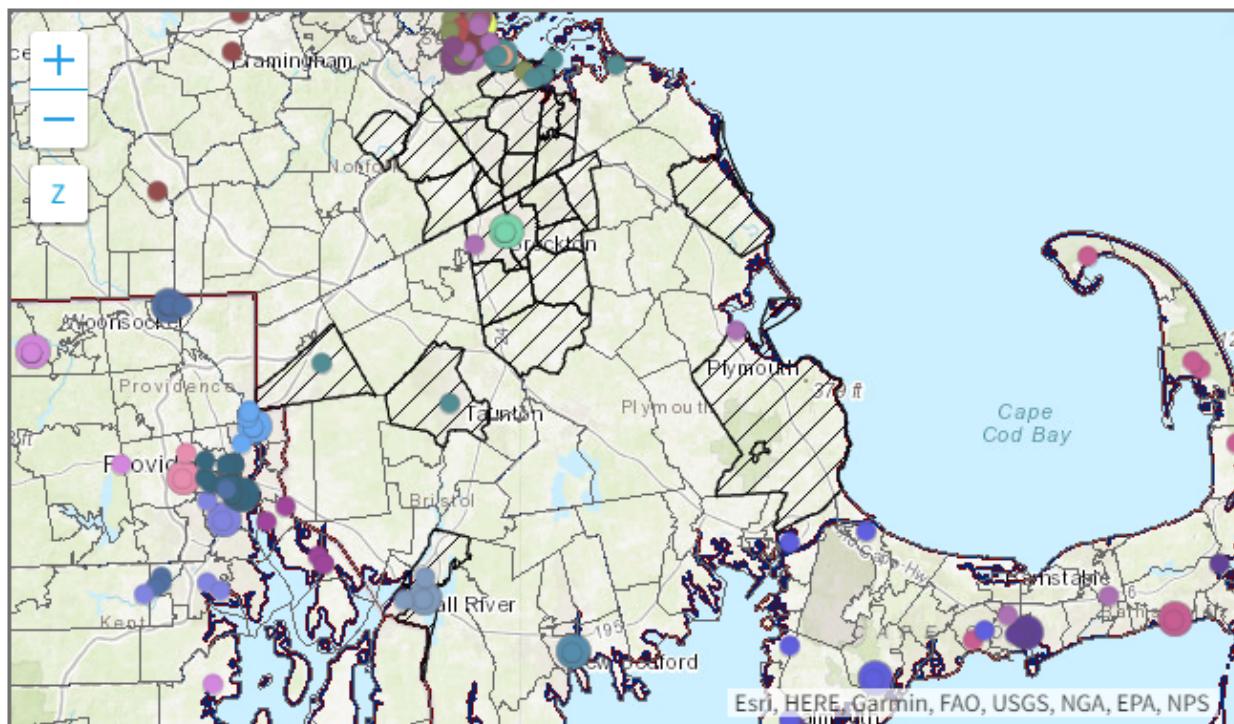
When examining the overall population of Brockton by age and sex cohort, it is notable that the size of population in the city is fairly stationary. Middle-aged and youth cohorts are relatively proportionate in size, with decreases in proportion of population cohorts above 70 years old. This indicates relatively stable fertility and mortality rates and population growth would likely occur slowly, as opposed to expeditiously, over the coming years.



B. BNHC Service Area



1 Patient origin of 75% of BNHC patients from striped indicated towns. Circles are Health Center Program sites.



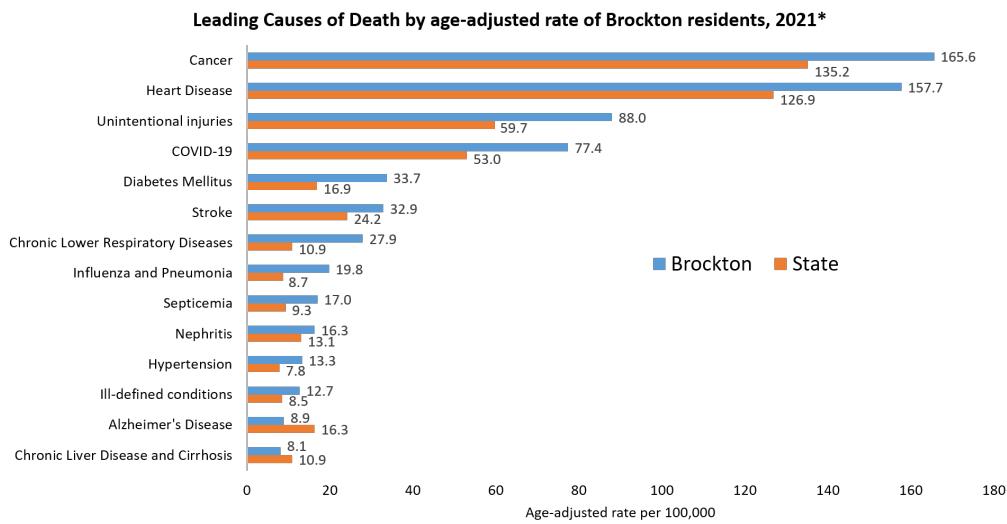
2 Patient origin of 90% of BNHC patients from striped indicated towns. Circles are Health Center Program sites.

When expanding the catchment area to include town of residence for 90% of BNHC patients, a more geographically dispersed model emerges. Outside of the immediate Brockton area, the towns of Attleboro, Taunton, Plymouth, and Marshfield. An additional map of BNHC's catchment area is included in *Appendix 1*.

5. Key Findings

An important note about mortality data in this section: Most race and ethnicity data from the Registry of Vital Records and Statistics are self-reported by decedents' families. In Brockton's data, there are many statistics with large reports of "Other, Non-Hispanic, Non-Latinx" as a decedent's identified race. The Registry of Vital Records and Statistics confirmed that this category predominantly encompasses individuals who report their ethnicity as Cape Verdean. To a lesser degree, this category tends to see self-reports of Brazilian and those who identify as Middle Eastern or North African who do not necessarily identify as Black, White, or Asian. Therefore, in interpreting these data, it is appropriate to assume that the majority group represented here is Cape Verdean; however, other races and ethnicities are as well, to a lesser degree.

A. Leading Causes of Mortality

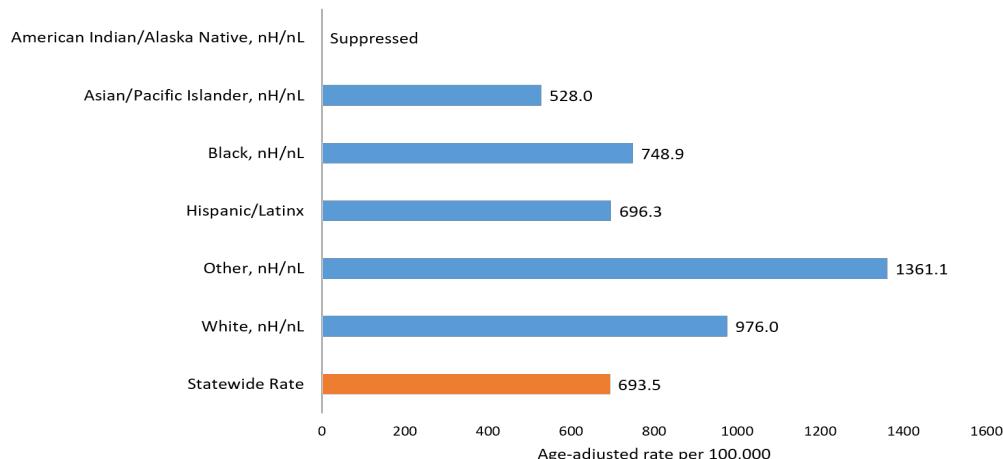


According to MDPH's Registry of Vital Records and Statistics, preliminary 2021 data show that the top five causes of death among Brockton residents are: 1) cancer, 2) heart disease, 3) unintentional injuries, 4) COVID-19, and 5) diabetes mellitus. Generally, unintentional injuries are primarily comprised by overdose and motor vehicle accident

fatalities. In 2021 there were 58 opioid-related overdose deaths among Brockton residents and 7 deaths from motor vehicle accidents located in the city.

With the exception of Alzheimer's disease and chronic liver disease/cirrhosis, all age-adjusted death rates for Brockton's leading causes of death exceed the statewide rates. This indicates an elevated prevalence of mortality from these conditions in the city.

Age-adjusted All Cause Mortality Rates of Brockton residents by Race/Ethnicity, 2021*



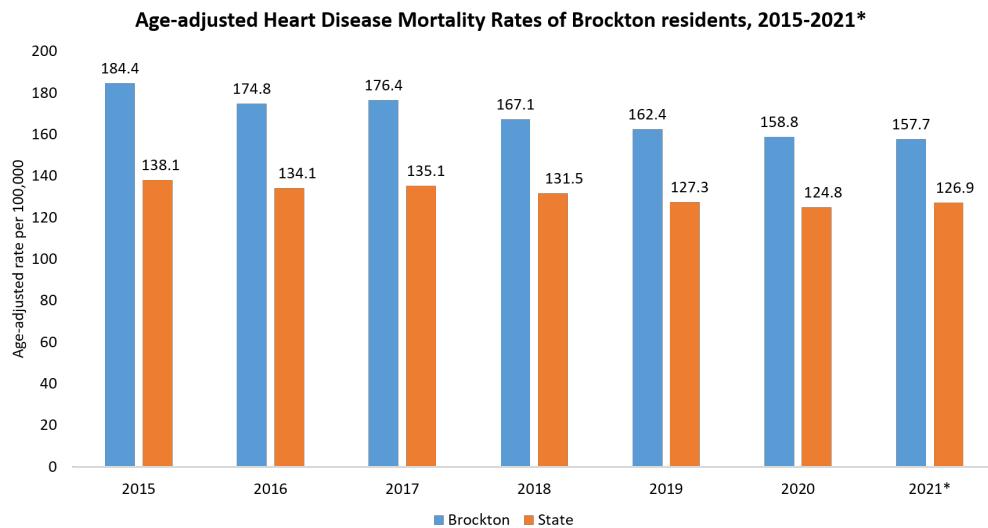
*2021 data from the Registry of Vital Records and Statistics are preliminary

When examining age-adjusted all-cause mortality among different racial and ethnic groups, all groups exceed the statewide all-cause mortality rate, apart from Asian and Pacific Islanders without Hispanic/Latinx ethnicity (528.0 per 100,000 v. 693.5 per 100,000). The mortality rate among those identified as Hispanic/Latinx is approximately the same as the statewide rate (696.3 per 100,000) v. 696.5 per 100,000). Notably, the age-adjusted mortality of the group encompassing "Other" racial and ethnic groups is nearly double the statewide rate. Predominantly represented in this group are those of Cape Verdean ancestry.

B. Chronic Disease

i. Heart Disease

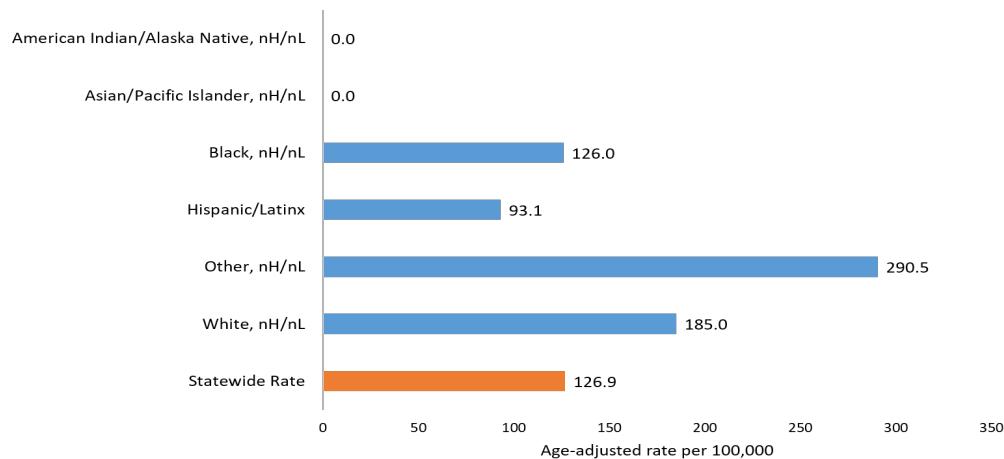
"It's kind of the usual stuff with the adults we take care of here, I'll just throw out- cardiac disease, because it's more inclusive than congestive heart failure and coronary heart disease in particular..." – Key Informant Participant



*2021 data from the Registry of Vital Records and Statistics are preliminary

While the age-adjusted mortality rate for heart disease has generally declined in Brockton from 2015 (184.4 per 100,000) to 2021 (157.7 per 100,000), the rate remains elevated above the statewide rate (126.9 per 100,000). This indicates a disproportionate burden of heart disease mortality in Brockton compared to the general state population.

Age-adjusted Heart Disease Mortality Rates of Brockton residents by Race/Ethnicity, 2021*

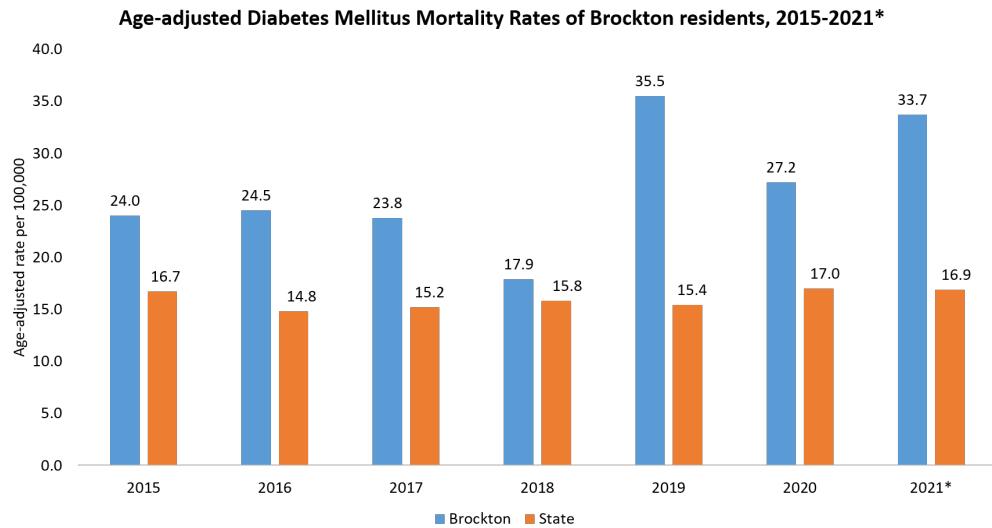


*2021 data from the Registry of Vital Records and Statistics are preliminary

When disaggregating heart disease mortality data by race and ethnicity, substantially higher mortality rates are observed among the “Other, non-Hispanic/non-Latino” demographic (290.5 per 100,000) compared to all other racial and ethnic groups. It is reasonable to conclude that disparities in heart disease mortality exist among non-White racial groups in Brockton, likely among the Cape Verdean and/or Haitian demographics.

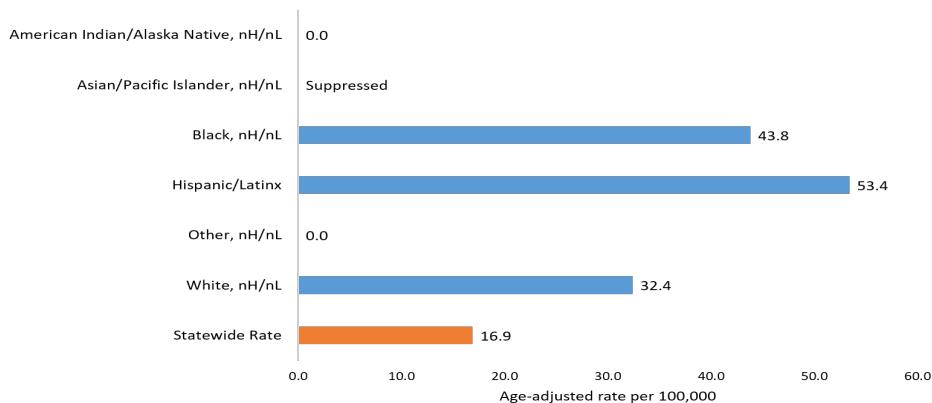
ii. Diabetes

“...I see the issues of hypertension, diabetes, as well as substance use being the top three issues facing our community... I know a ton of people who are diabetic, and I know they’re not sexy diseases or in the limelight constantly as some of the other issues are, people don’t talk about it as much, but those issues are prevalent in our community especially in the Black community and it’s killing our people...” – Key Informant Participant



While the Brockton age-adjusted mortality rate from diabetes mellitus was elevated from the statewide rate since 2015, substantial increases in the mortality rate were observed in 2019 and 2021. From 2018 to 2019 the mortality rate doubled among Brocktonians, with the citywide rate (35.5 per 100,000) being more than twice the statewide rate (15.4 per 100,000).

**Age-adjusted Diabetes Mellitus Mortality Rates of Brockton residents
by Race/Ethnicity, 2021***

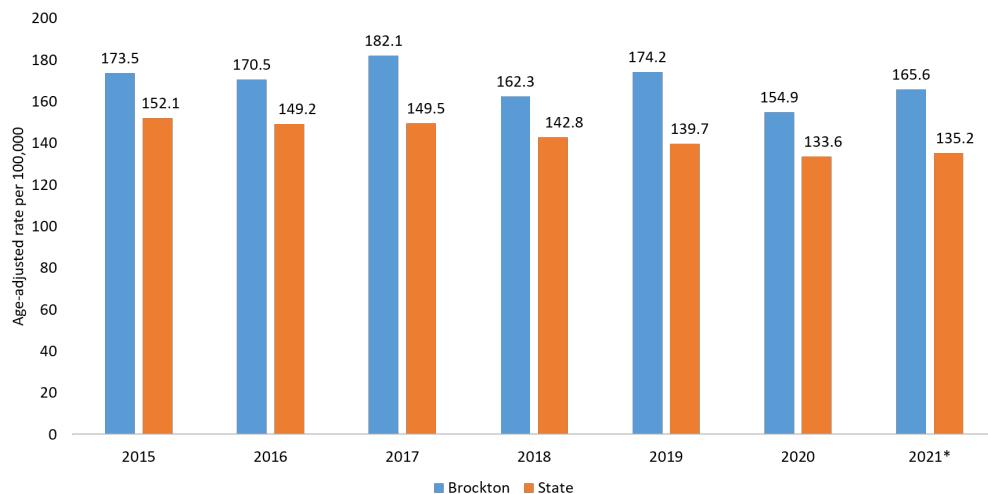


*2021 data from the Registry of Vital Records and Statistics are preliminary

It is notable that the age-adjusted mortality rate for diabetes mellitus is above the statewide rate for all recorded racial and ethnic groups in Brockton. Hispanic/Latinx and Black non-Hispanic/Latinx experience higher mortality from diabetes than their White counterparts, with this being greater among those identified as Hispanic/Latinx.

iii. Cancer

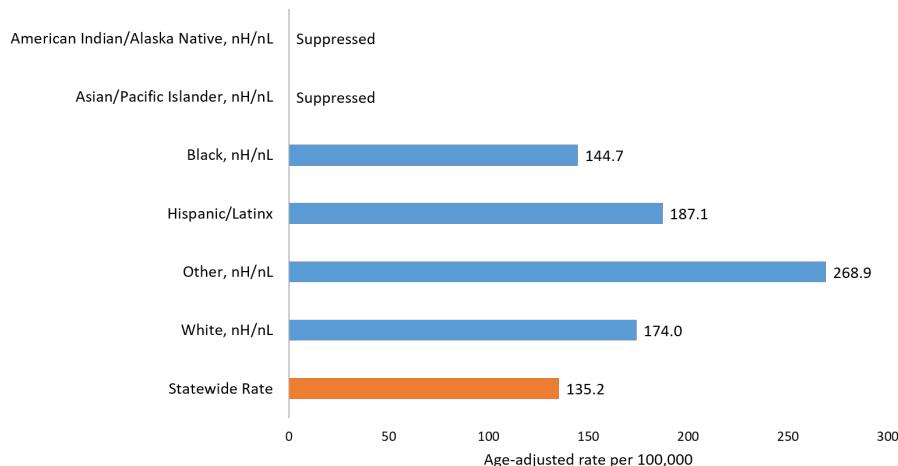
Age-adjusted Cancer Mortality Rates of Brockton residents, 2015-2021*



*2021 data from the Registry of Vital Records and Statistics are preliminary

The overall age-adjusted cancer mortality rates have slightly declined at both the state and city level from 2015 to 2021. The mortality rate in Brockton is consistently elevated from the statewide rate throughout this timeframe, peaking in 2017 (182.1 per 100,000).

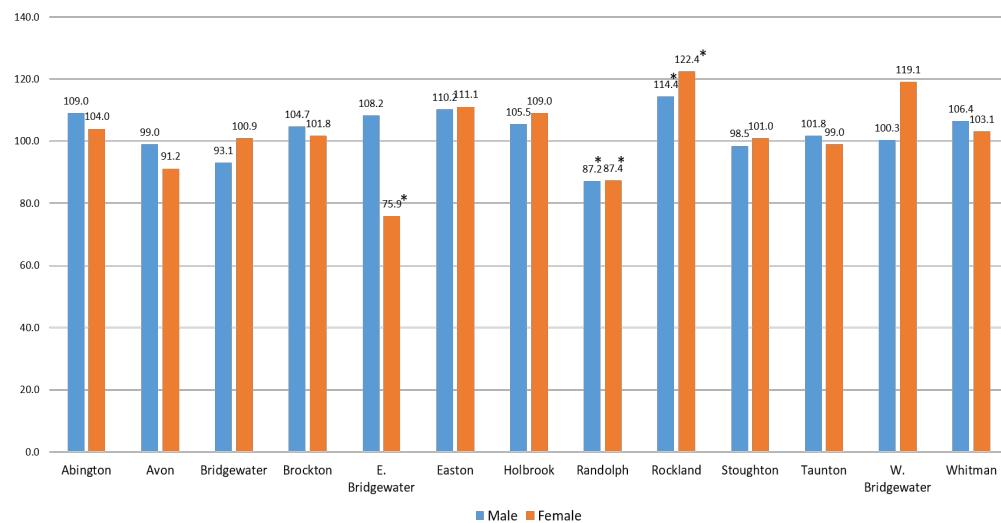
Age-adjusted Cancer Mortality Rates of Brockton residents by Race/Ethnicity, 2021*



*2021 data from the Registry of Vital Records and Statistics are preliminary

Delineation of cancer mortality by racial and ethnic group reveals a markedly elevated mortality rate among individuals in the “Other, non-Hispanic/Latinx” group (1361.1 per 100,000) compared to the statewide rate and citywide rate among other demographic groups. This likely indicates a significant disparity in cancer mortality among Cape Verdean and/or Haitian individuals in Brockton and is an area requiring further investigation to define this health inequity, including among different types of cancers and which specific racial groups are impacted.

Standardized Incidence Ratios, All Site/Types Cancer Cases, 2011-2015

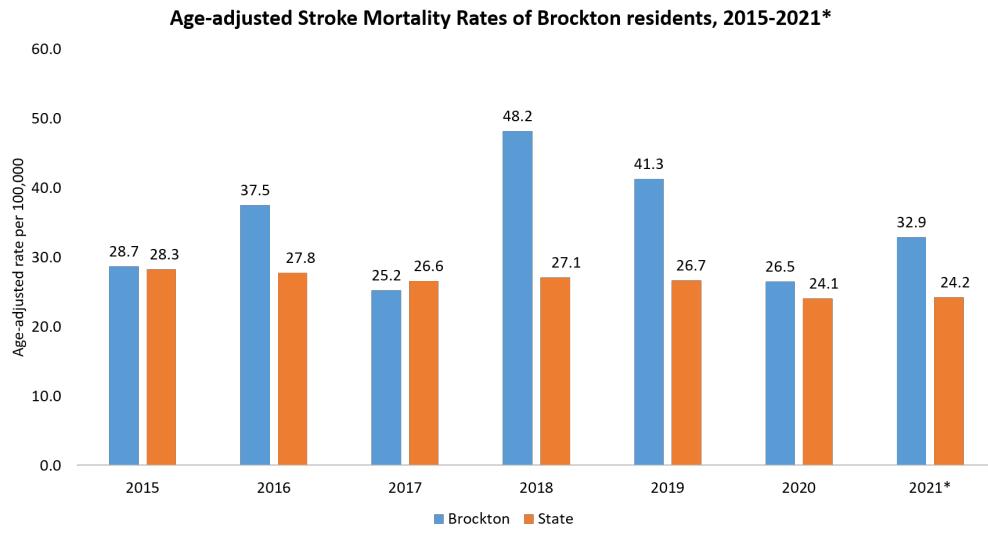


Standardized cancer incidence ratios (IR) for cities and towns in Massachusetts are published by the Department of Public Health in 5-year increments, with the most recent data available dating from 2011 to 2015. In the catchment

area, IRs for cancer cases among both males and females were statistically significantly above the statewide IR in Rockland, while significantly lower in Randolph and among females only in East Bridgewater.

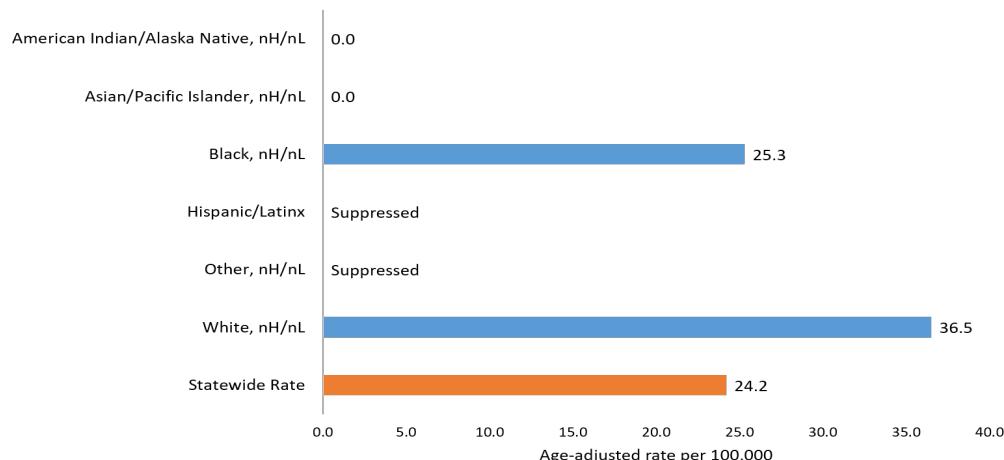
“When we first started, our branch was the only one doing prostate cancer awareness events like three times a year. Now all the branches in New England - and there comprises about 27 of them - are having prostate cancer events which is good because the Black men need to know this. And they have no explanation why the rate is higher among African American males but I can tell you- it's because they don't know when to get tested, they don't have the health coverage to go to get tested.” – Key Informant Participant

iv. Stroke



Mortality due to stroke in Brockton has varied compared to statewide rates from 2015 to 2021. In several years, Brockton's age-adjusted stroke mortality rate has been comparable to that of the state (2015, 2017, 2020), while in other years it has exceeded the statewide rate (2016, 2018, 2019, 2021).

Age-adjusted Stroke Mortality Rates of Brockton residents by Race/Ethnicity, 2021*

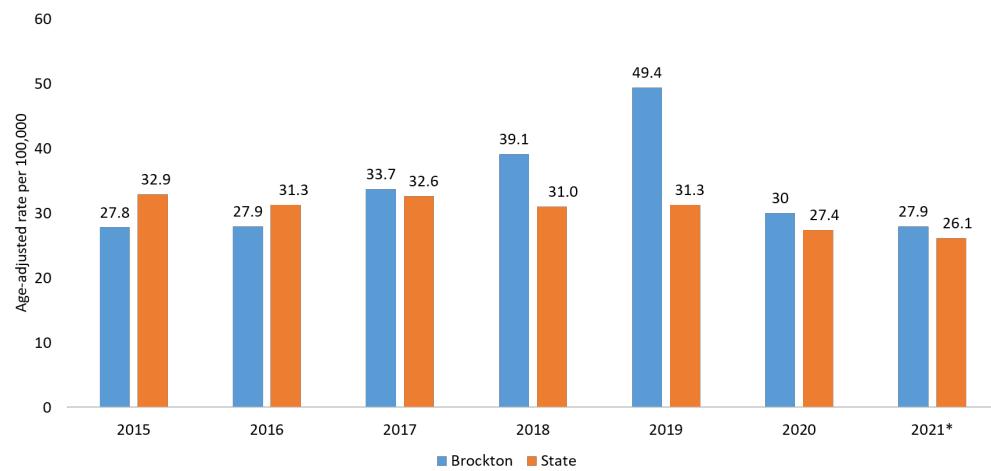


*2021 data from the Registry of Vital Records and Statistics are preliminary

Data from several racial and ethnic groups are suppressed due to low numbers. Available measures show an age-adjusted mortality rate due to stroke that is similar to the statewide rate for Black or African American individuals (25.3 versus 24.2 per 100,000) and slightly elevated among White individuals (36.5 versus 24.2 per 100,000).

V. Respiratory Disease

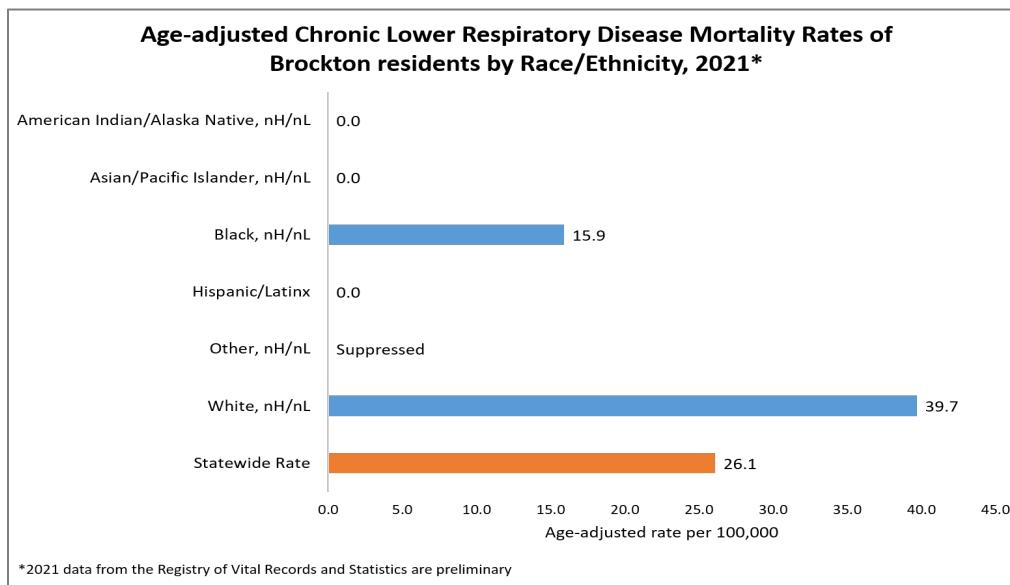
Age-adjusted Chronic Lower Respiratory Disease Mortality Rates of Brockton residents, 2015-2021*



*2021 data from the Registry of Vital Records and Statistics are preliminary

Chronic lower respiratory diseases captured in these mortality measures include chronic obstructive pulmonary disease (COPD), asthma, pulmonary hypertension, chronic bronchitis, and emphysema. In general, Brockton's age-

adjusted mortality rates from chronic lower respiratory diseases have been similar to the statewide rate, with an exception in 2019 where Brockton's rate was notably elevated compared to the state (49.4 versus 31.3 per 100,000).



When comparing rates of chronic lower respiratory disease deaths among different racial and ethnic groups, many data are suppressed due to low numbers. Generally, higher rates of mortality due to lower respiratory diseases are observed among people identifying as White compared to statewide data (39.7 versus 26.1 per 100,000), while rates are lower in the population identified as Black or African American (15.9 versus 26.1 per 100,000).

C. Infectious Disease

i. COVID-19

In early January 2020 a new type of respiratory illness, SARS-CoV-2, was identified in Wuhan, China (CDC, 2023). On January 20, 2020, the first case of COVID-19 was identified in the United States, triggering the beginning of a large-scale public health response and resulting in a pandemic of the novel virus (CDC, 2023). On March 16, 2020 the first case of COVID-19 was identified in Brockton. As of December 22, 2023, 34,955 confirmed cases of COVID-19 have been documented in Brockton and 539 confirmed COVID-19 deaths have been recorded.

With the advent of COVID-19 vaccinations, therapeutics, and increased infrastructure for clinical care, deaths from COVID-19 have precipitously dropped over time. Ongoing monitoring, prevention, and treatment for COVID-19 is recommended, similarly as to seasonal influenza. Disaggregated data for high-risk and historically marginalized

groups is important, including populations in long-term care facilities, congregate living settings, healthcare workers, and members of Black, Indigenous, Hispanic/Latino, and non-English speaking groups.

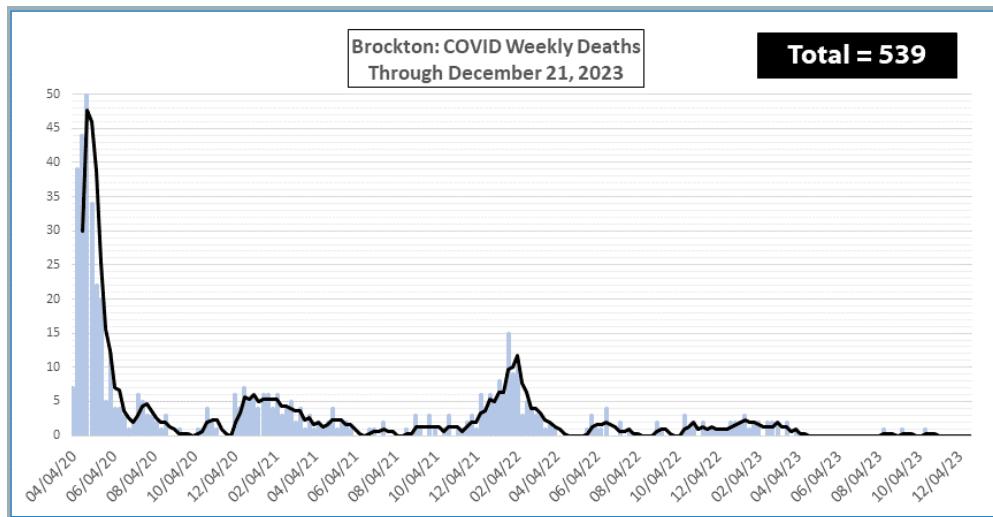
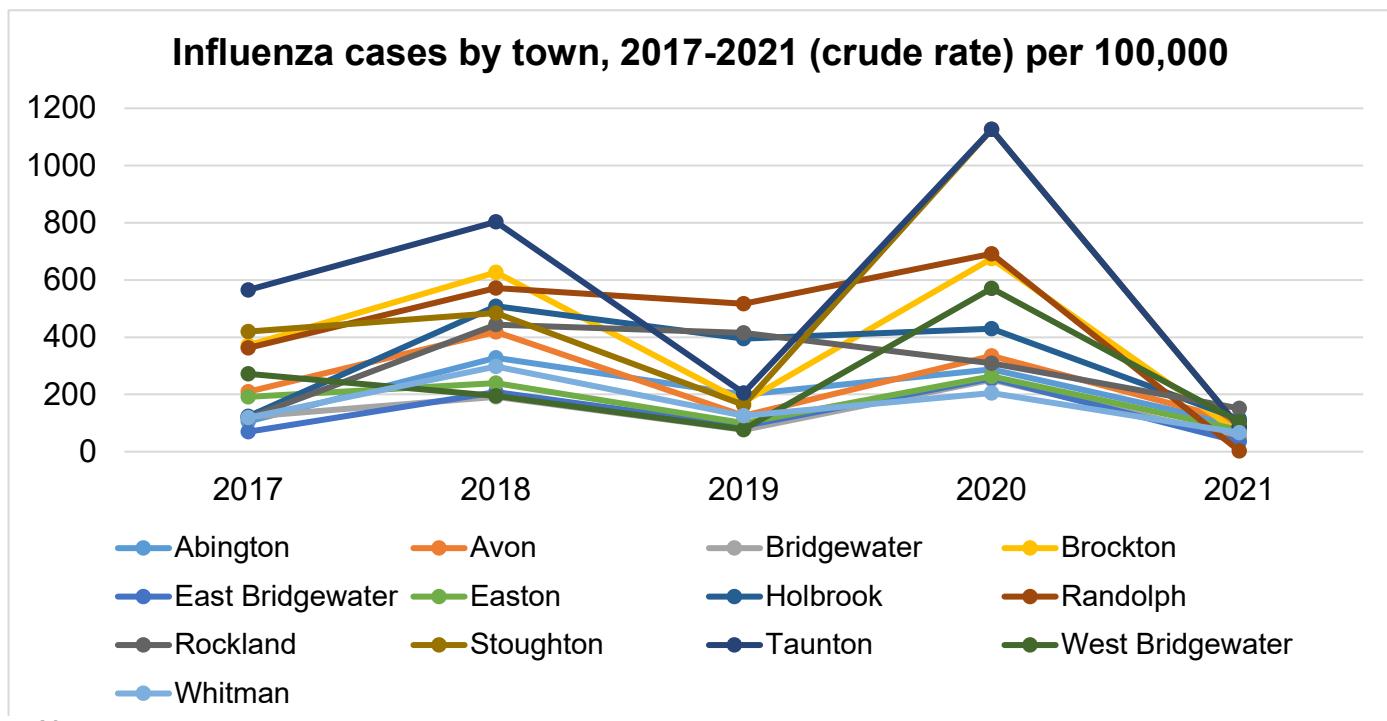


FIGURE 3 REPRODUCED FROM CITY OF BROCKTON COVID-19 DASHBOARD

ii. Seasonal Influenza

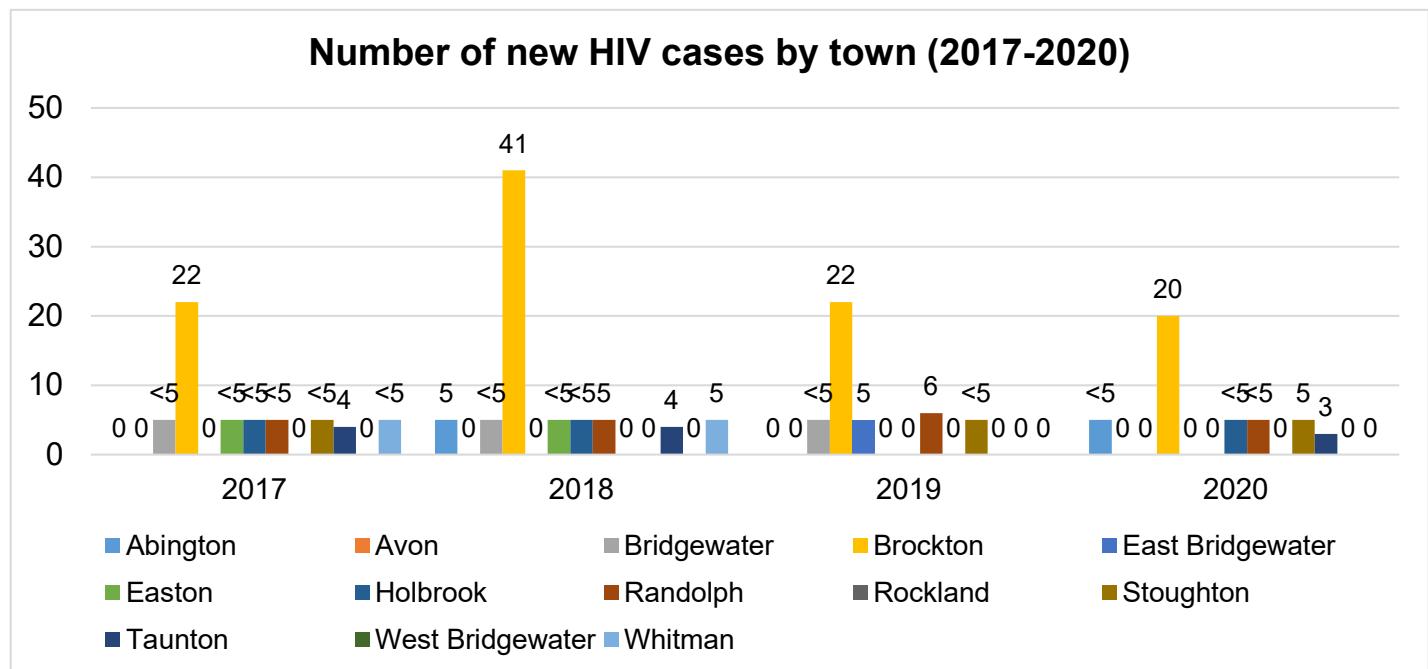


4 SOURCE: MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH BUREAU OF INFECTIOUS DISEASE AND LABORATORY SCIENCE

As expected, the number of seasonal influenza cases varies by the population of cities and towns, with municipalities with larger populations experiencing greater numbers of influenza cases. Higher cases of influenza cases are notable

in 2018 and 2020 when compared to other years in the needs assessment timeframe. The CDC estimates an influenza vaccine efficacy rate at 29% for 2018 (CDC, 2023). A vaccine efficacy rate for 2020 was not calculated (CDC, 2023). This relatively low efficacy rate for 2018 may help explain the increase in cases observed.

iii. HIV

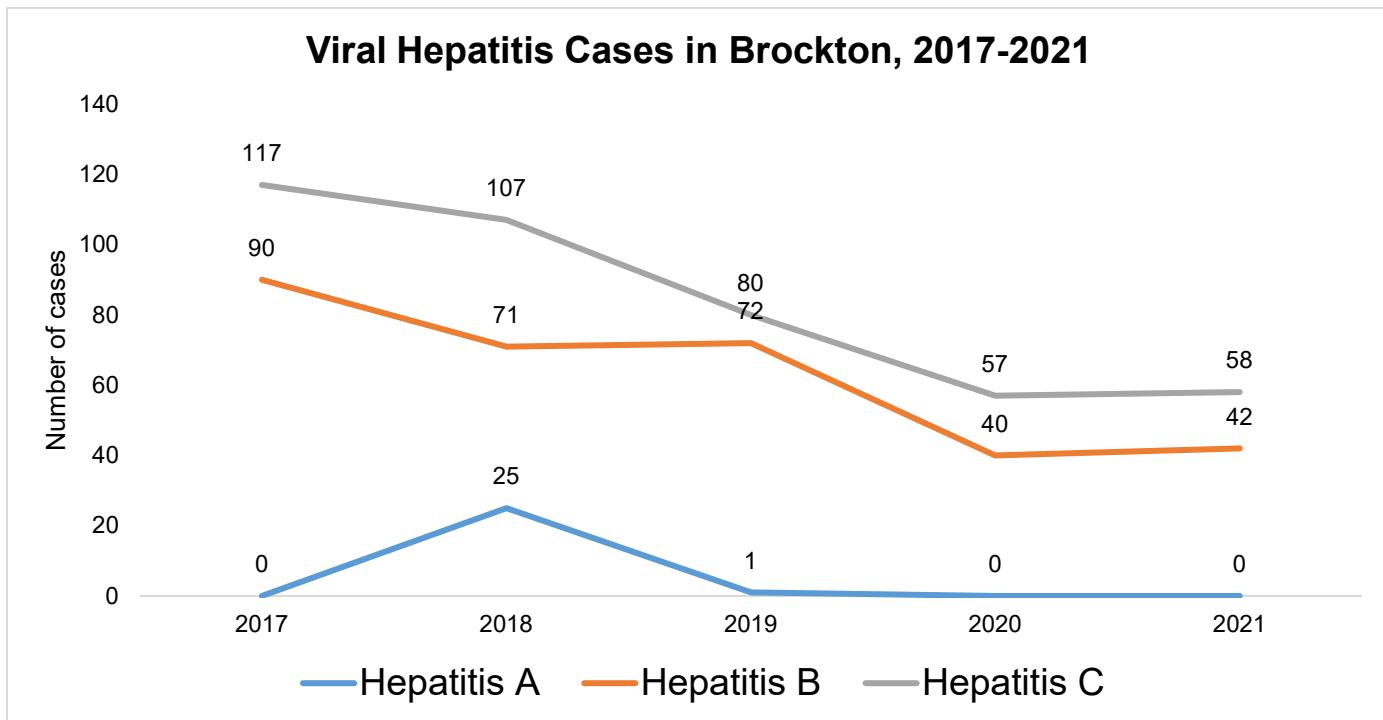


SOURCE: MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH BUREAU OF INFECTIOUS DISEASE AND LABORATORY SCIENCE

Data on new HIV cases are frequently suppressed in many cities and towns in the BNHC Service Area due to low numbers and risk for reidentification of cases. Of the municipalities in the service area, new HIV cases are highest in Brockton.

When comparing statewide numbers, from 2018 to 2020 Brockton had the highest rate of new HIV cases of any municipality in Massachusetts (27.8 per 100,000) (MA DPH, 2022). Priority populations for HIV testing and treatment include non-U.S. born individuals, people who inject drugs, and men who have sex with men (MSM).

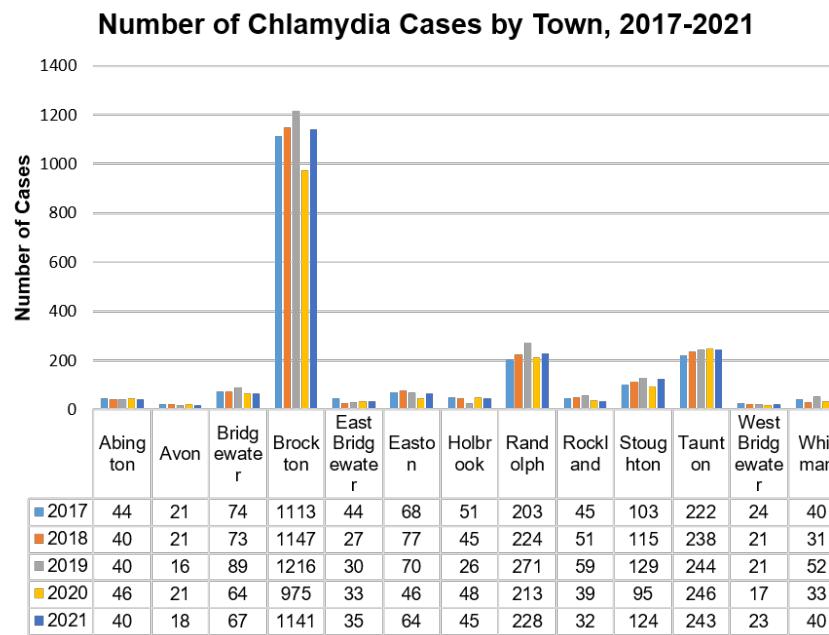
iv. Viral Hepatitis



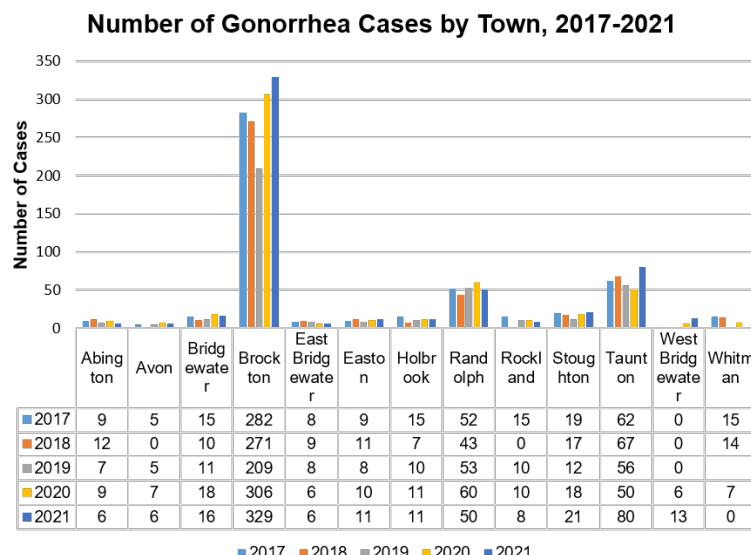
Cases of viral hepatitis throughout the wider CHNA catchment area were generally too low to examine trends by city or towns other than Brockton. In Brockton, cases of hepatitis B and C have been steadily declining since 2017, though appear to level off between 2020 and 2021. It will be important to note if this trend continues post-COVID-19 recovery.

In 2018, Brockton was a location affected by a statewide outbreak of hepatitis A primarily among people experiencing homelessness. Coordinated statewide efforts to test and vaccinate this marginalized population quelled the outbreak. In late 2023, the Department of Public Health released an alert indicating a new outbreak of hepatitis A, again among primarily individuals experiencing homelessness and people who use drugs.

v. Sexually Transmitted Infections

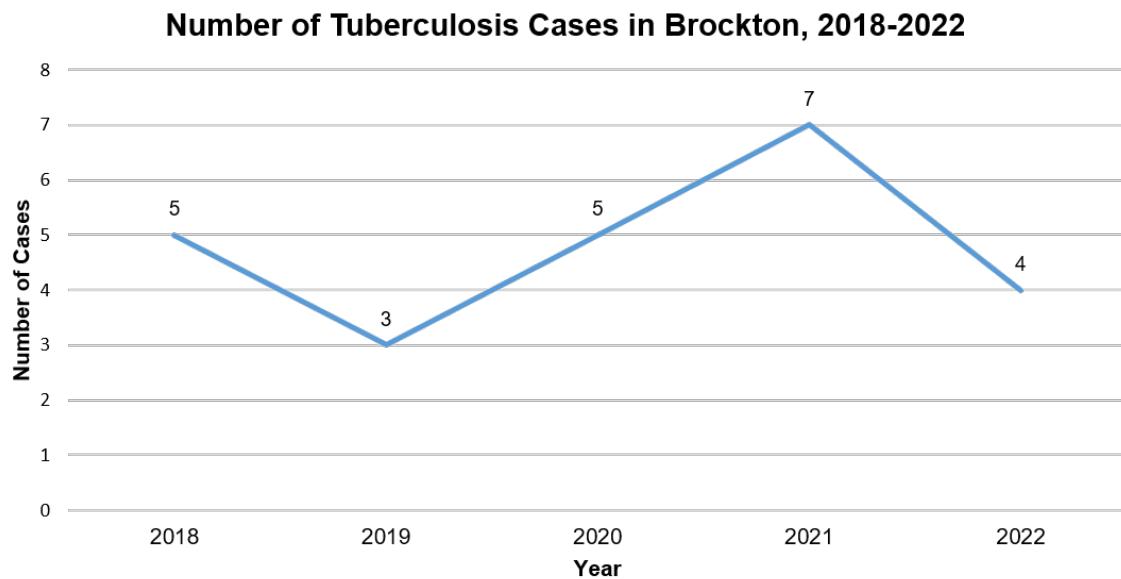


Chlamydia cases have remained mostly stable throughout the cities and towns in the BNHC Catchment Area, with lower numbers of cases reported during 2020, likely due to COVID social distancing protocols. Continued testing and treatment of STIs post-COVID-19 pandemic will be necessary to catch any potential upticks in new STI cases and respond in a timely manner.



Gonorrhea cases have remained mostly stable throughout the cities and towns in the BNHC Catchment Area, with slight upticks observed during 2021. Continued testing and treatment of STIs post-COVID-19 pandemic will be necessary to catch any potential upticks in new STI cases and respond in a timely manner.

vi. Tuberculosis

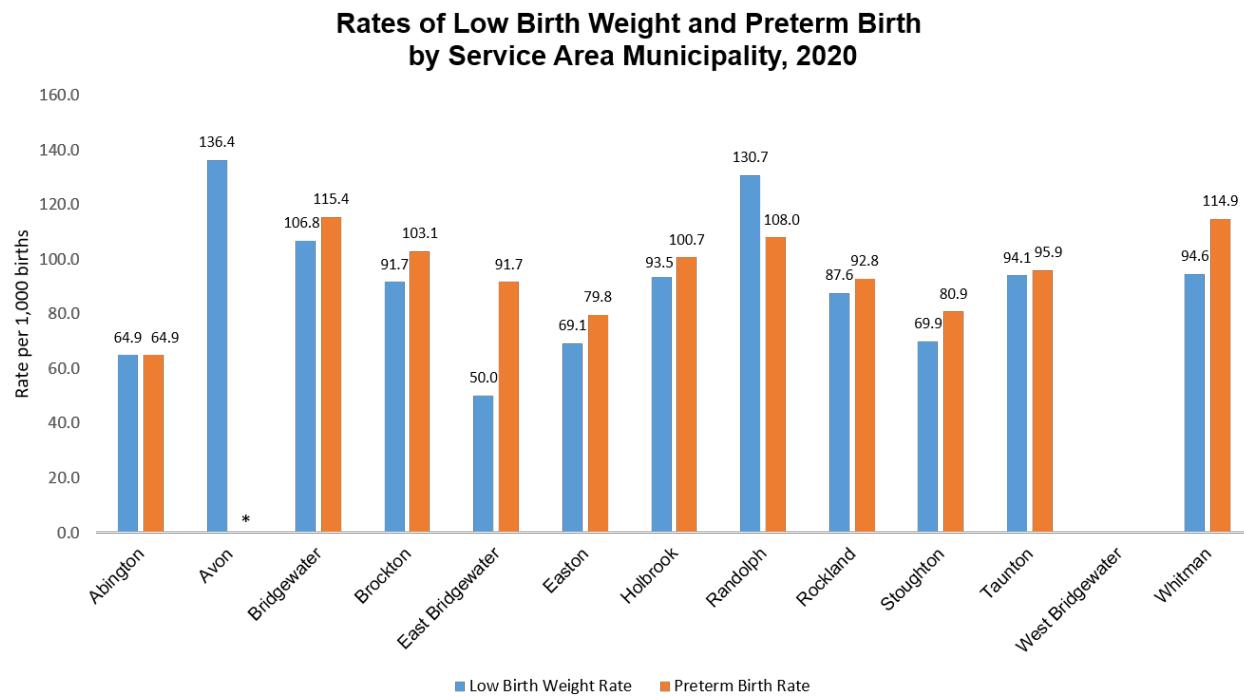


New cases of tuberculosis (Tb) continue to be of concern in Brockton, the surrounding region, and the state. In 2021, Brockton experienced a notable uptick in new Tb cases (n=7). While data for 2022 and 2023 have not yet been finalized from DPH, increases in Tb cases have continued to be observed in the city with at least 10 new Tb cases reported in the first 11 months of 2023.

D. Maternal & Child Health

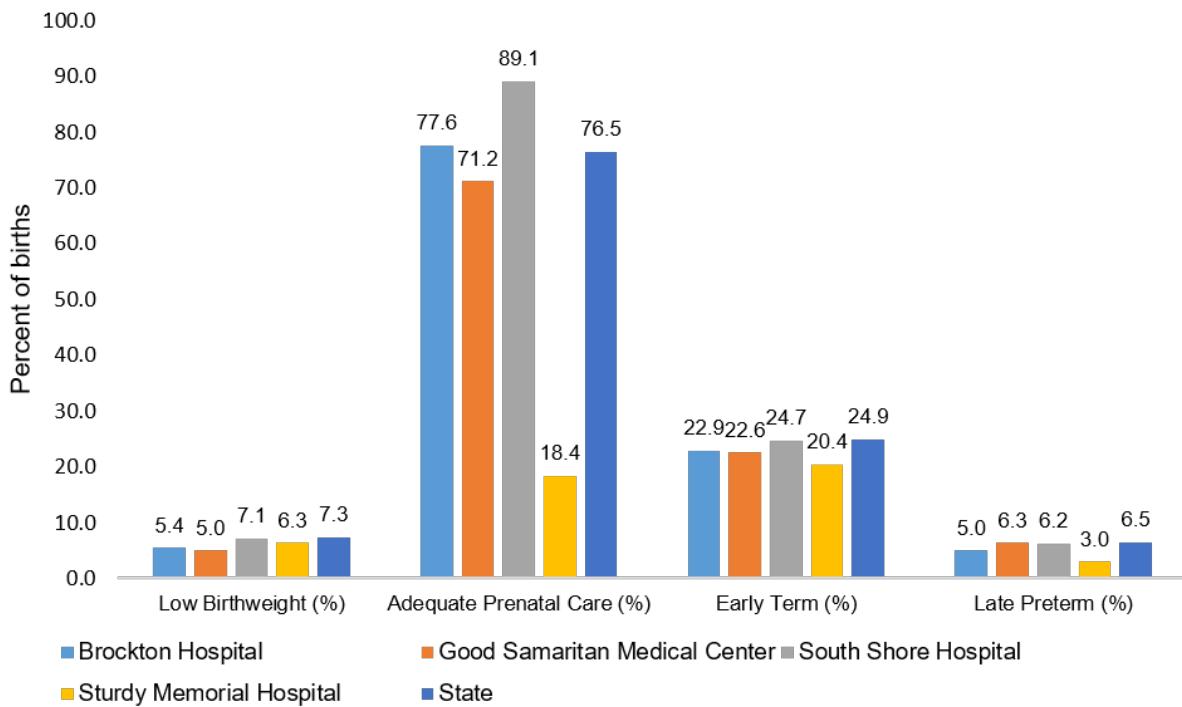
An important note about data in this section: Accurately and thoroughly depicting maternal health and birth outcomes at the local and service area levels is an ongoing challenge. Often, small numbers create large fluctuations in the epidemiological data and some numbers or rates may be suppressed due to how small they are. An additional limitation for drawing conclusions from these data is the age of the data. Some publicly available information is older than what is available regarding other health topics and some maternal health data is updated more for public consumption more regularly than others. All data presented below are the most recent publicly available data.

i. Birth outcomes



Birth outcomes are explored by examining the rates of low birthweight and preterm birth in the catchment area. When compared to the statewide rates, several communities experience rates in excess of observed state incidences of these birth outcomes. Avon, Bridgewater, Brockton, Holbrook, Randolph, Rockland, Taunton, and Whitman all exceed the statewide low birthweight rate (73.7 per 1,000 live births). Bridgewater, Brockton, East Bridgewater, Holbrook, Randolph, Rockland, Taunton, and Whitman also exceed the statewide rate of preterm birth (87.5 per 1,000 live births). Data from West Bridgewater and Avon were suppressed due to low counts and concerns for re-identification of the data. The outcomes of low birthweight and preterm birth are generally elevated in the catchment area and raise an area for further, specific investigation to better understand maternal and child health in the region.

Birth Outcome Measures by Hospital 2020



Key maternal health and birth outcome measures are available at the hospital-level for 2020. Percentages of low birthweight, adequate prenatal care, early term, and late preterm births are available for comparison to the statewide percentages. Percentages of low birthweight, early term birth, and late preterm birth are generally lower than the statewide percentages. The percentage of early term and late preterm births are notably lower at Sturdy Memorial Hospital. The percentage of births with adequate prenatal care varies by delivery hospital. Brockton Hospital and South Shore Hospital exceed the statewide percent of adequate prenatal care, while Good Samaritan Medical Center is slightly lower. Notably, Sturdy Memorial Hospital reports a percentage of deliveries with adequate prenatal care significantly below (18.4%) the statewide percent (76.5%).

ii. Key birth outcomes by race and ethnicity

Measure	Area Births	Area %	State Count or %
Total Births	n=1,416		n=72,835
Asian/Pacific Islander	33	2.3	8.0
Black, non-Hispanic	740	52.3	9.3
Hispanic	165	11.7	14.6
White, non-Hispanic	442	31.3	66.6

Measure	Area Births	Area %	State Count or %
Prematurity (<37 weeks gestation)	139	9.8	8.6
Asian/Pacific Islander	NA	NA	8.6
Black, non-Hispanic	73	9.9	10.9
Hispanic	17	10.3	8.4
White, non-Hispanic	26	5.9	7.0
Low birth weight (<2500 grams)	125	8.8	7.8
Asian/Pacific Islander	NA	NA	8.6
Black, non-Hispanic	73	9.9	10.9
Hispanic	17	10.3	8.4
White, non-Hispanic	26	5.9	7.0

Birth measures broken out by race and ethnicity that exceed the statewide measure are highlighted in gold above. Cities and towns in the BNHC Catchment Area are included in the “Area” calculations. Notably, the Catchment Area exceeds the statewide low birthweight rate and prematurity, which are primarily driven by disproportionate rates of low birthweight and premature births among those identifying as Hispanic/Latino.

iii. Infant mortality

Measure	Area Deaths	Area IMR	State IMR
Infant Deaths (< 1 yr.)	10	7.1	4.4
Asian/Pacific Islander	0	0.0	4.4
Black, non-Hispanic	3	4.1	8.2
Hispanic	1	NA	6.1
White, non-Hispanic	2	NA	3.4
Neonatal deaths (<28 days)	7	4.9	3.3
Asian/Pacific Islander	0	0.0	3.4
Black, non-Hispanic	3	4.1	6.3
Hispanic	0	0.0	4.4
White, non-Hispanic	1	NA	2.5
Postneonatal deaths (28-364 days)	3	2.1	1.1
Asian/Pacific Islander	0	0.0	0.9
Black, non-Hispanic	0	0.0	1.9
Hispanic	1	NA	1.7
White, non-Hispanic	1	NA	0.9

Measures of infant mortality are categorized by racial and ethnic group, and rates that exceed the statewide rate are highlighted in gold. The service area infant mortality rate (IMR) (7.1 deaths per 1,000 births) is more than 1.6 times higher than the statewide rate (4.4 deaths per 1,000 births). Mortality rates among several racial and ethnic groups are suppressed due to low numbers and high inconsistency in the data. The mortality rate for neonates less than 28 days old is elevated from the statewide rate for the service area, as is postneonatal death rate. Comparison between different racial and ethnic groups is not possible due to suppression of small data counts.

iv. Teen births

Location	2010 Teen Birth #	2010 Teen Birth rate	2019 Teen Birth #	2019 Teen Birth rate	2020 Teen Birth #	2020 Teen Birth rate
Brockton	119	35.5	60	18.9	60	18.6
Taunton	49	28.1	17	10.4	9	5.5
State	3907	17.1	1538	7.1	1353	5.9

Teen birth rates from 2019 and 2020 were published in 2023 for the 30 largest cities in the Commonwealth. Included in this publication were two cities in the BNHC catchment area: Brockton and Taunton. While both municipalities have experienced notable decreases in their teen birth rates since the reference year 2010, Brockton's teen birth rate has not experienced as dramatic a reduction as the statewide or Taunton rate. Brockton had the 8th highest teen birth rate in the Commonwealth in 2019 (18.9 per 1,000 females aged 15-19 in population). This inequality in the reduction of the teen birth rate suggests an area of opportunity for additional public health investigation and intervention.

v. Childhood Lead Poisoning

Exposure to lead is a concern primarily for young children. Children may be exposed to lead in the home by swallowing dust or chips from lead paint, imported food or other consumer products contaminated with lead, and/or breathing dust containing lead (EPA, 2023). Lead exposure, even at low levels, is associated with central and peripheral nervous system damage, learning disabilities, shorter stature, hearing impairment, and impaired formation and function of blood cells (EPA, 2023).

Lead Screening Rate (2021)	
Brockton	State
70%	68%

Percentage of houses built before 1978	
Brockton	State
80.4%	67.3%

Prevalence of Blood Lead Levels ≥ 5 ug/dL (5-year average 2017-2021)	
Brockton	State
34.5 per 1,000	13.6 per 1,000

In Brockton, the screening rate for childhood lead exposure (70%) is slightly higher than the statewide screening rate (68%). The percentage of housing stock in Brockton that may contain lead paint due (80.4%) to its year of construction is higher than the state percent (67.3%). The prevalence of elevated blood lead levels among Brockton children (greater than 5ug/dL) is approximately 2.5 times greater than the statewide prevalence, indicating the need for continued lead remediation and screening among children under age 4 years.

E. Environmental Health

“You know the demographics of this area - lower income, younger individuals, folks without access to vehicles, things like that. The entire city - all the census blocks in Brockton are considered Environmental Justice communities. We have limited English proficiency barriers, barriers for income, and minority individuals, and then those who are with language isolation, that trickles down to every aspect of the community, unfortunately.” – Key Informant Participant

i. Environmental Justice

Defining Environmental Justice

Environmental Justice (EJ) is the concept that all people are entitled to equal protection from environmental and health hazards and equal access to the development, implementation, and enforcement of environmental laws, regulations, and policies (CDC, 2022). EJ recognizes that people of color, indigenous peoples, low-income, and other vulnerable or marginalized populations are disproportionately burdened by environmental hazards and that these exposures help drive health disparities and often intertwined with other social inequities (HHS, 2022).

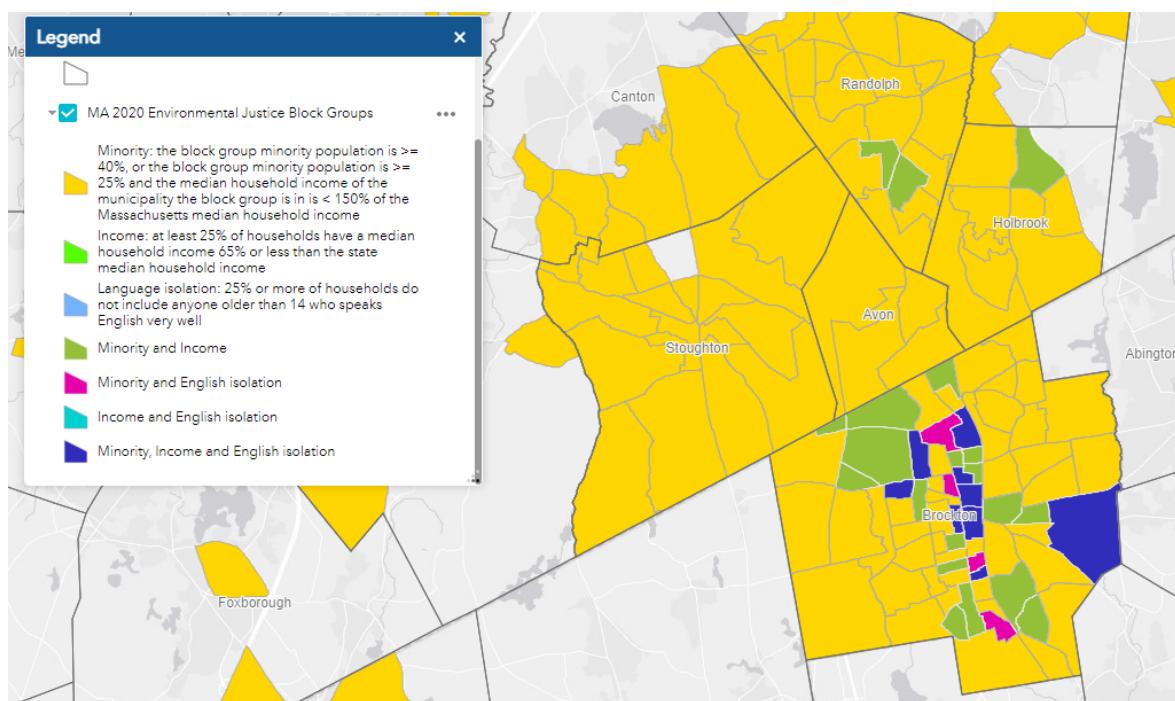
In 2021, Massachusetts passed sweeping legislation to promote environmental justice and combat climate change. Within these changes, the Commonwealth revised its definitions of EJ populations to include neighborhoods where *one or more* of the following are true (MDEP, 2022):

- The annual median household income is 65% of less of the statewide annual median household income

- Minorities make up more than 40% of the population
- 25% or more of households identify as speaking English less than “very well”
- Minorities make up 25% or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150% of the statewide annual median household income

EJ Populations in Brockton

Numerical and visual representations of EJ populations of Brockton and surrounding areas are available through the Massachusetts Department of Environmental Protection (MDEP). As of November 2022, 100% of all Brockton residents are determined to be members of the Commonwealth’s EJ population (MDEP, 2022). This includes all zip codes and census tracks in the city. Additionally, nearly the entire population located immediately north and northwest of Brockton is considered an EJ population, namely the towns of Stoughton, Randolph, Avon, and Holbrook.



6 ENVIRONMENTAL JUSTICE POPULATIONS IN THE GREATER BROCKTON AREA, 2022

ii. Air Quality

Background

The City of Brockton has one MassDEP Air Quality Monitoring station located at the Buckley Playground on Clinton Street. The station measures two pollutants: PM_{2.5} and ozone. PM_{2.5}, otherwise known as fine particulate matter, is pollution made of small solids or liquids in the air emitted from sources such as factories, power plants,

and both diesel and gasoline motor vehicles (American Lung Association, 2023). Exposure to PM_{2.5} is linked to premature cardiovascular and respiratory deaths and attributed to almost 48,000 premature deaths in the U.S. each year (American Lung Association, 2023). Ozone, also referred to as smog, is a lung irritant that can impact the respiratory system, including worsening symptoms of asthma, allergies, and COPD (American Lung Association, 2023). High levels of ozone can lead to increased emergency department visits and hospital admissions, as well as other negative health impacts over time (American Lung Association, 2023).

“We know that young people of color are more impacted by asthma, and we know that there's economic outcomes of that, where kids are not going to school, or people with asthma are less likely to go to work, we are working towards a fully electric fleet because of that. As the transportation provider in the area, we know that we can provide cleaner transportation that has trickle down impacts...” – Key Informant Participant

Data

In general, the Brockton area experiences good outdoor air quality. From measures at the Buckley Playground, the average annual mean concentration of PM_{2.5} was 8.26 $\mu\text{g}/\text{m}^3$, which is below the Environmental Protection Agency's annual national air quality standard of 12 $\mu\text{g}/\text{m}^3$ (MassDEP, 2022). From 2017 to 2021, however, the annual average PM_{2.5} concentration has steadily increased in Brockton which indicates that this measure should be carefully monitored over time to ensure the best air quality possible for residents. In 2021 the 24-hour average PM_{2.5} was 17.4 $\mu\text{g}/\text{m}^3$, which is below the national air quality standard of 35 $\mu\text{g}/\text{m}^3$ (MassDEP, 2022). The highest single PM_{2.5} reading from 2021 was 39.8 $\mu\text{g}/\text{m}^3$ (MassDEP, 2022).

In the same timeframe (2017-2021) the ozone annual mean ozone concentration in Brockton was 0.04ppm (MassDEP, 2022). During 2021, Brockton experienced 1 day above the 8-hour maximum national air quality standard for ozone at 0.0701ppm (MassDEP, 2022).

Year	Annual Mean PM 2.5 ($\mu\text{g}/\text{m}^3$)	Mean Ozone (ppm)
2017	4.51	0.04
2018	4.48	0.04
2019	6.78	0.04
2020	7.51	0.04
2021	8.26	0.04

iii. Drinking Water Quality

Background

Many environmental factors impact the quality of public and private drinking water supplies, which can in turn, impact a community's health. Storm water runoff, road salting, and improper disposal of hazardous materials can all contribute contaminants to the drinking water supply (MDEP).

Prior to February 2021, Brockton sourced its drinking water from the Brockton Reservoir at D.W. Field Park and Silver Lake in the towns of Pembroke, Plympton, and Kingston (Brockton DPW, 2021). On February 7, 2021, Brockton eliminated use of the Brockton reservoir at D.W. Field Park as a drinking water source due to the identification of elevated levels of per- and polyfluoroalkyls substances (PFAS) (Brockton DPW, 2021).

PFAS

PFAS are manmade "forever chemicals" frequently used in firefighting foams, food packaging, and heat resistant/non-stick coatings that may lead to increased cholesterol levels, changes in liver enzymes, small decreases in birth weight, decreased vaccine response in children, increased risk of hypertension or preeclampsia in pregnant people, and increased risk of kidney and testicular cancers (CDC, 2022).

While the public drinking water supply in Brockton may be free of PFAS, private wells require separate attention. The Massachusetts Department of Environmental Protection recommends that all private drinking water wells be tested for PFAS contamination and treated if PFAS6 levels exceed 20 parts per trillion (ppt). In March 2023 the U.S. Environmental Protection Agency (EPA) announced proposed rulemaking that would introduce a federal PFAS drinking water limit of 4 ppt if enacted, signaling the likely need for future local action to bring drinking water systems into compliance with the standard.

Information for residents with private wells in Massachusetts can be found at: <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas-in-private-well-drinking-water-supplies-faq#should-i-test-my-private-well-for-pfas?>

Fluoridation

Fluoridation of drinking water is recommended by the U.S. Centers for Disease Control and Prevention (CDC) and is associated with a 25% reduction in dental cavities in adults and children (CDC, 2020). The City of Brockton does not fluoridate its drinking water, indicating that residents may be at elevated risk for tooth decay and dental caries (CDC, 2020).

Lead

Lead exposure, even at low levels, is associated with central and peripheral nervous system damage, learning disabilities, shorter stature, hearing impairment, and impaired formation and function of blood cells (EPA, 2023). Groups particularly vulnerable to the effects of lead exposure include young children, infants, and fetuses (EPA, 2023). Sources of lead in drinking water are often service lines and home plumbing fixtures, rather than municipal water sources (EPA, 2023).

The City of Brockton sampled 46 sites in the municipality in 2021, with one site found to be over the maximum contaminant level goal (MCLG) of 15 parts per billion. A full drinking water report can be found at:

<https://brockton.ma.us/wp-content/uploads/2019/06/Consumer-Confidence-Report-2021.pdf>

iv. Built Environment

Background

The built environment is considered a structural determinant of health and includes all of the physical parts of where people live, work, play, and learn (Perdue et al., 2003). Elements of the built environment include homes, buildings, streets, open spaces, and infrastructure (Perdue et al., 2003). The attributes of a community's built environment impact health behaviors and health outcomes, acting as either facilitators or barriers to health (Perdue et al., 2003). Increased urban development has demonstrated mixed effects on health, such as decreased obesity, diabetes, and physical inactivity, but increases in physical and mental distress and binge drinking (Keralis et al., 2020).

Greenspace and Heat Island Effect

As early as 2018, Brockton was identified as a location subject to the urban heat island effect. Heat islands occur when greenspace and other natural land is replaced by high concentrations of pavement, buildings, and other surfaces that absorb and retain heat (EPA, 2023). A study planning for greenspace in Brockton found that in 2018, only 7% of the downtown area of Brockton had tree canopy coverage. In 2023, the National Oceanic and Atmospheric Administration selected Brockton as a city to map inequities in urban heat islands to better identify and address areas that are subject to extreme heat. Data from the mapping program will help strategize interventions to the built environment to reduce extreme temperatures and the urban heat island effect in Brockton. The US EPA maps areas with heat island effects, which includes large portions of Brockton and areas north and east of the city within the Catchment Area.

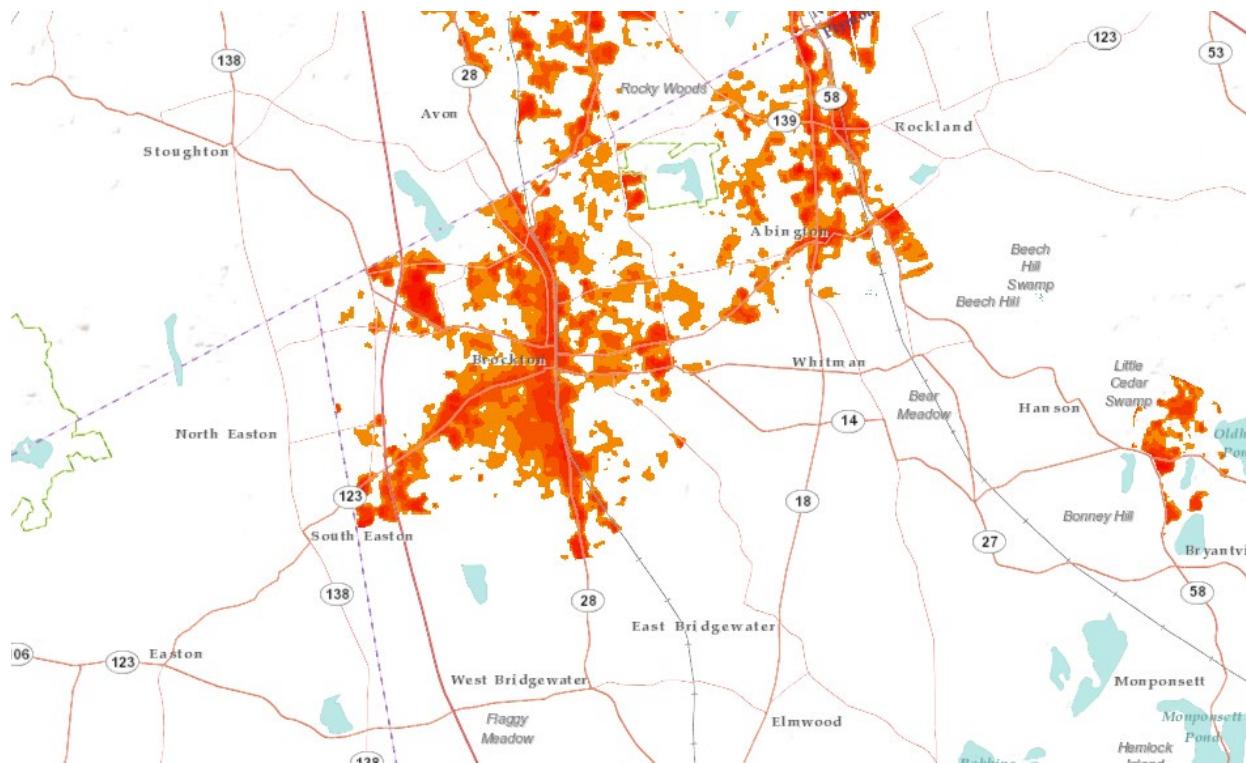


FIGURE 7 AREAS CONSIDERED HEAT ISLANDS

F. Behavioral Health

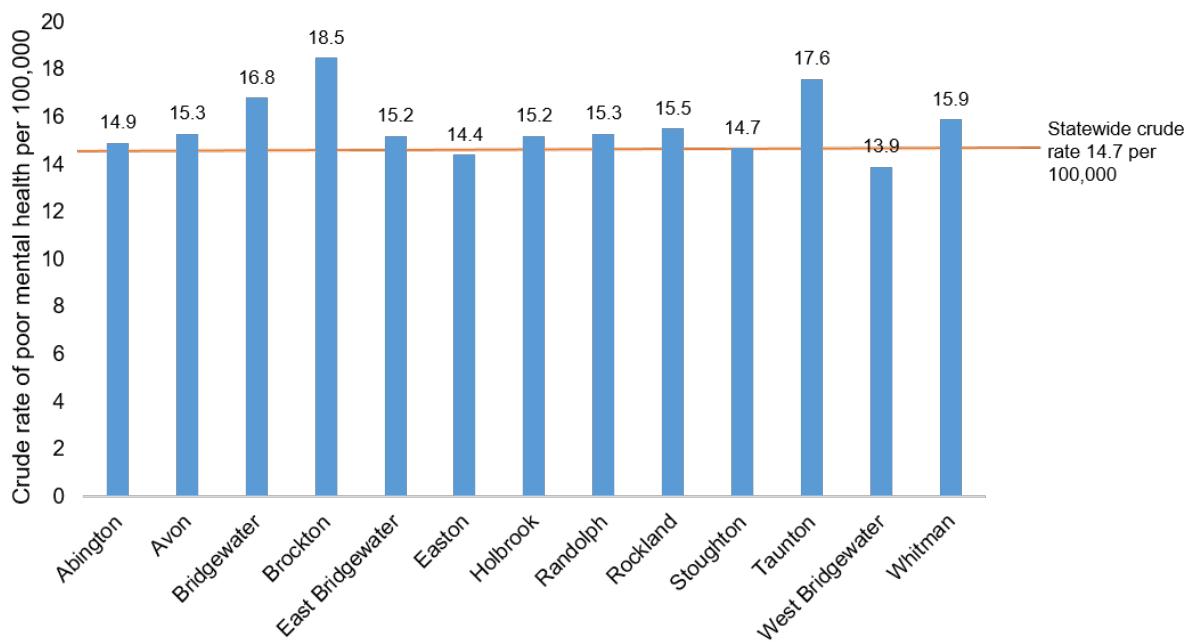
i. Mental Health

	Geographic Area	Age 18-25	Age 26+
Any mental illness in the past year	Massachusetts	34.7%	20.9%
	Northeast	33.2%	19.3%
	U.S.	33.7%	21.1%
Serious mental illness in the past year	Massachusetts	11.6%	3.7%
	Northeast	10.3%	3.8%
	U.S.	11.4%	4.7%
Received mental health services in past year	Massachusetts	21.4%	18.9%
	Northeast	20.8%	16.3%
	U.S.	19.2%	16.5%
Had serious thoughts of suicide in past year	Massachusetts	12.0%	2.7%
	Northeast	12.0%	3.0%
	U.S.	13.0%	3.6%
Made any suicide plans in past year	Massachusetts	4.8%	0.7%
	Northeast	4.9%	0.7%
	U.S.	4.9%	0.9%

Data on mental health are often limited at the local level, especially if investigating different demographic groups. Broader data at the state level are available from the National Survey on Drug Use and Health (NSDUH). The NSDUH measures prevalence of any mental illness (AMI), serious mental illness (SMI; mental illness where serious functional impairment is present); receipt of mental health services, and metrics on suicidal ideation and intent. Developmental and substance use disorders are excluded from these data.

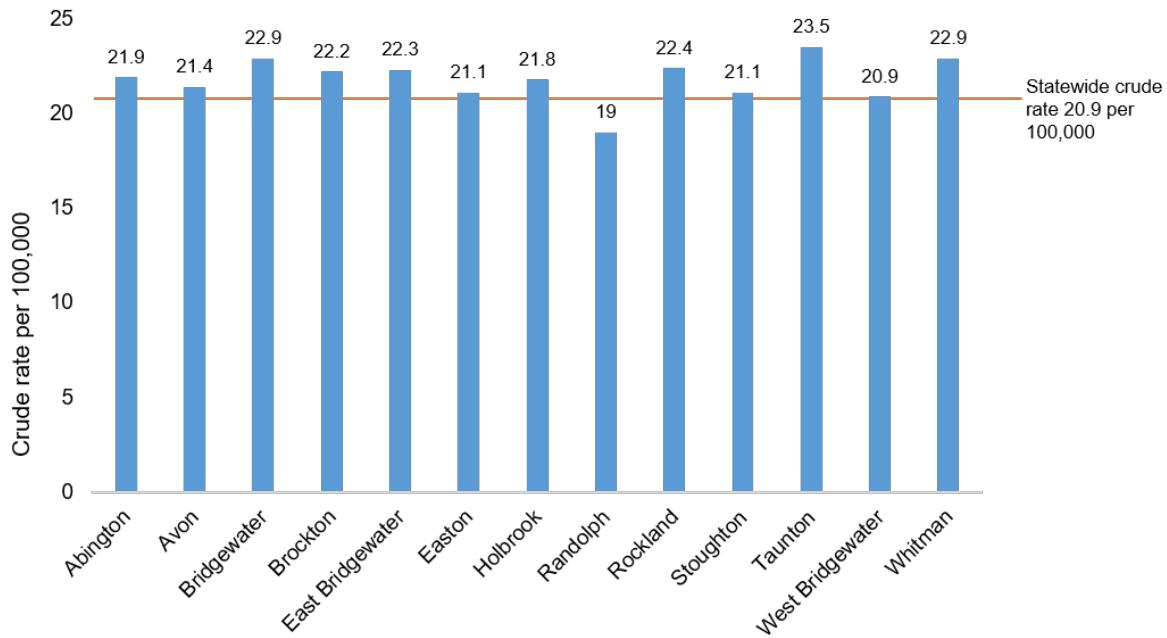
In Massachusetts, slightly higher rates of mental illness are observed among individuals 18 to 25 years of age compared to regional and national rates. In the demographic group age 26 and older, those rates are slightly lower than regional and national observations. Rates of suicidal ideation and intent are similar in Massachusetts compared to regional and national values. A higher proportion of individuals received treatment for their mental health in the past year in Massachusetts than among individuals living elsewhere in the region and country.

Adults Age 18+ with Poor Mental Health (Crude Rate per 100,000) by City/Town 2021



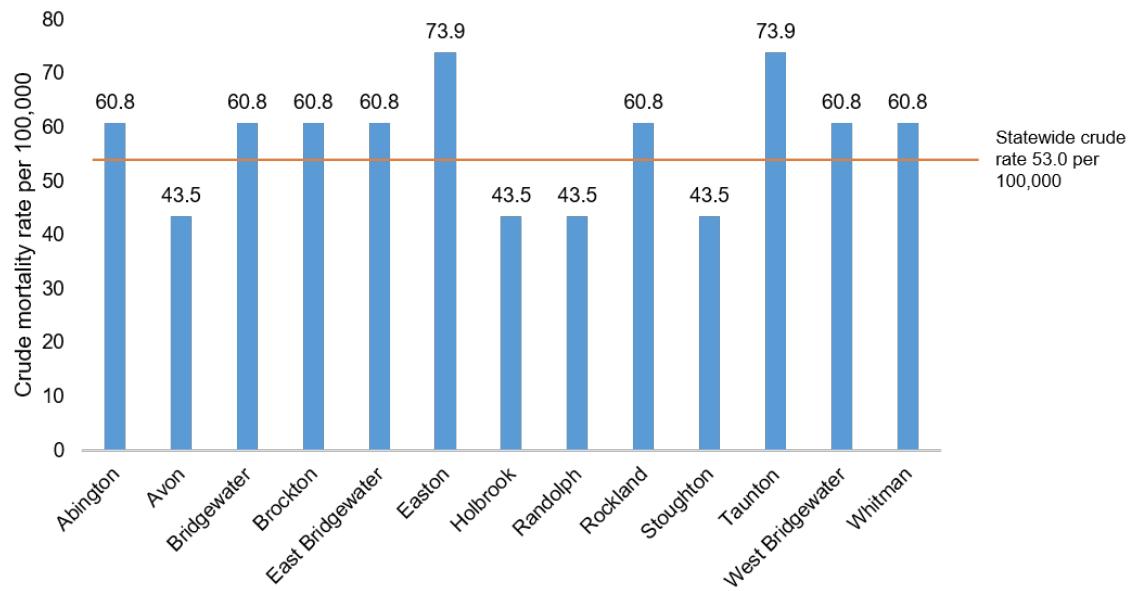
In general, adults aged 18 years and older in the catchment area report having poor mental health at rates near or slightly above the statewide rate of 14.7 persons per 100,000 self-reporting having poor mental health in 2021. Brockton and Taunton adults recorded the highest percentage of adults reporting poor mental health (18.5 per 100,000 and 17.6 per 100,000, respectively). West Bridgewater adults had the lowest rate of self-reported poor mental health at 13.9 per 100,000.

Adults 18+ with Depression (Crude Rate per 100,000) by City/Town 2021



Overall, cities and towns in the catchment area had rates of adult depression similar to the statewide rate of 20.9 per 100,000. Self-reported depression diagnosis from the Behavioral Risk Factor Surveillance System (BRFSS) was highest in Taunton (23.5 per 100,000) and lowest in Randolph (19.0 per 100,000).

Crude Mortality from intentional self-harm (suicide), alcohol-related disease, and drug overdose per 100,000 by City/Town 2016-2020



Specific mortality data by city and town is unavailable publicly due to relatively low counts of data. State reporting chooses to suppress these data to prevent re-identification of decedents. Instead, the Commonwealth publishes a “deaths of despair” statistic that encompasses deaths from intentional self-harm (suicide), alcohol-related disease, and drug overdoses as a measure of a community’s mental health and wellbeing and is an indicator of poor mental health. Rates are re-summarized from county-level data if local data are not available, which should signal caution in drawing generalized conclusions from these data.

The crude mortality rate from these causes of death was highest in Easton and Taunton from 2016 to 2020, at rates of 73.9 per 100,000 in population, which is notably higher than the statewide rate of 53.0 per 100,000. Lower rates were observed in Avon, Holbrook, Randolph, and Stoughton at 43.5 per 100,000.

ii. Substance Use

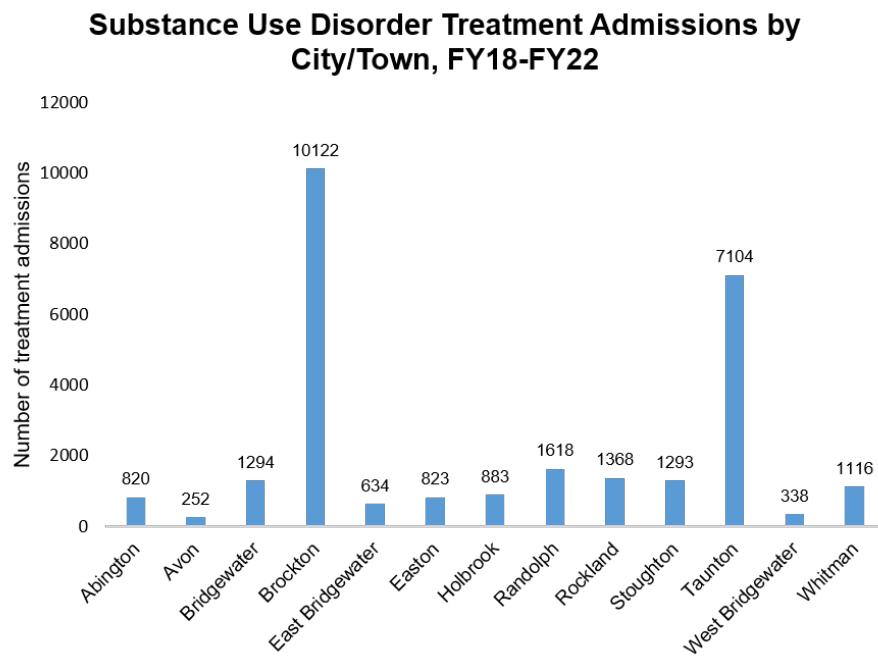
	Geographic Area	Age 12+	Age 12-17	Age 18-25	Age 26+
Marijuana use in past month	Massachusetts	17.2%	6.5%	27.9%	16.6%
	Northeast	14.4%	6.1%	24.3%	13.8%
	U.S.	13.0%	5.1%	24.1%	12.2%
Illicit drug use (other than marijuana) in past month	Massachusetts	3.5%	1.6%	5.2%	3.4%
	Northeast	3.7%	1.7%	4.8%	3.7%
	U.S.	3.2%	1.8%	4.1%	3.3%
Alcohol use in past month	Massachusetts	52.0%	7.4%	59.1%	55.4%
	Northeast	50.5%	7.3%	55.0%	54.4%
	U.S.	47.6%	7.0%	50.1%	51.9%
Tobacco product use in past month	Massachusetts	15.8%	2.9%	12.2%	17.7%
	Northeast	17.0%	3.0%	15.1%	18.8%
	U.S.	19.6%	2.6%	16.8%	22.0%
Substance use disorder in past year	Massachusetts	17.1%	9.7%	27.0%	16.3%
	Northeast	16.5%	9.3%	25.1%	16.0%
	U.S.	16.5%	8.6%	25.6%	16.1%

Rates of substance use are difficult to measure at the local level and publicly available data on this subject are limited. Estimates on the percent of the population at the state level are available as a part of the National Survey on Drug Use and Health (NSDUH).

In general, the Massachusetts population uses drugs and alcohol at rates higher than the national population and slightly higher than the Northeast regional area. An exception is tobacco use, where Massachusetts observes lower rates of tobacco use compared to national and regional populations across most age groups.

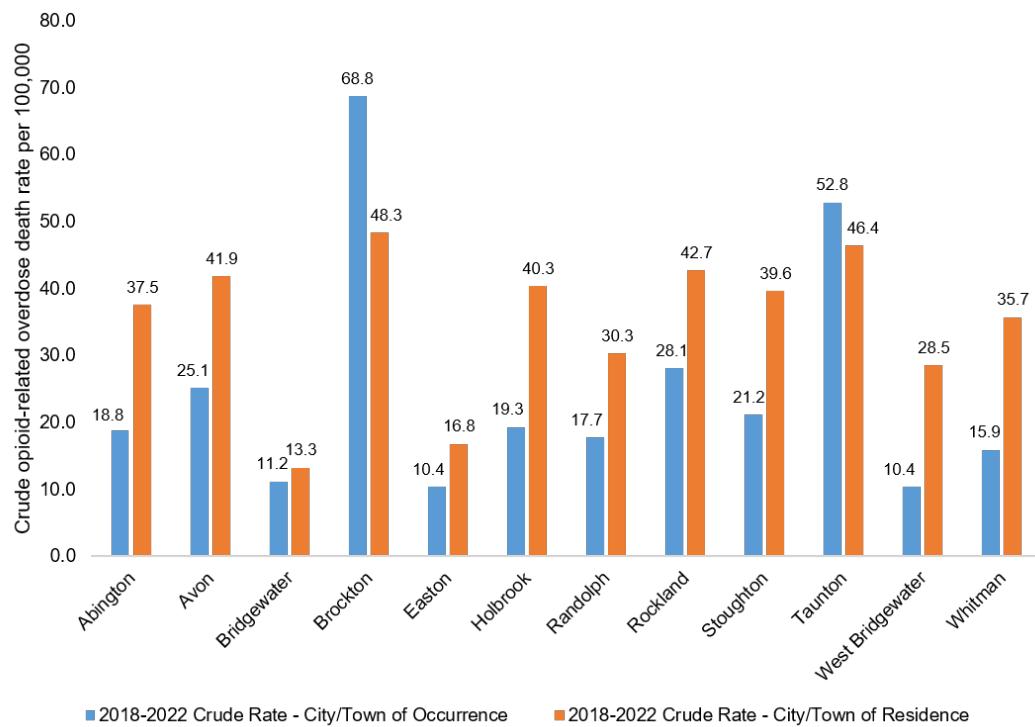
As expected, given higher rates of substance use, Massachusetts also experiences higher proportions of the population who meet DSM-V criteria for substance use disorder than its national and regional counterparts.

Differences are greatest between the 12- to 17-year-old and 18- to 25-year-old age groups when comparing Massachusetts to the larger U.S. population.



Data on treatment admissions for substance use disorder are available at the city/town level. Admissions to any treatment programs licensed or contracted with the Massachusetts Department of Public Health Bureau of Substance Addiction Services (BSAS) are recorded at time of intake. From Fiscal Year (FY) 2018 through FY 2022, Brockton and Taunton saw the highest number of residents seeking treatment for substance use disorder, which is expected given their larger population sizes. All other communities in the BNHC Catchment Area demonstrated treatment admissions proportionate to their population sizes. These data indicate unique treatment admissions, not unique individuals (i.e. the same individual may have had multiple admissions during the reporting timeframe).

Crude 5-year opioid-related overdose death rate, by city/town of occurrence and residence, 2018-2022



One measure on the impact of substance use is mortality due to opioid-related overdose. Overdose data are updated quarterly by the Department of Public Health, with city and town level data released annually. Opioid-related overdose death data are reported based upon a decedent's city/town of residence and additionally the city/town where the death occurred. Most cities and towns in BNHC's Catchment Area experience notable rates of opioid overdose deaths among residents. Brockton and Taunton hold the highest rates of overdose death for both place of occurrence and residence. This may indicate that these locations are places where people come to buy or use drugs or are staying in the area but are not necessarily residents of the community.

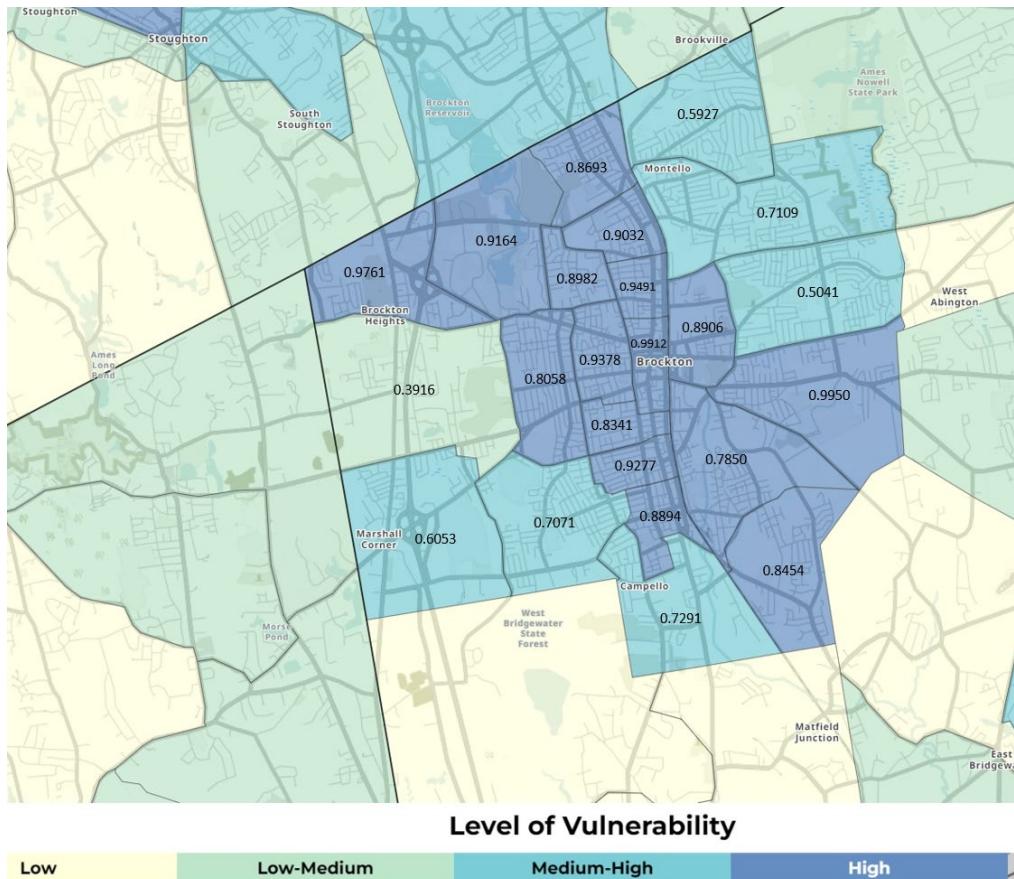
G. Social Drivers of Health

Social drivers of health (SDOH), also referred to as social determinants of health, are defined as "the conditions in which people are born, grow, live, work, and age," (WHO, 2023). These non-medical factors influence peoples' health outcomes and are driven by economic, social, and political forces and systems (WHO, 2023). Some examples of SDOHs include socioeconomic status, education, food insecurity, housing, social inclusion/non-discrimination, and access to health care, among others. It is estimated that 30-55% of health outcomes are attributable to SDOH (WHO,

2023). This section explores several key SDOH indicators in Brockton and the surrounding region. Overall, SDOH needs are pervasive in the BNHC Service Area, with highest need concentration in central Brockton.

“People don’t talk about the social determinants like we are supposed to, but to me, the one that really I feel like is really affecting Brockton would be economic stability because again, it still boils down to the idea of people not having work, people not having jobs. If you don’t have a job, how do you cater for your need? If you don’t have a means of livelihood, how do you cater for what you want or what you need?” – Key Informant Participant

Social Vulnerability Index



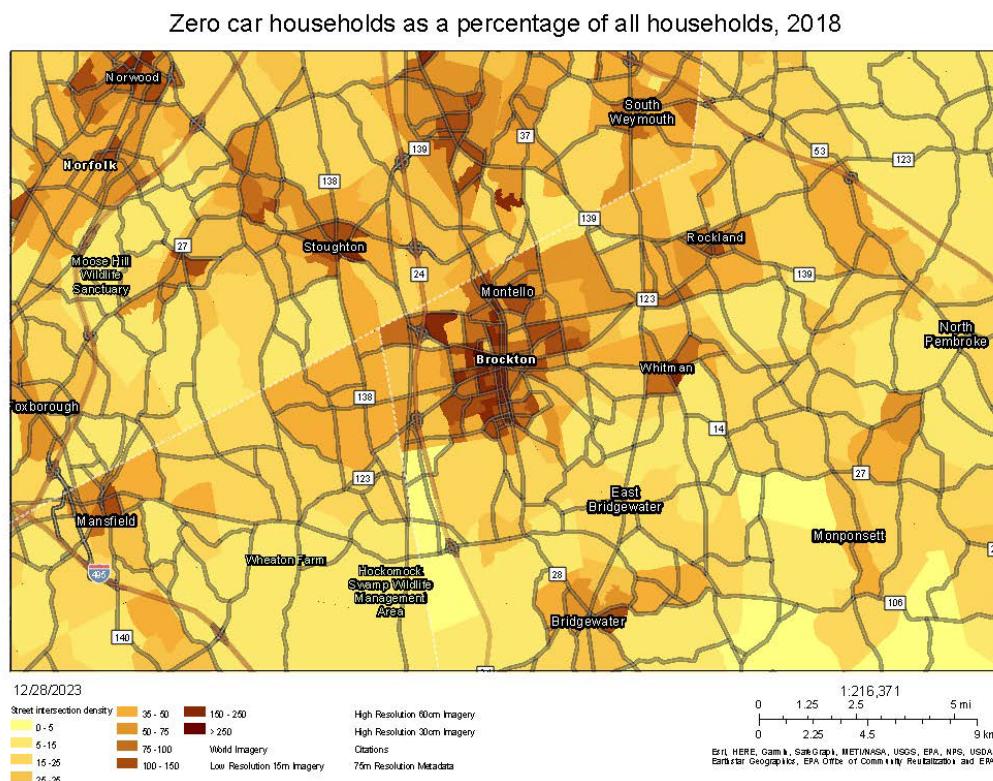
The Social Vulnerability Index (SVI) is a tool used by the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substance and Disease Registry (ATSDR) to measure the susceptibility of communities for potential negative health outcomes based upon their disproportionate exposure to external SDOH stressors.

The closer a census tract or community's SVI value is to 1 the more vulnerable they are based upon their elevated SDOH needs. Conversely, a census tract or community's SVI value nearing 0 indicates a lower level of vulnerability for negative health outcomes.

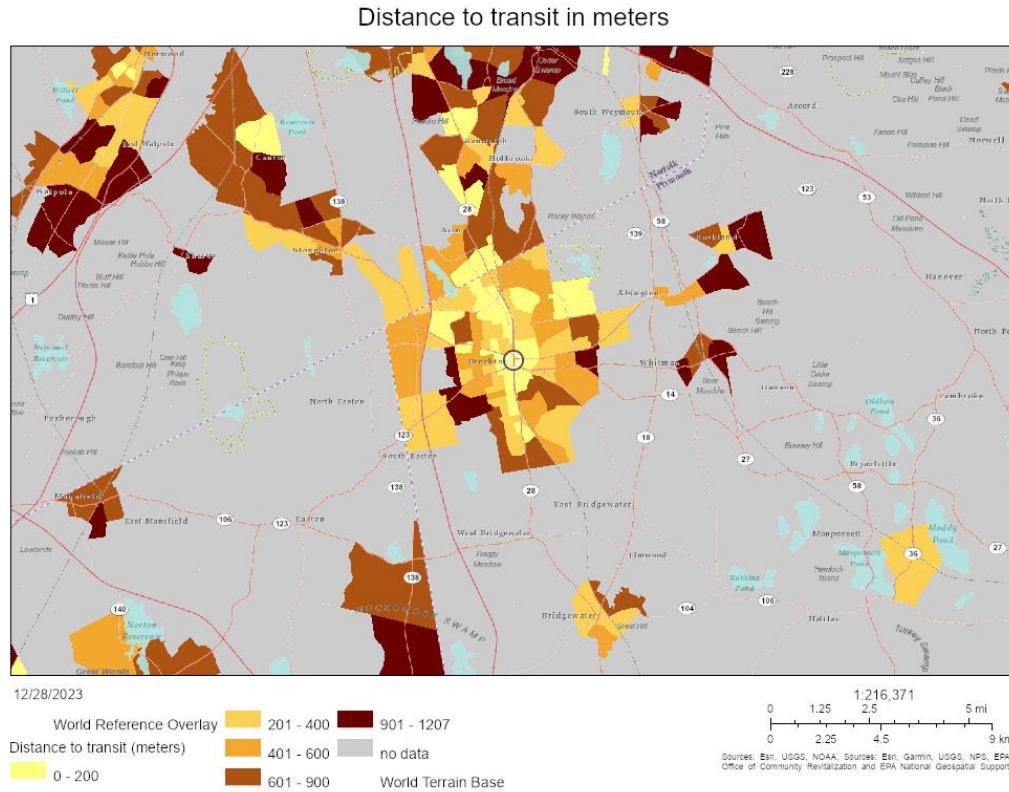
In Brockton, a high SVI score stretches from census tracts in the northwest of the city, through the downtown area, to its southeastern bounds. Census tracts in the west and northeast areas of Brockton experience lower SVI values indicating lower levels of social vulnerability. The population inhabiting the high-SVI tracts should be recognized as disproportionately impacted by SDOH stressors and at greater risk for negative health outcomes related to social needs.

i. Transportation

Transportation access impacts public health by influencing how easily people can access common destinations such as grocery stores, health care services, jobs, and education (US DOT, 2015).

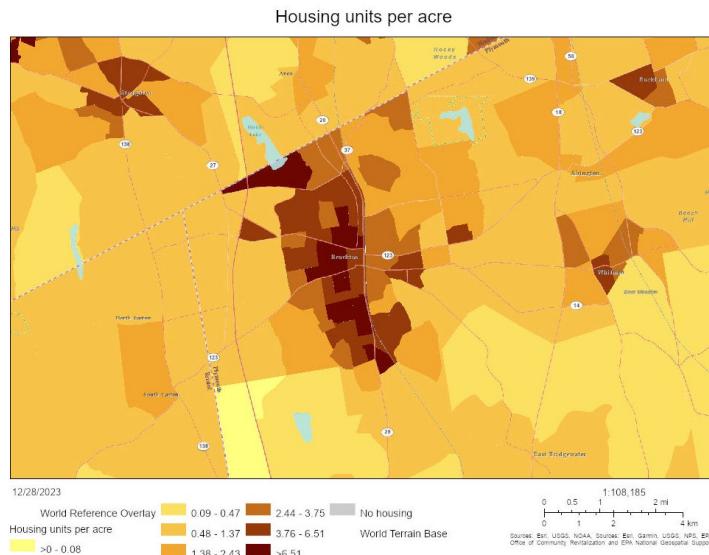


In areas where public transportation is limited, examining the percentage of households which have access to a vehicle is important. There are several areas of central Brockton where a high proportion of the population has no access to a personal vehicle. There are several other smaller areas throughout the immediate BNHC Catchment Area where household vehicles are limited.

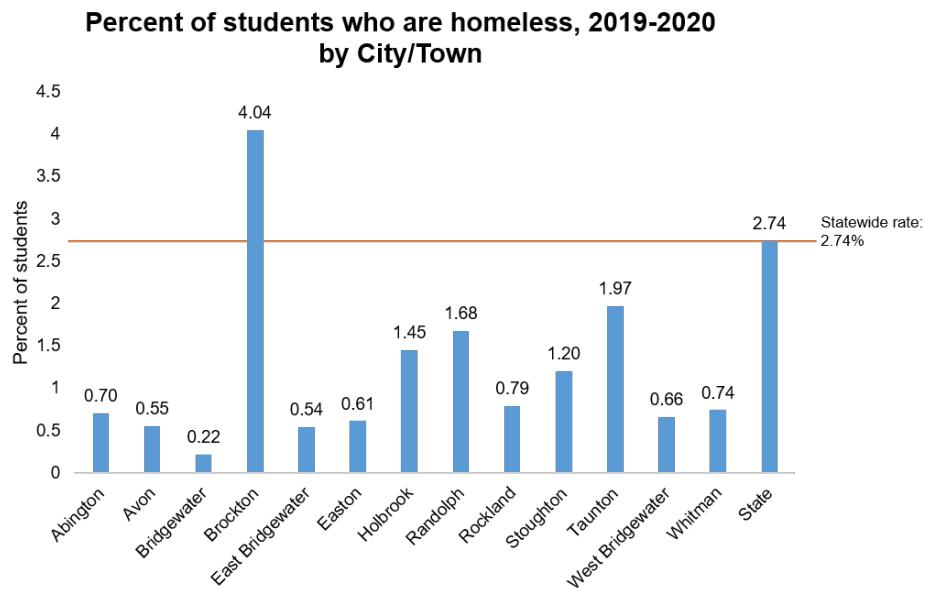


Another measure to evaluate transportation access is examining distance to public transit options. Despite both Massachusetts Bay Transit Authority (MBTA) and Brockton Area Transit (BAT) operating in Brockton, there are still several areas of the city where access to transit is greater than 0.5 miles (900 meters). Several locations in the BNHC Catchment Area located outside of Brockton are also situated more than 0.5 miles away from transit options. Understanding how access to transportation affects engagement with health and human services is vital to promoting health services and successful health programs.

ii. Housing



Housing in Brockton is densely situated in the central corridor of the city, with some areas having greater than 6.51 housing units per acre. The presence of higher density housing units indicates that extra investigation into housing quality and conditions may be necessary and consideration for the spread of infectious diseases should be given.



Homelessness is a persistent phenomenon in Brockton and its surrounding communities, as it is throughout much of the state and country at this time. Measuring homelessness and housing instability can be challenging due to varying definitions of homelessness by different state and federal agencies and the rapid fluidity of housing status experienced by many individuals. One measure that can help investigate this is the proportion of students considered homeless by city and town in the BNHC Catchment Area. The definition of homelessness used for students is broad and can include housing instability such as couch surfing. The percentage of Brockton students considered homeless (4.04%) is nearly double the statewide percent (2.74%). This indicates that homelessness is a significant issue within the city and further, targeted investigation of its scale, root causes, and solutions is necessary in order to promote health among unhoused or housing insecure populations.

iii. Income & Socioeconomic Status

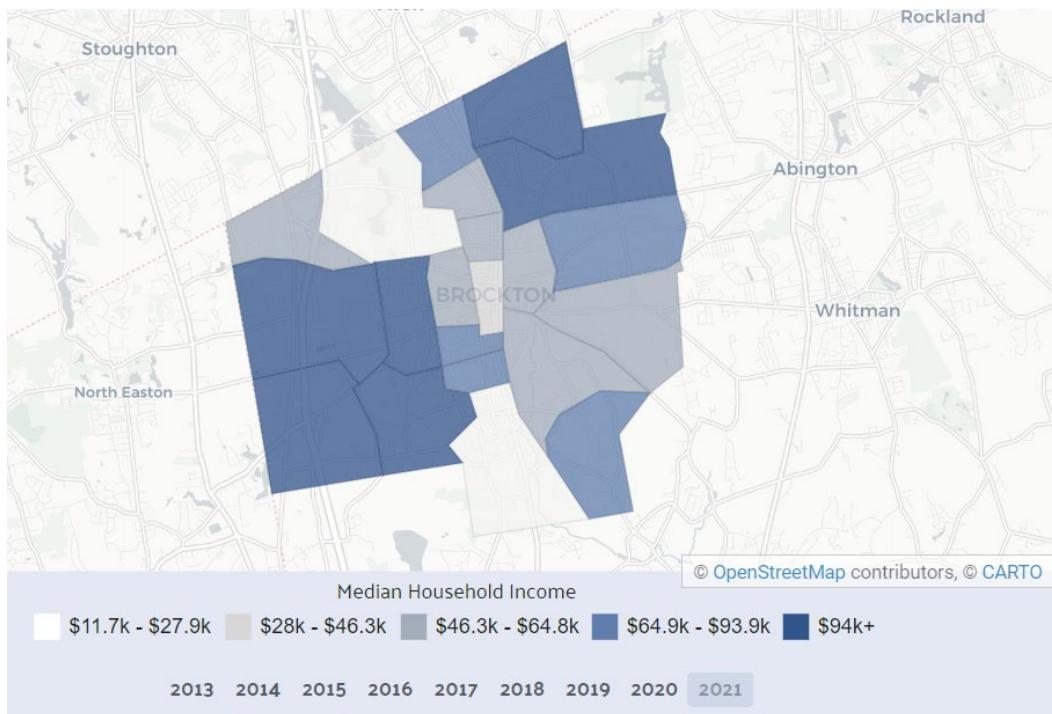


FIGURE 8 BROCKTON MEDIAN INCOME BY CENSUS TRACT 2021; SOURCE: AMERICAN COMMUNITY SURVEY, 2022

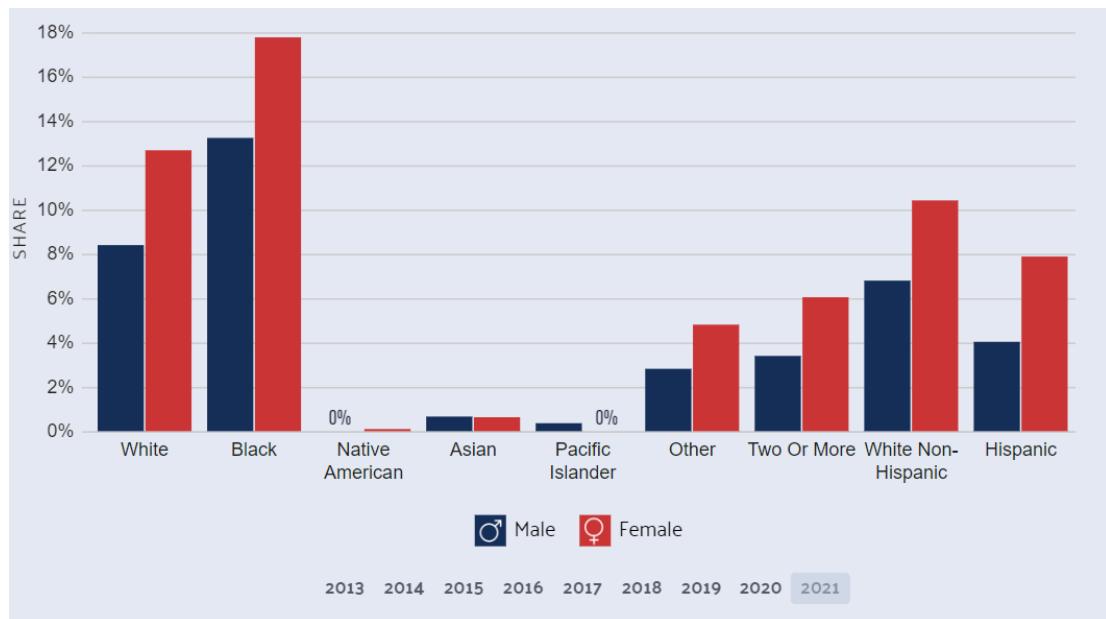


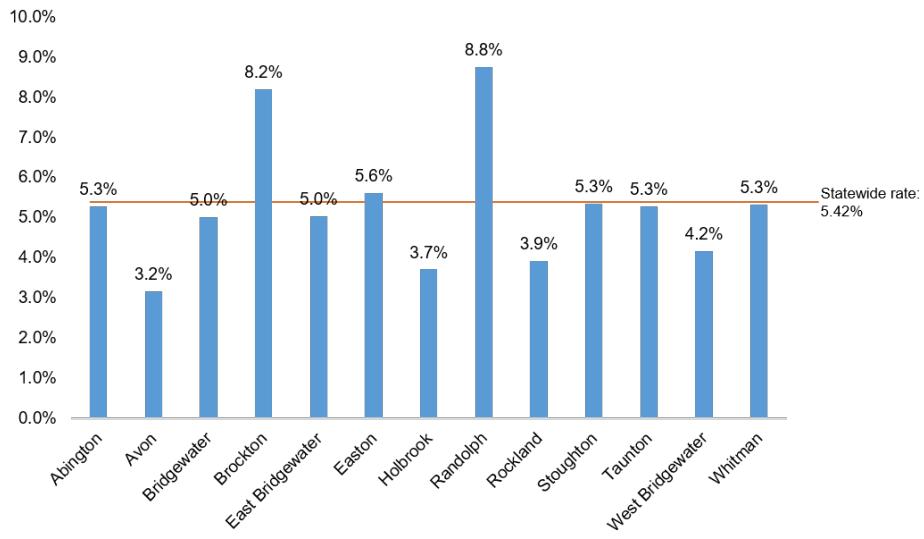
FIGURE 9 BROCKTON PERCENT SHARE OF PEOPLE EXPERIENCING POVERTY BY RACE/ETHNICITY AND SEX 2021; SOURCE: AMERICAN COMMUNITY SURVEY, 2022

Data from the 2020 U.S. Census and 2022 American Community Survey provide broad overviews of income. With a median income of \$74,799, Brockton's median income is lower than that of the statewide median income of \$94,488. Moreover, income is not equally distributed among different geographic areas of the city or among different racial, ethnic, and gender groups in the city. Census tracts that span from the northwest across to the southeast areas of the city see considerably lower median incomes than areas in the geographic southwest and northeast sections of Brockton.

American Community Survey results also reveal that females of any racial or ethnic group are more likely to be experiencing poverty than their male counterparts. People identifying as Black females are disproportionately burdened by poverty more than any other racial, ethnic, or gender class. Those identifying as Asian are notably far less likely to be living in poverty than any other racial, ethnic, or gender group.

iv. Employment

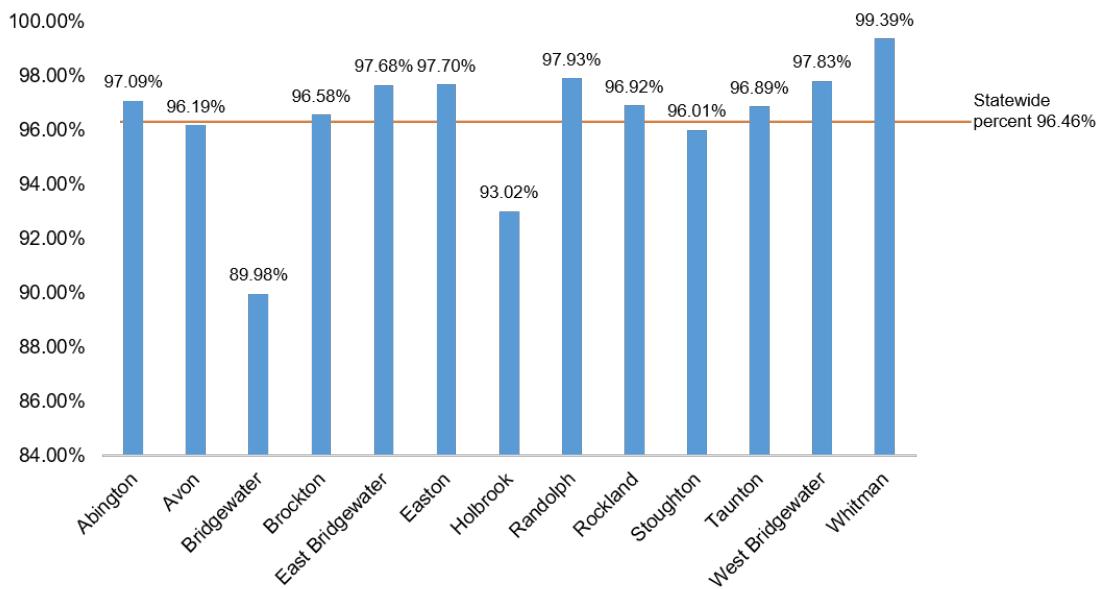
Unemployment Rate 2017-2021 by City/Town



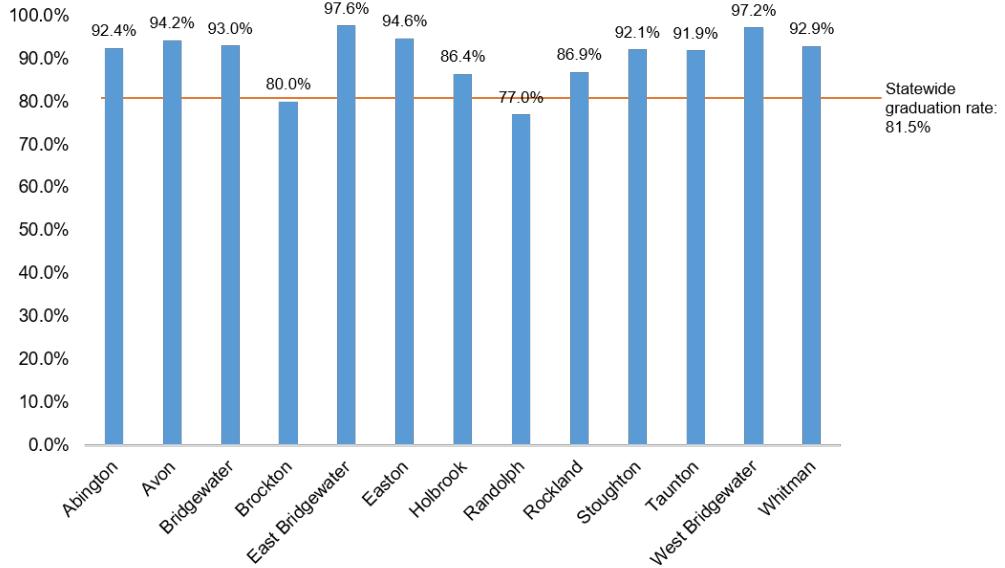
Employment is a social driver of health in that it helps provide financial resources, promotes social mobility, and demonstrates positive relationships with people's mental and physical health (van der Noordt et al., 2014). Rates of unemployment vary among the different cities and towns in the BNHC Catchment Area. Avon (3.2%), Holbrook (3.7%), Rockland (3.9%), and West Bridgewater (4.2%) experience unemployment rates below the statewide rate (5.45%), while Brockton (8.2%) and Randolph (8.8%) see rates substantially above the statewide rate. Abington (5.3%). Bridgewater (5.0%), East Bridgewater (5.0%), Easton (5.6%). Stoughton (5.3%), Taunton (5.3%), and Whitman (5.3%) have unemployment rates similar to the statewide rate.

v. Education

Percent of Population Age 5-17 Enrolled in School, 2017-2021

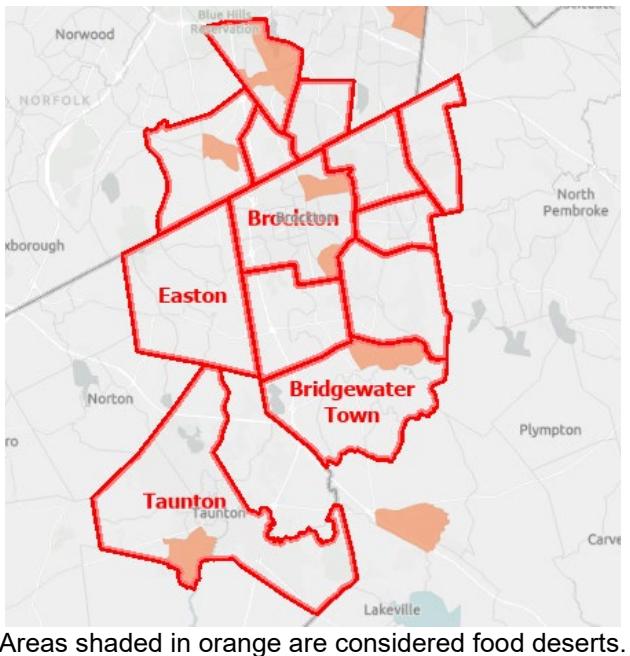


Graduation Rate by City/Town 2019-2020



Education is another social factor that can impact health. In the BNHC Service Area, school enrollment is below the statewide average (96.46%) in two communities: Bridgewater (89.98%) and Holbrook (93.02%). High school graduation rates are below the state average (81.5%) in two Service Area communities: Brockton (80.0%) and Randolph (77.0%).

vi. Food Insecurity



Areas shaded in orange are considered food deserts.

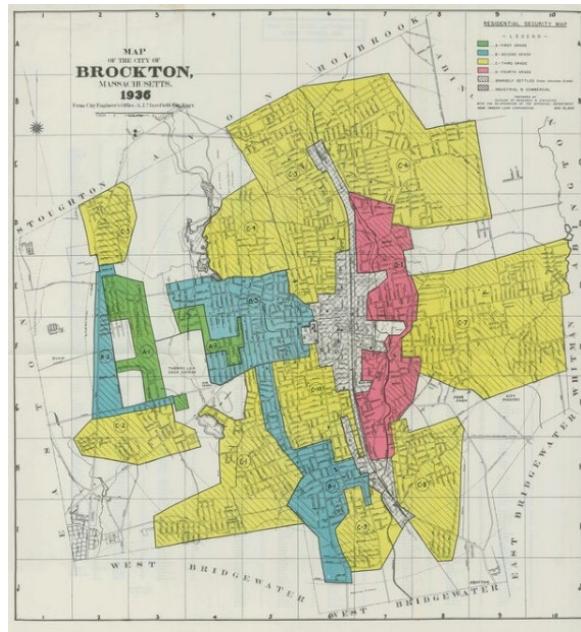
One factor negatively impacting food security is the presence of food deserts, or areas where access to affordable, nutritious food is limited. Several areas considered food deserts are present in the BNHC Service Area. The largest food desert is in Randolph along its eastern section. Smaller areas in Stoughton, Brockton, Bridgewater, and Taunton are also considered food deserts.

H. Health Equity

At the global, national, state, and local levels not all groups of people are able to achieve their best health and quality of life. Differences in health outcomes among different societal groups are called *health inequalities*. When these differences are negatively experienced by members of historically marginalized or oppressed groups, we refer to them as *health disparities* and the unequally experienced factors leading to them as *health inequities*. The CDC defines health disparities as “preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by populations that have been disadvantaged by their social or economic status, geographic location, or environment,” (CDC, 2022). Conversely, health equity is “the state in which everyone has a fair and just opportunity to attain their highest level of health” through resolution of historical and modern injustices, barriers to health and access to health care, and work to eradicate preventable health disparities (CDC, 2022).

Massachusetts has made health equity a priority at the state level, and Brockton too has signaled the importance of improving equity in health outcomes at the local level. During the height of the COVID-19 pandemic, the city formed its Health Equity Taskforce and Wellness Trust Team to help address disparities in COVID-19 infection, access to

vaccinations, and vaccine hesitancy. Now, in the protracted COVID-19 recovery phase, the importance of focus on health equity in Brockton is heightened, given its high density of historically oppressed populations, preexisting health disparities, and impact of legacy structural, political, and systemic racism and discrimination. Moving forward, it will be critical to evaluate the historic and present systemic, policy, and structural factors at play at the local level that negatively impact health. For example, understanding Brockton's history with the destructive lending practices of redlining and identifying and addressing where residual effects may be felt, such as zoning by-laws and other city policies. These types of laws and policies can have negative impacts on social drivers of health and access to health services.



i. Emerging Health Disparities

While defining and investigating suspected health disparities is out of scope for this Community Health Needs Assessment, there are several emerging areas where possible disparities exist, and a justification exists for additional research and inquiry. The following findings or results warrant further specific analysis:

- 1. Elevated mortality rates among state-defined racial and ethnic groups:** Given the dramatic elevation of mortality rates among Black/African American, "Other" non-Hispanic/Latino, and White group compared to the statewide rate requires further investigation. In particular, understanding the burden of mortality encompassed in the "Other" group, which may primarily be comprised of Cape Verdean and/or Haitian-identifying individuals and determining if there are subgroups in the general population or within racial/ethnic groups that are disproportionately impacted, such as those experiencing homelessness, people with complex social

determinant of health needs, or other factors that may marginalize subgroups of individuals and experience high mortality.

2. **Elevated mortality due to chronic diseases, especially heart disease and cancer, among Cape Verdean and Haitian individuals:** state vital records statistics are unable to accurately capture prominent cultural groups who live in Brockton; however, it is suspected that the “Other, non-Hispanic/Latino” group is primarily comprised of Cape Verdean and Haitian individuals. Given the elevated mortality rate due to heart disease and cancer in this demographic group, further investigate of disease burden among the Cape Verdean and Haitian communities is warranted.
3. **Elevated mortality due to diabetes mellitus among those identified as Hispanic/Latino:** the marked elevated of the mortality rate due to diabetes mellitus among people identified as Hispanic/Latino is an area for further investigation.
4. **Differential exposure to social drivers of health:** there is evidence that social factors influencing health in a negative way (i.e. low socioeconomic status, discrimination, homelessness, food insecurity) are disproportionately burdened by people of color in Brockton and the larger BNHC Service Area. Additional investigation for more descriptive data on this topic will be important as health and social service agencies work to address SDOH needs in the city and shift to a value-based care environment.
5. **Disproportionate impact of environmental factors influencing health from an Environmental Justice lens:** despite Brockton having a substantial EJ population, little investigation has been completed to examine the relationship between a disproportionate burden of pollution and other environmental hazards and people’s health in Brockton. In order to better understand inequalities in mortality and chronic disease in the city and Service Area, evaluation of unfair or inequitable exposure to environmental risk factors should be examined.

- ii. **Summary Best Practices for Identifying and Addressing Health Inequities & Disparities**

In 2020, the Massachusetts Department of Public Health (MDPH) released its Racial Health Equity Road Map, which provides broad guidance on how to best assess and address issues related to health equity. The entire Road Map may be accessed [here](#) and key recommendations are summarized below. Individuals and organizations focused on addressing health needs in Brockton should reference the Road Map to help identify priority areas and inform their planning and implementation processes to promote health equity among the services offered in the city.

Key Recommendations from MDPH Racial Health Equity Road Map

Examine health issues with a focus on impacts of racism.

Assess readiness for a program or organization to use data to address racism.

Disaggregate data by race and ethnicity and understand limitations of the data.

Use additional data sources to uncover causes of differences and disparities among different racial and ethnic groups.

Plan activities to address unjust or avoidable differences in health outcomes.

Present complex data in ways that are clear and easy to understand for all.

I. Qualitative Findings

iii. Health Conditions

Overwhelmingly, the health conditions of concern mentioned most frequently by key informant interview (KII) respondents (n=14/16, (88%) were mental health and substance use issues. Interviewees noted that these problems particularly affect those experiencing homelessness in Brockton, though not exclusively. Respondents shared that among both the population experiencing homelessness and the general population, socioeconomic and environmental stressors, such as poverty, exacerbate the city's behavioral health crisis and that a culture of stigma and shame can be a reinforcing factor that prevents people from accessing mental health and substance use disorder services. Qualitative findings also highlight the need to address substance use among youth populations.

Alongside concerns about behavioral health, interview respondents noted chronic health conditions as prominent issues in Brockton, most commonly mentioning hypertension (n=7/17; 41%), diabetes (n=6/16; 38%), and obesity (n=4/16; 25%). Similarly to the emergent theme when discussing behavioral health, interviewees noted the influence of social determinants of health on chronic health outcomes. Education about diseases, dietary decisions, affordability of medication, and competing priorities such as work and family were mentioned as challenges in the management of chronic disease among the Greater Brockton population.

It would be remiss to exclude a note that many respondents conflated social determinants of health as medical conditions, often citing social factors such as "homelessness" or "poverty" as medical issues that individuals

experience. This phenomenon unequivocally reinforces the perceived overwhelming effects of social determinants of health on the wellbeing of people living in Brockton and its surrounding communities.

iv. Social Determinants of Health

When asked about social determinants of health, key informants most commonly responded with topics related to housing insecurity (n=17/17, 100%), poverty (n=16/17, 94%), and transportation (n=9/17, 53%). In discussing housing, respondents referenced the city's "homelessness crisis" and spoke to the high amount of adversity individuals face if they do not have stable housing. It was noted that housing insecurity limits activities of daily living due to significant instability and uncertainty.

The theme of poverty was also predominant in the KIIs. Respondents noted that financial instability negatively impacts peoples' abilities to fulfill their basic and social needs, and that economic challenges impact all other areas of health for example, access to healthy food. Other social determinants of health often noted in KIIs included education, difference in cultural or language, employment, and racial discrimination.

"There's no secret that Brockton is a poor community. We are a struggling community. We've got a lot of immigrants that work 2, 3, sometimes 4 jobs to be able to make ends meet. ... Remember the more money you make, the less you can get help from the traditional ways. You can't get food stamps you can't get rental assistance because you might be over income. But you have to be over income to be able to pay your rent, so it's a vicious cycle... They're poor enough not to be called rich, but rich enough not to be called poor." – Key Informant Participant

v. Gaps and Barriers

Many key informants (n=10/17, 59%) pointed to systemic and state-level barriers when discussing Brockton's biggest obstacles to a healthier population. The most commonly cited barriers included overall lack of access to healthcare (n=11/17, 65%) and lack of state-level support (n=10/17, 59%), followed by a lack of adequate outreach efforts in the community (n=9/17, 53%). Somewhat conflicting narratives arose regarding access to care in Brockton – some individuals indicated the closing of Brockton Hospital and staffing shortages as a reason why individuals could not receive adequate medical care. Others noted a plethora of services in Brockton, but a lack of knowledge about such services and lack of suitable outreach by organizations who deliver those services. Regardless of the cause, however, respondents emphasized that the population in and around Brockton has difficulty accessing health care.

Individuals also had conflicting viewpoints on the themes of communication and collaboration between community entities, whether those entities be nonprofit organizations, local government, and the state. Several individuals believed service provider organizations to be very insular, with an unwillingness to share resources with other groups or go beyond what was minimally required of them. Other respondents, however, did not find this to be an issue, even

praising the interconnectedness of the various service providers in the city. Despite this difference, most agreed that systemic issues prevailed in preventing Brockton in bettering its health landscape.

"We know that access to healthcare is critical and from [our] perspective we know that generally there's a high percentage of individuals who will not go to follow up doctors' appointments because they don't have transportation.." – Key Informant Participant

vi. Assets

Key informants found strengths in many areas of Brockton, ranging from individual organizations to the overarching spirit of the city. Some organizations commonly mentioned were BNHC and its mobile unit, Old Colony YMCA, Father Bill's and MainSpring, and other organizations who provide services related to the housing and overdose crises. Notable individuals mentioned include Mayor Sullivan, who was acknowledged by multiple participants for his efforts, often participating in community-wide initiatives and events related to health. More than that, respondents praised the city for its sense of community and community spaces. Churches and other houses of worship were noted as important places and community gathering spaces.

vii. Disparities

Unfortunately, members of historically oppressed and marginalized populations still experience many disparities in health outcomes and access to health care. The most pervasive theme raised by interview respondents was racism and racial disparities (14/17, 82%). When asked why racial identity was linked with such inequitable health outcomes among Black, Indigenous, and other People of Color (BIPOC) populations, some respondents seemed incredulous at the fact they would even need to be asked. Key informants alluded to elements of systemic, structural, institutionalized, and interpersonal racism as upstream influencers of health inequities and disparities experienced primarily by Black or African American identifying community members. For example, respondents pointed to increased overdose deaths among Black residents despite an overall increase in services to address substance use and decreases in overdose deaths among their White counterparts. Interviewees also made mention of poorer maternal health outcomes among pregnant people of color and increased incidence and severity of chronic health conditions like hypertension and diabetes among Brockton's Black population. Informants expressed frustration at the fact that Brockton is the only "minority-majority city" in New England, yet state funding (i.e. COVID relief funds) and state organizations seem to refuse to acknowledge these disparities and fail to offer adequate services in the city.

Another theme contributing to health disparities was cultural and linguistic differences, often experienced by Brockton's immigrant community members. Interviewees noted that learning an entirely new culture and language is extremely difficult on its own and adding the complexity of navigating the U.S. health care system reinforces health disparities. Participants noted that language barriers may prevent a patient from taking their medications correctly and

the failure to deliver culturally appropriate care leads to ineffective services. While most organizations have interpreter services in place, respondents noted a need for more providers that culturally resemble and relate to the population they serve.

"If you're in trouble and ... you're embarrassed and I don't speak the language and you don't speak mine, then I don't know the food you like I don't have that cultural [knowledge]- how can you come in here and open your heart when [you can't even understand each other]? You can't, and we need better access and more people who look like the community to be out there available to the community, and I think that's a huge, huge barrier.." – Key Informant Participant

A final emergent theme focused on social determinants of health as a facilitator of health disparities, with respondents noting that financial means, transportation, and housing insecurity affect access to health care services. Several miscellaneous concerns raised by key informants highlighted groups that may be at higher risk for negative impacts to their health. One respondent noted that the aging adult population struggles more with socialization and mobility than any other age group and can experience isolation leading to poorer health. Adolescents and young adults were also raised as a priority population due to the health care system's ability to intervene with adverse childhood experiences (ACEs) or traumatic childhood experiences as a preventive health measure.

"Women's health is one of [the top issues], when I'm saying women's health I mean maternity care, pregnancy, all of the above... because when we are in our office, a lot of people have concerns about especially the pregnant women ... don't know where to go and how to access care. So, we have to try to educate them and give them more education regarding how to take care of themselves ... And then the lack of following up when women give birth, so it feels like you give birth and then everything stops. Everything's about the baby and not about the woman, especially in the Black community. There is a lack of follow up with people of color." – Key Informant Participant

6. Recommendations

1. Engage epidemiological and community support to further define inequities in mortality and chronic disease outcomes among Brockton's Black/African American, Cape Verdean, and Haitian groups.
2. Prioritize greater access to local-level mental health data, especially among youth, young adults, and by racial and/or ethnic groups. The dearth of actionable, local-level data is a risk for failing to adequately address behavioral health needs for Brockton and the Catchment Area population.
3. Promote disaggregation of health outcomes data whenever possible to identify potential health inequities and disparities and better tailor health interventions, programs, and services. This should center on standardized demographic groups, including racial, ethnic, and cultural groups, people experiencing homelessness, people with high SDOH needs, and members of any other historically marginalized groups.
4. Engage epidemiological and community support to better understand maternal and child health outcomes in the Catchment Area. Currently, small data sets focused primarily on mortality and birth outcomes fail to capture true inequalities in birthing outcomes among perinatal individuals and infants. A greater in-depth understanding of factors negatively affecting maternal and child health, especially among women of color, in the Catchment Area is warranted.
5. Health care organizations should seek mechanisms for meaningful feedback from patients of historically marginalized groups to improve access to acceptable health care services. Quantitative data demonstrate failure of the health care system to equitably address health among these groups, and qualitative findings enhance this with data that point to experiences of racism and discrimination when accessing services.
6. Enhancing services to prevent, diagnose, and treat HIV and tuberculosis is a key need derived from quantitative infectious disease data.
7. Epidemiological support and community for a comprehensive assessment of behavioral health needs and outcomes at the community-level should be prioritized. Current data are inadequate to identify health disparities related to mental health and substance use in Brockton and the Catchment Area. A more granular assessment of behavioral health can help guide organizations and the community as it continues to seek effective approaches for addressing mental health and substance use.

7. Recognitions

Brockton Neighborhood Health Center would like to extend our sincere appreciation to contributors to this Needs Assessment. We are appreciative of the time, thoughts, and feedback provided by representatives from the following organizations that will help enhance health services in Brockton:

BAMSI	FATHER BILL'S & MAINSPRING	HOMELESS IMPROVEMENT PROJECT
BROCKTON AREA TRANSIT AUTHORITY	GOOD SAMARITAN MEDICAL CENTER	MASSASOIT COMMUNITY COLLEGE
BROCKTON NAACP	HAITIAN COMMUNITY PARTNERS	OLD COLONY YMCA
CAPE VERDEAN ASSOCIATION OF BROCKTON	HARBOR HEALTH PACE PROGRAM	PLYMOUTH COUNTY OUTREACH HUB
CITY OF BROCKTON	HEALTH IMPERATIVES	SIGNATURE HEALTHCARE

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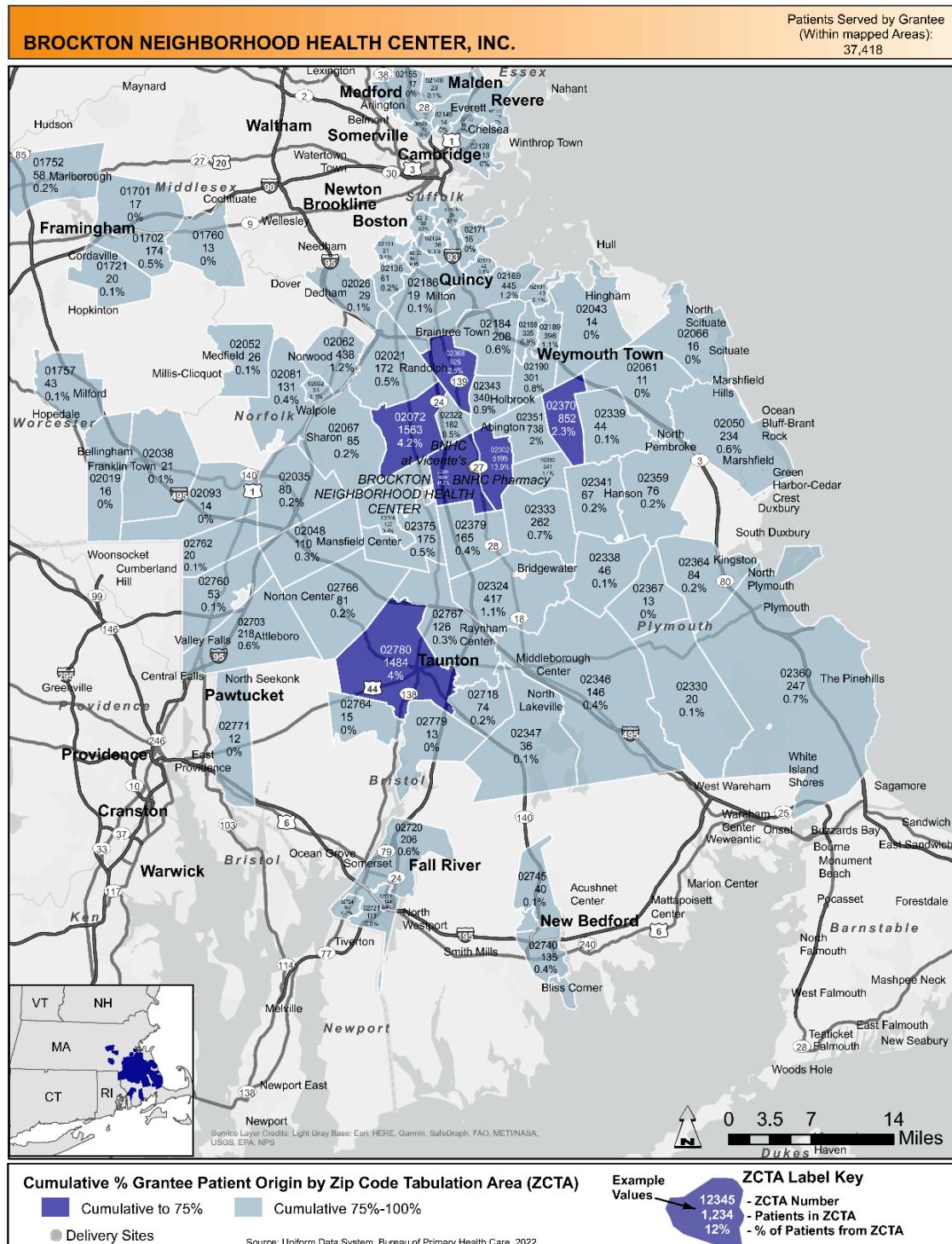
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Appendix 1: Supplemental Service Area Map



Appendix 2: Key Informant Interview Guide

Introduction:

The Brockton Neighborhood Health Center is currently in the process of writing its Community Health Needs Assessment, which is a document that details the most prevalent health needs of BNHC's served community. We hope that the results of this report can be used to guide future action from our health center to prioritize and target these needs.

To conduct research for our needs assessment, we are holding interviews with organizational, community, or institutional leaders who have a professional and experiential insight into the health issues of Brockton. I would love to learn how your perceptions of Brockton's health needs are shaped by your experience with [X ORGANIZATION].

[Before we start, I would like to ask if it is alright that I record this interview—this will only be used for ease of notetaking and accuracy of documentation. Your interview responses will not specifically identify you and whatever you say will be analyzed in aggregate with other responses.]

- Can you please introduce yourself and your role at your organization?
 - How long have you worked at this organization?
 - What does this work entail?
 - Do you live in Brockton? For how long?
 - If not, where do you live, and for how long have you lived there?
- What are the top three health conditions in Brockton that you are most concerned about?
 - What have you seen in the community that makes you say this? (repeat for each health condition)
- The next question is about social determinants of health. A social determinant of health is a non-medical condition that influences a person's health. Which social determinants of health do you think impact people's health in Brockton the most?
 - What have you seen in the community that makes you say this?
- The next question aims to understand community assets that positively impact health in Brockton. Assets are any resource that improves population health—including people, places, services, and funding. What are some community assets that you think positively impact health in Brockton?
 - What does X entity do?
 - Have you personally worked with X entity?
 - Do you know anyone who has personally benefited from X entity?
- This question focuses on gaps or barriers that prevent the community from being as healthy as it can be. What resources or supports do the Brockton community still need to improve the population's health?
 - Can you give specific examples?

- What specifically is happening (or not happening) that would make you say that?
- What are the first steps you think should be taken to ameliorate this issue?
- The next question is about health disparities and inequities –
- What do you think are some examples of health disparities or inequities within the city of Brockton?
 - Which populations are impacted by these disparities?
 - Why do you think these differences exist?
 - How severe of a difference do you think this is?

Conclusion:

Thank you very much for your time and sharing your experiences with us. Do you have any additional comments or anything that you would like to add before we conclude this interview?

Do you have any questions for me?

- Would you like us to email you the completed Needs Assessment report when it is finished? It will also be available publicly on the BNHC website for anyone to access.
- Can ask if they have any other recommendations on dissemination.