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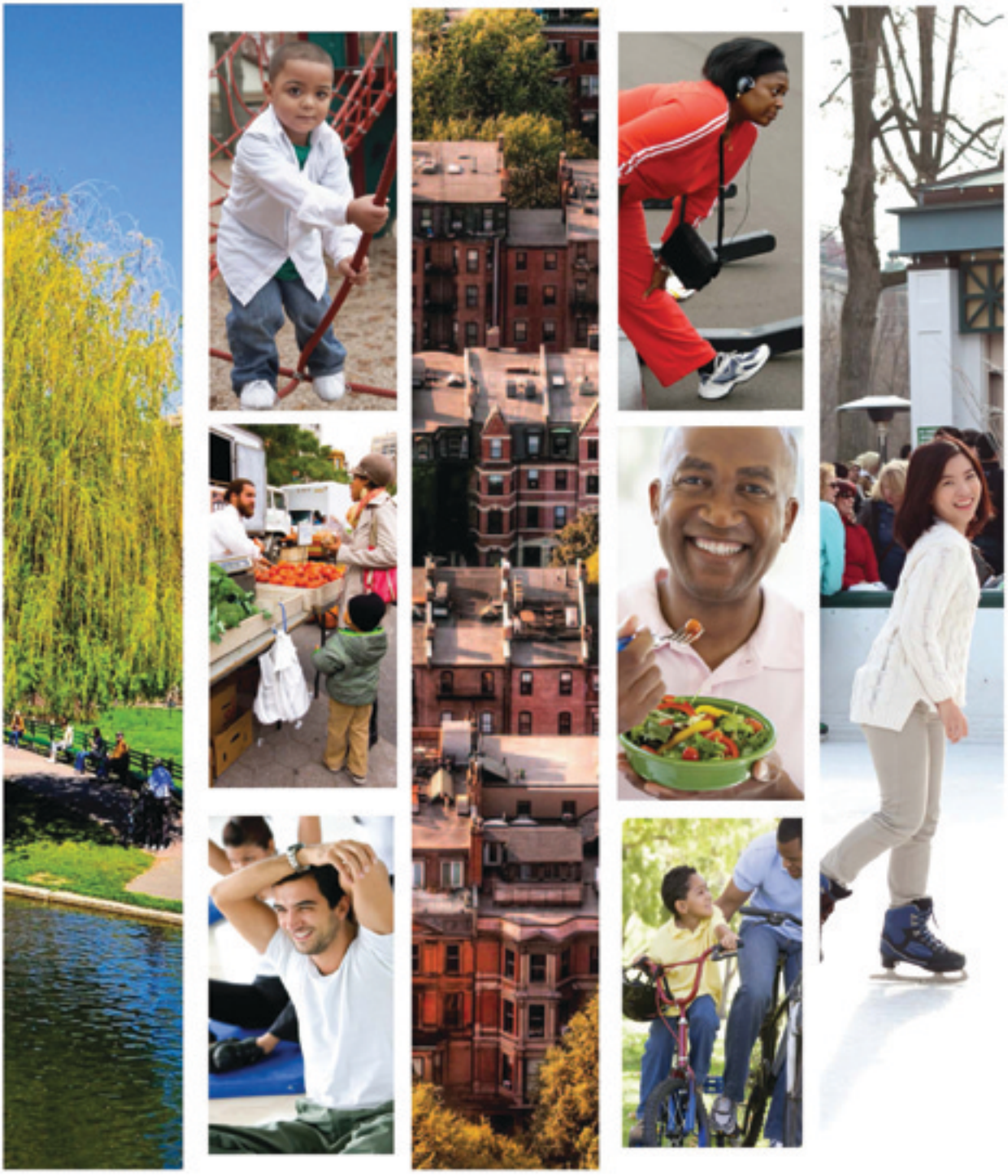

Health of Boston 2014-2015

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BOSTON PUBLIC HEALTH COMMISSION

Building a Healthy Boston

Health of Boston
2014-2015

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Introduction

Welcome to *Health of Boston 2014-2015*!

This report provides a broad picture of the overall health experience of our city, describes many of the contextual factors that influence the health of Boston residents, and identifies groups of individuals and communities at greatest risk for poor health outcomes. *Health of Boston 2014-2015* provides information to help build knowledge and stimulate discussion among individuals that live in our communities. Data sources include the U.S. census, birth and death registries, emergency department and inpatient discharge databases, sexually transmitted and infectious disease surveillance data, and surveys that describe individual behaviors or community demographics and assets. Data from this report provide a foundation for discussion and further planning. This year's report focuses attention on determinants that influence the health of Boston residents and communities. Determinants of health are the realities of one's life that make a person healthy or not. They include the social and economic environment, the physical environment, and personal behaviors related to health and wellness. Determinants impact an individual's health and the collective health experience of a population in both direct and indirect ways.

Understanding the social and economic makeup of a person's life is critical to understanding an individual's health experiences and, collectively, the differences in health experiences and outcomes experienced by population groups. Examples of social and economic determinants include perceived safety, level of educational attainment, and the availability/accessibility of resources necessary to meet daily needs. In addition to these social and economic determinants, lifelong exposure to varying forms of racism and discrimination may cause prolonged stress which can also adversely impact health outcomes. Data in this report demonstrate that Boston's Black and Latino residents collectively experience higher levels of poor health outcomes, chronic disease, and mortality, than Boston's White residents overall. Similar racial/ethnic differences in income, education and employment status are observed as well.

The physical or *built* environment in which people live is widely recognized as a determinant that influences mental and physical health. Access to green spaces for exercise or relaxation, grocery stores and restaurants with affordable healthy foods, and safe housing, are all important for maintaining good

health. Neighborhoods serve as the physical and social environments of our daily lives. For this reason we often present data stratified by neighborhood to show that health experiences vary dramatically by location. In other words, place matters.

Individual characteristics and behaviors also play an important role in health outcomes. Positive changes in individual behavior related to diet and exercise can reduce the risk of developing a chronic disease. It is important, however, to acknowledge that individual behaviors are inextricably linked to the social and economic context of an individual's life.

In order to present a comprehensive picture of the health of Boston residents, *Health of Boston 2014-2015* begins with the demographic and socioeconomic characteristics of the diverse populations living in Boston. Next, the report focuses on leading health indicators, using a wide variety of health conditions, disease burdens, and risk behaviors to describe health status. Trends in disease status over time are highlighted, with a focus on differences in disease burdens present between racial and ethnic groups.

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

The entire *Health of Boston 2014-2015* report can be found on the Boston Public Health Commission's website at www.bphc.org.

Executive Summary

Health of Boston 2014-2015 broadly outlines the current state of health experienced by residents of Boston. We use a public health framework for understanding health as a whole-person experience that is shaped by individual and environmental influences.

Boston: Demographic Profile

From 2000 to 2010, the population in Boston increased almost five percent from 589,141 in 2000 to 617,591 in 2010. During this time, Boston experienced a shift in the composition of races, ethnicities, and languages spoken. From 2000 to 2012, the largest population increase was among Latino residents, who made up 14.4% of the population in 2000 but 18.6% of the population in 2012. During the same time period, the percentage of Asian residents rose from 7.5% to 9.1%. From 2000 to 2012, the percentage of White residents decreased from 49.5% to 46.0% while the percentage of Black residents was relatively stable. In 2012, 63.4% of residents spoke English exclusively, while 15.9% of residents reported speaking Spanish or Spanish Creole. Among other commonly spoken languages, French Creole, Chinese, and Vietnamese figured prominently.

Health Equity

Using a variety of health indicators, *Health of Boston 2014-2015* tracks progress made towards the goal of achieving health equity among all Boston residents, where no one is disadvantaged from achieving their health potential because of socially determined circumstances. Historically, we've seen consistently lower life expectancy and poorer health outcomes for individuals of color as compared to White residents of Boston. Although some gains to bridge the gap have been made over time, there remains much to accomplish. Reconciling these differences necessitates that all individuals have the necessary individual, social, and environmental resources to successfully live healthy lives.

Racial/Ethnic Group Comparisons

This year's report depicts persistently different health outcomes between racial and ethnic groups. The Health Inequities table (page 25) allows readers to assess how Asian, Black, Latino, and White population groups compare across a variety of health outcomes.

- Black residents experience a disproportionate burden of morbidity and mortality from common conditions. Black residents experience higher rates of preterm births, asthma emergency room

visits, obesity, hypertension, hepatitis B, tuberculosis, influenza, HIV infection, diabetes hospitalizations and deaths, heart disease hospitalizations, nonfatal gunshot/stabbing emergency department visits, and cancer deaths compared to White residents.

- Latino residents experience higher rates of the following conditions compared to White residents: heart disease hospitalizations, HIV infection, influenza, asthma emergency department visits, diabetes hospitalizations, and nonfatal gunshot/stabbing emergency department visits.
- Asian residents experience higher rates of tuberculosis and Hepatitis B compared to White residents.

Boston: Social Determinants of Health

Opportunities to access the financial and community resources necessary to meet basic needs, make positive health choices, and avoid the adverse health impacts of chronic stress are not equally available to all Boston residents.

Educational Attainment and Health:

- In 2012, a higher percentage of Boston residents (15.2%) had less than a high school education than Massachusetts residents overall (10.3%).
- The median income for Boston residents with less than a high school education was approximately $26,800 to $33,800 lower than the median income of those with Bachelor's degree.
- In 2012, 32% of those with a less than a high school education lived below the poverty level.
- After adjusting for age, race/ethnicity and gender, those who received less than a high school education were more likely to report diabetes, persistent sadness, hypertension and persistent anxiety compared to those who received at least some college level education.

Employment and Health:

- For the years 2010-2012 combined, the unemployment rate in Boston was 11%. Black, Latino, and Asian residents had higher unemployment rates compared to White residents during the same time period.
- After adjusting for age, gender, and race/ethnicity, adults who were out of work were more likely to report diabetes, persistent anxiety and persistent sadness and were more likely to be obese than their employed counterparts.

Income/Poverty and Health:

- During 2010 to 2012, White residents had a poverty rate of 15.2% while the poverty rate for Asian, Black, and Latino residents was higher (30.3%, 25.1%, and 34.4% respectively).
- After adjusting for differences in age, race/ethnicity and gender, adults who had a household income of <$25,000 were more likely to report asthma, diabetes, hypertension, persistent anxiety and persistent sadness and were more likely to be obese compared to those with a household income $50,000+.

Housing and Health:

- Sixty-seven percent of Boston residents lived in renter-occupied units during 2010-2012. Compared to Whites (57.9%), a higher percentage of Asian (75.6%), Black (72.4%) and Latino (84.6%) residents lived in renter-occupied units during the same time period.
- For 51% of Boston residents, their rent was 30% or more than their household income.
- After adjusting for differences in age, race/ethnicity and gender, renters were more likely to report asthma, diabetes, hypertension, persistent anxiety and persistent sadness and were more likely to be obese compared to those who own homes.

Health of Boston: Summary and Trends

Long-term data allow us insight into the progress of public health efforts over time, reflecting both areas of improvement and areas where progress continues to be needed. Here are just a few highlighted trends representing public health successes in this report:

- The percentage of insured Boston residents increased significantly from 2005 to 2013.
- From 2008 to 2012, infant deaths among Black infants declined significantly from 14.6 per 1,000 births to 6.6 per 1,000 births.
- Smoking among Boston public high school students is on the decline: from 2005 to 2013, the percentage of students who reported smoking decreased from 15.3% to 7.9%.
- In 2013, 16.8% of Boston public high school students reported drinking one or more sodas per day, a decrease from 24.0% in 2011.
- From 2008 to 2012, Boston experienced a 34% decrease in the incidence rate of the infectious disease tuberculosis.

- From 2008 to 2012, there was a significant decrease in heart disease deaths among Boston residents. This decline in death rates was driven by a decrease among Black and White residents.

Health Indicators

This report uses standard domains in population health to define well-being, disease, and death in context of both personal characteristics and social environments. As health is multi-dimensional, each health trend and association should be considered in light of the environments and circumstances that set the stage for exposures and opportunities.

Health-Related Behaviors

Personal health behaviors contribute to a person's risk for disease and to one's overall quality of life and well-being. Behaviors such as smoking, excessive alcohol use, and intake of excess calories including sugar sweetened beverages, contribute to cancers, obesity, cardiovascular disease, hypertension, diabetes, and premature death. Conversely, physical activity and fruit and vegetable consumption are protective against each one of those poor health outcomes (1,2). Data for these trends is taken from the BBRFSS and YRBSS surveys.

- In 2013, approximately 19.1% of Black and 21.8% of Latino high school students reported consuming less than one serving of fruits and vegetables per day, compared to 11.1% of White and 5.9% of Asian students.
- In 2013, a higher percentage of adults with at least some college education met the CDC guidelines for aerobic physical activity compared to those with less than a high school diploma and those with a high school diploma or GED.
- For the years 2011 and 2013 combined, 22.9% of White Boston public high school students reported smoking, compared to 3.8% of Asian students, 5.2% of Black students and 10.0% of Latino students.

Access to Care

In measuring access to medical care and resources, the report considers insurance coverage, access to a regular place of care, and the frequency with which individuals actually utilize medical care on a preventative and emergency basis. Preventative care at every stage of life helps all Americans stay healthy, avoid or delay the onset of disease, keep diseases they already have from becoming worse or debilitating, lead productive lives, and reduce costs (3).

- In 2013, 94% of Boston residents had health insurance coverage. Between 2005 and 2013, the percentage of residents with health insurance increased significantly.
- Trends in insurance coverage varied across race/ethnicity from 2005 to 2013. Insurance coverage for White residents increased significantly but not for Black or Latino residents.
- In 2013, 89.4% of adults surveyed had seen a doctor within the past two years, with no significant increase from 2010.

Maternal and Child Health

Birth rates, infant mortality rates (IMR), and infant characteristics of birth weight and gestational age provide important measures for the well-being of infants and pregnant women, and are often viewed as a reflection of the health status of a community.

- Of the Boston females ages 15-19 who gave birth in 2012, 13% had given birth previously. There was no significant change in the percentage of teens with repeat births from 2008 to 2012.
- The birth rate among Boston female adolescents ages 15 to 17 years decreased from 19.7 births per 1,000 females 15-17 years of age in 2008 to 10.1 in 2012. A decrease in the birth rate from 2008 to 2012 was also observed among Black, Latino, and White adolescents.
- From 2008-2012, there was a significant decrease in the rate of neonatal infant deaths from 5.1 to 2.9 neonatal deaths per 1000 births.

Chronic Disease

Chronic diseases, such as asthma, diabetes, heart disease, and hypertension, significantly impact an individual's quality of life. The burden of these diseases falls heavily on communities of color.

- While there was no significant difference in the prevalence of asthma among racial/ethnic groups, asthma hospitalization rates, for all ages, were significantly higher for Black and Latino

residents, 4.6 and 3.4 per 1,000 residents respectively, compared with White residents (1.2 per 1,000 residents).

- In 2012, Boston residents had 5,572 asthma ED visits; 85% (4,746) of these were anonymously linked to 3,274 unique individuals. Of these individuals, 77% had 1 asthma ED visit, 14% had 2 asthma ED visits, and 8% had 3 or more asthma ED visits.
- The rate of asthma hospitalizations was highest among those 3-5 years of age in 2012.
- In 2013, 8.6% of Boston adults reported having diabetes. Higher percentages of Black (14.1%) and Latino (12.6%) adults reported having diabetes compared to White (5.1%) adults.
- While they remain persistently higher than the diabetes hospitalization rates of White residents, the rates for Black and Latino residents has also decreased from 2008-2012. However, there was no significant change over time for Asian and White residents.
- In 2013, 24.0% of Boston adults reported they had hypertension (high blood pressure).
- In 2012, there were 131.1 deaths per 100,000 Boston residents due to heart disease; a significant decrease since 2008. The rate of Black and White resident heart disease deaths also decreased over time. There were no significant changes over time for Asian and Latino residents.
- In 2013, 14% of Boston public school students were obese while 22% of Boston adults were obese.

Sexual Health

Sexual health is an integral part of personal and relational well-being. Every Boston resident deserves to live free of risk of sexually transmitted infections (STIs) and enjoy safe, health-promoting relationships. Many STIs can be asymptomatic, making this an area where prevention efforts directed towards high-risk groups is especially important...

- Between 2005 and 2013, the percentage of Boston public high school students who had ever had sex significantly decreased over time from 54.4% to 46.6%. However, during the same time period, the percentage of high school students who report using a condom when they last had sex decreased from 76.3% to 66.5%.
- In 2013, a higher percentage of Latino (57.4%) students engaged in sexual activity compared to White students (35.0%).
- Rates for chlamydia were highest among adolescent females ages 15-19.
- In Boston, there was no significant change in the incidence rate for newly diagnosed HIV/AIDS cases over time from 2007 to 2011. In 2011, the incidence rate for both Black residents (66.9

per 100,000 residents) and Latino residents (34.6 per 100,000 residents) was higher than it was for White residents (18.2 per 100,000 residents).

Infectious Disease

Infectious diseases present a unique health threat to Boston residents as new microbes emerge and spread, and many pathogens become drug-resistant. Prevention of infection through targeted vaccination and prevention among high-risk groups is essential, while combating antibiotic resistance was one of 2014's national public health priorities (4). This report presents trend data for tuberculosis, Hepatitis B and C, Salmonella, and influenza (the flu).

- The rate of tuberculosis infection has dropped dramatically, decreasing 34% from 2008 to 2012.
- In 2012, rates of hepatitis B were highest among Boston's Asian population, whose rate of infection was 325.4 new cases per 100,000 residents, as compared to 16.8 among White residents.
- The 2012-2013 influenza season was significantly worse than recent years: 256.8 new cases per 100,000 residents, compared to just 10.6 new cases per 100,000 residents in the 2011-2012 season.

Mental Health

Mental health is an essential element of well-being, which allows individuals to participate in their relationships and lives to the fullest extent. A lack of mental health, which spans from slight disruptions in mood to full-blown incapacity, impairs an individual's ability to rationalize, make important decisions about their health habits, and develop steady relationships and employment opportunities, while also making them more susceptible to unhealthy coping mechanisms.

- In 2013, 30% of Boston public high school students reported persistent sadness.
- From 2005 to 2013, the percentage of adults reporting persistent sadness increased from 8.4% to 12.2%.
- From 2008 to 2012, mental health hospitalizations decreased for Boston overall, however, there were no significant changes over time for any racial/ethnic groups. In 2012, Asian, Black, and Latino residents experienced lower rates of mental health hospitalizations compared to White residents.

- From 2005 to 2013, the percentage of adults reporting persistent anxiety increased from 13.4% to 20.2%. In 2013, the rate of persistent anxiety was lowest among Asian residents at 10.7%, significantly lower than for White residents at 23.1%.

Substance Abuse

Substance abuse involves the excessive use of alcohol or the use of drugs in a non-pr**es**cribed manner to achieve an altered physiological state. Misuse of alcohol or other drugs over time can lead to physical and/or psychological dependence on these substances and increased risk of morbidity and death.

- From 2005 to 2013, there was an increase in the percentage of Boston public high school students who reported using marijuana within the past 30 days.
- Unintentional overdose/poisoning hospital patient encounters increased from 2008 to 2012.
- In 2012, unintentional overdose hospital patient encounters for cocaine were significantly higher for Black residents compared to White residents. Conversely, unintentional overdoses patient encounters for all opioids (including heroin) were significantly lower for Black and Latino residents compared to White residents.

Violence

Violence is damaging to all of those who encounter it, whether individuals are directly victimized or indirectly exposed. The impact of violence in communities has far reaching economic and health consequences, negative impacts which are multiplied by the economic vulnerability of communities. The impact of bullying has emotional, physical, and academic ramifications for many of our youngest residents (5).

- In 2013, 17.0% of Boston public high school students reported being bullied either in person or electronically.
- The rate of emergency department visits from nonfatal assault-related gunshots and stabbings decreased for Boston overall from 2008 to 2012, as well as for Black and Latino residents.
- Homicide rates, the highest rates of which occur among Black residents, did not change significantly from 2008 to 2012.

Cancer

Cancer is currently the leading cause of death for Boston residents above the age of 45, and ranks behind injuries as the second leading cause of death for those ages 25-44. Prevention efforts and targeted screening remain vitally important for preventing many unnecessarily premature deaths.

- In 2013, 90% of females ages 50-74 had a mammogram within the past two years. A significantly higher percentage of Latino females (96.3%) reported having a mammogram within the past 2 years when compared to White females (88.2%).
- From 2008-2012, Asian and Latino residents had lower cancer death rates compared with White residents, although Latino residents experienced an increase in cancer deaths from 2008 to 2012.
- Lung cancer, the most preventable cancer, claimed more lives than any other cancer across the racial/ethnic groups in Boston from 2010 to 2012.

Deaths

Death is inevitable and occurs across all demographic groups within Boston. Our concern is primarily with those factors that contribute to or cause premature death, which robs our city of the contributions of many individuals before their time.

- The average life expectancy in Boston is 80 years of age, and is higher for female residents than male residents.
- The 2008 to 2012 life expectancy data show that Asian and Latino residents, on average, experience higher life expectancies than both Black and White residents.
- The age adjusted all-cause mortality rate for Asian residents (380.5 deaths per 100,000) and Latino residents (496.1 deaths per 100,000) was lower than that of White residents (749.3 deaths per 100,000). There was no statistical difference in the all-cause mortality rate between Black and White residents.
- Cancer was the leading cause of death for Boston residents from 2008 to 2012. Diseases of the heart was the second leading cause of death during these 5 years.
- Cancer and heart disease remained the top two leading causes of death for both males and females, and all racial/ethnic groups from 2008 to 2012.

Life Course and Healthy People 2020 Indicators

This report provides a table of Life Course Indicators (LCI) which are used to identify and track influences and experiences that widely impact health opportunities of Boston residents. While 23 indicators are presented, for only 18 indicators can U.S. data be directly compared to Boston data. There are 5 indicators for which Boston's population fares better than the US population. These include the prevalence of bullying and the rates of preterm births, teen births, repeat teen births, and suicide. For the remaining 13 indicators, Boston rates are similar to or worse than national averages.

Healthy People 2020 (HP 2020) leading health indicators measure progress toward national goals for improving the health of Americans. This report provides a comparison of Healthy People 2020 targets to results for Boston residents. Of the 74 HP 2020 indicators presented, Boston's population has achieved 30 recommended targets. Targets achieved are in the domains of maternal and child health, heart disease and stroke, diabetes, sexually transmitted diseases, injury and violence prevention, cancer, mental health and mental disorders, environmental health, nutrition and weight status, oral health, respiratory diseases and family planning.

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Notes to Readers

1) Who analyzed the data in this report?

Unless otherwise indicated by a note underneath a graphic, all data in this report was analyzed by the Research and Evaluation Office of the Boston Public Health Commission.

2) What is survey data?

In this report, data from several surveys are presented. These include the American Community Survey, Boston Behavioral Risk Factor Survey, Youth Risk Behavioral Survey, and Boston Survey of Children's Health. Data are collected from a randomly selected subset (or sample) of the Boston population. These results are then adjusted statistically (or weighted) to make estimates for the entire Boston population which reflect how Boston residents might have responded to the same survey questions if every single person had been interviewed.

3) What is non-survey data?

Data shown in this report that do not come from a survey are considered non-survey data. Non-survey data are usually presented as rates, and are considered to be *true* values based on a full population count, not estimates. Unless otherwise noted, data are presented as crude rates which is the number of events divided by the population at risk.

4) When describing survey data, how do we determine if one percentage is higher or lower than another?

As introduced in question 2, survey data drawn from a randomly selected sample of the population is used to generate point estimates (i.e. percentages), that represent the entire population if every single person were accounted for. Projecting these statistical estimates onto the entire population introduces a degree of uncertainty about how well the sample data reflects the true frequency of events in the entire population. This degree of uncertainty is often referred to as *standard error*. For this report, the standard error is used to generate 95% confidence intervals for the estimates presented. Except where noted, the confidence intervals are then used to make determinations about statistically significant differences between estimates. If the confidence intervals have overlapping values, then we cannot say with 95% certainty that the two estimates differ significantly. If the confidence intervals do not have overlapping values, then we can say with 95% certainty that one estimate is higher or lower than the other.

In the case of the American Community Survey, the Z-test is used instead of comparing 95% confidence intervals. A test value is calculated using the estimates and associated standard errors. If the test value is greater than the critical value of 1.96, then we can say with 95% certainty the two estimates are significantly different. If the test value is less than or equal to the critical value, then we cannot say with 95% cetainty that the two estimates differ significantly.

This determination is often referred to as *statistical significance*. In this report, when the text refers to an estimate as *higher* or *lower* than another, it means that these estimates are different in a statistically significant way with 95% certainty.

5) When describing non-survey data, how do we determine if one rate is higher or lower than another?

In previous versions of this report, non-survey data did not routinely undergo statistical testing. In this year's report, statistical tests were used to determine whether one rate is different from another. An exception to this are leading causes of mortality and leading causes of cancer mortality. These data are ranked based on counts, a method used by the National Center for Health Statistics. Statistical tests were also not performed on various program data including data from Women, Infants and Children (WIC) and the Boston Public Health Commission's Emergency Shelter Commission.

Although non-survey data are not estimates based on a sample of the population (i.e., survey data), they are still subject to error. The error, known as random error, may be substantial when a rate is based on a small number of events or cases of disease. Hypothetically speaking, an observed rate for a single year is considered an estimate of the true underlying rate for the population. As the numerator of the observed rate increases, its ability to estimate the true underlying rate also increases.

In Boston, rates are often based on a small number of events or cases. Random error may inherently be higher in these situations, therefore we utilize statistical testing to assess significant differences in rates over time and between sub-populations.

Statistical significance does not necessarily mean that observed differences are important or meaningful. In making such a determination, one must interpret the social context in which these data were collected in any given year, changes in how data were categorized or reported, and city-wide programs that may have affected event occurrence.

6) When describing both survey and non-survey data, how do we determine if rates or percentages are changing over time?

For this report, regression analysis was used to assess whether health data rates and point estimates changed over time. These tests did not involve the comparison of confidence intervals, which is often done when comparing data from the same time frame or two data points from two separate time frames. As a result, trends were identified in cases with overlapping confidence intervals across the specified data years. Trend analysis was performed on survey and non-survey data if 5 years worth of data were available for presentation. For additional analytical information please contact the BPHC Research and Evaluation Office.

7) What do the terms *insufficient sample size*, *n<5* and *n<11 mean*?

In the notes under charts, the phrase *insufficient sample size* is used to describe data points that are not presented. This occurs when the stratification of survey data by population groups results in a sample that is too small to calculate reliable point estimates. In addition, to protect the confidentiality of respondents, data are not presented when the sample size is too small.

The notation, *n<5,* is used when there are fewer than five occurrences of an event (e.g., births, deaths, or new cases of a disease) and thus a rate cannot be presented in order to protect the confidentiality of these individuals. The notation, n<11, is used when there are fewer than eleven occurrences of an event such as emergency department visits or hospitalizations. In some instances, combining several years of data increases the sample size enough for data to be reported.

8) Why are some rates written in gray text instead of black text?

Rates written in gray indicate a rate that is based on fewer than 20 events. The National Center for Health Statistics does not publish rates based on fewer than 20 observations because these data do not meet their requirement for a minimum degree of accuracy. In *Health of Boston 2014-2015*, rates are presented regardless of the 20 count rule, but are flagged as being unreliable so that the reader knows to interpret them with caution.

9) Why do we sometimes combine several years of data?

In certain instances, when there are too few cases or an insufficient sample size in a given year, we combine data from two or more years in order to permit the calculation and presentation of a rate or point estimate. In this report, the title of a chart or table, indicates whether two or more years of data have been combined.

10) How do we define neighborhood boundaries in this report?

Neighborhoods can be defined in a number of ways. In this report, zip codes are used to identify neighborhood boundaries since this information is often collected with Boston health data. For more information, please refer to the Technical Notes.

11) Why are some of the data older than other data?

The most recent data available are presented in this report: some are older than others, and the availability varies by source. Several factors determine when data are available including the frequency of data collection, the post-collection cleaning and verification process, and resources available to manage and analyze the data.

12) Why do some charts have data tables?

Charts with data tables underneath or on the side are seen throughout this report when the data source is a survey. Data are set up in this way so that both point estimates and 95% confidence intervals are available to readers. Confidence intervals speak to the reliability of estimates based on survey data. Seequestion 4 for a better understanding of why confidence intervals are important.

Health Equity

Health Equity

The concept of health equity, or equal opportunity for optimal health, captures the idea that no one should be hindered from achieving his or her full health potential due to social position or socially determined circumstances (1). Good health, the attainment of physical, mental, and social well-being and the absence of disease, is vital for individuals to fully engage in society, overcome personal adversities, and realize their full potential as human beings (2). The opportunity for every person to achieve his or her full health potential is widely recognized as a fundamental human right (2,3).

Health Disparities and Health Inequities

The terms "health disparities" and "health inequities" are often used interchangeably, but in fact represent two distinct concepts, which at times overlap. Health disparities are differences in the rate of disease incidence, prevalence, morbidity, mortality, or survival rates in certain populations compared to others (4). Disparities can be attributed to variations in individual biology and genetics, such as when health changes occur due to the normal course of aging, or if a genetic variation causes the onset of disease (5). For instance, we would expect a higher incidence of heart disease among older adults than younger adults.

When the underlying cause of health differences is socially produced and avoidable however, those differences gain the distinction of "lacking fairness or justice" and are termed *health inequities* (6). Inequities occur when unfair social policies and practices have denied certain individuals the opportunity for health, either through a lack of health promoting resources or increased exposure to risk factors for disease (7). Building waste plants in low-income areas, for instance, could potentially expose residents who live there to toxic environmental exposures. This difference in health risk exposure is socially produced, modifiable, and unjust. Resulting poorer health outcomes related to this increased risk for these low-income residents, therefore, are considered health inequities. The concept of health disparities, on the other hand, does not imply that differences are associated with unjust societal influences (8).

Although individual-level choices and genetics do play a role in the health outcomes individuals experience, inequities refer to underlying structural influences which exist prior to individual choice or which may influence individual choice. These underlying factors consistently create intra-community

variability in health status, and are often referred to as social determinants of health. They include the presence or absence of safe environments; opportunities for high-quality education; access to nutritious and affordable foods; convenient spaces for physical activity; social support; employment opportunities; health-supporting community norms; resources for disease prevention and management; and access to quality healthcare (9). The unequal distribution of these social determinants of health can contribute to the disparate health outcomes among populations that have less access to these health-promoting resources (10).

Influence of Racism and Discrimination

The influence of racism and other exclusionary practices can contribute to an unequal distribution of critical health-promoting resources among particular racial/ethnic groups. Social inequities, such as poverty and a lack of educational and employment opportunities, often have origins in discriminatory laws, policies, and practices that have historically denied people of color the right to earn income, own property, and accumulate wealth.

For example, while practices promoting housing segregation existed for centuries, one example of the formalization of these practices within federal law occurred with the establishment of the Federal Housing Administration (FHA) in 1934. The FHA was originally founded to provide affordable, long-term loans to eligible buyers to purchase property during the Great Depression. FHA's initial zoning policies reflected prevailing attitudes of racial discrimination at the time, utilizing a discriminatory rating system called redlining to guarantee that any residential areas housing non-White individuals would be rated "red" to designate low property worth and unstable community investments (11). According to the FHA's first Underwriter's property manual, property ratings were automatically diminished by a number of "adverse factors" including the "ingress of undesirable racial or nationality groups" (11). FHA's financing support, approved only for property in highly-rated ("non-red") areas, was selectively allocated to White individuals who were considered "worthy" investments for properties. These exclusively White, highly-rated, and well-invested areas often happened to be those built away from smoke, fog, commercial development, railroads, and high-traffic noise pollution, guaranteeing White residents benefited from improved environmental conditions in their new communities (12).

Simultaneously, the FHA refused to underwrite loans for individuals or communities of color whom they considered "second-class", propagating widespread institutional racism through property owners, real estate boards, and community associations (12,13). Redlining simultaneously denied Black Americans the opportunity to sell or purchase property through racially restricted covenants and

stripped market value from their formerly valuable properties. Designation with low value ratings caused the economic worth of their property, and, in turn, their communities, to sharply decline. Property devaluation due to institutional racism became a barrier to the accumulation of wealth from home ownership for people of color living in urban areas. Thus, these policies had multi-generational effects reducing the socio-economic status of future generations of Black Americans.

After decades of legalized discriminatory housing practices, the Fair Housing Act of 1968 was enacted to prohibit discrimination in housing rental or acquisition based on race, color, or national origin (15). However, the lasting consequences of these discriminatory practices on, among other things, homeownership, the accumulation of wealth, housing safety and stability, and, subsequently, health, among communities of color remain evident today (13,14).

Approaches to Achieving Health Equity

Health inequities will persist as long as social, economic, and environmental resources are distributed unfairly and unequally. Approaches to reducing health inequity should be built on the understanding that social, economic, and environmental inequities are root causes of health inequities. Strategies need to address inequities in education, employment, income, housing, neighborhood safety, recreational opportunities, environmental hazards, healthcare, and healthy food access in order to ultimately improve the health and well-being of people of color. Strategies for change in policy, systems, and the environment should prioritize values of justice, equity, inclusion, transformation, sustainability, and integrity.

Addressing the root causes of health inequities requires a long-term commitment to comprehensive multi-level and multi-sector strategies. Broad coalitions of public, private, nonprofit, and community stakeholders are required to change community structures (15). In order to do this work effectively, resident voices are essential. Residents should help to define the assets and challenges of their communities, help to identify the possible solutions, and participate in the implementation of those solutions (16). It is this model of building partnerships with community residents, community-based organizations, policy makers, and large institutions that is essential to promoting system and policy level change to promote health in all of Boston's communities.

The table on the following page highlights some of the racial and ethnic health inequities experienced by Boston residents.

Health Indicators by Race/Ethnicity

Indicator	Year(s)	Race/Ethnicity			
		Asian	Black	Latino	White
Maternal and Child Health					
Infant Deaths (per 1,000 live births)	2012	n<5	6.6	6.5	3.0
Low Birth Weight (Percent of Births)	2012	6.3%	10.5%	9.1%	7.3%
Preterm Births (Percent of Births)	2012	5.6%	10.5%	10.7%	9.3%
Chronic Disease					
Asthma (Percent of Adults)	2013	2.8% (0.2-5.3)	11.9% (9.4-14.4)	11.9% (8.8-15.1)	11.8% (9.5-14.2)
Asthma Emergency Department Visits (per 1,000 residents)	2012	2.8	21.8	12.7	4.1
Diabetes Hospitalizations (per 1,000 residents)	2012	0.6	3.9	2.3	1.4
Diabetes Deaths (per 100,000 residents)	2012	n<5	39.5	23.9	14.3
Heart Disease Hospitalizations (per 1,000 residents)	2012	4.1	13.6	9.9	9.0
Heart Disease Deaths (per 100,000 residents)	2012	44.6	155.9	80.2	144.9
Hypertension (Percent of adults)	2013	16.2% (9.9-22.4)	36.7% (33.0-40.5)	26.2% (22.0-30.3)	18.6% (16.7-20.6)
Obesity (Percent of adults)	2013	15.3% (8.9-21.6)	33.0% (29.3-36.8)	27.3% (23.1-31.6)	16.2% (13.9-18.4)
Sexual Health					
Ever Sex (Percent of High School Students)	2013	22.0 (12.8-31.2)	50.4 (43.3-57.4)	57.4 (50.8-64.0)	35.0 (25.4-44.6)
Newly Diagnosed Cases of HIV (per 100,000 residents)	2011	n<5	66.9	34.6	18.2
People Living with HIV (per 100,000 residents)	2011	140.7	1541.3	854.2	742.0
Infectious Disease					
Influenza (per 100,000 residents)	2012-2013	125.6	405.6	269.5	174.7
Hepatitis B (per 100,000 residents)	2012	325.4	59.7	18.7	16.8
Hepatitis C (per 100,000 residents)	2012	46.0	150.0	157.9	178.9
Salmonella (per 100,000 residents)	2012	24.8	20.4	9.8	17.9
Tuberculosis (per 100,000 residents)	2012	17.7	15.3	n<5	2.1

Indicator	Year(s)	Race/Ethnicity			
		Asian	Black	Latino	White
Mental Health					
Mental Health Hospitalizations† (per 100,000 residents)	2012	1.7	8.3	5.3	9.9
Persistent Sadness (Percent of Public High School Students)	2013	19.8% (11.4-28.3)	29.6% (24.1-35.1)	32.9% (27.3-38.4)	30.3% (20.9-39.7)
Persistent Sadness (Percent of Adults)	2013	9.1% (4.6-13.7)	13.1% (10.3-16.0)	16.7% (12.8-20.6)	10.8% (8.5-13.0)
Persistent Anxiety (Percent of Public High School Students)	2013	10.1% (0.7-19.6)	14.9% (11.5-18.4)	16.9% (12.2-21.6)	18.9% (16.5-21.2)
Persistent Anxiety (Percent of Adults)	2013	10.7% (5.7-15.7)	19.2% (16.0-22.5)	17.7% (13.6-21.8)	23.1% (20.0-26.1)
Suicide (per 100,000 residents)†	2012	n<5	3.1	n<5	7.6
Substance Abuse					
Unique-Person Treatment† Admissions (per 1,000 residents)	2013	1.2	14.2	13.3	15.9
Unintentional Overdose Deaths† (per 100,000 residents)	2012	n<5	6.6	9.9	22.3
Violence					
Bullied in the Past 12 Months (Percent of Public High School Students)	2013	6.8% (3.1-10.6)	12.4% (8.1-16.7)	12.2% (8.9-15.5)	18.4% (10.2-27.5)
Nonfatal Gunshot/Stabbing Emergency Department Visits† (per 1,000 residents)	2012	n<5	2.3	0.7	0.3
Homicide† (per 100,000 residents)	2012	n<5	19.9	7.7	2.0
Cancer					
Mammograms within the Past 2 Years (Percent of Females Ages 50-74)	2013	*	90.8% (86.7-95.0)	96.3% (92.7-99.9)	88.2% (84.8-91.5)
Pap Test within the Past 3 Year (Percent of Females Ages 21-65)	2013	61.8% (49.2-74.3)	85.8% (81.6-90.1)	84.4% (78.8-90.1)	92.3% (89.7-94.8)
Overall Cancer Deaths† (per 100,00 residents)	2012	131.9	209.5	132.6	200.0
Death					
Life Expectancy	2012	87.2	77.0	86.4	79.5
All-Cause Mortality† (per 100,000 residents)	2012	380.5	772.8	496.1	749.3

*Insufficient sample size

†Age-adjusted rate

NOTES: Gray text in tables represents rates based on counts less than 20 and should be interpreted with caution. Black text in tables represents rates based on counts of at least 20.

Shaded in red are rates or percentages that are higher or less favorable than the corresponding rate for White residents.

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Life Course Theory & Indicators

Accumulative responses to biological and social influences over time shape the direction in which individual potential for health will be realized or diminished (1). The Life Course Theory, an all-inclusive response to understanding differences in a social and longitudinal context, recognizes that the ongoing interaction of disease risk, protective influences, and exposure to social and environmental stressors over time accumulate to either prevent or incite disease and to optimize or diminish well-being (2,3). Overarching differences in health outcomes between individuals and population groups overshadow the effect of isolated personal behaviors to reflect unique ways in which varying life experiences related to health exert their influence.

Preventing disease and optimizing health begins during the prenatal period and first years of life, with formation of the brain, immune system, and endocrine system, and continues throughout life (4). Genetic "programming" in response to maternal behaviors and exposures is thought to begin in the womb, while subsequent developmental periods are critical windows for the benefits of crucial health-promoting influences—such as appropriate nutrition, social stimulation, and safe, non-toxic environments—to take root (1). As different stages of life bring a shift in the opportunities and daily stressors we are exposed to, we are also surrounded by varying levels of resources such as positive relationships and economic security, to protect health and buffer risk. Simultaneously, damaging exposures can threaten to undermine our health experience, such as environmental pollution, food insecurity, and/or a lack of medical care (2). The extent to which protective and adverse features of our physical environment, culture, social institutions, communities, and families interact with our individual biological, psychological, and spiritual selves defines the direction of our health trajectory during different periods of our lives (5).

To measure the prevalence of instrumental life experiences that are recognized to determine critical aspects of physical and mental health, the Association of Maternal & Child Health Programs (AMCHP) guided the creation of *Life Course Indicators (LCI)* (6). These standardized indicators are designed to measure behaviors, experiences, and exposures that influence health outcomes, as well as community capacity to support positive health outcomes. The indicators span from the neonatal period onward, with tools for measuring childhood experiences, family well-being, economic experiences, health care access and quality, mental health, discrimination and segregation, reproductive life experiences and early life services, as well as the presence of community health policy, organizational capacity, and social capital. By capturing social and environmental aspects of a person's lifelong health experience, life course indicators provide an understanding of the influences encountered over a lifetime, versus an isolated point in time. In short, life course indicators are used as a holistic, evidence-based framework

to measure progress being made toward better health in communities.

We've included a number of life course indicators in this report in order to outline the extent of both health opportunity and disadvantage woven into the life experiences of Boston residents. Below is a table depicting Life Course Indicators presented in *Health of Boston 2014-2015*:

Life Course Indicator	Definition	Year	Percent (95% Confidence Interval When Available) or Rate	Percent (95% Confidence Interval When Available) or Rate by Race/Ethnicity	
Adolescent Smoking	**Boston, Data Source: Youth Risk Behavior Survey**				
	Percent of high school students who smoked cigarettes in past 30 days (≥ 1 day in past 30 days)	2013	7.9% (5.8-10.0)	**Asian**	Insufficient sample
				Black	5.5% (2.9-8.2)
				Latino	9.9% (6.2-13.6)
				White	15.6% (6.8-24.4)
	United States, Data Source: Youth Risk Behavior Surveillance System				
	Percent of high school students who smoked cigarettes in past 30 days (≥ 1 day in past 30 days)	2013	4.0% (3.0–5.3)	**Asian**	Not reported
				Black	1.7% (1.0–2.8)
				Latino	1.9% (1.4–2.5)
				White	5.6% (4.2–7.4)
Adverse Childhood Experiences Among Children	**Boston, Data Source: Boston Survey of Children's Health**				
	Percent of children whose parents responded to the Boston Survey of Children's Health that their children were exposed to adverse childhood experiences	2012	1 ACE: 25.9% (22.8-29.0)	**Asian**	1 ACE: Insufficient sample
					2+ ACE: Insufficient sample
				Black	1 ACE: 33.0% (26.8-39.3)
					2+ ACE: 23.1% (17.9-28.4)
			2+ ACE: 21.6% (18.6-24.5)	**Latino**	1 ACE: 28.9% (22.7-35.1)
					2+ ACE: 28.6% (22.2-35.0)
				White	1 ACE: 14.2% (11.0-17.4)
					2+ ACE: 10.4% (7.7-13.1)
	United States, Data Source: National Survey of Children's Health				
	Percent of children whose parents responded to the National Survey of Children's Health that their children were exposed to adverse childhood experiences	2011-2012	1 ACE: 25.3% (24.7-26.0)	**Asian**	Not Reported
					Not Reported
				Black	1 ACE: 29.3% (27.6-31.1)
					2+ ACE: 31.1% (29.2-32.9)
			2+ ACE: 22.6% (22.0-23.2)	**Latino**	1 ACE: 29.1% (27.4-30.9)
					2+ ACE: 21.8% (20.1-23.4)
				White	1 ACE: 23.3% (22.6-24.0)
					2+ ACE: 21.0% (20.3-21.7)

Bullying	**Boston, Data Source: Youth Risk Behavior Survey**				
	Percent of high school students who reported being bullied on school property or electronically bullied during the past 12 months	2013	Bullied on School Property: 13.9% (11.5-16.3)	**Asian**	School: 15.6% (5.0-26.3)
					Electronically: 9.3% (3.1-15.6)
				Black	School: 12.2% (8.2-16.2)
					Electronically: 8.3% (5.4-11.2)
			Bullied Electronically: 9.2% (7.0-11.3)	**Latino**	School: 14.5% (10.8-18.5)
					Electronically: 8.7% (5.2-12.2)
				White	School: 11.4% (10.9-22.1)
					Electronically: 13.1% (8.0-18.2)
	United States, Data Source: Youth Risk Behavior Surveillance System				
	Percent of high school students who reported being bullied on school property or electronically bullied during the past 12 months	2013	Bullied on School Property: 19.6% (18.6–20.8)	**Asian**	Not reported
					Not reported
				Black	School: 12.7% (11.3–14.2)
					Electronically: 8.7% (7.3–10.4)
			Bullied Electronically: 14.8% (13.7–15.9)	**Latino**	School: 17.8% (16.3–19.4)
					Electronically: 12.8% (10.9–14.9)
				White	School: 21.8% (20.0–23.7)
					Electronically: 16.9% (15.3–18.7)
Depression Among Youth	**Boston, Data Source: Youth Risk Behavior Survey**				
	Percent of high school students who felt sad or hopeless almost every day for two weeks or more in a row during the previous 12 months	2013	30.1% (26.4-33.9)	**Asian**	19.8% (11.4-28.3)
				Black	29.6% (24.1-35.1)
				Latino	32.9% (27.3-38.4)
				White	30.3% (20.9-39.7)
	United States, Data Source: Youth Risk Behavior Surveillance System				
	Percent of high school students who felt sad or hopeless almost every day for two weeks or more in a row during the previous 12 months	2013	29.9% (28.3–31.6)	**Asian**	Not reported
				Black	27.5% (25.2–30.0)
				Latino	36.8% (34.3–39.5)
				White	27.3% (25.5–29.3)
Diabetes*	**Boston, Data Source: Boston Behavioral Risk Factor Survey**				
	Percent of adults ever told that they have diabetes	2013	8.6% (7.7-9.6)	**Asian**	6.4% (2.3-10.5)
				Black	14.1% (11.6-16.6)
				Latino	12.6% (9.7-15.5)
				White	5.1% (4.2-6.1)

	United States, Data Source: Behavioral Risk Factor Surveillance System				
	Percent of adults ever told that they have diabetes	2012	9.7%	**Asian**	Not Reported
				Black	13.6%**
				Latino	9.5%**
				White	9.4%**
Food Insecurity	**Boston, Data Source: Boston Behavioral Risk Factor Survey**				
	Percent of adults who reported in the past 12 months being often or sometimes hungry but not eating because they could not afford enough food	2013	Hungry; could not afford food: 12.4% (10.9-13.9)	**Asian**	Hungry; could not afford food: 5.1% (1.5-8.8)
					Food did not last; no $ to get more: 15.6% (9.6-21.6)
				Black	Hungry; could not afford food: 18.2% (14.9-21.5)
					Food did not last; no $ to get more: 42.0% (37.9-46.1)
	Percent of adults who reported in the past 12 months that often or sometimes the food they purchased did not last and they did not have money to get more		Food did not last; no $ to get more: 26.9% (24.9-28.9)	**Latino**	Hungry; could not afford food: 27.7% (22.8-32.5)
					Food did not last; no $ to get more: 49.8% (44.6-54.9)
				White	Hungry; could not afford food: 6.0% (4.2-7.8)
					Food did not last; no $ to get more: 14.4% (11.8-17.0)
	United States, Data Source: United States Department of Agriculture Economic Research Service				
	Percent of households that were food insecure at least some time during the past 12 months	2013	14.3%	**Asian**	Not Reported
				Black	26.1%
				Latino	23.7%
				White	10.6%
High School Graduation Rate	**Boston, Data Source: Office of Data and Accountability, Boston Public Schools**				
	High school graduation rate (4-year cohort) for Boston Public Schools	2013	65.9%	**Asian**	83.7%
				Black	63.6%
				Latino	59.8%
				White	75.0%
	United States, Data Source: National Center for Education Statistics				
	High school graduation rate (4-year cohort) as measured by the Adjusted Cohort Graduation Rate	2011-2012	81%	**Asian/PI†**	93%
				Black	68%
				Latino	76%
				White	85%

Homelessness	**Boston, Data Source: Emergency Shelter Commission, Boston Public Health Commission**				
	Based on the number of sheltered and unsheltered homeless people on one night in December 2013	2013	Homeless Rate: 115.4 per 10,000	**Asian**	Not Reported
				Black	
				Latino	
				White	
	United States, Data Source: U.S. Department of Housing and Urban Development, Annual Homeless Assessment Report to Congress				
	Based on the number of sheltered and unsheltered homeless people on one night in January 2013	2013	Homeless Rate: 20.0 per 10,000	**Asian**	Not Reported
				Black	
				Latino	
				White	
Homicide Rate	**Boston, Data Source: Boston Resident Deaths, Massachusetts Department of Public Health**				
	Homicide rate (per 100,000 people)	2012	6.6	**Asian**	n<5
				Black	19.9
				Latino	7.7
				White	2.0
	United States, Data Source: National Vital Statistics System Records				
	Homicide rate (per 100,000 people)	2011	5.2	**Asian/PI†**	2.0
				Black	18.4
				Latino	3.4
				White	3.1
HIV Prevalence	**Boston, Data Source: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health**				
	HIV rate (per 100,000 people)	2011	858.3	**Asian**	140.7
				Black	1541.3
				Latino	854.2
				White	742
	United States, Data Source: CDC National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention Atlas				
	HIV rate (per 100,000 people)	2010	339.4	**Asian**	77.8
				Black	1242.4
				Latino	432.4
				White	174.2
Hypertension*	**Boston, Data Source: Boston Behavioral Risk Factor Survey**				
	Percent of adults ever told that they have hypertension	2013	24.0% (22.3-25.6)	**Asian**	16.2% (9.9-22.4)
				Black	36.7% (33.0-40.5)
				Latino	26.2% (22.0-30.3)
				White	18.6% (16.7-20.6)
	United States, Data Source: Behavioral Risk Factor Surveillance System				
	Percent of adults ever told that they have hypertension	2011	30.8%	**Asian**	Not Reported
				Black	39.2%**
				Latino	22.0%**
				White	31.7%**

Medical Insurance for Adults	**Boston, Data Source: Boston Behavioral Risk Factor Survey**				
	Percent of adults 18 years and older with medical insurance	2013	94.0% (92.8-95.2)	**Asian**	94.8% (91.2-98.5)
				Black	93.6% (91.3-95.8)
				Latino	87.0% (83.0-91.1)
				White	96.4% (94.8-98.0)
	United States, Data Source: Kaiser State Health Facts				
	Percent of adults 18 years and older with medical insurance	2012	84.6%	**Asian**	Not available
				Black	
				Latino	
				White	
Overweight and Obesity (Adults)*	**Boston, Data Source: Boston Behavioral Risk Factor Survey**				
	Percent of adults who are overweight or obese with self-reported height and weight data	2013	Overweight: 34.1% (32.0-36.1) Obese: 21.7% (20.0-23.4)	**Asian**	Overweight: 23.6% (16.4-30.9)
					Obese: 15.3% (8.9-21.6)
				Black	Overweight: 35.4% (31.5-39.3)
					Obese: 33.0% (29.3-36.8)
				Latino	Overweight: 37.6% (32.6-42.7)
					Obese: 27.3% (23.1-31.6)
				White	Overweight: 33.7% (30.6-36.7)
					Obese: 16.2% (13.9-18.4)
	United States, Data Source: Behavioral Risk Factor Surveillance System				
	Percent of adults who are overweight or obese with self-reported height and weight data	2012	Overweight: 35.8% Obese: 27.6%	**Asian**	Not Reported
					Not Reported
				Black	Overweight: 34.3%**
					Obese: 36.6%**
				Latino	Overweight: 38.0%**
					Obese: 29.3%**
				White	Overweight: 35.9%**
					Obese: 26.5%**
Overweight and Obesity (Children)	**Boston, Data Source: Boston Survey of Children's Health**				
	Percent of children (10-17 yrs) who are currently overweight or obese	2012	39.5% (34.1-45.0)	**Asian**	Insufficient sample
				Black	40.2% (31.0-49.4)
				Latino	51.6% (40.0-63.2)
				White	20.0% (14.5-25.5)
	United States, Data Source: National Survey of Children's Health				
	Percent of children (10-17 yrs) who are currently overweight or obese	2011-2012	31.3% (30.3-32.4)	**Asian**	Not Reported
				Black	41.6% (38.8-44.4)
				Latino	39.9% (36.6-43.2)
				White	26.3% (25.2-27.4)

Oral Health Preventative Visit for Children	**Boston, Data Source: Boston Survey of Children's Health**				
	Percent of children ages 1-17 who received at least one preventative dental visit in the past 12 months	2012	78.0% (75.1-81.0)	**Asian**	74.9% (59.7-90.1)
				Black	81.1% (75.8-86.3)
				Latino	80.0% (74.3-85.7)
				White	72.8% (67.5-78.0)
	United States, Data Source: National Survey of Children's Health				
	Percent of children ages 1-17 who received at least one preventative dental visit in the past 12 months	2011-2012	77.2% (76.5-77.8)	**Asian**	Not Reported
				Black	75.9% (74.2-77.7)
				Latino	73.9% (72.1-75.7)
				White	79.7% (78.9-80.4)
Physical Activity Among High School Students	**Boston, Data Source: Youth Risk Behavior Survey**				
	Percent of high school students who are physically active for at least 60 minutes per day on five or more of the past seven days	2013	29.1% (24.0-34.1)	**Asian**	26.6% (19.0-34.3)
				Black	27.7% (20.7-34.7)
				Latino	27.9% (21.5-34.3)
				White	38.2% (25.4-51.1)
	United States, Data Source: Youth Risk Behavior Surveillance System				
	Percent of high school students who are physically active for at least 60 minutes per day on five or more of the past seven days	2013	47.3% (45.3-49.2)	**Asian**	Not reported
				Black	41.0% (38.1-43.9)
				Latino	44.7% (41.2-48.3)
				White	50.1% (47.4-52.8)
Poverty	**Boston, Data Source: American Community Survey**				
	Percent of population living under the Federal Poverty Level	2012	21.6%	**Asian**	29.2%
				Black	24.6%
				Latino	33.5%
				White	14.0%
	United States, Data Source: American Community Survey				
	Percent of population living under the Federal Poverty Level	2012	15.9%	**Asian**	13.0%
				Black	28.1%
				Latino	25.4%
				White	11.0%
Preterm Births	**Boston, Data Source: Boston Resident Live Births, Massachusetts Department of Public Health**				
	Percent of live births born < 37 weeks gestation	2012	9.6%	**Asian**	5.7%
				Black	10.5%
				Latino	10.7%
				White	9.3%
	United States, Data Source: National Vital Statistics System Records				
	Percent of live births born < 37 weeks gestation	2012	11.6%	**Asian/PI†**	10.2%
				Black	16.2%
				Latino	5.0%
				White	10.7%

Repeat Teen Birth	**Boston, Data Source: Boston Resident Live Births, Massachusetts Department of Public Health**				
	Percent of teen births that are repeat teen births (ages 15-19)	2012	12.8%	**Asian**	n<5
				Black	15.6%
				Latino	12.8%
				White	n<5
	United States, Data Source: National Vital Statistics System Records				
	Percent of teen births that are repeat teen births (ages 15-19)	2010	18.3%	**Asian/PI†**	17.6%
				Black	20.4%
				Latino	20.9%
				White	14.8%
Suicide	**Boston, Data Source: Boston Resident Deaths, Massachusetts Department of Public Health**				
	Suicides (per 100,000 people)	2012	5.4	**Asian**	n<5
				Black	3.1
				Latino	n<5
				White	7.6
	United States, Data Source: National Vital Statistics System Records				
	Suicides (per 100,000 people)	2011	12.7	**Asian/PI†**	6
				Black	5.3
				Latino	5.2
				White	14.5
Teen Births	**Boston, Data Source: Boston Resident Live Births, Massachusetts Department of Public Health**				
	Number of live births born to women ages 15-19 years per 1,000 women ages 15-19 years	2012	14.0	**Asian**	2.2
				Black	23.7
				Latino	32.9
				White	3.0
	United States, Data Source: National Vital Statistics System Records				
	Number of live births born to women ages 15-19 years per 1,000 women ages 15-19 years	2012	29.4	**Asian/PI†**	9.7
				Black	43.9
				Latino	46.3
				White	20.5
Unemployment Rate	**Boston, Data Source: American Community Survey**				
	Percent of persons age 16 and older in the labor force who were unemployed	2012	9.6% (8.6-10.6)	**Asian**	10.0% (7.7-12.3)
				Black	19.6% (17.8-21.4)
				Latino	16.4% (14.4-18.4)
				White	6.7% (6.0-7.4)
	United States, Data Source: American Community Survey				
	Percent of persons age 16 and older in the labor force who were unemployed	2012	9.4%	**Asian**	7.1%
				Black	16.8%
				Latino	11.4%
				White	7.6%

Usual Place of Healthcare for Children	**Boston, Data Source: Boston Survey of Children's Health**				
	Percent of families who report their child 0-17 yrs received services at a usual place of healthcare	2012	92.6% (90.5-94.6)	**Asian**	Insufficient sample
				Black	91.3% (87.2-95.3)
				Latino	87.8% (83.0-92.6)
				White	97.9% (96.5-99.2)
	United States, Data Source: National Survey of Children's Health				
	Percent of families who report their child 0-17 yrs received services at a usual place of healthcare	2011-2012	91.4% (90.9-91.8)	**Asian**	Not Reported
				Black	87.8% (86.5-89.1)
				Latino	83.8% (82.3-85.3)
				White	95.8% (95.5-96.2)

* Data from the Behavioral Risk Factor Surveillance Systems represents the median for 50 states and the District of Columbia and are not directly comparable to data from the Boston Behavioral Risk Factor Survey.

** Data for one or more states and the District of Columbia may be excluded from race/ethnicity stratifications due to insufficient sample size.

† Asian or Pacific Islander

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Healthy People 2020

Healthy People 2020 was implemented on December 2, 2010 by the U.S. Department of Health and Human Services (1). It consists of "a comprehensive set of 10-year national goals and objectives for improving the health of all Americans" (2). Healthy People 2020 (HP 2020) is the result of collaboration and feedback from a variety of public health professionals, governmental officials, organizations, as well as the public, and is a continuation of a process that began 30 years ago (3). The framework of HP 2020 contains 42 public health topic areas with more than 1,200 objectives and includes a small set of objectives, called HP 2020 Leading Health Indicators. The HP 2020 Leading Health Indicators have been designated as high-priority (2).

HP 2020 Leading Health Indicators address ways in which the health of Americans can be improved by reducing factors that contribute to a number of preventable diseases and conditions such as overweight/obesity, infant mortality, teen pregnancy, chronic diseases like heart disease, stroke, diabetes, and cancer, infectious disease, substance abuse, injury/violence, tobacco use, and others (2). In addition, HP 2020 Leading Health Indicators call for improvement in health by actions such as increasing access to health care, increasing physical activity, increasing use of preventive dental services, and increasing the proportion of high school seniors who never use illicit drugs.

In the table that follows, the measures associated with the HP 2020 objectives and leading HP 2020 Leading Health Indicators are compared to results for Boston residents.

Healthy People 2020				
Access to Health Services				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Increase the proportion of persons with medical insurance	100 %	93.3% (91.9-94.6)	2013	BBRFSS
Increase the proportion of children and youth ages 17 years and under who have a specific source of ongoing care	100 %	98.7% (97.8-99.6)	2012	BSCH
Maternal, Infant & Child Health				
Objective	**Target (Birth and infant death rates per 1,000 live births; death rates per 100,000)**	**Boston (Birth and infant death rates per 1,000 live births; death rates per 100,000)**	**Year(s)**	**BPHC Data Source**
Reduce total preterm births	11.4 %	9.6%	2012	Birth File
Reduce very preterm or live births at less than 32 weeks of gestation	1.8 %	1.7%	2012	Birth File
Reduce live births at 32 to 33 weeks of gestation	1.4 %	1.2%	2012	Birth File
Reduce late preterm or live births at 34-36 weeks of gestation	8.1 %	6.6%	2012	Birth File
Reduce low birth weight (LBW)	7.8 %	8.4%	2012	Birth File
Reduce very low birth weight (VLBW)	1.4 %	1.5%	2012	Birth File
Reduce the rate of all infant deaths (within 1 year)	6.0	4.7	2012	Birth File/Death File
Reduce the rate of neonatal deaths (within the first 28 days of life)	4.1	2.9	2012	Birth File/Death File
Reduce the rate of postneonatal deaths (between 28 days and 1 year)	2.0	1.9	2012	Birth File/Death File

Reduce the rate of deaths among children ages 1 to 4 years	26.5	47.6	2010-2012	Death File/Census File
Reduce the rate of deaths among children ages 5 to 9 years	12.4	49.7	2010-2012	Death File/Census File
Reduce the rate of deaths among adolescents ages 10-14 years	14.8	42.4	2010-2012	Death File/Census File
Reduce the rate of deaths among adolescents ages 15-19	54.3	91.1	2010-2012	Death File/Census File
Reduce the rate of deaths among young adults ages 20-24 years	88.3	137.8	2010-2012	Death File/Census File
Reduce the rate of infant deaths from sudden infant death syndrome (SIDS)	0.50	0.20	2010-2012	Birth File/Death File
Reduce the rate of infant deaths related to birth defects (congenital heart defects)	0.34	0.80	2010-2012	Birth File/Death File
Heart Disease and Stroke				
Objective	**Target (Hospitalizations per 1,000; deaths per 100,000)**	**Boston (Hospitalizations per 1,000; deaths per 100,000)**	**Year**	**BPHC Data Source**
Reduce coronary heart disease deaths*	103.4	73.7	2012	Death File
Reduce stroke deaths*	34.8	34.0	2012	Death File
Reduce the proportion of adults with hypertension	26.9% of adults ages 18 yrs and older	24% (22.3-25.6)	2013	BBRFSS
Diabetes				
Objective	**Target (per 100,000)**	**Boston (per 100,000)**	**Year**	**BPHC Data Source**
Reduce the diabetes death rate*	66.6	19.6	2012	Death File
Sexually Transmitted Diseases				
Objective	**Target (rates per 100,000)**	**Boston (rates per 100,000)**	**Year**	**BPHC Data Source**
Reduce gonorrhea rates among females ages 15 to 44 years	251.9 new cases	161.5	2012	STI File/Census File

Reduce gonorrhea rates among males ages 15 to 44 years	194.8 new cases	267.4	2012	STI File/Census File
Reduce domestic transmission of primary and secondary syphilis among females	1.3 new cases	2.5	2011-2012	STI File/Census File
Reduce domestic transmission of primary and secondary syphilis among males	6.7 new cases	55.8	2011-2012	STI File/Census File
Immunization and Infectious Diseases				
Objective	**Target (rates per 100,000)**	**Boston (rates per 100,000)**	**Year(s)**	**BPHC Data Source**
Reduce new Hepatitis B infections in adults ages 19 and older	1.5	57.9 (new cases all ages)	2012	Communicable Disease Control Division, BPHC
Reduce new Hepatitis C infections	0.25	170.2 new cases	2012	Communicable Disease Control Division, BPHC
Reduce tuberculosis (TB)	1.0	6.6 new cases	2012	Communicable Disease Control Division, BPHC
Substance Abuse				
Objective	**Target (rates per 100,000)**	**Boston (rates per 100,000)**	**Year(s)**	**BPHC Data Source**
Reduce the proportion of adolescents reporting use of marijuana during the past 30 days	6.0%	24.1% (21.3-27.0) (Ages less than 18)	2013	YRBS
Reduce drug-induced deaths*	11.3	16.7	2012	Death File/Census File
Reduce the proportion of persons engaging in binge drinking during the past month—adolescents aged 12-17 years	8.6%	13.8% (11.0-16.6)	2013	YRBS
Reduce the proportion of persons engaging in binge drinking during the past 30 days—adults aged 18 years and older	24.4 %	25.4% (23.2-27.5)	2013	BBRFSS

Increase the proportion of high school seniors never using substances—alcoholic beverages	30.5%	33.1% (25.6-40.5)	2013	YRBS
Injury and Violence Prevention				
Objective	**Target (rates per 100,000)**	**Boston (rates per 100,000)**	**Year**	**BPHC Data Source**
Reduce homicides*	5.5	6.6	2012	Death File/Census File
Reduce bullying among adolescents	17.9%	12.8% (10.1-15.4)	2013	YRBS
Reduce nonfatal firearm-related injuries*	18.6	16.3	2012	ED File/Census File
Reduce hospitalizations for nonfatal injuries*	555.8	627.5	2012	Hospitalization File/Census File
Reduce firearm-related deaths*	9.3	4.4	2012	Death File/Census File
Cancer				
Objective	**Target (rates per 100,000)**	**Boston (rates per 100,000)**	**Year**	**BPHC Data Source**
Reduce the overall cancer death rate*	161.4	186.3	2012	Death File/Census File
Increase the proportion of women who receive a breast cancer screening based on the most recent guidelines	81.1%	89.5% (86.8-92.2)	2013	BBRFS
Increase the proportion of women who receive a cervical cancer screening based on the most recent guidelines	93.0%	86.1% (83.7-88.5)	2013	BBRFS
Reduce the lung cancer death rate*	45.5	45.2	2012	Death File/Census File
Reduce the female breast cancer death rate*	20.7	17.7	2012	Death File/Census File
Reduce the colorectal cancer death rate*	14.5	16.8	2012	Death File/Census File
Reduce the prostate cancer death rate*	21.8	27.4	2012	Death File/Census File

Mental Health and Mental Disorders				
Objective	**Target**	**Boston**	**Year(s)**	**BPHC Data Source**
Reduce the suicide rate*	10.2 per 100,000 population	5.4 per 100,000 residents	2012	Death File/Census File
Adolescent Health				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Increase the proportion of students who graduate with a regular diploma 4 years after starting 9th grade	82.4%	65.9%	2013	Office of Data and Accountability, Boston Public Schools
Environmental Health				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Increase trips to work made by bicycling	0.6%	2.0%	2012	American Community Survey
Increase trips to work made by walking	3.1%	15.5%	2012	American Community Survey
Increase trips to work made by mass transit	5.5%	34.6%	2012	American Community Survey
Food Safety				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Reduce infections caused by Salmonella species transmitted commonly through food	11.4 cases per 100,000	17.1 per 100,000	2012	Communicable Disease Control Division, BPHC
Nutrition and Weight Status				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Reduce the proportion of children ages 2 to 5 years who are considered obese	9.6%	Insufficient Data †	2012	BSCH
Reduce the proportion of adolescents ages 12 to 19 years who are considered obese	16.1%	21.2% (15.9-26.6)	2012	BSCH
Increase the proportion of adults who are at a healthy weight	33.9 %	40.7% (38.4-42.9)	2013	BBRFSS

Reduce the proportion of adults who are obese	30.5%	21.7% (20.0-23.4)	2013	BBRFSS
Oral Health				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Increase the proportion of low-income (<=200% of poverty line) children and adolescents who received any preventive dental service during the past year	33.2%	79.0% (74.3-83.7)	2012	BSCH
Respiratory Diseases				
Objective	**Target (Hospitalizations/ED per 10,000; Deaths per 100,000)**	**Boston**	**Year**	**BPHC Data Source**
Reduce hospitalizations for asthma among children under age 5 years	18.1	80.1	2012	Hospitalization File/Census File
Reduce hospitalizations for asthma among children and adults ages 5 to 64 years	8.7	16.8	2012	Hospitalization File/Census File
Reduce hospitalizations for asthma among adults ages 65 years and older	20.1	30.7	2012	Hospitalization File/Census File
Reduce emergency department (ED) visits for asthma among children under age 5 years	95.7	216.1	2012	ED File/Census File
Reduce emergency department (ED) visits for asthma among children and adults ages 5 to 64 years	49.7	85.3	2012	ED File/Census File
Reduce emergency department (ED) visits for asthma among adults ages 65 years and older	13.7	57.3	2012	ED File/Census File
Reduce deaths from chronic obstructive pulmonary disease (COPD) among adults*	102.6	57.7	2012	Death File

Family Planning				
Objective	**Target (rates per 1,000)**	**Boston (rates per 1,000)**	**Year**	**BPHC Data Source**
Reduce pregnancies among adolescent females ages 15 to 17 years	36.2	11.2	2012	Birth File
Reduce pregnancies among adolescent females ages 18 to 19 years	105.9	34.7	2012	Birth File
Increase the proportion of female adolescents ages 15 to 17 years who have never had sexual intercourse	80.2 %	61.7% (55.7-67.6)	2013	YRBS
Increase the proportion of male adolescents ages 15 to 17 years who have never had sexual intercourse	79.2 %	52.3% (44.7-60.0)	2013	YRBS
Increase the proportion of female adolescents ages 15 years and under who had never had sexual intercourse	93.9 %	77.2% (70.1-84.2)	2013	YRBS
Increase the proportion of male adolescents ages 15 years and under who had never had sexual intercourse	92.7 %	70.7% (61.8-79.5)	2013	YRBS
Physical Activity				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Increase the proportion of adolescents who meet current Federal physical activity guidelines for aerobic physical activity	20.2 %	15.3% (12.2-18.4)	2013	YRBS
Tobacco Use				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Reduce cigarette smoking by adults	12.0%	18.4% (16.6-20.2)	2013	BBRFSS
Reduce use of cigarettes by adolescents (past month)	16.0%	7.9% (5.8-10.0)	2013	YRBS

HIV				
Objective	**Target**	**Boston**	**Year**	**BPHC Data Source**
Reduce new AIDS cases among adolescents and adults	12.4 new cases per 100,000	31.0 (Ages 18 and older)	2011	HIV/AIDS Surveillance Program, MA Department of Public Health

*Rates are age-adjusted at the national and Boston levels

† >20% missing data

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Chapter 1:
Demographics

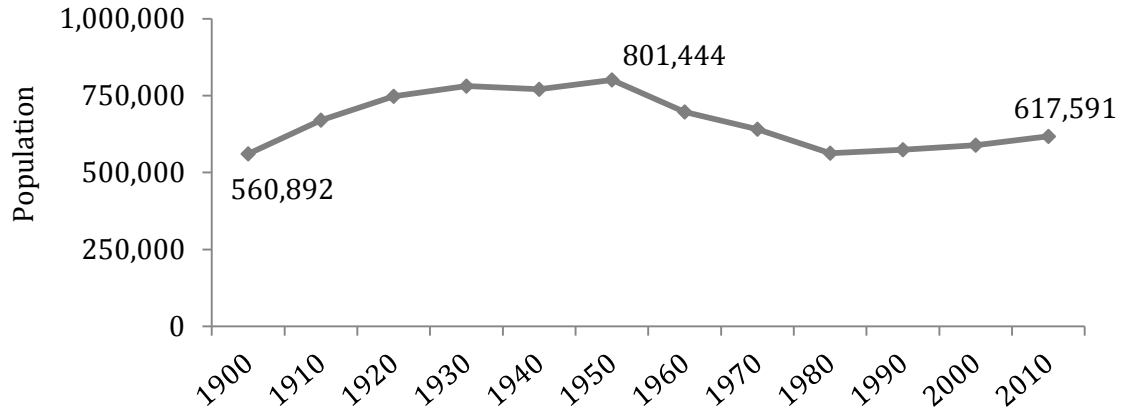
Demographics

Boston's population has grown in the last decade. Much of this change can be attributed to local and state policies that have created a strong and well-balanced economy and supported neighborhood redevelopment (1). With its many colleges and universities, Boston is especially appealing to young and well-educated people from around the world. In 2012, 26% of the Boston population was foreign-born compared with only 15% of the Massachusetts population and 13% of the entire US population (2).

Although Boston is a racially and ethnically diverse city in which less than 50% of its residents are White, Boston was ranked among the top 20% of highly segregated metropolitan areas in the United States in 2010, alongside Cincinnati, Ohio and Birmingham, Alabama(4). Racial residential segregation refers to the degree to which two or more racial/ethnic groups live separately from one another in a geographic area (3). . Segregation affects health by creating different economic, physical, and social environments that shape the health behaviors and choices individuals make (5,6,7). Evidence exists that segregation of people of color into poor neighborhoods is associated with increased adult mortality (6). Whenever possible, health indicators in this report are stratified by individual socioeconomic (SES) indicators and presented geographically in maps.

Demographic characteristics for children and adolescents differ from the rest of the Boston population. Black children make up the highest proportion of youth under the age of 18, whereas White individuals make up the largest proportion of all residents. We give special attention to the subpopulation of Boston youth for whom many Boston's programs and policies seek to support and protect.

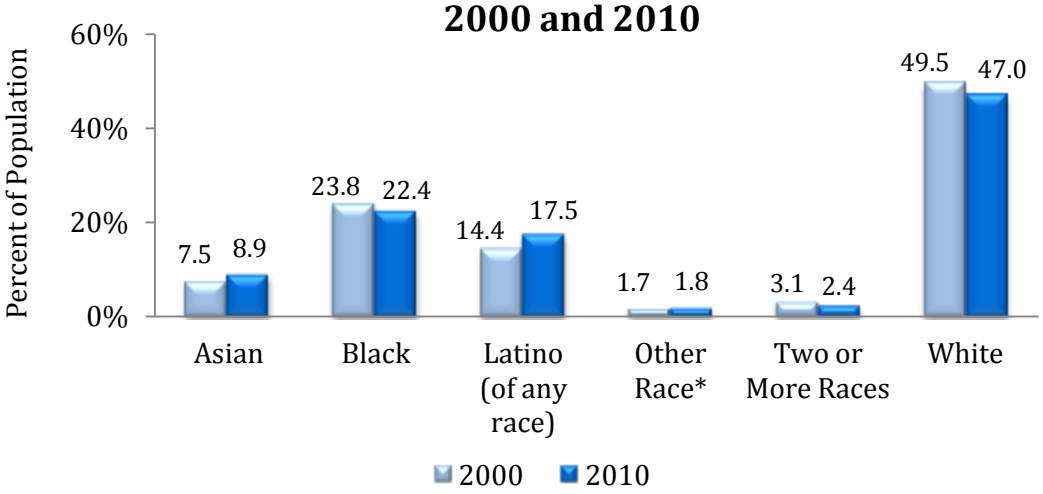
Figure 1.1 Boston Population, 1990-2010



DATA SOURCES: Decennial Censuses 1900- 2010, U.S. Census Bureau

In 2010, Boston had 617,591 residents, making it the most populous city in Massachusetts. Data from the decennial censuses demonstrate that the population of Boston has varied dramatically over the past 110 years, reaching a high point of 801,444 residents in 1950. In 2010, 52% of the Boston population was female (data not shown). The population of Boston increased 4.8% between 2000 and 2010.

Figure 1.2 Population by Race/Ethnicity, 2000 and 2010



*Includes American Indians/Alaskan Natives, and Some Other Races

DATA SOURCES: Decennial Censuses 2000 and 2010, U.S. Census Bureau

Between 2000 and 2010, the percentage of Asian and Latino residents increased while the percentage of Black and White residents decreased.

Figure 1.3 Population by Race/Ethnicity and Year, 1980, 1990, 2000, 2005-2012						
Year	Not Latino					Latino (of any Race)
	Asian	Black	Other Race*	Two or More Races	White	
2012	9.1%	23.3%	1.0%	2.0%	46.0%	18.6%
2011	9.1%	22.7%	1.8%	2.1%	46.0%	18.4%
2010	8.9%	22.4%	1.8%	2.4%	47.0%	17.5%
2009	7.5%	21.7%	1.6%	1.7%	51.2%	16.3%
2008	8.2%	21.6%	1.7%	1.5%	50.8%	16.2%
2007	8.6%	21.2%	2.0%	1.5%	49.8%	16.9%
2006	8.0%	23.4%	2.1%	1.4%	50.2%	14.9%
2005	8.7%	23.5%	†	1.2%	48.6%	14.7%
2000	7.5%	23.8%	1.7%	3.1%	49.5%	14.4%
1990	5.2%	24.0%	1.3%	‡	59.1%	10.4%
1980	2.7%	21.7%	1.3%	‡	67.9%	6.4%

* Includes American Indians/Alaskan Natives and Some Other Races
† Insufficient sample size
‡ Prior to the 2000 census, data were not collected on whether individuals identified as belonging to two or more races

DATA SOURCES: Decennial Censuses 1900-2000, U.S. Census Bureau; American Community Survey, 2005, 2006, 2007, 2008, 2009, 2010, 2011, and 2012, U.S. Census Bureau

The population of Boston has become increasingly diverse over time. While 50% of Boston residents were White in 2000, this percentage fell to slightly less than a majority (46%) by 2012. Much of the diversification in the population of Boston is due to an increase in the Latino population relative to the overall population of Boston, which increased from 14% in 2000 to 19% in 2012.

Note: The 2000 Census was the first to offer respondents the option of identifying as belonging to more than one race. Therefore, census data from before 2000 are not strictly comparable to census data in 2000 and beyond. Nonetheless, these data provide good estimates of the changes in the racial and ethnic composition of Boston. Also, verifiable data were not available for 2001-2004.

Neighborhood	Figure 1.4 Population by Neighborhood, 2000 and 2010		
	2000	2010	% change
Boston	**589,141**	**617,591**	**+4.8%**
Allston/ Brighton	66,467	72,092	+8.5%
Back Bay*	46,504	50,017	+7.6%
Charlestown	15,195	16,439	+8.2%
Chinatown	5,138	7,383	+43.7%
East Boston	38,413	40,508	+5.5%
Fenway	47,449	54,565	+15.0%
Hyde Park	28,392	28,488	+0.3%
Jamaica Plain	36,293	35,401	-2.5%
Mattapan	27,815	25,562	-8.1%
North Dorchester	58,675	59,273	+1.0%
North End	6,401	6,915	+8.0%
Roslindale	32,527	29,826	-8.3%
Roxbury	34,665	40,527	+16.9%
South Boston	30,048	33,889	+12.8%
South Dorchester	75,329	71,262	-5.4%
South End†	27,311	33,881	+24.1%
West Roxbury	24,058	25,861	+7.5%

* Includes Beacon Hill, Downtown, the North End, and the West End
† Includes Chinatown

DATA SOURCES: Decennial Censuses 2000 and 2010, U.S. Census Bureau

Between 2000 and 2010, the overall population of Boston increased by 4.8%.

Among neighborhoods, Chinatown, the South End, and Roxbury experienced the greatest increases in population (43.7%, 24.1%, and 16.9%, respectively) while Roslindale, Mattapan, and South Dorchester experienced the greatest decreases in population (-8.3%, -8.1%, and -5.4%, respectively).

Neighborhood	Figure 1.5 Population by Neighborhood and Race/Ethnicity, 2000 and 2010													
	Total Population		Asian		Black		Latino		White		Other Race*		Two or More Races	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
	Count	Count	%	%	%	%	%	%	%	%	%	%	%	%
Boston	**589,141**	**617,591**	**7.5%**	**8.9%**	**23.8%**	**22.4%**	**14.4%**	**17.5%**	**49.5%**	**47.0%**	**1.7%**	**1.8%**	**3.1%**	**2.4%**
Allston/ Brighton	66,467	72,092	13.7%	15.2%	4.5%	4.6%	9.2%	9.9%	68.6%	66.2%	1.4%	1.6%	2.6%	2.4%
Back Bay†	46,504	50,017	9.2%	10.1%	5.1%	4.7%	3.8%	5.2%	80.1%	78.0%	0.4%	0.5%	1.4%	1.6%
Charlestown	15,195	16,439	5.0%	8.2%	3.6%	4.7%	11.6%	9.7%	78.6%	75.8%	0.3%	0.5%	0.9%	1.2%
Chinatown	5,138	7,383	59.7%	48.3%	4.2%	3.5%	4.2%	4.1%	30.3%	42.0%	0.3%	0.2%	1.4%	1.8%
East Boston	38,413	40,508	4.0%	3.5%	3.1%	3.2%	39.0%	52.9%	49.7%	37.2%	1.3%	1.8%	2.9%	1.5%
Fenway	47,449	54,565	13.6%	17.3%	6.7%	5.8%	8.2%	9.0%	68.1%	64.7%	0.7%	0.5%	2.7%	2.7%
Hyde Park	28,392	28,488	1.6%	1.8%	32.4%	43.3%	13.4%	22.3%	48.8%	29.5%	0.7%	1.0%	3.1%	2.1%
Jamaica Plain	36,293	35,401	5.1%	5.2%	13.9%	12.0%	24.9%	22.6%	52.9%	57.1%	0.6%	0.7%	2.5%	2.5%
Mattapan	27,815	25,562	1.0%	0.9%	81.9%	80.4%	7.1%	11.7%	4.8%	3.8%	0.7%	0.9%	4.5%	2.4%
North Dorchester	58,675	59,273	6.6%	6.6%	47.8%	44.0%	17.5%	22.6%	18.2%	17.1%	4.9%	5.7%	5.2%	3.8%
North End	6,401	6,915	1.3%	2.5%	0.4%	0.7%	2.0%	3.6%	95.1%	91.8%	0.2%	0.4%	1.1%	0.9%
Roslindale	32,527	29,826	2.6%	2.7%	16.5%	21.3%	20.2%	25.9%	56.8%	47.1%	0.6%	0.9%	3.3%	2.2%
Roxbury	34,665	40,527	3.1%	5.1%	51.1%	41.4%	24.4%	27.0%	13.5%	20.2%	4.0%	3.4%	4.0%	3.0%
South Boston	30,048	33,889	3.9%	4.9%	2.5%	4.6%	7.7%	9.9%	84.3%	78.8%	0.4%	0.5%	1.2%	1.2%
South Dorchester	75,329	71,262	8.3%	9.8%	46.7%	45.8%	11.8%	14.7%	25.7%	22.7%	3.0%	3.6%	4.5%	3.5%
South End‡	27,311	33,881	19.6%	21.2%	20.2%	15.8%	16.3%	15.5%	40.9%	45.0%	0.7%	0.6%	2.3%	1.9%
West Roxbury	24,058	25,861	4.1%	6.4%	2.1%	5.0%	3.5%	6.8%	88.6%	80.0%	0.4%	0.4%	1.4%	1.5%

* Includes American Indians/Alaskan Natives and Some Other Races
† Includes Beacon Hill, Downtown, the North End, and the West End
‡ Includes Chinatown

DATA SOURCES: Decennial Censuses 2000 and 2010, U.S. Census Bureau

Figure 1.6 Population Counts by Neighborhood and Race/Ethnicity, 2000 and 2010

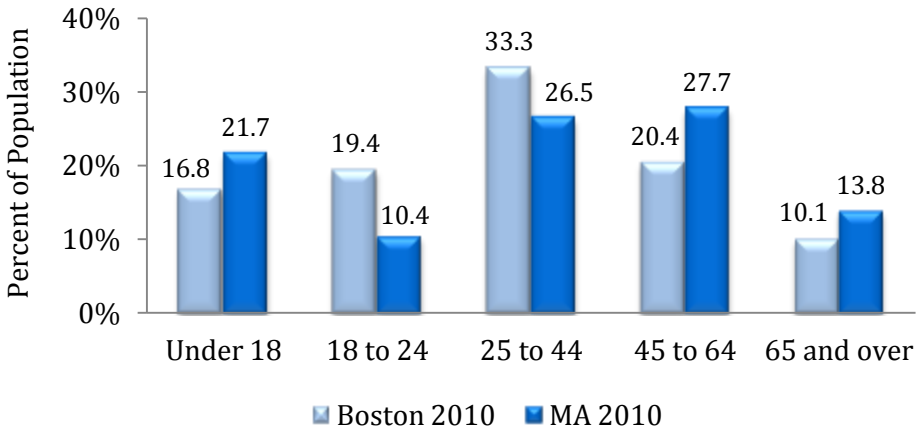
Neighborhood	Asian			Black			Latino			White			Other Race*			Two or More Races		
	2000 Count	2010 Count	% change	2000 Count	2010 Count	% change	2000 Count	2010 Count	% change	2000 Count	2010 Count	% change	2000 Count	2010 Count	% change	2000 Count	2010 Count	% change
Boston	**44,280**	**55,028**	**+24.3%**	**140,305**	**138,072**	**-1.6%**	**85,089**	**107,917**	**+26.8%**	**291,561**	**290,310**	**-0.4%**	9,732	**11,305**	**+16.2%**	**18,174**	**14,959**	**-21.5%**
Allston/ Brighton	9,123	10,984	+20.4%	2,997	3,341	+11.5%	6,125	7,163	+16.9%	45,582	47,719	+4.7%	910	1,156	+27.0%	1,730	1,729	-0.1%
Back Bay†	4,275	5,039	+17.9%	2,381	2,350	-1.3%	1,780	2,582	+45.1%	37,232	39,014	+4.8%	187	231	+23.5%	649	801	+19.0%
Charlestown	761	1,344	+76.6%	539	764	+41.7%	1,764	1,591	-9.8%	11,946	12,458	+4.3%	46	80	+73.9%	139	202	+31.2%
Chinatown	3,069	3,569	+16.3%	213	259	+21.6%	213	303	+42.3%	1,556	3,100	+99.2%	13	16	+23.1%	74	136	+45.6%
East Boston	1,553	1,413	-9.0%	1,177	1,283	+9.0%	14,990	21,419	+42.9%	19,078	15,051	-21.1%	511	724	+41.7%	1,104	618	-78.6%
Fenway	6,469	9,425	+45.7%	3,177	3,176	-0.0%	3,866	4,922	+27.3%	32,332	35,313	+9.2%	326	258	-20.9%	1,279	1,471	+13.1%
Hyde Park	453	499	+10.2%	9,211	12,338	+33.9%	3,796	6,351	+67.3%	13,861	8,408	-39.3%	191	295	+54.5%	880	597	-47.4%
Jamaica Plain	1,867	1,829	-2.0%	5,052	4,253	-15.8%	9,025	7,983	-11.5%	19,205	20,209	+5.2%	225	251	+11.6%	919	876	-4.9%
Mattapan	265	218	-17.7%	22,768	20,555	-9.7%	1,985	2,978	+50.0%	1,328	959	-27.8%	205	241	+17.6%	1,264	611	-106.9%
North Dorchester	3,855	3,934	+2.0%	28,030	26,085	-6.9%	10,246	13,418	+31.0%	10,659	10,157	-4.7%	2,843	3,401	+19.6%	3,042	2,278	-33.5%
North End	84	175	+108.3%	24	46	+91.7%	127	252	+98.4%	6,086	6,348	+4.3%	13	30	+130.8%	67	64	-4.7%
Roslindale	853	796	-6.7%	5,360	6,342	+18.3%	6,553	7,738	+18.1%	18,473	14,034	-24.0%	204	273	+33.8%	1,084	643	-68.6%
Roxbury	1,059	2,045	+93.1%	17,705	16,785	-5.2%	8,464	10,938	+29.2%	4,681	8,202	+75.2%	1388	1,356	-2.3%	1,368	1,201	-13.9%
South Boston	1,178	1,675	+42.2%	749	1,574	+110.1%	2,298	3,354	+46.0%	25,333	26,704	+5.4%	121	176	+45.5%	369	406	+9.1%
South Dorchester	6,230	6,997	+12.3%	35,156	32,605	-7.3%	8,913	10,471	+17.5%	19,367	16,152	-16.6%	2282	2,558	+12.1%	3,381	2,479	-36.4%
South End‡	5,358	7,188	+34.2%	5,505	5,338	-3.0%	4,451	5,255	+18.1%	11,165	15,249	+36.6%	194	195	+0.5%	638	656	+2.7%
West Roxbury	981	1,642	+67.4%	498	1,283	+157.6%	833	1,754	+110.6%	21,319	20,681	-3.0%	99	110	+11.1%	328	391	+16.1%

* Includes American Indians/Alaskan Natives and Some Other Races
† Includes Beacon Hill, Downtown, the North End, and the West End
‡ Includes Chinatown

DATA SOURCES: Decennial Censuses 2000 and 2010, U.S. Census Bureau

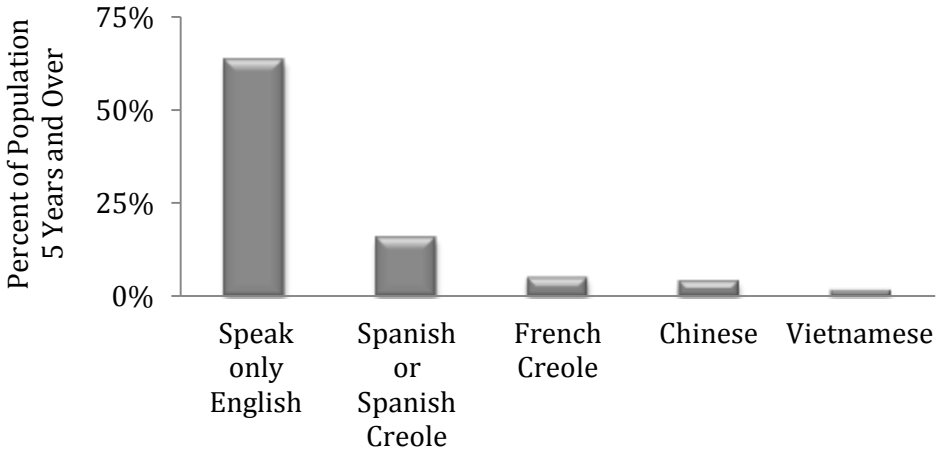
Boston has a higher percentage of adults ages 18-24 and 25-44 compared with Massachusetts. A higher percentage of Massachusetts residents are younger than 18 and older than 44 compared with Boston.

Figure 1.7 Population by Age Group, Boston and Massachusetts, 2010



DATA SOURCE: Decennial Census 2010, U.S. Census Bureau

Figure 1.8 Most Frequently Reported Languages Spoken at Home, 2012

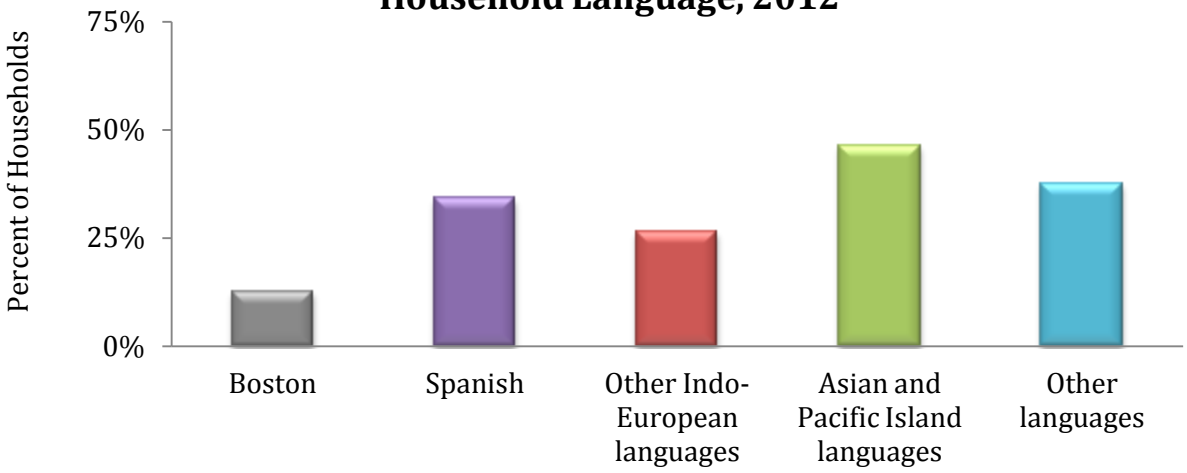


Speak only English	Spanish or Spanish Creole	French Creole	Chinese	Vietnamese
63.4% (62.1-64.6)	15.9% (15.2-16.7)	5.1% (3.9-6.2)	4.2% (3.5-5.0)	1.7% (1.2-2.1)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

While English was the language most frequently reported being spoken at home, 37% of Boston residents ages 5 and over reported speaking a language other than English at home (data not shown). Spanish (including Spanish Creole) was spoken at home by 16% of Boston residents, while 5% spoke French (including Patois, Cajun, and French Creole), 4% spoke Chinese, and 2% spoke Vietnamese.

Figure 1.9 Linguistically Isolated Households by Household Language, 2012



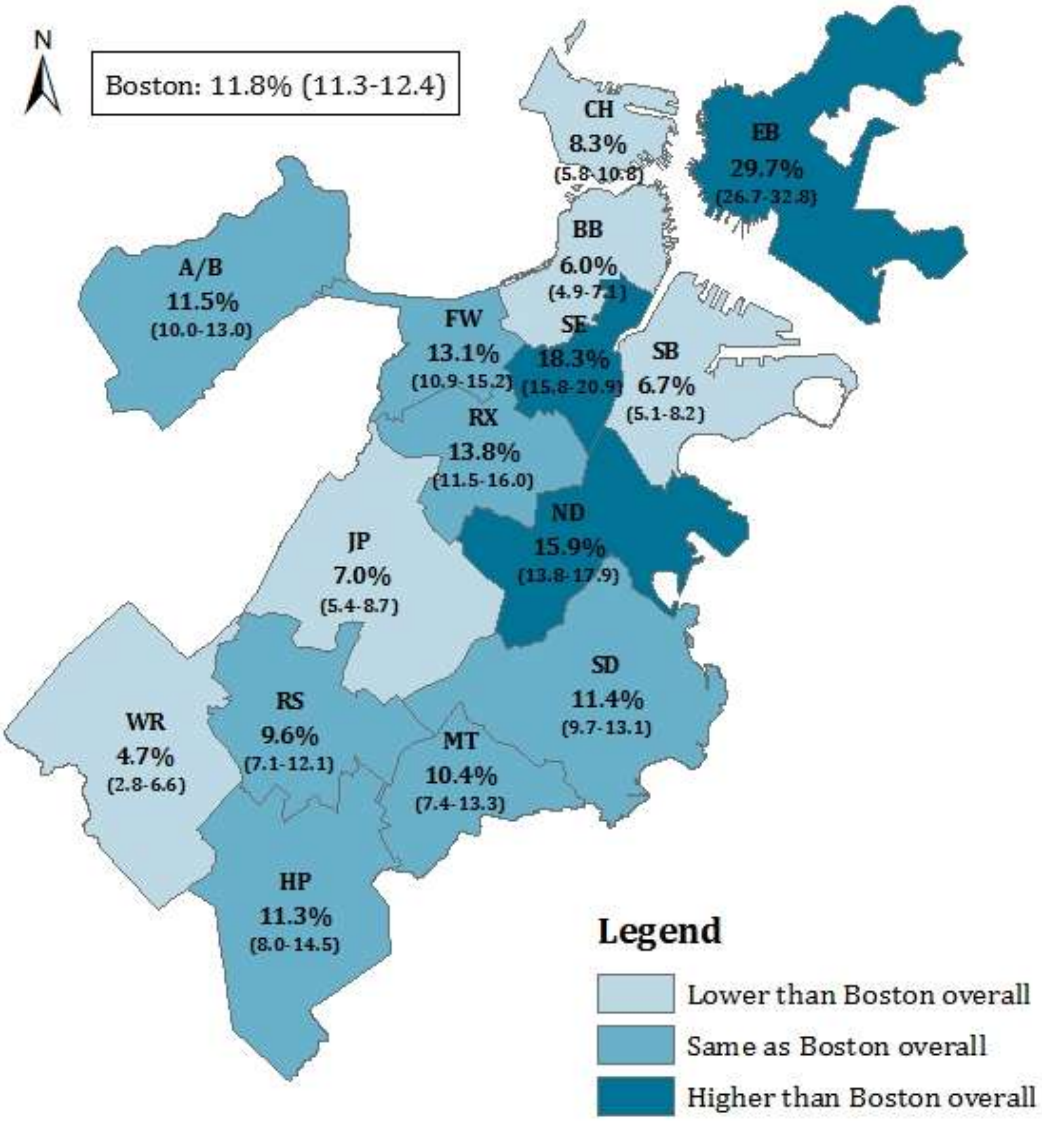
Boston	Spanish	Other Indo-European Languages	Asian and Pacific Island Languages	Other Languages
12.6% (11.3-13.9)	34.1% (29.9-38.2)	26.5% (20.5-32.6)	46.4% (40.2-52.6)	37.7% (21.9-53.4)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, 13% of Boston households were linguistically isolated (defined as having no one within the household 14 years of age and over who speaks English only, or speaks English very well). Thirty-four percent of the linguistically isolated households spoke Spanish, 27% percent spoke Other Indo-European languages, 46% spoke Asian and Pacific Island languages, and 38% spoke other languages.

Note: Other Indo-European languages include: English-based Pidgin Creoles, Germanic, Romance (excluding Spanish), Celtic, Slavic, Baltic, Iranian, and Indic languages.

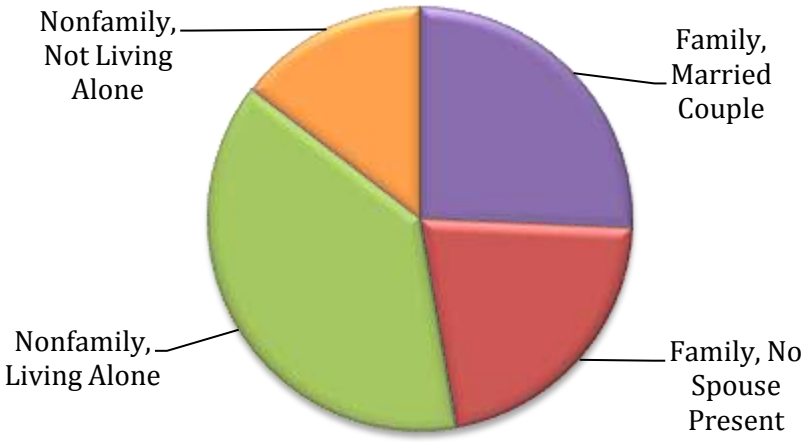
Figure 1.10 Linguistically Isolated Households by Neighborhood, 2008-2012 Combined



DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

During 2008-2012, 12% of Boston households were linguistically isolated. Compared to Boston overall, a higher percentage of households in East Boston, North Dorchester and the South End were linguistically isolated (30%, 16%, and 18%, respectively). A lower percentage of households in Back Bay, Charlestown, Jamaica Plain, South Boston and West Roxbury were linguistically isolated (6%, 8%, 7%, 7%, and 5%, respectively).

Figure 1.11 Type of Household, 2012

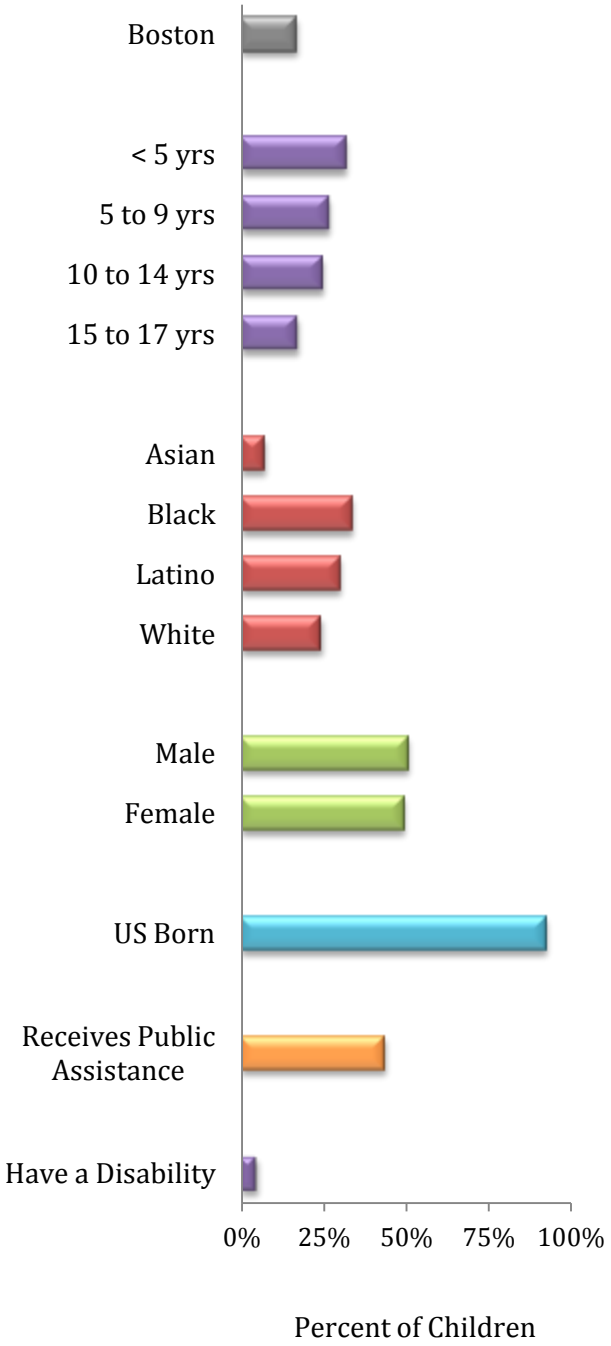


Family, Married Couple	Family, No Spouse Present	Nonfamily, Living Alone	Nonfamily, Not Living Alone
25.7% (24.2-27.2)	21.5% (20.2-22.9)	38.2% (36.6-39.8)	14.6% (13.2-15.9)

DATA SOURCE: American Community Survey, 2012 , U.S. Census Bureau

In 2012, 47% of all households in Boston consisted of families. The census defines a family household as one in which there is at least one person living in the household who is related by marriage, blood, or adoption to the householder (head of household). Of all households, an estimated 38% were individuals living alone, and an estimated 26% were married couple families, that is, the householder was living with a spouse.

Figure 1.12 Children by Selected Indicators, 2010-2012



Boston	16.9% (16.5-17.3)
Age of Child	
<5 yrs	31.7% (31.2-32.1)
5 to 9 yrs	26.5% (25.2-27.8)
10 to 14 yrs	24.7% (23.4-26.0)
15 to 17 yrs	17.1% (16.7-17.6)
Race/Ethnicity of Child	
Asian	7.2%*
Black	33.5%*
Latino	29.9%*
White	24.3%*
Gender of Child	
Male	50.5% (49.2-51.8)
Female	49.5% (48.5-50.5)
US Born	92.7% (92.2-93.1)
Receives Public Assistance	43.6% (41.4-45.9)
Have a Disability	4.9% (4.2-5.6)

*Due to limited information, confidence intervals for each racial/ethnic group could not be calculated, and are therefore, not available.

DATA SOURCE: American Community Survey, 2010-2012, U.S. Census Bureau

Seventeen percent of Boston residents were less than 18 years of age. Children less than 5 years of age made up the greatest percentage of children (32%), while 15-17 year olds made up the smallest percentage of children (17%). Thirty-four percent of children in Boston were Black, 30% were Latino, 24% were White, and 7% were Asian. Ninety-three percent of Boston children were born in the United States, 44% received public assistance, and 5% had a disability.

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Chapter 2: Social Determinants of Health

Social Determinants of Health

Beyond individual physiology and health-related behaviors, there are other economic, environmental and social factors that influence health. Collectively, we refer to these as social determinants of health. Social determinants are societal influences that help to describe the circumstances in which people are born, grow up, live, work and age (1). Social determinants of health are uniquely experienced by individuals, differentially impacting health experiences and ultimately contributing to health inequities (2). Research has identified a wide range of social factors that are associated with differences in health outcomes (2):

- Employment
- Access to Healthy Food
- Access to Health Care
- Exposure to Violence
- Insurance Coverage
- Education
- Access to Health Resources
- Income
- Housing Conditions
- Transportation Options
- Environmental Safety
- Occupational Safety

These social determinants of health impact an individual's life in many specific ways, for example, the quality of education available to them, their ability to find and maintain employment and the type of work (including levels of exposure to occupational hazards), access to safe and stable housing, and access to health care and the quality of those services (3). The resulting life experiences, in turn, directly influence physical and mental health and contribute to health inequities. Our report describes how many health-promoting resources, such as income, employment, education, and home ownership, are unevenly distributed within our city among those of differing races and ethnicities, socioeconomic status, and geographic locations.

Social determinants of health can be described in terms of three broad context areas: economic, environmental, and social.

Economic Conditions and Health

Economic factors that influence health occur on both community and individual levels. On the community level, economic factors believed to be associated with health outcomes include collective income, poverty rates, employment opportunities, community investment, tax base and spending priorities for local tax dollars (2). On an individual-level, the opportunity to obtain a meaningful job

with few occupational hazards, address financial needs, and remain food secure are paramount to maintaining good health. Economic resources enable health purchasing power including the ability to attain resources to manage or control disease (4). Lack of economic opportunity can create a vicious cycle where children who grow up in poverty are less able to acquire the needed resources for health and are more likely to experience mental, emotional, and behavioral disorders as a result (5). The effects of coping with daily economic hardship can trigger a physical response which may damage immune defense, dysregulate physical processes, and accelerate aging or the onset of chronic disease (6,7).

The opportunity for a quality education is widely recognized as a leading influence of acquiring higher economic position and is associated with better health outcomes. Educational attainment is associated with improved working conditions and higher income, which in turn allows for improved housing, nutrition, control of hazards and stress, as well as direct health benefits from having quality health insurance, retirement benefits, and adequate sick leave (8). Educational attainment is also closely linked to improved health knowledge, literacy, and behaviors, all of which are associated with improved health awareness and disease management (8).

Environmental Conditions and Health

The "built environment", or physical structures and infrastructure of communities and homes, can profoundly impact the safety and lifestyle options of the residents (9). Neighborhood safety, desirable areas for physical activity, close proximity to providers of affordable and nutrient-dense foods such as fruits and vegetables, clean air, access to formal health services, transportation options, and affordable housing are all essential to helping individuals attain full and vibrant health. Conversely, a density of retailers selling tobacco and alcohol, the presence of deserted and rundown lots, and industrial pollution serve to diminish safety and health (1,8).

Physical inactivity, which increases the risk of diabetes, high blood pressure, and obesity, can be spurred by environmental conditions that produce fear and concern of victimization such as the presence of crime, or by a lack of well-kept sidewalks and walkability in neighborhoods (10). Children living in such physical environments are more likely to become overweight and obese (11). Communities with fewer physical assets and less desirable living conditions experience poorer overall health, including higher levels of depression, infant mortality, low birth weight, child maltreatment, and homicide rates (12). The built environment serves to mediate an individual's perceptions about the health opportunities available to them, their ability and likelihood of engaging in healthy behaviors and their ability to buffer toxic and stressful exposures.

Social Conditions and Health

Social conditions encompass the social relationships, family structure, and cultural dynamics within which defined groups of people function and interact (13) (14). The "acceptability" or "norms" for positive behaviors can also be developed within these networks, and may influence health-related behaviors (15). Social conditions also include social capital, which refers to the individual and communal time and energy available for community improvement, social networking, civic engagement, and other activities that create social bonds between individuals and groups (16). Social capital can be formed through an individual's level of trust and sharing within communities, while dense social networks and civic engagement provide structure for social capital (17). The presence of social capital, support, trust, and reciprocity have been associated with improved overall psychological well-being and improved perceptions of personal health (18).

Social conditions also encompass perceptions of community members about their social surroundings. Crime rates, housing patterns, and law enforcement policies can all influence a person's perceptions of the value and safety of their social environment, as well as their tendency to engage positively in their community (2). When social relationships or conditions breed an environment of fear, suspicion, discrimination, and/or racism, a chronic stress response may occur to the detriment of health (19, 20). Chronic stress can create long-term elevation in stress hormones, implicated in the development of anxiety, depression, digestive problems, heart disease, sleep problems, weight gain, and problems with memory and concentration (21). Encouragingly, however, positive social ties tend to naturally reduce the negative effects of stress in a person's life by encouraging more healthful behaviors and "buffering" stressful influences (22, 23).

This section presents data on educational attainment, employment, income, and housing status and the association of these factors with specific health outcomes.

Education

Education is a very general term used to refer to the experience and/or result of learning undertaken primarily in institutional settings such as schools and colleges (24). The number of years of schooling is often used as a measure of education, and is associated with income status.

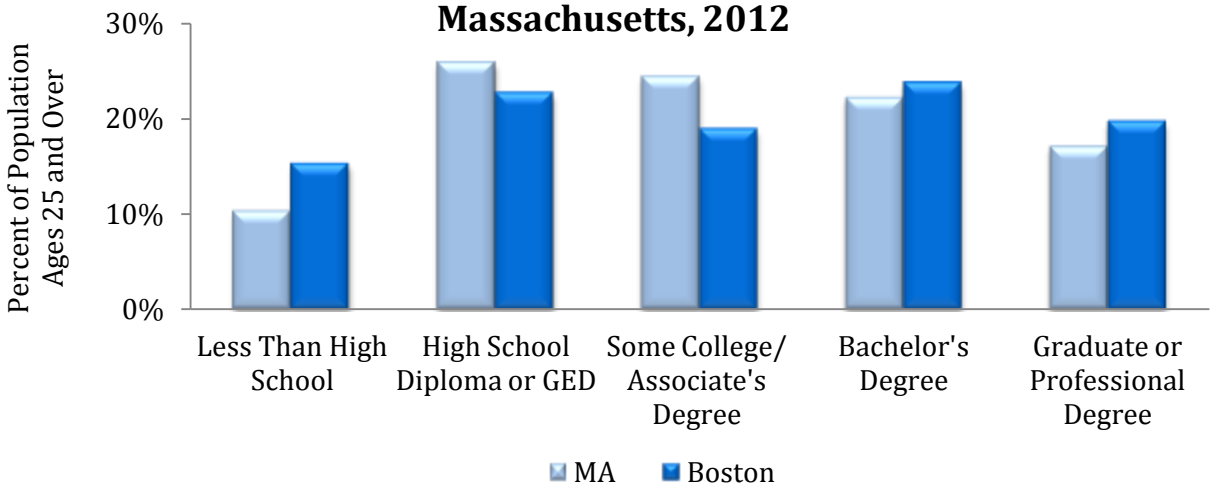
Education is associated with health in many ways. Higher educational attainment is associated with improved working conditions and income, which in turn allows for improved housing, nutrition, control of hazards and stress, as well as direct health benefits of quality health insurance, retirement benefits, and sick leave (8). Educational attainment is also closely linked to improved health knowledge, literacy, and behaviors, which are, in turn, associated with improved health awareness and disease management (8). Individuals with more years of formal education tend to have healthier behaviors and better health outcomes. Education also helps promote and sustain healthy lifestyles and positive choices that support and nurture personal development, relationships, and community well-being (25). Although educational attainment is associated with adult socioeconomic status (SES), many studies suggest that schooling has an important effect on health independent of SES (26).

Additionally, parental level of education attainment is a significant predictor of child health, with children of more highly educated parents having better overall health than children with less educated parents (27).

Despite Boston's reputation as an education hub, racial inequities in educational attainment exist. Data presented in this section show that a larger percentage of Black and Latino residents have fewer years of education than White residents. Inequities are also reflected in the graduation rates for males and females.

This section presents data on educational attainment and selected health indicators associated with educational attainment.

Figure 2.1 Educational Attainment, Boston and Massachusetts, 2012

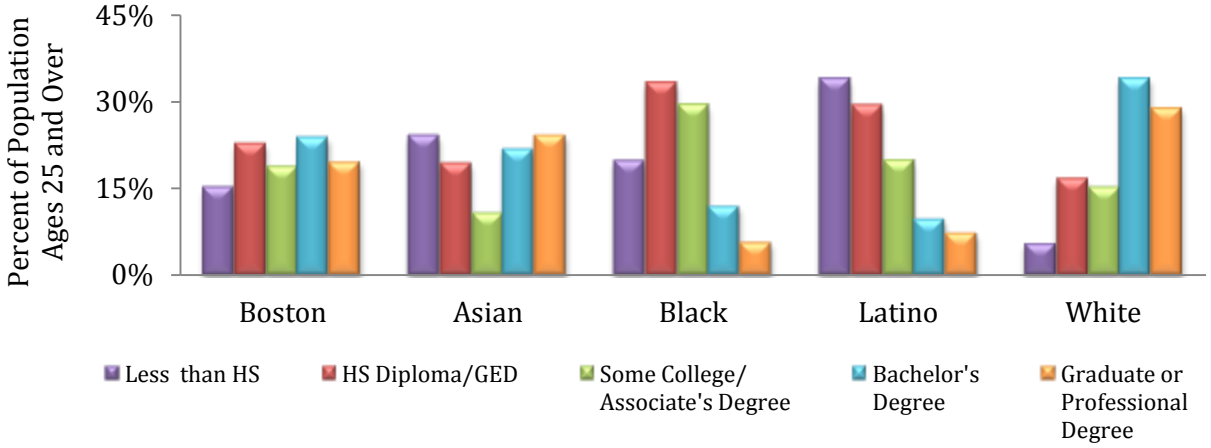


	Less than High School	High School Diploma or GED	Some College/ Associate's Degree	Bachelor's Degree	Graduate or Professional Degree
MA	10.3% (10.1-10.6)	25.9% (25.5-26.4)	24.4% (24.0-24.8)	22.2% (21.8-22.6)	17.1% (16.7-17.4)
Boston	15.2% (14.0-16.4)	22.6% (21.5-23.8)	18.8% (17.7-19.9)	23.7% (22.4-25.0)	19.6% (18.5-20.7)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, a higher percentage of Boston residents had less than a high school education than Massachusetts overall. Boston also had higher percentages of the population with a Bachelor's degree and graduate or professional degree. Lower percentages of Boston residents obtained a high school diploma/GED or completed some college or an associate's degree compared to Massachusetts residents.

Figure 2.2 Educational Attainment by Race/Ethnicity, 2010-2012

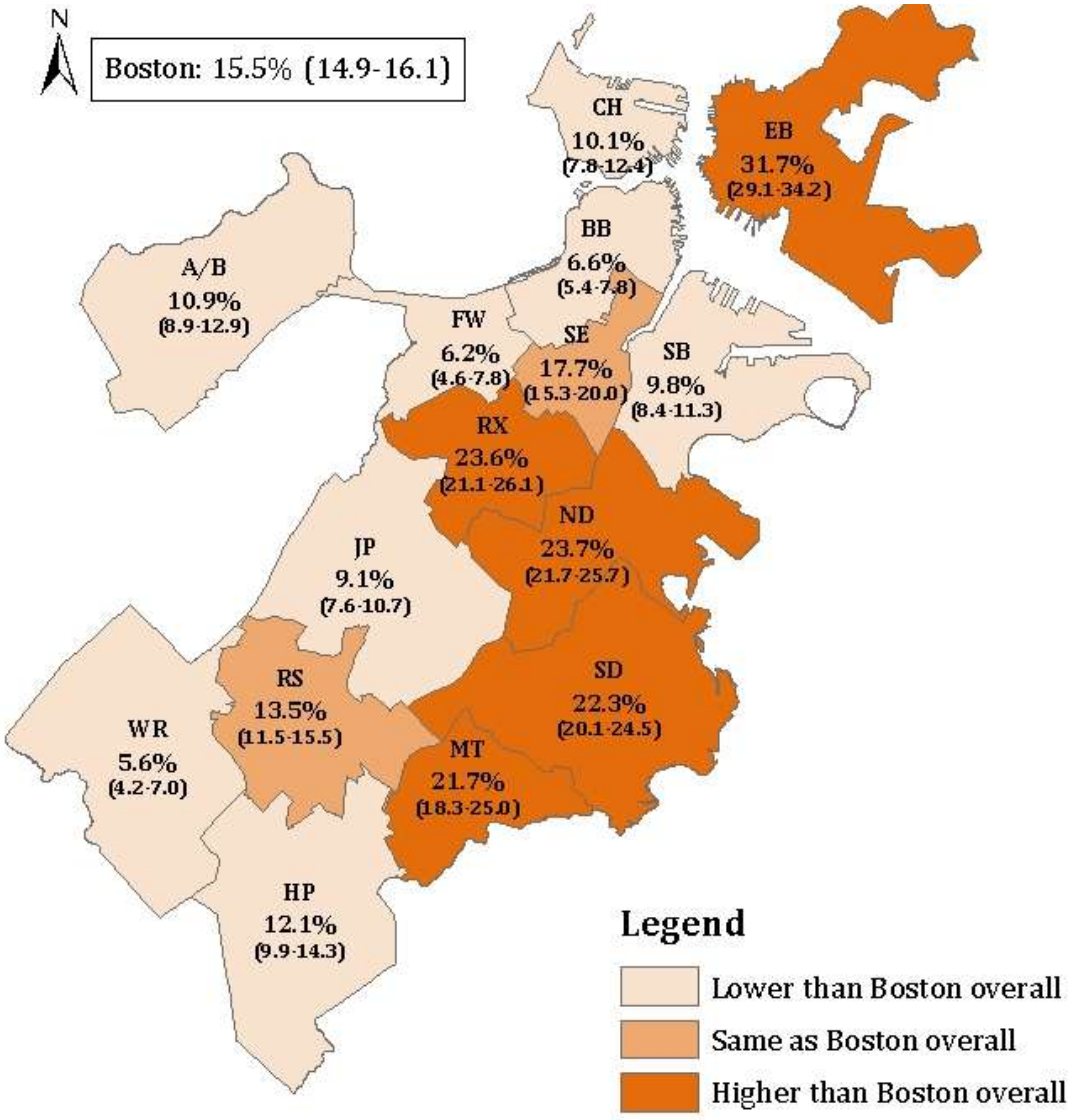


	Less than High School	High School Diploma or GED	Some College/ Associate's Degree	Bachelor's Degree	Graduate or Professional Degree
Boston	15.2% (14.4-16.0)	22.7% (21.9-23.5)	18.7% (18.1-19.3)	23.8% (23.0-24.6)	19.6% (19.0-20.2)
Asian	24.1% (21.0-27.2)	19.3% (16.6-22.0)	10.7% (8.7-12.7)	21.8% (19.4-24.2)	24.2% (21.0-27.4)
Black	19.8% (17.9-21.7)	33.2% (31.3-35.1)	29.3% (27.6-31.0)	11.9% (10.6-13.2)	5.7% (4.9-6.5)
Latino	33.9% (31.5-36.3)	29.3% (26.8-31.8)	19.8% (17.9-21.7)	9.7% (8.3-11.1)	7.3% (6.0-8.6)
White	5.5% (4.9-6.1)	16.7% (15.9-17.5)	15.1% (14.3-15.9)	34.0% (32.7-35.3)	28.9% (27.9-29.9)

DATA SOURCE: American Community Survey, 2010-2012, U.S. Census Bureau

During the period 2010-2012, there were racial/ethnic differences in educational attainment among Boston residents ages 25 and over. Higher percentages of Black and Latino residents had less than a high school diploma, a high school diploma or GED, and some college or associate's degree than White residents. A higher percentage of Asian residents also had less than a high school diploma than White residents. The percentage of Boston residents who attained a Bachelor's degree or graduate or professional degree was lower for Asian, Black, and Latino residents compared to White residents.

Figure 2.3 Percent of Population with Less than a High School Education by Neighborhood, 2008-2012 Combined

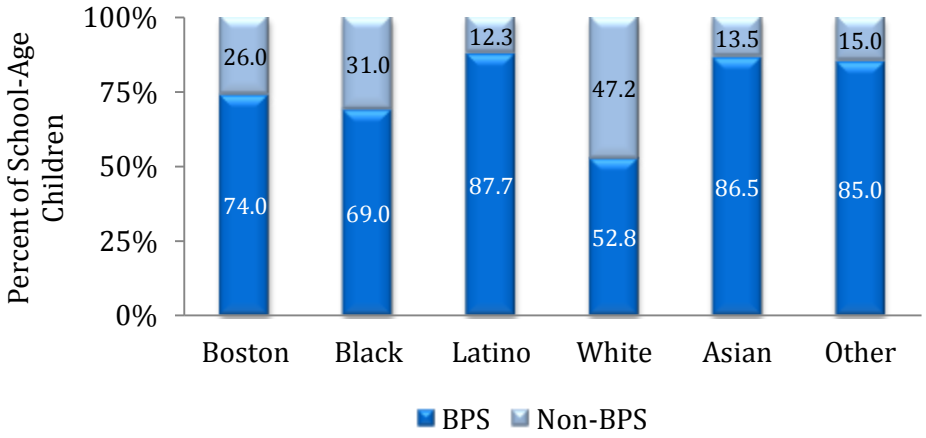


NOTE: Back Bay includes Beacon Hill, Downtown, the North End, and the West End. The South End includes Chinatown.

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

During the period 2008-2012, 16% of Boston residents had less than a high school diploma with percentages ranging from 6% in West Roxbury to 32% in East Boston. A higher percentage of residents from five Boston neighborhoods had less than a high school diploma compared to Boston overall. Those neighborhoods included East Boston, Mattapan, North Dorchester, Roxbury, and South Dorchester.

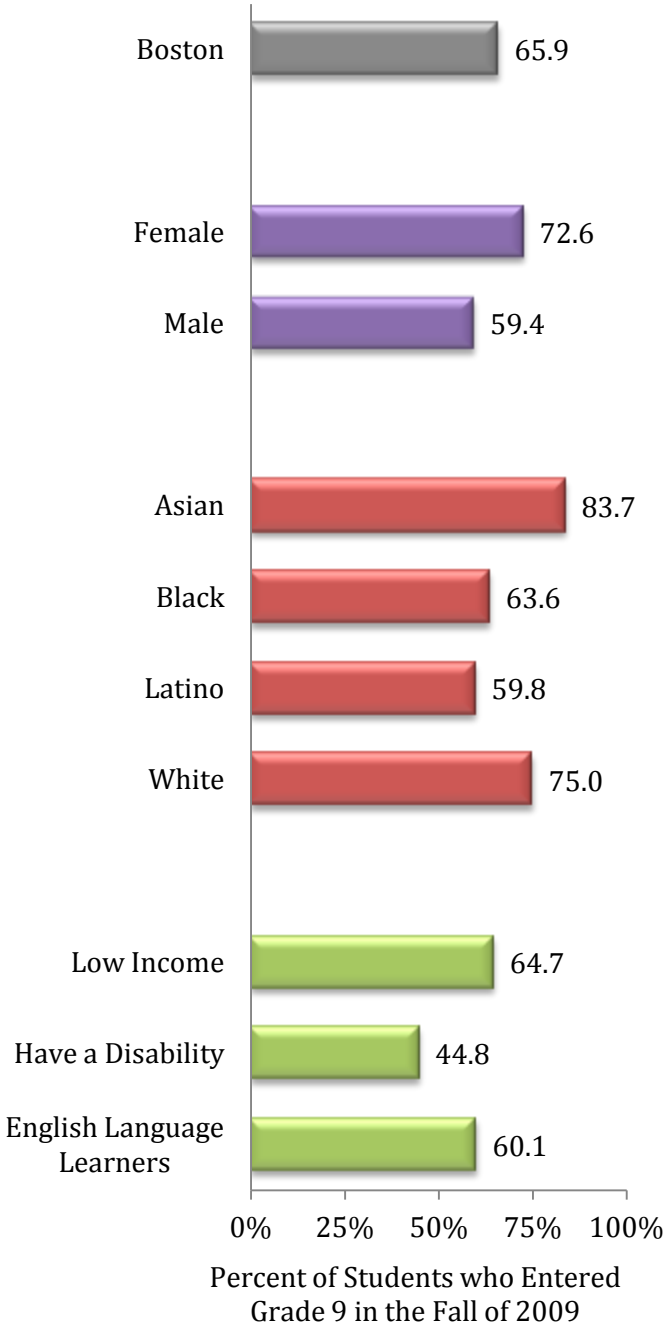
Figure 2.4 Boston School-Age Children Attending School by Type of School and Race/Ethnicity, 2012-2013



DATA SOURCE: Office of Data and Accountability, Boston Public Schools

Almost three-quarters of Boston school-age children attended Boston public schools during 2012-2013. Most Latino and Asian children attended Boston public schools, 88% and 87%, respectively. By comparison, only 53% of White children attended Boston public schools.

Figure 2.5 Boston Public Schools Four-Year High School Graduation Rates, 2013 Cohort

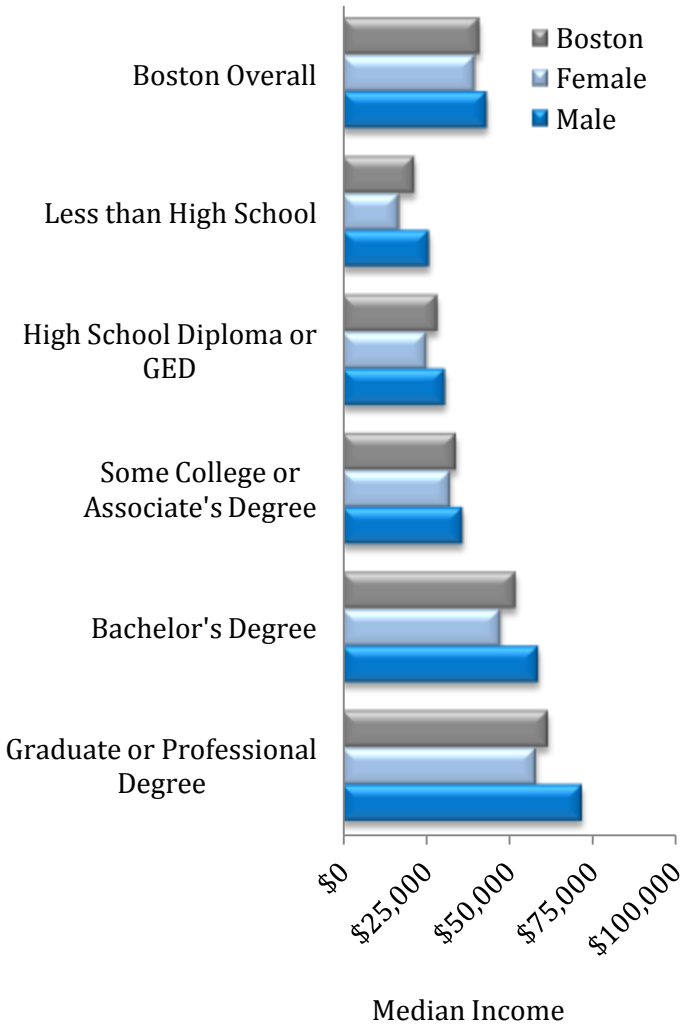


Overall, 66% of Boston public school students who entered Grade 9 in the fall of 2009 graduated in four years. Seventy-three percent of females graduated in four years, while only 59% percent of males graduated in four years. Eighty-four percent of Asian students graduated in four years compared to 60% of Latino students. Additionally, 45% of students with disabilities and 60% of English Language Learners graduated in the expected amount of time (four years).

NOTE: Five-year graduation rates were unavailable.

DATA SOURCE: Office of Data and Accountability, Boston Public Schools

Figure 2.6 Median Earnings by Educational Attainment and Gender, 2012



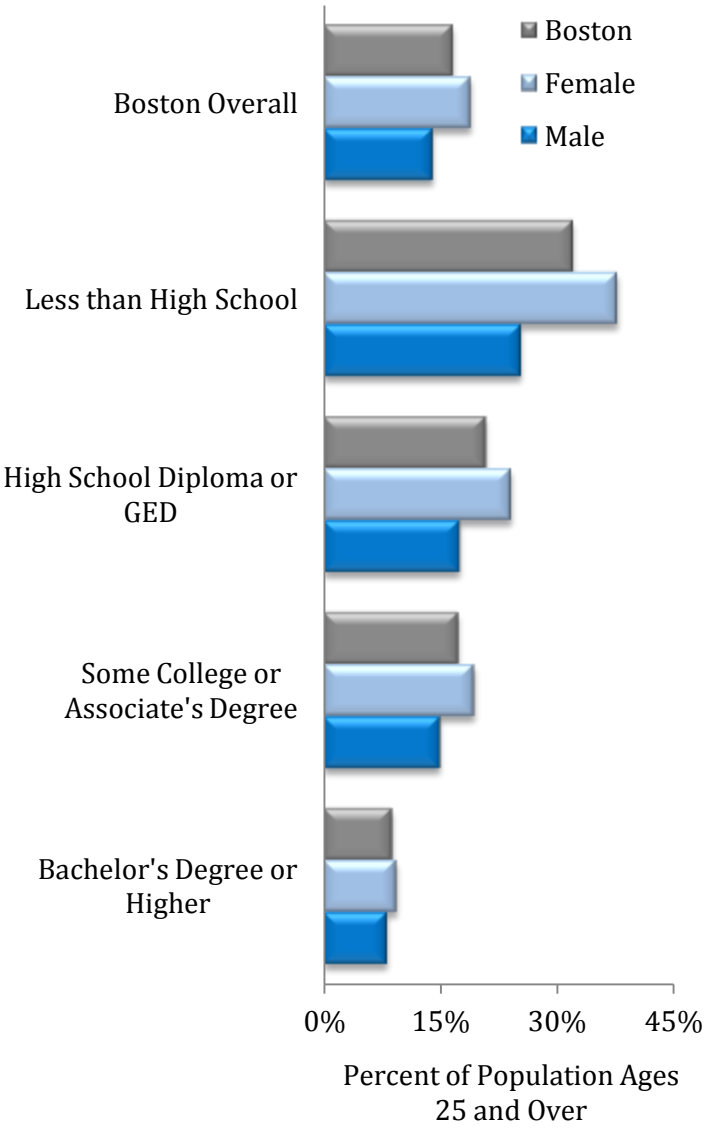
Median earnings of Boston residents ages 25 and over varied in 2012 by educational attainment and gender. Females with less than a high school diploma and those with a graduate or professional degree had lower earnings than males with the same educational attainment.

	Boston	Female	Male
Boston Overall	$41,192 (40,426-41,958)	$39,791 (38,010-41,572)	$43,307 (38,964-47,650)
Less than High School	$21,729 (20,029-23,429)	$17,029 (13,700-20,358)	$26,050 (22,975-29,125)
High School Diploma or GED	$28,600 (25,149-32,051)	$25,260 (21,400-29,120)	$30,904 (29,285-32,523)
Some College or Associate's Degree	$34,232 (31,494-36,970)	$32,392 (29,822-34,962)	$36,040 (32,232-39,848)
Bachelor's Degree	$52,119 (50,321-53,917)	$47,455 (43,856-51,054)	$58,758 (52,388-65,128)
Graduate or Professional Degree	$61,797 (59,522-64,072)	$58,186 (54,088-62,284)	$71,806 (64,954-78,658)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, the percentage of Boston residents ages 25 and over who lived below the poverty level varied by educational attainment and gender. Compared to males, higher percentages of female residents overall, as well as those with less than a high school diploma, and those with a high school diploma or GED lived in poverty.

Figure 2.7 Poverty Status by Educational Attainment and Gender, 2012



	Boston	Female	Male
Boston Overall	16.6% (15.2-17.9)	18.9% (17.2-20.6)	14.0% (12.3-15.7)
Less than High School	32.0% (28.3-35.7)	37.7% (32.1-43.3)	25.3% (20.7-29.8)
High School Diploma or GED	20.8% (17.9-23.8)	24.1% (19.4-28.8)	17.4% (14.0-20.9)
Some College or Associate's Degree	17.3% (14.9-19.7)	19.3% (16.3-22.4)	14.9% (11.2-18.7)
Bachelor's Degree or Higher	8.8% (7.5-10.1)	9.4% (7.7-11.1)	8.1% (6.1-10.1)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

Figure 2.8 Health Indicators by Educational Attainment, 2012 and 2013				
	Year	**Less than High School**	**High School Diploma or GED**	**Some College/ Bachelor's Degree or Higher**
Low Birthweight Births	2012	9.8%	9.9%	7.7%
Preterm Births	2012	10.3%	10.1%	9.3%
Asthma*	2013	12.5% (8.1-18.7)	11.7% (8.8-15.5)	9.3% (7.7-11.2)
Diabetes*	2013	3.8% † (2.4-5.9)	3.7% † (2.4-5.7)	2.4% (1.7-3.4)
Hypertension*	2013	30.1% † (22.9-38.5)	17.1% † (14.3-20.4)	16.0% (13.9-18.2)
Obesity*	2013	22.0% (16.7-28.4)	24.9% † (21.0-29.2)	18.6% (16.5-20.9)
Persistent Anxiety*	2013	27.1% † (20.5-34.9)	16.5% (12.8-20.9)	18.7% (16.6-21.1)
Persistent Sadness*	2013	19.1% † (13.7-26.0)	13.9% † (10.4-18.5)	9.8% (8.2-11.6)

*Adjusted for age, race/ethnicity and gender.

†Model tested comparison to reference group (Some College/Bachelor's Degree or Higher) is statistically significant ($p<0.05$).

DATA SOURCES: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission and Boston resident live births, Massachusetts Department of Public Health.

The above table presents select health indicators by educational attainment. After adjusting for differences in age, race/ethnicity and gender, rates of these adverse health outcomes tend to decrease with increased educational attainment. Those who received less than a high school education were more likely to report diabetes, persistent sadness, hypertension and persistent anxiety compared to those receiving at least some college level education. Those who received a high school education were more likely to report diabetes and persistent sadness and were more likely to be obese compared to those receiving at least some college education.

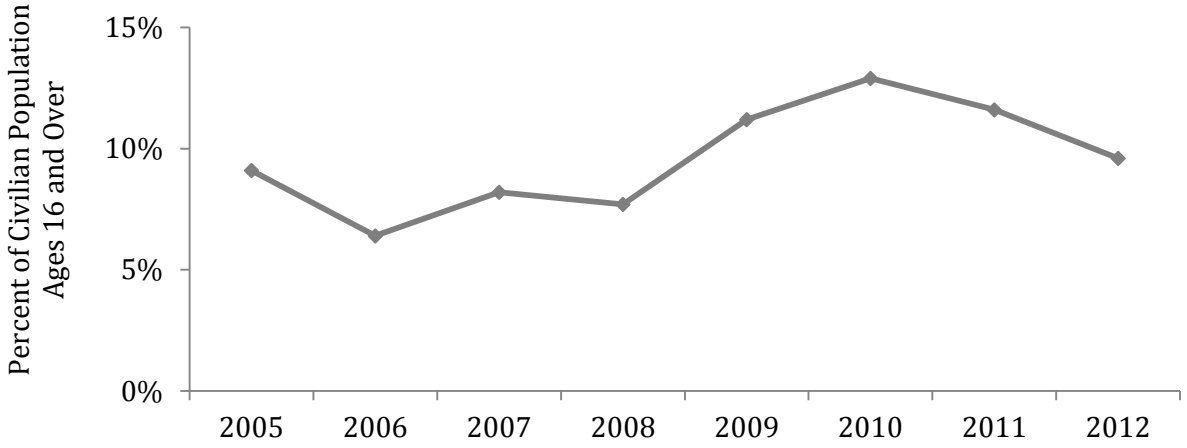
Employment

On average, American adults spend more than half of their waking hours at work (38). For millions of Americans, a stable job in safe working conditions provides several benefits critical to maintaining good health, such as income, health insurance, and stability (39).

Employment is associated with income and is part of an individual's and community's socioeconomic status. Being employed makes it easier for workers to live in healthy neighborhoods, provide quality education for their children, secure child care services, and buy healthy foods (39). Unemployed Americans face numerous health challenges beyond loss of income. It has been well documented that perceived health (self reported excellent, good, or poor health) and physical functioning decrease with age. However, research indicates that these declines are more gradual among individuals with full-time employment (40). In terms of mental health, a 2010 Gallup Poll found that unemployed Americans were more likely than employed Americans to be diagnosed with depression and report feelings of sadness and worry (39).

In 2010, Boston supplied an estimated 652,180 jobs, approximately one out of every five jobs in Massachusetts and one out of every thirteen jobs in New England (41). The number of Boston-based jobs exceeds the resident labor force by more than double; this means that many who work in Boston do not actually live in the city (41). This section presents data on unemployment and the association between selected health indicators and employment status.

Figure 2.9 Unemployment Rate by Year



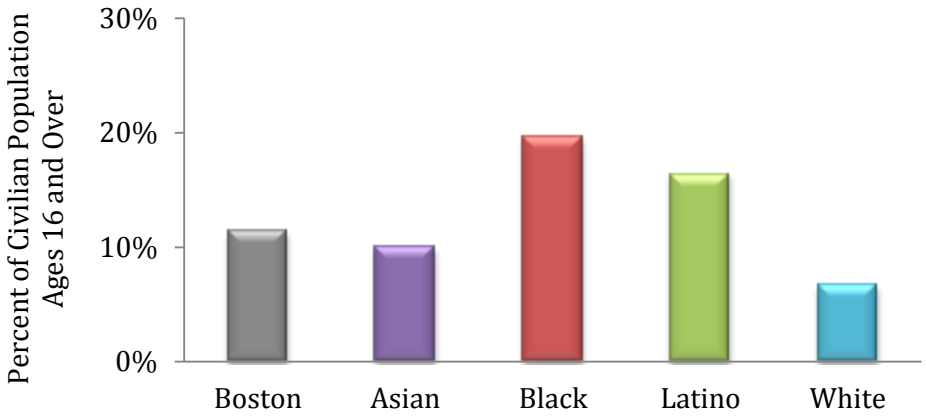
2005	2006	2007	2008	2009	2010	2011	2012
9.1% (7.9-10.3)	6.4% (5.6-7.2)	8.2% (7.0-9.4)	7.7% (6.6-8.8)	11.2% (9.8-12.6)	12.9% (11.8-14.0)	11.6% (10.4-12.8)	9.6% (8.6-10.6)

DATA SOURCE: American Community Survey, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, U.S. Census Bureau

Since 2005, the unemployment rate for Boston was highest in 2010 (13%). Rates decreased in 2011 and 2012.

For the years 2010-2012 combined, the unemployment rate in Boston was 11%. Black, Latino, and Asian residents had higher unemployment rates compared to White residents during the same time period.

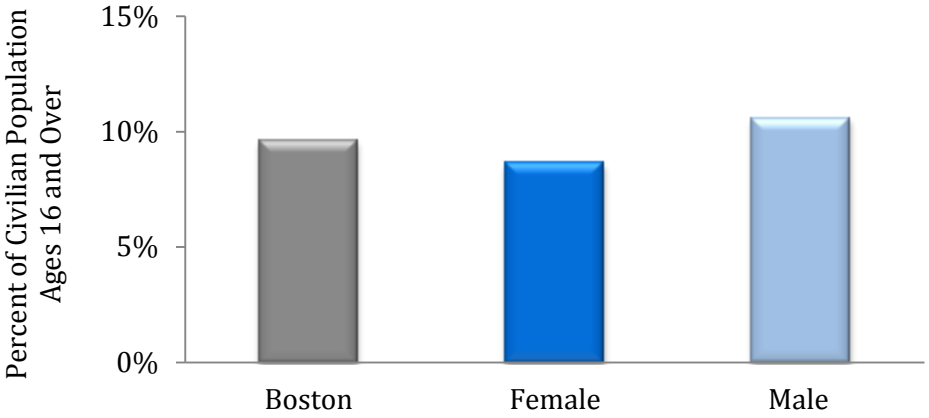
Figure 2.10 Unemployment Rate by Race/Ethnicity, 2010-2012 Combined



Boston	Asian	Black	Latino	White
11.4% (10.8-12.0)	10.0% (7.7-12.3)	19.6% (17.8-21.4)	16.4% (14.4-18.4)	6.7% (6.0-7.4)

DATA SOURCE: American Community Survey, 2010-2012, U.S. Census Bureau

Figure 2.11 Unemployment by Gender, 2012

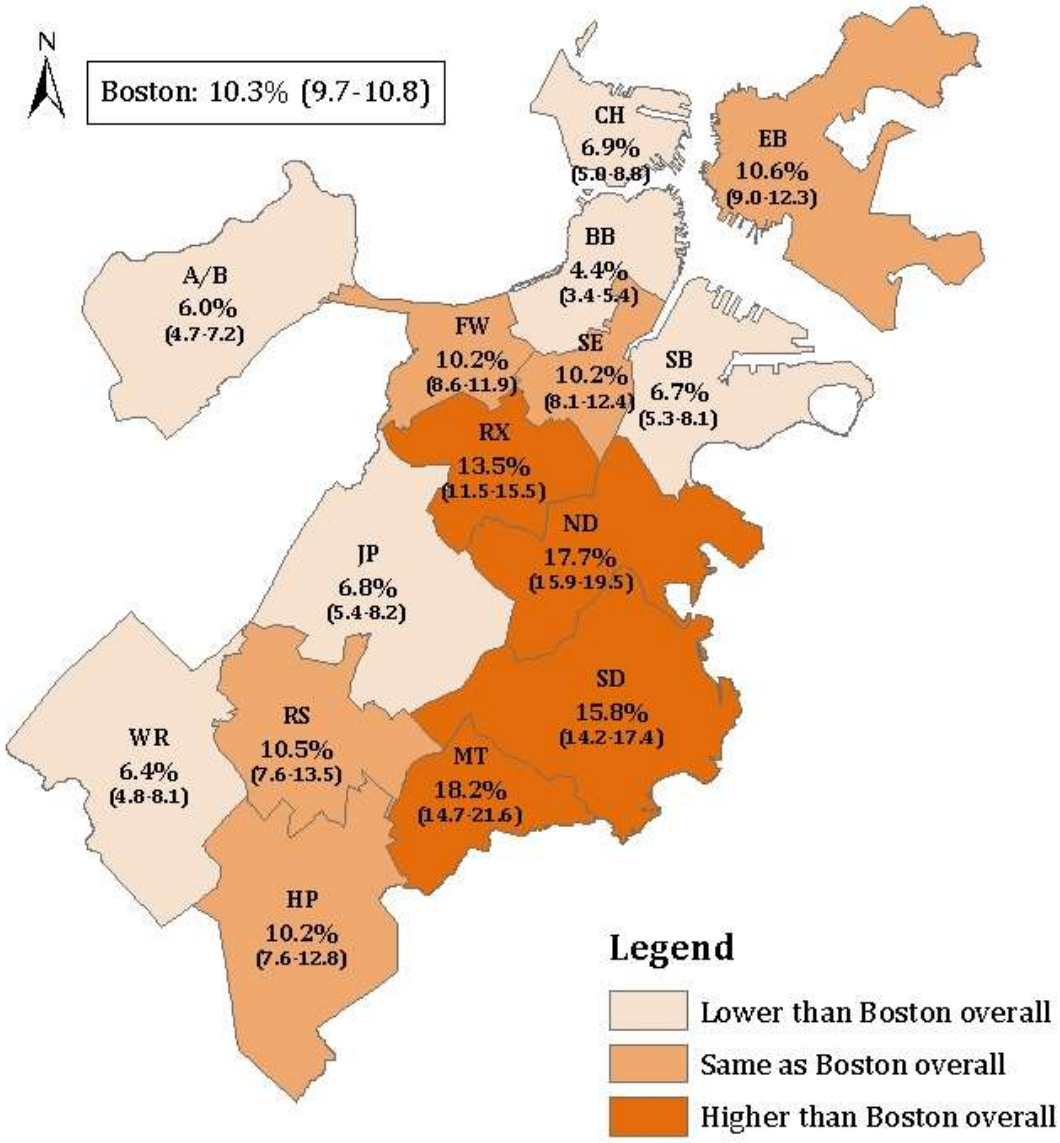


In 2012, Boston's unemployment rate was 10%. Compared to male residents, females had a lower unemployment rate.

Boston	Female	Male
9.6% (8.6-10.6)	8.6% (7.3-9.9)	10.6% (9.2-12.0)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

Figure 2.12 Unemployment Rate by Neighborhood, 2008-2012 Combined

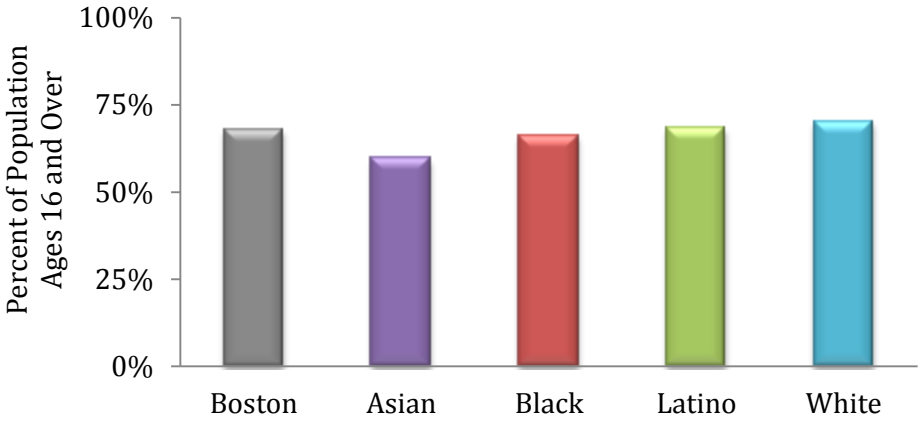


NOTE: Back Bay includes Beacon Hill, Downtown, the North End, and the West End. The South End inc ludes Chinatown.

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

During the time period 2008 to 2012, Boston's unemployment rate was 10%. Although rates for Allston/Brighton, Back Bay, Charlestown, Jamaica Plain, South Boston and West Roxbury were lower compared to the rate for Boston, rates were higher for Mattapan, North Dorchester, Roxbury, and South Dorchester.

Figure 2.13 Labor Force Participation Rate by Race/Ethnicity, 2010-2012 Combined



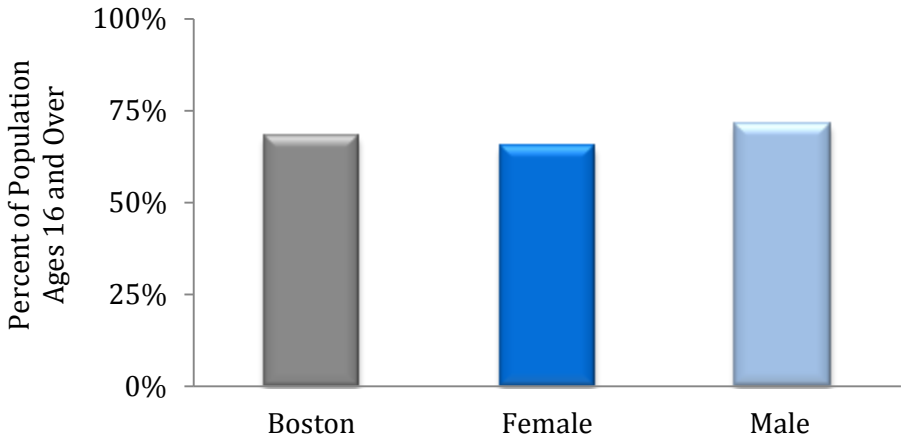
Boston	Asian	Black	Latino	White
67.9% (67.3-68.5)	59.7% (57.7-61.7)	66.3% (64.6-68.0)	68.5% (66.7-70.3)	70.2% (69.4-71.0)

DATA SOURCE: American Community Survey, 2010-2012, U.S. Census Bureau

The estimated Labor Force Participation Rate (LFPR) was 68% for Boston during the time period 2010 to 2012 combined. Asian and Black residents had lower LFPR compared to White residents in the same time period.

Figure 2.14 Labor Force Participation by Gender, 2012

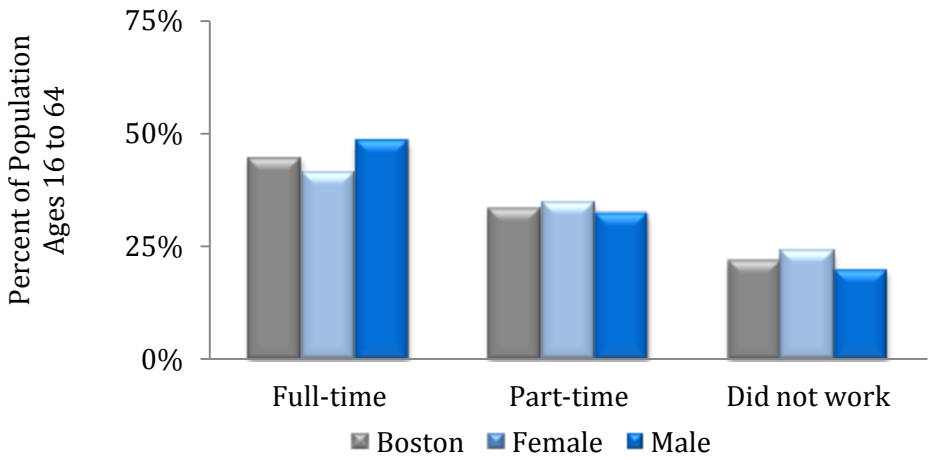
In 2012, the estimated Labor Force Participation Rate was lower for females compared to males.



Boston	Female	Male
67.9% (67.3-68.5)	65.3% (63.7-66.9)	71.1% (69.6-72.7)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

Figure 2.15 Employment Status by Gender, 2012

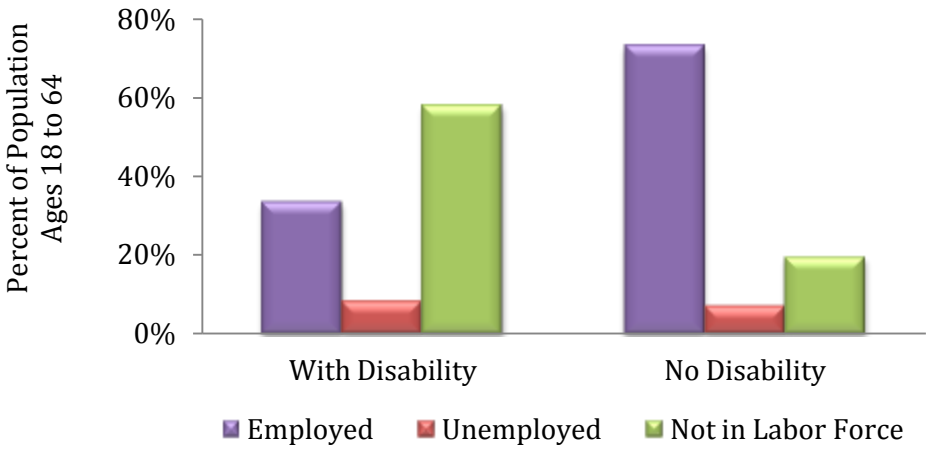


	Full-time	Part-time	Did not work
Boston	44.6% (43.3-45.9)	33.5% (32.3-34.7)	21.9% (20.8-23.1)
Female	41.2% (39.6-42.9)	34.7% (33.0-36.3)	24.1% (22.5-25.6)
Male	48.2% (46.6-49.8)	32.2% (30.4-33.9)	19.7% (18.1-21.2)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, 45% of Boston residents worked full-time, 34% worked part-time, and 22% did not work. Compared to males, a lower percentage of females worked full-time while a higher percentage of females worked part-time or did not work.

Figure 2.16 Employment Status by Disability Status, 2012

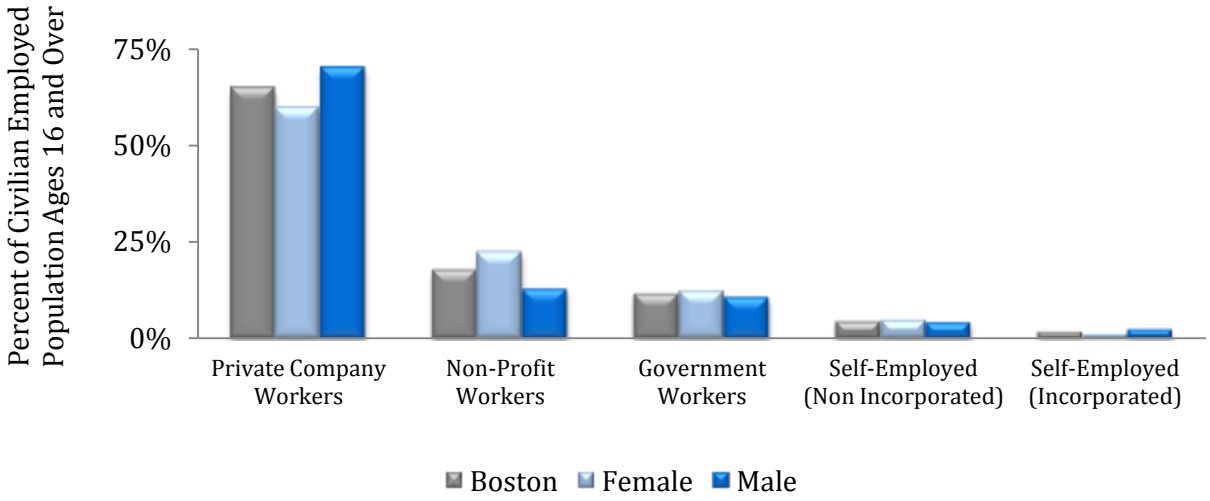


	Employed	Unemployed	Not in Labor Force
No Disability	73.4% (71.6-75.2)	7.0% (6.2-7.8)	19.6% (18.5-20.7)
Have a Disability	33.6% (29.4-37.8)	8.2% (5.9-10.6)	58.2% (53.6-62.7)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, a lower percentage of Boston residents with a disability were employed compared to residents with no disability. For the same year, a higher percentage of residents with a disability were not in the labor force compared to residents without a disability.

Figure 2.17 Class of Worker by Gender, 2012

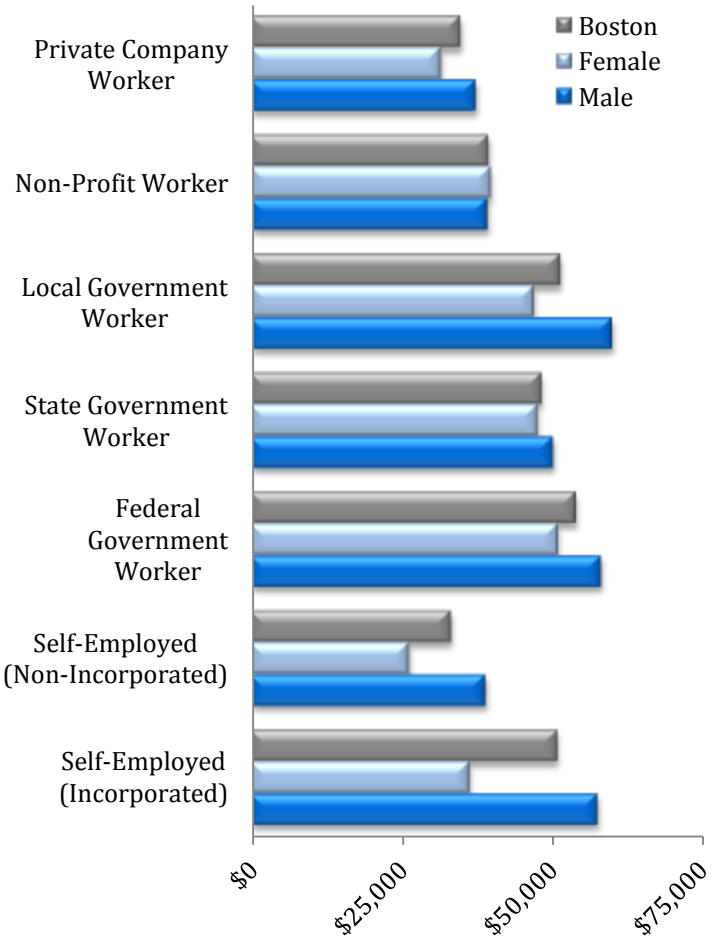


	Boston	Female	Male
Private Company Workers	64.9% (63.1-66.7)	59.7% (57.2-62.2)	70.2% (67.8-72.7)
Non-Profit Workers	17.7% (16.5-18.8)	22.4% (20.7-24.1)	12.8% (11.3-14.3)
Government Workers	11.5% (10.5-12.5)	12.2% (10.8-13.7)	10.7% (9.3-12.0)
Self-Employed (Non-Incorporated)	4.3% (3.5-5.1)	4.6% (3.3-5.9)	4.1% (3.1-5.0)
Self-Employed (Incorporated)	1.6% (1.2-2.0)	1.0% (0.6-1.4)	2.2% (1.4-3.0)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, the majority of Boston residents were employed by private companies. However, a lower percentage of those residents were females as compared to males. A higher percentage of females worked for non-profit companies as compared to males. A lower percentage of females were self-employed (incorporated) compared to males.

Figure 2.18 Median Income by Type of Work and Gender, 2012



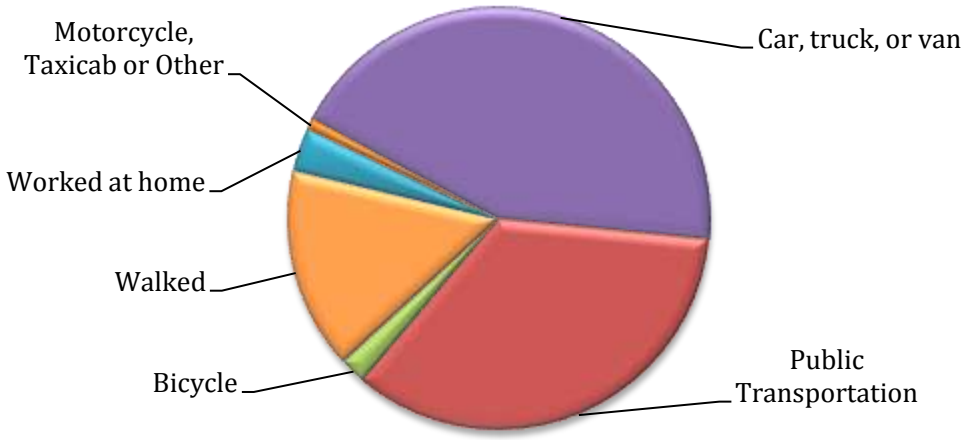
Percent of Civilian Employed Population Ages 16 and Over

Boston residents working for the federal government had the highest median income in 2012 ($54,008). Females working for a private company or the local government had lower median incomes compared to males.

	Boston	Female	Male
Private Company Worker	$34,847 (33,009-36,685)	$31,479 (29,854-33,104)	$37,377 (33,176-41,578)
Non-Profit Worker	$39,476 (36,989-41,963)	$39,719 (35,853-43,585)	$39,282 (35,979-42,585)
Local Government Worker	$51,388 (48,400-54,376)	$46,898 (41,005-52,791)	$60,032 (49,099-70,965)
State Government Worker	$48,263 (42,144-54,382)	$47,480 (41,901-53,059)	$50,179 (30,241-70,117)
Federal Government Worker	$54,008 (42,630-65,386)	$50,868 (34,483-67,253)	$58,138 (41,761-74,515)
Self-Employed (Non-Incorporated)	$33,223 (20,376-46,070)	$26,183 (12,582-39,784)	$38,991 (30,259-47,723)
Self-Employed (Incorporated)	$50,894 (40,457-61,331)	$36,207 (23,594-48,820)	$57,583 (37,000-78,166)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

Figure 2.19 Workers' Means of Transportation to Work, 2012

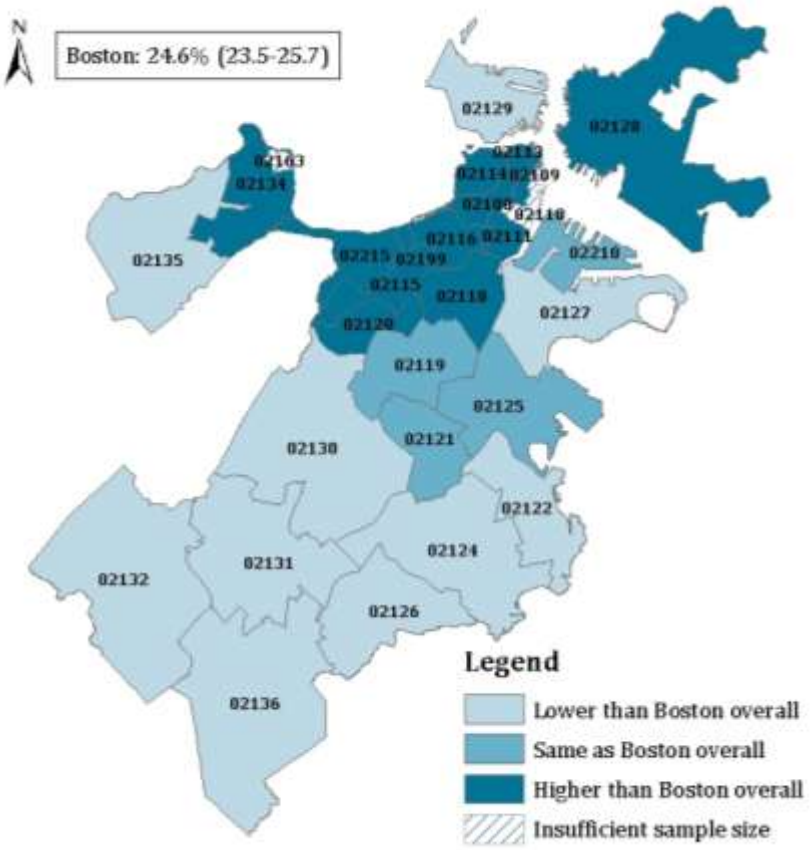


Car, truck or van	43.8% (42.3-45.3)
Public Transportation	34.6% (33.0-36.3)
Bicycle	2.0% (1.5-2.5)
Walked	15.5% (14.2-16.7)
Worked at Home	3.3% (2.6-3.9)
Motorcycle, Taxicab or Other	0.8% (0.5-1.2)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, 44% of Boston's employed residents drove to work in a car, truck, or van. Thirty-five percent of working residents relied on public transportation and 16% walked to work.

Figure 2.20 Zero-Vehicle Households by Neighborhood, 2008-2012 Combined



During the combined years of 2008-2012, 25% of Boston households had a vehicle. A higher percentage of households in zip codes 02108, 02109, 02111, 02113, 02114, 02115, 02116, 02118, 02120, 02128, 02134, 02199, and 02215 did not have a vehicle compared to Boston households overall. However, a lower percentage of households in zip codes 02122, 02124, 02126, 02127, 02129, 02130, 02131, 02132, 02135 and 02136 did not have a vehicle compared to Boston overall.

Neighborhood	Zip Code	Zero Vehicle Households
Boston		24.6% (23.5-25.7)
Allston/ Brighton	02134	33.9% (28.3-39.5)
	02135	20.9% (17.4-24.4)
	02163	*
Back Bay (Beacon Hill, Downtown, West End)	02108	59.5% (46.9-72.1)
	02109	44.5% (35.2-53.8)
	02110	*
	02114	54.7% (49.0-60.4)
	02116	33.9% (29.6-38.2)
	02199	46.3% (26.9-65.7)
Charlestown	02129	14.1% (10.3-17.9)
East Boston	02128	30.4% (26.2-34.6)
Fenway	02115	54.1% (46.8-61.4)
	02215	21.6% (18.1-25.1)
Hyde Park	02136	5.5% (3.5-7.5)
Jamaica Plain	02130	17.6% (13.9-21.3)
Mattapan	02126	17.1% (11.7-22.5)
North Dorchester	02121	27.1% (21.5-32.7)
	02125	55.9% (50.9-60.9)
North End	02113	63.9% (57.2-70.6)
Roslindale	02131	8.7% (6.4-11.0)
Roxbury	02119	21.6% (16.7-26.5)
	02120	51.5% (42.3-60.7)
South Boston	02127	17.5% (13.9-21.1)
	02210	23.1% (12.6-33.6)
South Dorchester	02122	16.9% (12.5-21.3)
	02124	16.4% (13.1-19.7)
South End	02111	44.7% (34.2-55.2)
	02118	31.5% (26.9-36.1)
West Roxbury	02132	2.1% (1.0-3.2)

* Insufficient sample size

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

Figure 2.21 Health Indicators by Employment Status, 2013			
	Employed	**Out of Work**	**Other†**
Asthma*	8.6% (7.1-10.5)	10.5% (7.1-15.2)	13.3% ‡ (10.3-17.0)
Diabetes*	1.9% (1.3-2.8)	3.6% ‡ (2.2-5.8)	4.7% ‡ (3.2-6.8)
Hypertension*	14.5% (12.5-16.7)	18.2% (13.0-24.9)	25.5% ‡ (21.6-29.9)
Obesity*	17.1% (15.1-19.4)	29.3% ‡ (23.0-36.6)	23.8% ‡ (20.1-28.1)
Persistent Anxiety*	16.2% (14.0-18.7)	25.6% ‡ (19.7-32.5)	23.9% ‡ (20.0-28.3)
Persistent Sadness*	8.1% (6.5-10.1)	19.0% ‡ (13.8-25.6)	17.1% ‡ (13.7-21.1)

*Adjusted for age, race/ethnicity and gender

†Includes homemakers, students, retirees and those unable to work

‡Model tested comparison to reference group (Employed) is statistically significant ($p<0.05$).

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

The above table presents select health indicators by employment status. After adjusting for age, race/ethnicity and gender, the prevalence of these health conditions tends to be higher among those who are out of work and among the other non-employed group (homemakers, students, retirees and those unable to work) compared to those who were employed. Adults who were out of work were more likely to report diabetes, persistent anxiety and persistent sadness and were more likely to be obese. Adults among the other non-employed group were significantly more likely to report asthma, diabetes, hypertension, persistent sadness and persistent anxiety and were more likely to be obese as well.

Income & Poverty

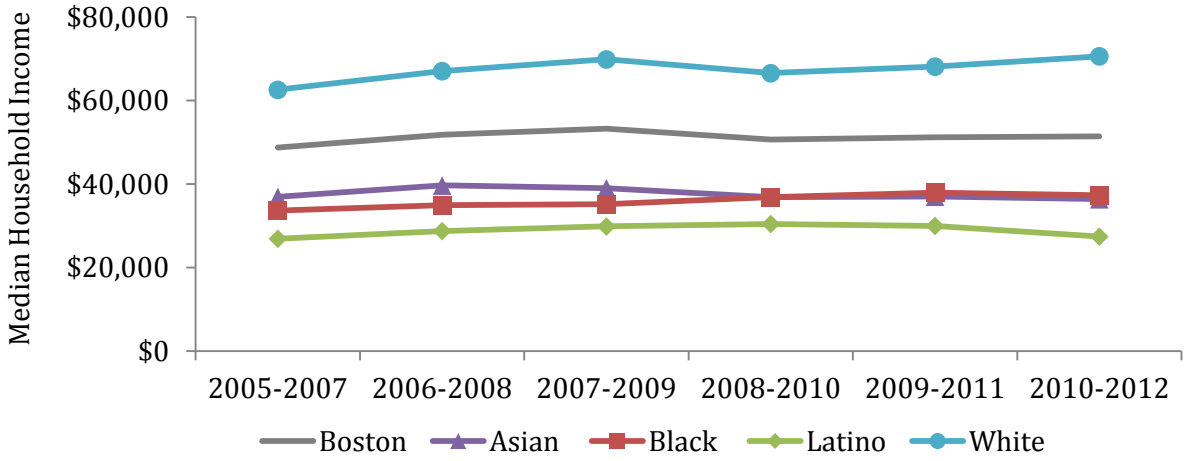
The Gini index represents the distribution of income in a population (0=perfect equality or a situation in which everyone has the same income; 1= perfect inequality or where income is concentrated in the hands of one or a few) (28). As a general rule, an index between 0.5 and 0.7 translates to a high level of unequal income distribution or income inequality. The degree of income inequality in Boston is striking: in 2012 the Gini index was 0.54.

In 2012, the official poverty rate in the United States was 15.9%, while in Boston, it was 21.6% with significant geographic variation [see poverty map in this section] (29). Poverty thresholds vary by family size and composition. For example, a family of four with two children and two adults has a poverty threshold of $23,283, while a single person under the age of 65 has a poverty threshold of $11,945. Residents living at or below poverty have a difficult time making ends meet. Working for forty hours a week at minimum wage ($8), an individual will earn only $16,640 annually (30). The gap between the current minimum wage and what is considered necessary to support a family makes it difficult for Boston's lowest-earning families to enjoy the same resources and financial safety net as higher-income individuals.

The cumulative effects of poverty are powerful predictors of poor health outcomes, often explained by a combination of environmental factors, social pressures, and influences on personal behavior. Poverty leads to chronic stress, which has been associated with poor health outcomes, and may encourage adverse coping behaviors such as tobacco use and excessive alcohol consumption. Chronic diseases such as diabetes have been shown to be associated with income (31); individuals making less than $25,000 are two and half times more likely to develop diabetes than those with incomes over $50,000. Those living below the poverty line, especially children, are more likely to develop asthma symptoms (32). Inequities in HIV/AIDS death rates between socioeconomic groups is partly attributed to higher rates of risk behavior, depression and impaired access to antiretroviral therapy (33, 34).

This section presents data on household income, poverty, and food insecurity in Boston, and the association between income and selected health indicators.

Figure 2.22 Median Household Income by Race/Ethnicity and Year (3 Year Estimates)

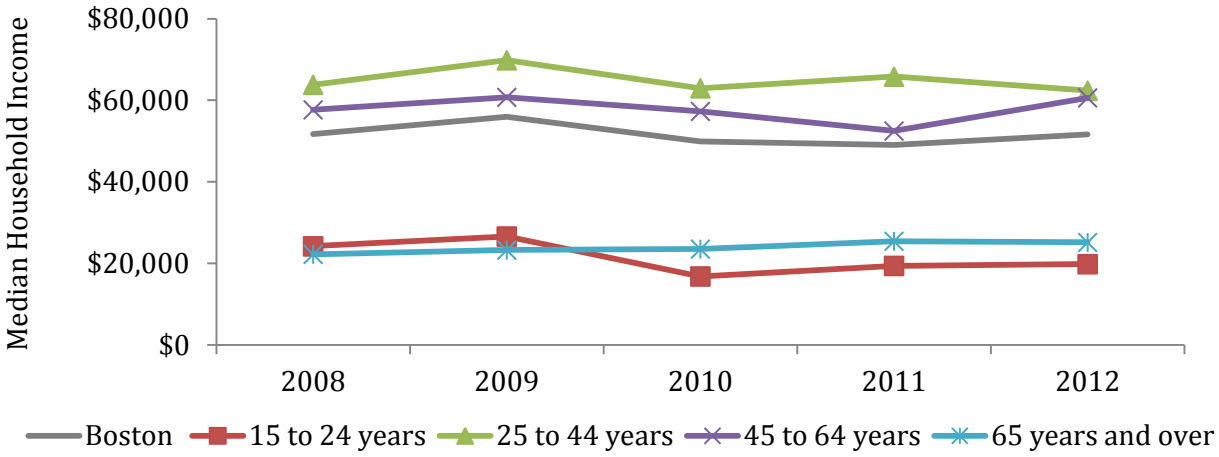


	Boston	Asian	Black	Latino	White
2005-2007	$48,729 (46,980-50,478)	$36,937 (32,901-40,973)	$33,702 (31,523-35,881)	$26,947 (23,647-30,247)	$62,605 (60,205-65,005)
2006-2008	$51,849 (50,662-53,036)	$39,691 (36,491-42,891)	$34,985 (32,223-37,747)	$28,793 (26,185-31,401)	$67,087 (64,587-69,587)
2007-2009	$53,324 (51,993-54,655)	$39,031 (34,798-43,264)	$35,197 (33,443-36,951)	$29,886 (27,714-32,058)	$69,890 (67,806-71,974)
2008-2010	$50,710 (49,613-51,807)	$36,889 (33,035-40,743)	$36,922 (34,719-39,125)	$30,485 (28,000-32,970)	$66,583 (64,759-68,407)
2009-2011	$51,230 (49,949-52,511)	$37,027 (31,960-42,094)	$37,974 (35,929-40,019)	$30,019 (27,069-32,969)	$68,162 (65,923-70,401)
2010-2012	$51,452 (50,016-52,888)	$36,419 (32,393-40,445)	$37,385 (34,509-40,261)	$27,461 (23,061-31,861)	$70,644 (67,809-73,479)

DATA SOURCE: American Community Surveys, 2005-2007, 2006-2008, 2007-2009, 2008-2010, 2009-2011, 2010-2012, U.S. Census Bureau

Racial/ethnic group differences were observed for median household income of Boston residents. For combined years of 2010-2012, Asian, Black, and Latino resident households had lower median household income compared to White resident households.

Figure 2.23 Median Household Income by Age and Year

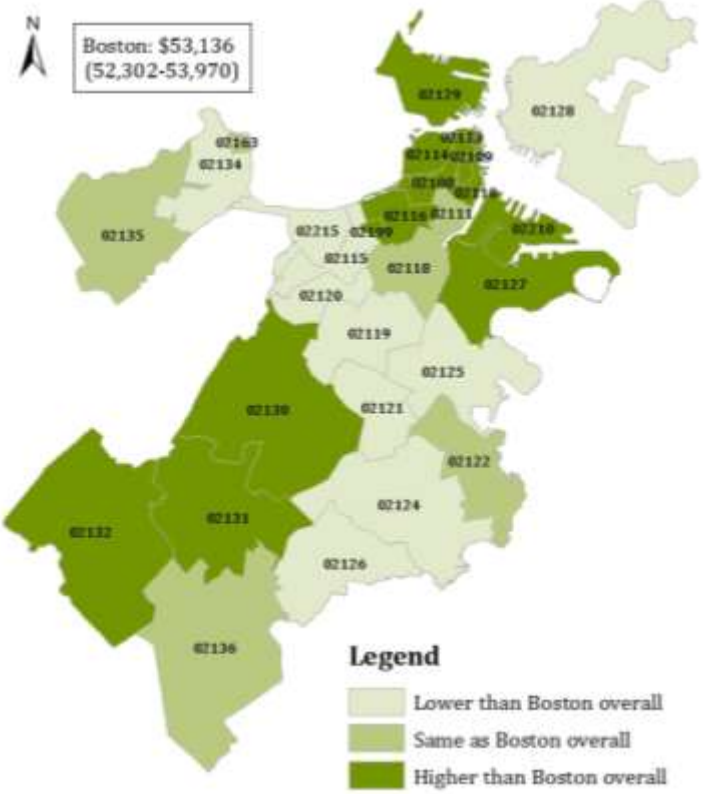


	Boston	15 to 24 years	25 to 44 years	45 to 64 years	65 years and over
2008	$51,688 (50,174-53,202)	$24,201 (17,190-31,212)	$63,831 (58,653-69,009)	$57,685 (50,602-64,768)	$22,225 (19,706-24,744)
2009	$55,979 (52,794-59,164)	$26,611 (18,828-34,394)	$69,853 (65,263-74,443)	$60,759 (55,757-65,761)	$23,257 (19,835-26,679)
2010	$49,893 (46,983-52,803)	$16,804 (10,925-22,683)	$62,982 (59,589-66,375)	$57,302 (50,443-64,161)	$23,520(18,916-28,124)
2011	$49,081 (45,887-52,275)	$19,398 (15,613-23,183)	$65,824 (60,913-70,735)	$52,492 (48,966-56,018)	$25,443 (22,041-28,845)
2012	$51,642 (49,663-53,621)	$19,826 (15,352-24,300)	$62,364 (56,631-68,097)	$60,617 (56,071-65,163)	$25,155(20,502-29,808)

DATA SOURCE: American Community Survey, 2008, 2009, 2010, 2011, 2012, U.S. Census Bureau

In 2012, the estimated median household income of Boston residents was $51,642. Compared to households in which the head of household was 25-44 years of age, households with the head of household ages 15-24 and 65 years and over had lower median household income in 2012.

Figure 2.24 Median Household Income by Zip Code, 2008-2012 Combined

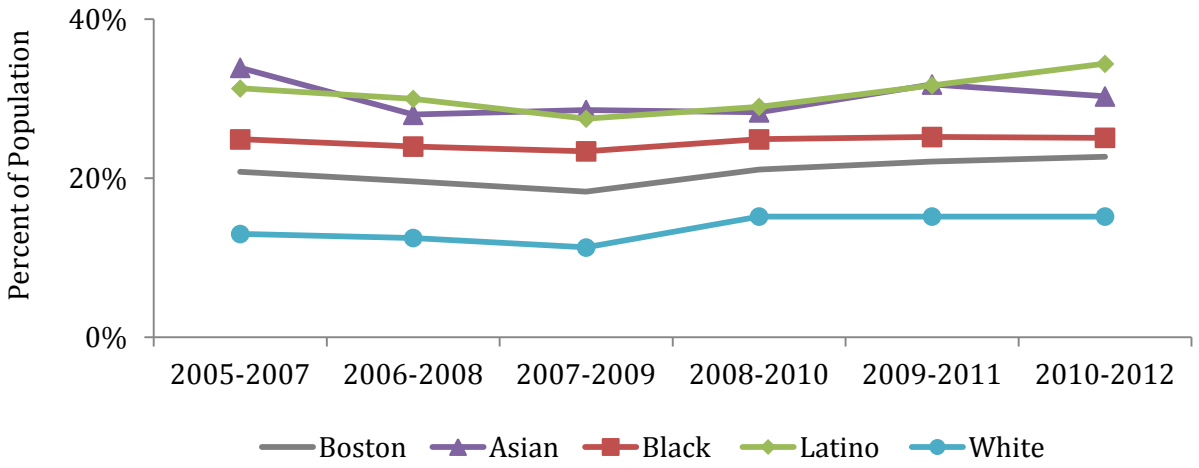


During 2008 to 2012 combined, the median household income for Boston residents was $53,136. Residents living in zip codes 02115, 02119, 02120, 02121, 02124, 02125, 02126, 02128, 02134, and 02215 had lower household income compared to Boston overall.

Neighborhood	Zip Code	Median Income
Boston		$53,136 (52,302-53,970)
Allston/ Brighton	02134	$37,638 (34,949-40,327)
	02135	$50,291 (46,135-54,447)
	02163	$43,889 (24,923-62,855)
Back Bay (Beacon Hill, Downtown, West End)	02108	$95,753 (75,684-115,822)
	02109	$128,022 (109,940-146,104)
	02110	$123,795 (90,412-157,178)
	02114	$79,734 (66,211-93,257)
	02116	$87,630 (78,454-96,806)
	02199	$107,159 (73,249-141,069)
Charlestown	02129	$89,105 (80,225-97,985)
East Boston	02128	$49,549 (46,556-52,542)
Fenway	02115	$23,677 (19,502-27,852)
	02215	$42,298 (38,550-46,046)
Hyde Park	02136	$57,080 (52,633-61,527)
Jamaica Plain	02130	$74,198 (68,736-79,660)
Mattapan	02126	$43,532 (38,418-48,646)
North Dorchester	02121	$30,419 (27,940-32,898)
	02125	$30,823 (26,067-35,579)
North End	02113	$64,413 (58,174-70,652)
Roslindale	02131	$61,099 (57,285-64,913)
Roxbury	02119	$27,051 (21,553-32,549)
	02120	$32,367 (27,717-37,017)
South Boston	02127	$67,012 (61,648-72,376)
	02210	$111,061 (75,203-146,919)
South Dorchester	02122	$51,798 (45,317-58,279)
	02124	$48,329 (45,824-50,834)
South End	02111	$44,758 (32,577-56,939)
	02118	$50,000 (42,168-57,832)
West Roxbury	02132	$82,421 (75,989-88,853)

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

Figure 2.25 Population Living Below Poverty Level by Race/Ethnicity and Year (3 Year Estimates)

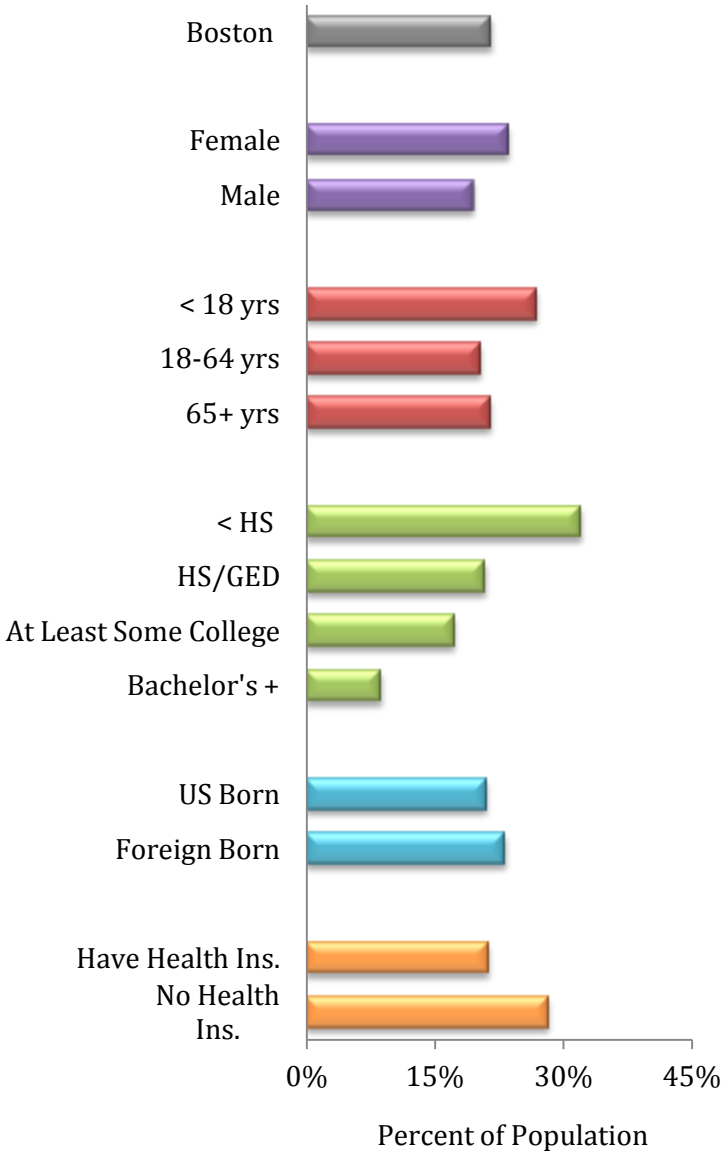


	Boston	Asian	Black	Latino	White
2005-2007	20.8% (19.7-21.9)	33.9% (30.0-37.8)	24.9% (22.8-27.0)	31.3% (27.7-34.9)	13.0% (11.8-14.2)
2006-2008	19.6% (18.6-20.6)	28.0% (24.4-31.6)	24.0% (21.4-26.6)	30.0% (26.9-33.1)	12.5% (11.2-13.8)
2007-2009	18.3% (17.3-19.3)	28.6% (24.9-32.3)	23.4% (21.1-25.7)	27.5% (25.0-30.0)	11.3% (10.3-12.3)
2008-2010	21.1% (20.1-22.1)	28.3% (24.7-31.9)	24.9% (22.6-27.2)	29.0% (26.3-31.7)	15.2% (14.0-16.4)
2009-2011	22.1% (21.0-23.2)	31.8% (28.2-35.4)	25.2% (22.8-27.6)	31.7% (28.8-34.6)	15.2% (14.1-16.3)
2010-2012	22.7% (21.7-23.7)	30.3% (26.7-33.9)	25.1% (22.6-27.6)	34.4% (32.0-36.8)	15.2% (14.2-16.2)

DATA SOURCE: American Community Survey, 2005-2007, 2006-2008, 2007-2009, 2008-2010, 2009-2011, 2010-2012, U.S. Census Bureau

An estimated 23% of Boston residents had an income below the poverty level for the combined years of 2010-2012. Compared to White residents, the percentage of Asian, Black and Latino residents living below poverty level was higher for 2010-2012.

Figure 2.26 Population Living Below Poverty Level by Selected Indicators, 2012



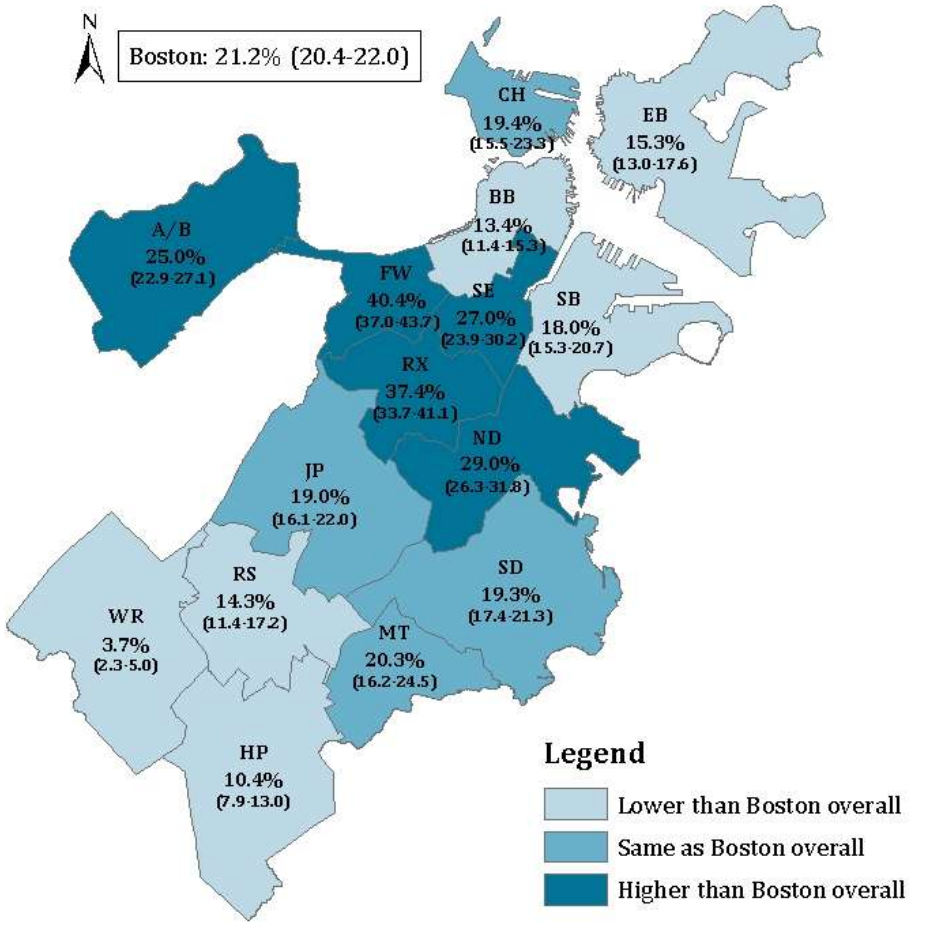
Boston	21.6% (20.1-23.2)
Gender	
Female	23.6% (21.6-25.6)
Male	19.5% (17.8-21.2)
Age	
<18 yrs	26.9% (23.3-30.6)
18-64 yrs	20.3% (18.8-21.8)
65+ yrs	21.4% (18.4-24.5)
Educational Attainment	
Less than High School	32.0% (28.0-36.1)
High School Diploma or GED	20.8% (17.8-23.9)
Some College or Associate's Degree	17.3% (14.8-19.8)
Bachelor's Degree or Higher	8.8% (7.5-10.0)
Place of Birth	
US Born	21.0% (19.5-22.5)
Foreign Born	23.2% (20.4-26.0)
Health Insurance Status	
Have Health Insurance	21.3% (20.0-22.5)
No Health Insurance	28.3% (21.1-35.4)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, an estimated 22% of Boston residents lived below the poverty level. A lower percentage of male residents than female residents lived below the poverty level as well as residents with a high school diploma or GED or higher education compared with residents who had less than a high school education. A higher percentage of residents under the age of 18 lived below the poverty level compared to residents ages 18-64. The percentage of residents living in poverty was similar with respect to place of birth and health insurance status.

Figure 2.27 Percent of Population with Income Below Poverty Level, 2008-2012 Combined

During the combined years of 2008 and 2012, Allston/Brighton, Fenway, North Dorchester, Roxbury, and South End had a higher percentage of residents living below the poverty level compared to Boston overall. In the same time period, compared to Boston overall, a lower percentage of residents lived below the poverty level in Back Bay, East Boston, Hyde Park, Roslindale, South Boston, and West Roxbury. No statistical difference was seen for other neighborhoods.



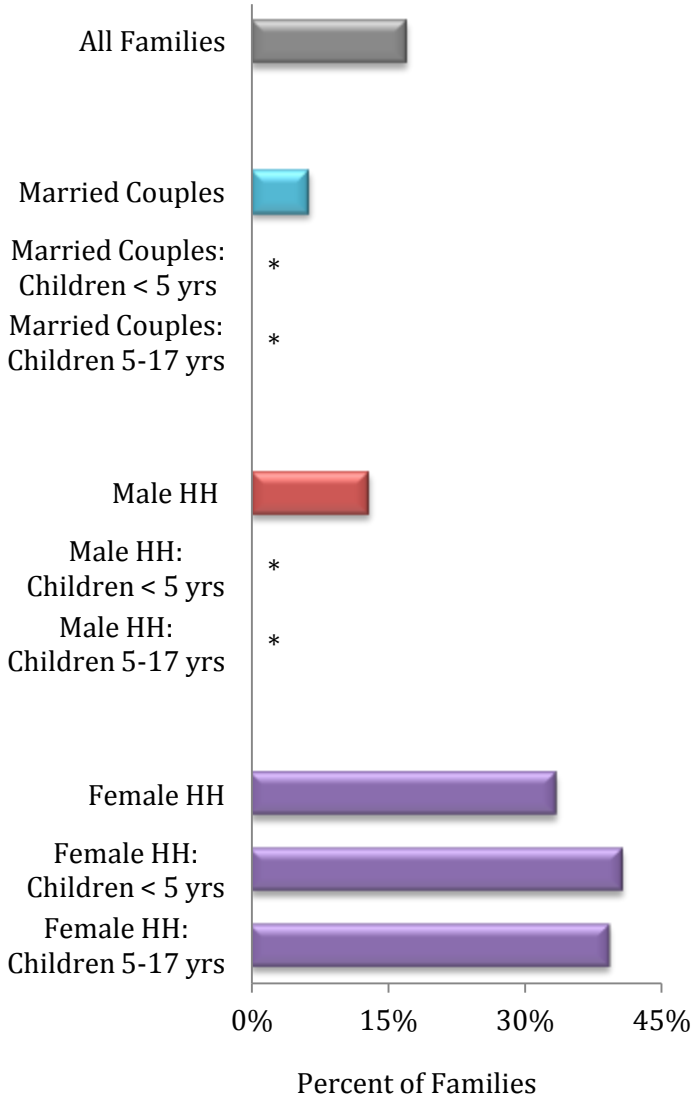
NOTE: Back Bay includes Beacon Hill, Downtown, the North End, and the West End. The South End includes Chinatown.

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

Poverty status was determined for all people except people who are institutionalized, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years of age. These groups were excluded from the numerator and denominator when calculating poverty rates for neighborhoods and Boston overall. For example, due to the high proportion of students living in college dormitories, the poverty level for Fenway represents only approximately 50% of its population.

Though poverty is experienced across all socio-demographic groups, poverty in Fenway occurs primarily among a younger (ages 18 to 29), White and Asian population, which is very different than what we see in other Boston neighborhoods where poverty is more often experienced among single-parent households, the elderly, Black, Latino, and immigrant populations. Fenway's relatively high poverty rate may largely reflect students living off campus and lacking steady/full-time employment incomes.

Figure 2.28 Population Living Below Poverty Level by Family Type, 2012



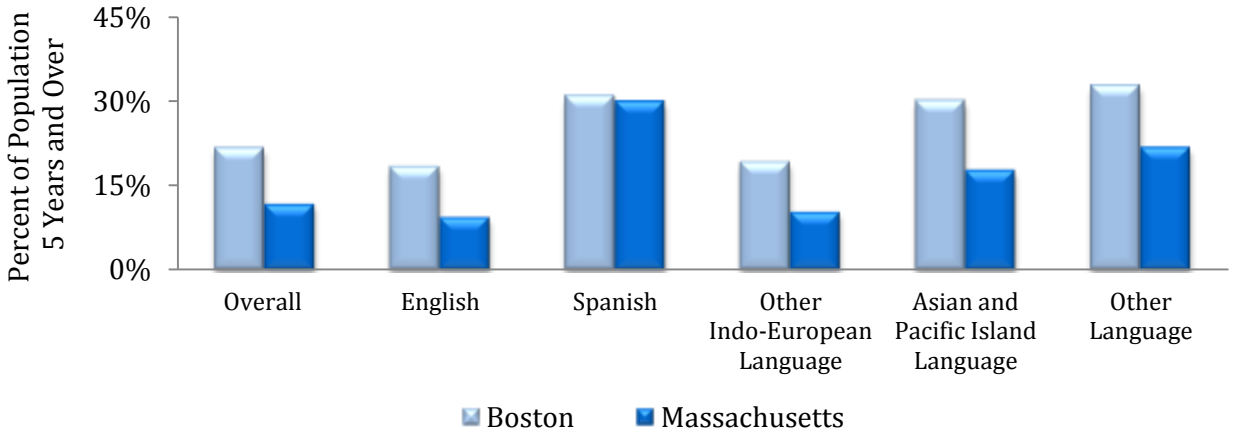
All Families	17.0% (14.8-19.1)
Married Couple Families	
Married Couples	6.4% (4.4-8.3)
Married Couples: Children < 5 yrs	*
Married Couples: Children 5-17 yrs	*
Male Headed Household Families	
Male Headed Household	12.9% (7.9-17.8)
Male HH: Children < 5 yrs	*
Male HH: Children 5-17 yrs	*
Female Headed Household Families	
Female Headed Household	33.5% (28.9-38.0)
Female HH: Children < 5 yrs	40.7% (27.9-53.6)
Female HH: Children 5-17 yrs	39.2% (31.4-47.1)

*Insufficient sample size

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, 17% of all Boston families lived below the poverty level. Compared to female-headed households, a lower percentage of married couples and male-headed households lived below the poverty level.

Figure 2.29 Population Living Below Poverty Level by Language Spoken at Home, Boston and Massachusetts, 2012

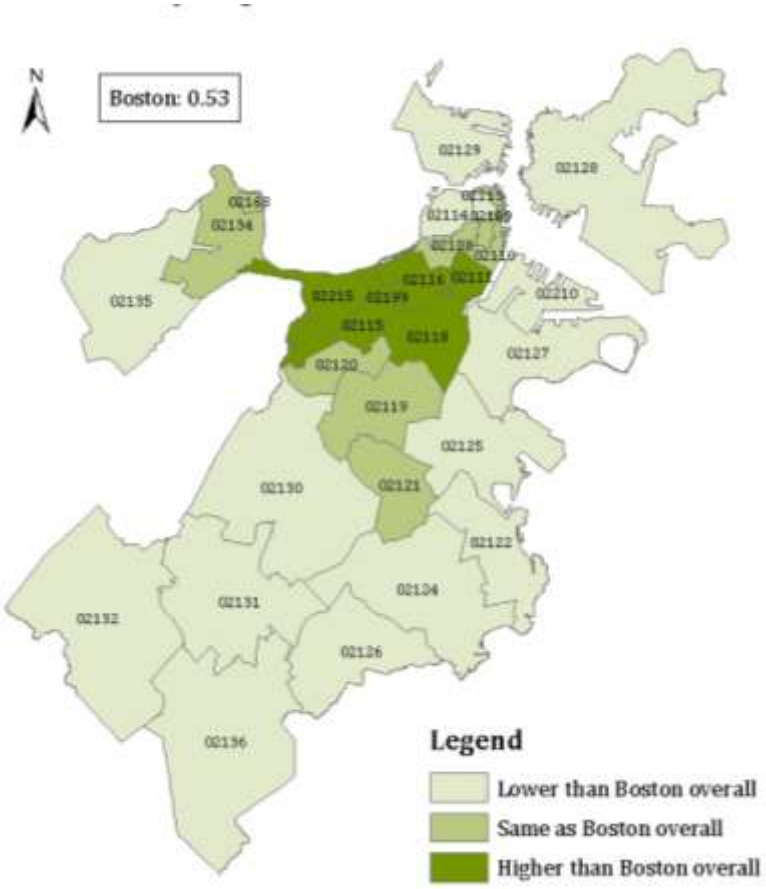


	Overall	English	Spanish	Other Indo-European Language	Asian and Pacific Island Language	Other Language
Boston	21.6% (20.0-23.2)	18.3% (16.7-20.0)	30.8% (26.5-35.1)	19.1% (13.1-25.1)	30.0% (24.2-35.8)	32.7% (19.0-46.4)
MA	11.6% (11.2-11.9)	9.3% (9.0-9.6)	29.7% (28.0-31.5)	10.2% (8.9-11.5)	17.6% (15.2-20.0)	21.6% (17.2-26.0)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

Compared to Massachusetts, a higher percentage of Boston residents lived below the poverty level in 2012. A higher percentage of Boston residents who spoke English, other Indo-European languages, or Asian and Pacific Island languages at home lived below the poverty level compared to Massachusetts.

Figure 2.30 Gini Index by Zip Code, 2008-2012 Combined



The Gini index represents the distribution of income in a population (0=perfect equality or a situation in which everyone has the same income; 1= perfect inequality or where income is concentrated in the hands of one or a few). As a general rule, an index between 0.5 and 0.7 translates to a high level of unequal income distribution or income inequality. The Gini Index was applied to the Boston population by zip code. The overall Boston's Gini index was 0.53 for the combined time period of 2008 to 2012. The index values by zip code ranged from 0.42 (02210) to 0.69 (02111). Compared to Boston, zip codes 02111, 02115, 02116, 02118, 02199, 02215 had higher Gini index values.

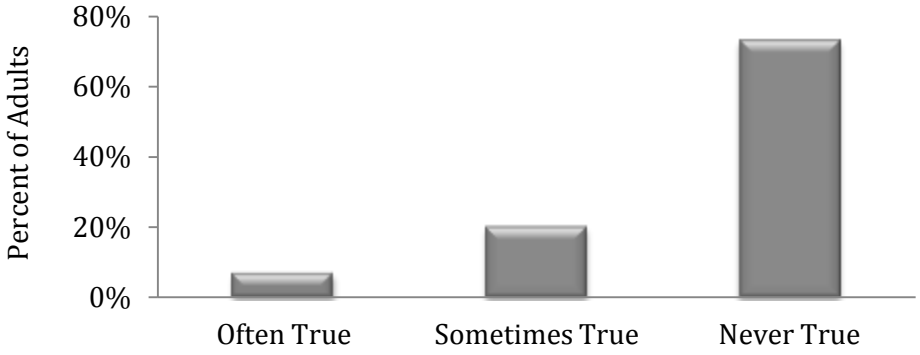
Neighborhood	Zip Code	Gini Index
Boston		0.53 (0.53-0.54)
Allston/ Brighton	02134	0.52 (0.47-0.56)
	02135	0.47 (0.45-0.49)
	02163	0.52 (0.41-0.63)
Back Bay (Beacon Hill, Downtown, West End)	02108	0.52 (0.44-0.59)
	02109	0.48 (0.43-0.54)
	02110	0.57 (0.49-0.65)
	02114	0.49 (0.46-0.52)
	02116	0.59 (0.56-0.62)
	02199	0.60 (0.55-0.65)
Charlestown	02129	0.50 (0.48-0.53)
East Boston	02128	0.42 (0.40-0.44)
Fenway	02115	0.65 (0.62-0.68)
	02215	0.49 (0.47-0.51)
Hyde Park	02136	0.43 (0.41-0.46)
Jamaica Plain	02130	0.48 (0.45-0.50)
Mattapan	02126	0.44 (0.42-0.47)
North Dorchester	02121	0.52 (0.49-0.56)
	02125	0.57 (0.54-0.61)
North End	02113	0.47 (0.43-0.52)
Roslindale	02131	0.44 (0.42-0.46)
Roxbury	02119	0.53 (0.49-0.56)
	02120	0.51 (0.47-0.54)
South Boston	02127	0.48 (0.46-0.50)
	02210	0.42 (0.34-0.50)
South Dorchester	02122	0.44 (0.41-0.46)
	02124	0.46 (0.44-0.48)
South End*	02111	0.69 (0.64-0.74)
	02118	0.58 (0.56-0.61)
West Roxbury	02132	0.43 (0.40-0.46)

* Includes Chinatown.

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

For 7% of Boston residents in 2013, it was often true that the food they purchased did not last and they did not have money to get more.

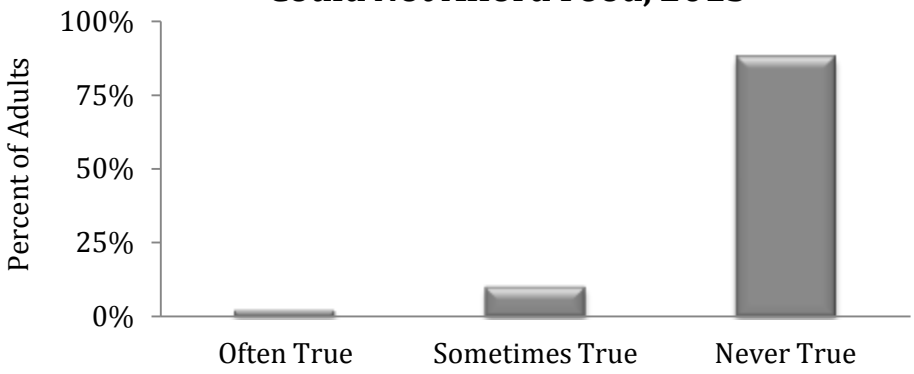
Figure 2.31 Food Purchased Did Not Last and Did Not Have Money to Get More, 2013



Often True	Sometimes True	Never True
6.8% (5.7-8.0)	20.1% (18.3-21.9)	73.1% (71.1-75.1)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

Figure 2.32 Hungry But Did Not Eat Because Could Not Afford Food, 2013



In 2013, it was often true that 2% of Boston residents remained hungry because they could not afford food. This was sometimes true for 10% of residents.

Often True	Sometimes True	Never True
2.2% (1.6-2.9)	10.2% (8.8-11.6)	87.6% (86.1-89.1)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

Figure 2.33 Health Indicators by Household Income, 2013			
	Less than $25,000	**$25,000-$49,999**	**$50,000 or more**
Asthma*	15.1% † (11.8-19.0)	10.4% (7.6-13.9)	7.1% (5.3-9.3)
Diabetes*	4.6% † (3.1-6.9)	3.1% † (2.1-4.8)	1.8% (1.2-2.7)
Hypertension*	24.2% † (20.6-28.1)	18.0% (14.3-22.4)	15.3 (12.6-18.5)
Obesity*‡	25.8% † (21.3-30.3)	18.2% (15.0-21.9)	17.3% (14.7-20.3)
Persistent Anxiety*‡	30.6% † (26.2-35.4)	16.9% (13.1-21.5)	12.9% (10.6-15.5)
Persistent Sadness*‡	22.4% † (18.5-26.8)	8.5% (6.0-12.0)	5.6% (4.1-7.7)

*Adjusted for age, race/ethnicity and gender

†Model tested comparison to reference group ($50,000 or more) is statistically significant ($p<0.05$).‡15-20% of unweighted sample was missing data

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

The above table describes select health indicators by household income level. After adjusting for differences in age, race/ethnicity and gender, the prevalence of the above health outcomes tends to decrease as income level increases. Those who had a household income of <$25,000 were more likely to report asthma, diabetes, hypertension, persistent anxiety and persistent sadness and were more likely to be obese compared to those with a household income $50,000+. Those who had a household income of $25,000-$49,999 were more likely to report diabetes compared to those with a household income of $50,000.

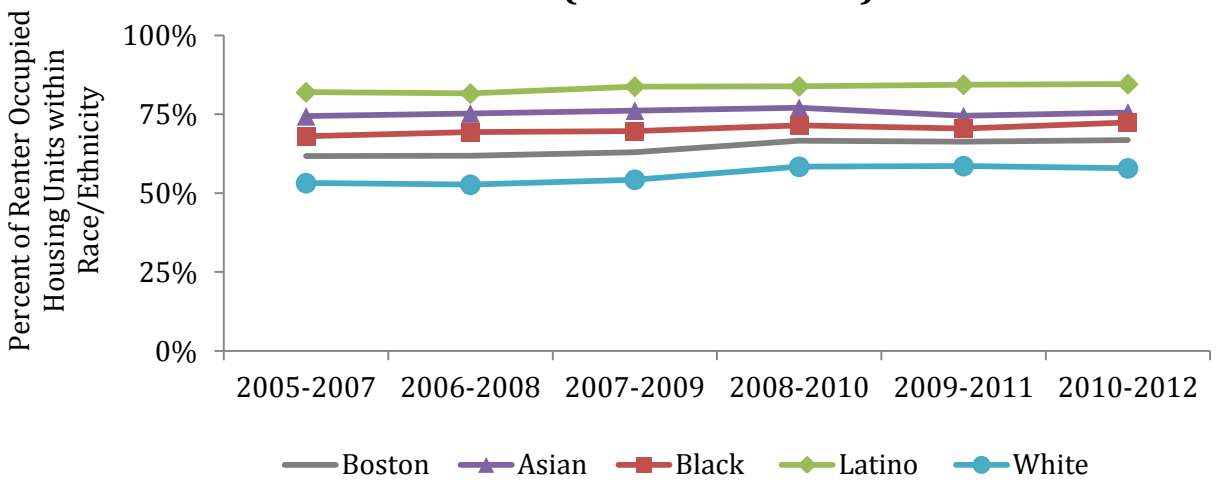
Housing

In Boston, the median value of owner-occupied housing units is about $370,400 with over 25% of those homes topping $500,000 (35). Average rental prices in Boston are among the highest in the nation (36) with over 35% of residents paying more than $1,500 a month (35). Subsidized housing, accessible on a limited basis to those with incomes less than 50% of the city-wide median income level (37), often has a wait list of more than two years (38). Meanwhile, nearly 80,000 Boston residents are cost burdened and pay over 30% of their income toward rent (39, 40), diverting finances away from other necessities such as childcare, food, medical, and dental care (41). The benefits of home ownership, including tax deductions, cost savings over time compared to renting, and the ability to build equity, are reserved for higher-income individuals. Lower-income individuals who cannot afford home ownership often struggle with the negative impact that residential instability has on crime (42), mental health (43) and social capital (44, 45).

Safe and stable housing provides personal security, reduces stress and exposure to disease, and provides a foundation for meeting basic hygienic, nutritional, and healthcare needs. Average income gains over the past decade have failed to keep pace with rising housing costs, pushing thousands of residents into unstable housing situations(46). In 2013, over 7,000 individuals in Boston were homeless (47). Without consistent access to health care, homeless individuals are less likely to participate in preventative care and are much more likely to utilize the emergency department for non-emergencies. Such patterns of use are not only a burden on the healthcare system, but detrimental to personal health as well (48).

This section presents data on housing tenure, foreclosures, and homelessness, and the association between housing tenure and selected health indicators.

Figure 2.34 Renter-Occupied Tenure by Race/Ethnicity and Year (3 Year Estimates)

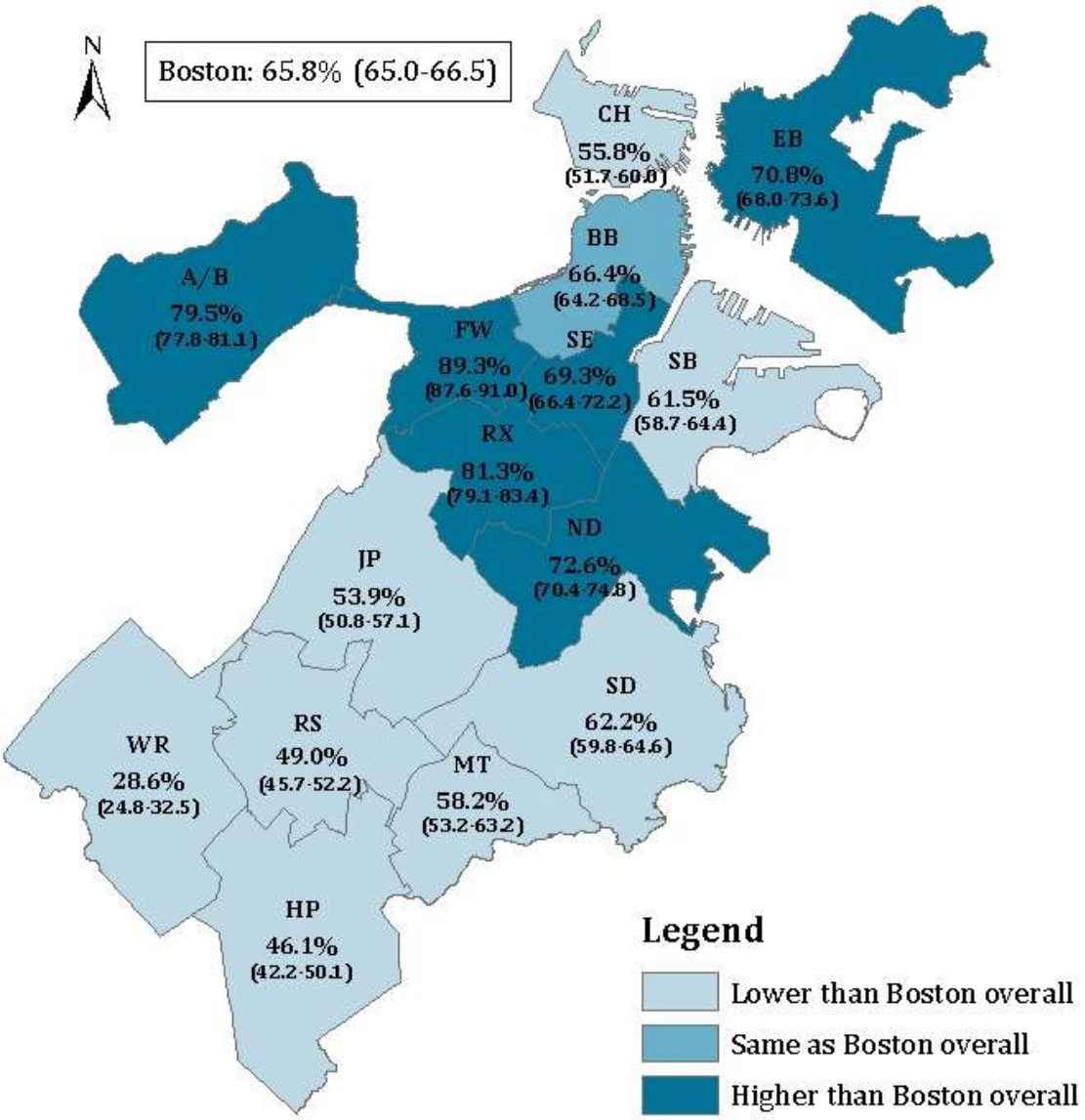


	Boston	Asian	Black	Latino	White
2005-2007	61.8% (60.7-62.9)	74.4% (70.3-78.5)	68.0% (65.7-70.3)	82.0% (79.5-84.5)	53.2% (51.7-54.7)
2006-2008	61.9% (60.8-63.0)	75.3% (72.3-78.3)	69.4% (66.9-71.9)	81.6% (79.2-84.0)	52.7% (51.2-54.2)
2007-2009	63.0% (61.9-64.1)	76.2% (72.9-79.5)	69.7% (67.7-71.7)	83.8% (81.7-85.9)	54.3% (52.9-55.7)
2008-2010	66.6% (65.8-67.4)	77.1% (73.8-80.4)	71.5% (69.6-73.4)	83.9% (81.9-85.9)	58.4% (57.2-59.6)
2009-2011	66.3% (65.2-67.4)	74.5% (71.5-77.5)	70.5% (68.2-72.8)	84.4% (82.1-86.7)	58.6% (57.4-59.8)
2010-2012	66.8% (66.0-67.6)	75.6% (72.7-78.5)	72.4% (70.5-74.3)	84.6% (82.7-86.5)	57.9% (56.8-59.0)

DATA SOURCE: American Community Survey, 2005-2007, 2006-2008, 2007-2009, 2008-2010, 2009-2011, 2010-2012, U.S. Census Bureau

The three year estimates for renter-occupied tenure varied by race/ethnicity. Compared to Whites, a higher percentage of Asian, Black and Latino residents lived in renter-occupied units during 2010-2012. Sixty-seven percent of Boston residents lived in renter-occupied units during the same time period.

Figure 2.35 Renter-Occupied Tenure by Neighborhood, 2008-2012 Combined

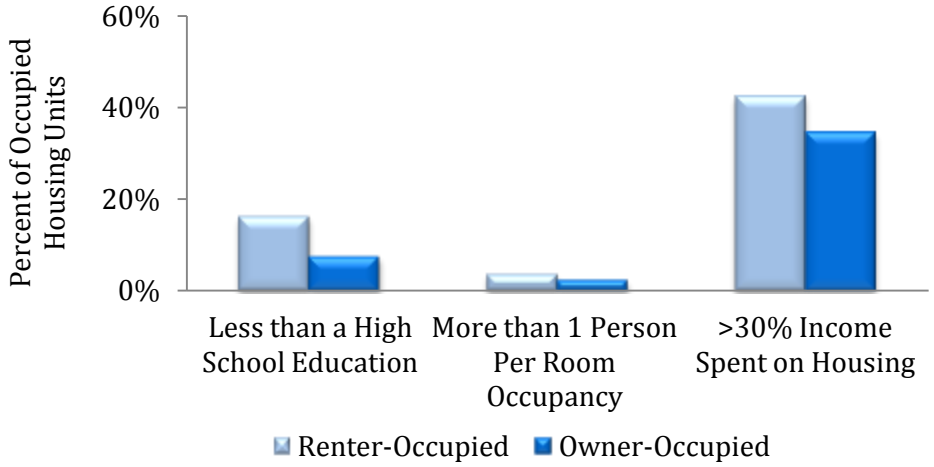


NOTE: Back Bay includes Beacon Hill, Downtown, the North End, and the West End. The South End includes Chinatown.

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

During 2008-2012, a higher percentage of units in Allston/Brighton, East Boston, Fenway, North Dorchester, Roxbury and the South End were renter-occupied compared to Boston. The percentage of renter-occupied units was lower in all other neighborhoods except for Back Bay where there was no statistical difference compared to Boston.

Figure 2.36 Tenure by Selected Characteristics, 2012

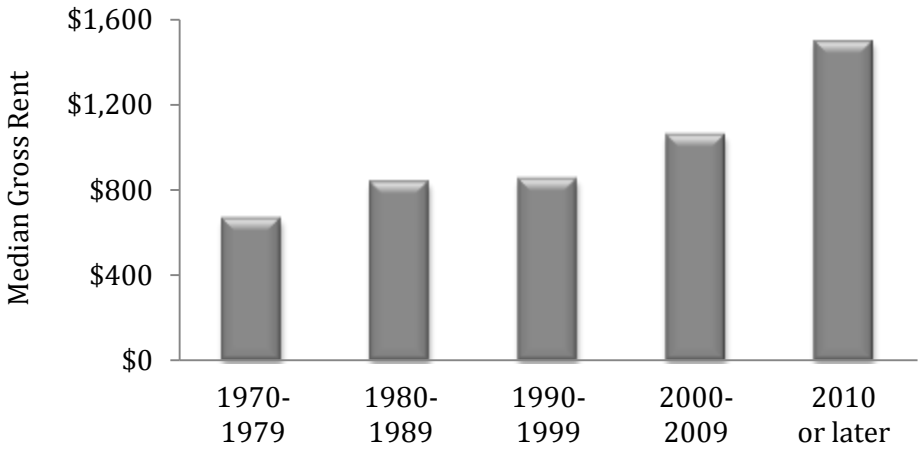


	Renter-Occupied	Owner-Occupied
Less than a High School Education	16.3% (14.7-17.9)	7.5% (6.2-8.8)
More than 1 Person Per Room Occupancy	3.7% (2.8-4.5)	2.4% (1.5-3.3)
>30% Income Spent on Housing	42.5% (39.8-45.3)	34.5% (31.3-37.6)

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, a higher percentage of Boston residents living in renter-occupied units had less than a high school education, more than one person per room occupancy and paid more than 30% of their income on housing compared to residents in owner-occupied units.

Figure 2.37 Median Gross Rent* by Year Householder Moved into Unit, 2012



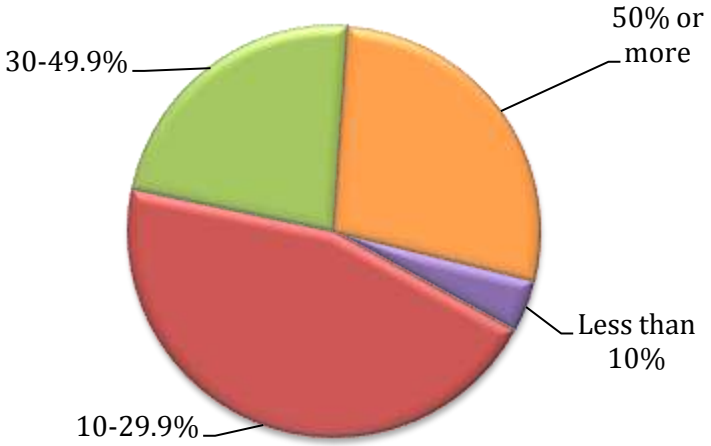
1970-1979	1980-1989	1990-1999	2000-2009	2010 or later
$668 (445-891)	$840 (606-1,074)	$854 (744-964)	$1,060 (1,003-1,117)	$1,498 (1,436-1,560)

*Includes average monthly utility costs

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, the median gross rent for a householder moving into a unit in 2010 or later was $1,498, compared to only $668 for householders who moved into a unit during 1970-1979.

Figure 2.38 Gross Rent* as a Percentage of Household Income, 2012



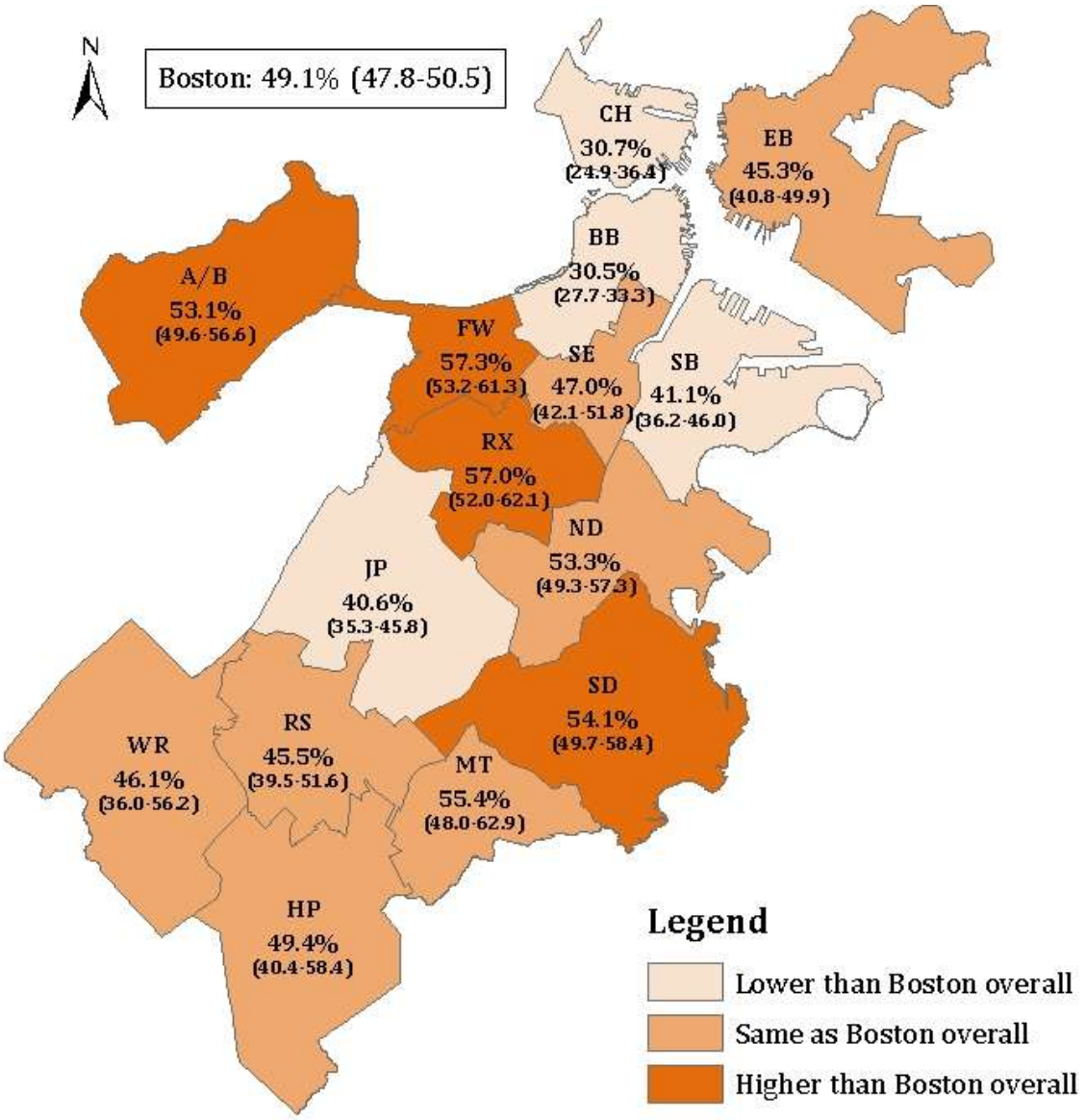
Less than 10% of Income	10-29.9% of Income	30-49.9% of Income	50% or more of Income
4.1% (3.1-5.0)	45.3% (43.2-47.5)	22.8% (20.9-24.7)	27.8% (25.6-30.0)

*Includes average monthly utility costs

DATA SOURCE: American Community Survey, 2012, U.S. Census Bureau

In 2012, almost one-third (28%) of Boston residents paid 50% or more of their household income in rent. For 51% of Boston residents, their rent was 30% or more than their household income.

Figure 2.39 Renter-Occupied Housing Units Paying At Least 30% Income Towards Rent, 2008-2012 Combined

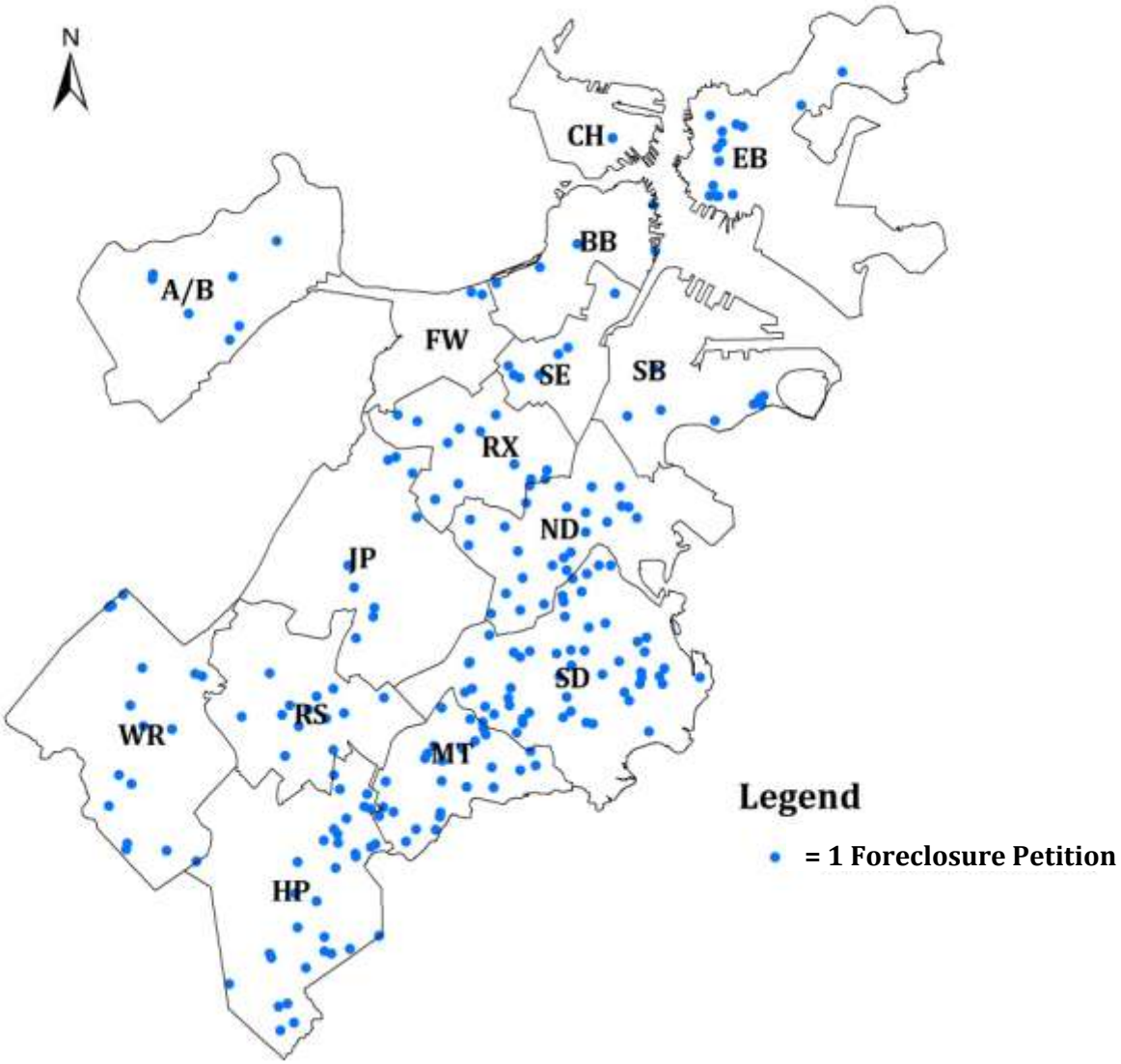


NOTE: Back Bay includes Beacon Hill, Downtown, the North End, and the West End. The South End includes Chinatown.

DATA SOURCE: American Community Survey, 2008-2012, U.S. Census Bureau

During 2008 -2012, 49% of Boston residents living in renter-occupied housing units paid at least 30% of their income towards rent. Compared to Boston overall, a higher percentage of residents in Allston/Brighton, Fenway, Roxbury and South Dorchester paid at least 30% of their income towards rent. A lower percentage of Back Bay, Charlestown, Jamaica Plain and South Boston residents paid at least 30% of their income towards rent.

Figure 2.40 Foreclosure Petitions by Neighborhood, 2013



NOTE: Back Bay includes Beacon Hill, Downtown, the North End, and the West End. The South End includes Chinatown.

DATA SOURCE: Department of Neighborhood Development

DATA ANALYSIS: Department of Neighborhood Development

Figure 2.41 Foreclosure Petitions by Neighborhood, 2013							
Neighborhood	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**% decrease from 2008-2013**
Boston	**1,899**	**2,172**	**1,541**	**732**	**890**	**232**	**88%**
Allston/Brighton	60	93	67	29	31	7	88%
Back Bay*	36	50	51	17	37	5	86%
Charlestown	26	22	25	10	11	1	96%
East Boston	185	164	113	53	61	14	92%
Fenway	9	23	20	10	13	2	78%
Hyde Park	156	189	140	81	103	32	79%
Jamaica Plain	70	92	75	23	29	9	87%
Mattapan	183	196	132	72	90	26	86%
North Dorchester	276	324	212	92	108	24	91%
Roslindale	108	149	96	53	58	13	88%
Roxbury	155	137	91	63	54	12	92%
South Boston	97	93	86	34	45	8	92%
South Dorchester	462	531	324	141	177	55	88%
South End†	22	40	43	18	23	7	68%
West Roxbury	54	69	66	36	50	17	69%

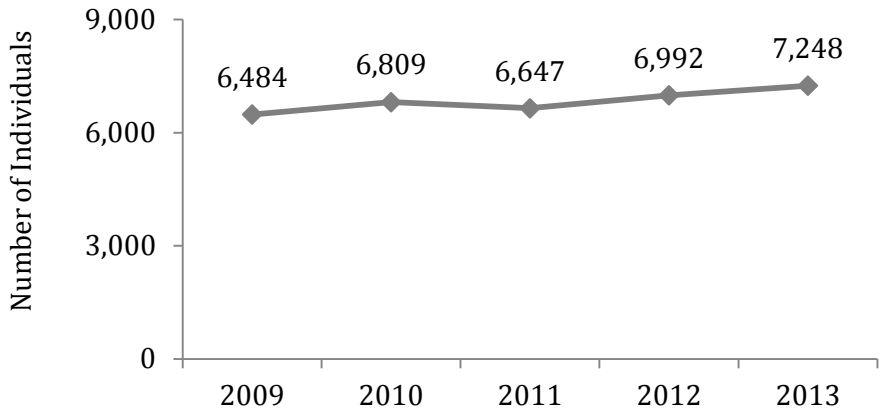
*Includes Beacon Hill, Downtown, the North End, and the West End

†Includes Chinatown

DATA SOURCE: Department of Neighborhood Development

A foreclosure petition is the first step in the foreclosure process of a home. The number of foreclosure petitions in Boston was 232 in 2013, a decrease of 88% from 2008. Foreclosure petitions decreased in all neighborhoods from 2008-2013.

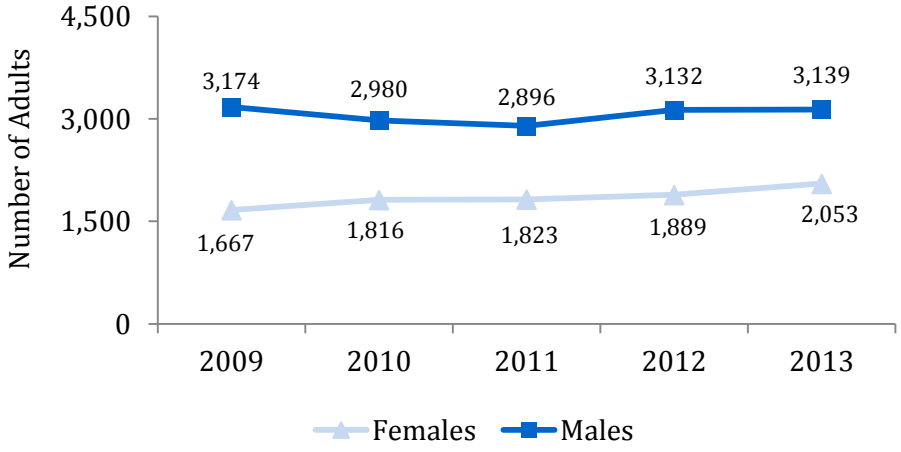
Figure 2.42 Homeless Count by Year



DATA SOURCE: Emergency Shelter Commission, Boston Public Health Commission

In 2013, 7,248 homeless individuals were counted in Boston. Since 2009, the number of homeless individuals has increased by 12%.

Figure 2.43 Homeless Adults by Gender and Year



DATA SOURCE: Emergency Shelter Commission, Boston Public Health Commission

Since 2009, there have been consistently higher numbers of homeless adult males compared to homeless adult females.

Figure 2.44 Health Indicators by Tenure, 2013			
	Own	**Rent**	**Other Arrangement ‡**
Asthma*	7.8% (6.0-10.1)	12.5% † (10.5-14.9)	3.3% † (1.6-6.7)
Diabetes*	2.3% (1.6-3.5)	3.2% † (2.2-4.5)	3.2% (1.2-6.5)
Hypertension*	15.1% (12.6-17.9)	18.6% † (16.0-21.5)	29.2% † (19.9-40.6)
Obesity*	17.1% (14.5-20.0)	21.8% † (19.2-24.6)	24.3% (16.3-34.6)
Persistent Anxiety*	13.7% (11.3-16.5)	22.9% † (20.3-25.4)	17.1% (10.9-25.8)
Persistent Sadness*	5.2% (4.1-6.6)	15.8% † (13.4-18.5)	11.7% † (6.7-19.7)

*Adjusted for age, race/ethnicity and gender

† Model tested comparison to reference group (Own) is statistically significant ($p<0.05$).

‡"Other arrangement" may include group home, or staying with friends or family without paying rent

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

The above table presents select health indicators by housing tenure. After adjusting for differences in age, race/ethnicity and gender, renters were more likely to report asthma, diabetes, hypertension, persistent anxiety and persistent sadness and were more likely to be obese compared to those who own homes. Those who had other housing arrangements were more likely to report asthma, hypertension and persistent sadness compared to home owners.

Racism

Racism can take many forms ranging from interpersonal interactions to institutional/structural policies and practices. Although the expression of outright discrimination has been reduced in recent decades, the residual effects from historically discriminatory policies now shape more subtle and nuanced forms of racism at the structural, institutional, interpersonal, and internalized levels Decades of research indicate that systemic racism negatively affects health in the United States (49).Understanding the many pathways through which racism permeates our community will enable us to address racial inequities in health outcomes that are apparent today.

At the structural level, racism can be perpetuated through a system of selectively allocating social privilege. An commonly cited example of structural racism is evident in the interaction between Black individuals and the criminal justice system (50). Black individuals disproportionately enter the criminal justice system compared to other races, which has lifelong consequences for the individual and community (50). Economic and employment opportunities, access to resources such as housing and education, and social capital are a few examples of necessities that become virtually inaccessible once an individual interacts with the criminal justice system. Lack of access to these necessities, in turn, may exacerbate health inequities.

At the institutional level, organizational policies and practices affect access to goods, services, and opportunities. Within the healthcare system, studies have demonstrated that Black patients are less likely to receive the appropriate care compared to White patients. In one study, Black and White actors portrayed patients with coronary disease (49). Physicians were less likely to recommend standard cardiac catheterization for Black patients as compared to Whites patients (51). Other studies have found that Black patients are less likely to receive transplants than Whites patients. One group of researchers have reasoned that physicians' possess “subconscious bias” when delivering care (52).

Prejudice, discrimination, and bias at the interpersonal level can affect the way people of all races perceive and interact with each other, both intentionally and unintentionally. For example, within the patient-provider relationship, perceived racism is associated with less positive interactions and decreased ease of conversation over the course of care (53).

Internalized racism occurs when individuals begin to absorb the discriminatory messages they are often bombarded with; this can lead to feelings of inferiority and low self-esteem (54).

Research demonstrates that perpetual perceptions and exposure to racism and discrimination act as a

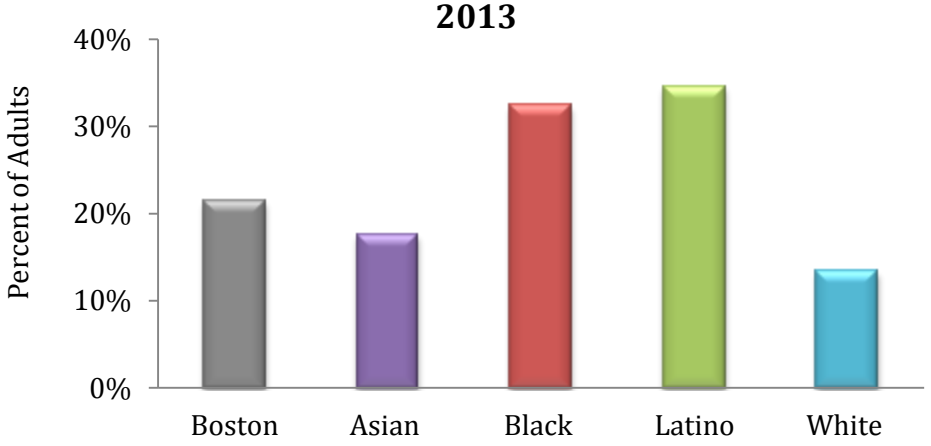
chronic stressor by increasing stress hormones that lead to increases in blood pressure and heart rate. The combination of chronic stress with other social disadvantages such as low income, can contribute to a number of health conditions including heart disease, depression, hypertension, obesity, and elevated blood sugar (55, 56, 57). Negative coping mechanisms related to marginalization or discrimination further impact health. Behaviors reportedly used to reduce feelings of stress include the use of tobacco, alcohol, other harmful substances, as well as poor eating or sleeping patterns (55, 56).

Racism at the structural, institutional, interpersonal, and internalized levels may influence health experiences and outcomes for individuals and communities. Efforts to address racial/ethnic health inequities must include mechanisms to dismantle racism at every level and to counteract its impact on health.

This section presents data on individuals who experienced physical symptoms as a result of being treated differently because of their race, and individuals who perceived they were treated worse because of their race in the health care setting.

In 2013, 22% of Boston residents reported thinking about their race once or more per day. Compared to White residents, a higher percentage of Black and Latino residents thought about their race once or more per day.

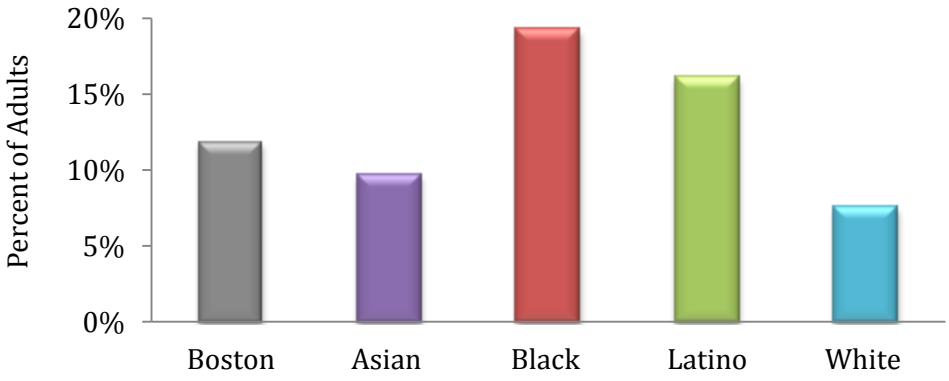
Figure 2.45 Adults Who Thought About Their Race Once or More per Day by Race/Ethnicity, 2013



Boston	Asian	Black	Latino	White
21.5% (19.6-23.3)	17.6% (11.4-23.8)	32.4% (28.5-36.3)	34.6% (29.5-39.6)	13.4% (10.9-15.9)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

Figure 2.46 Adults Who Felt Emotionally Upset by Perceived Race-Related Treatment Once or More per Day by Race/Ethnicity, 2013

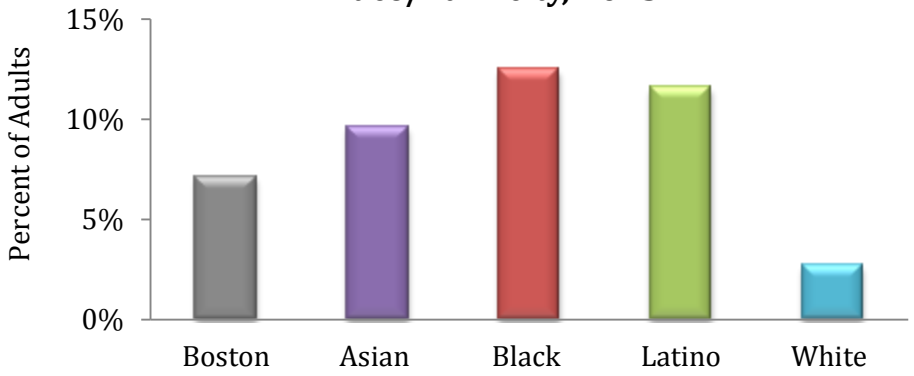


Boston	Asian	Black	Latino	White
11.8% (10.4-13.3)	9.7% (4.5-14.9)	19.3% (16.0-22.5)	16.1% (12.4-19.9)	7.6% (5.6-9.6)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 12% of Boston residents felt emotionally upset once or more per day as a result of how they were treated based on their race. A higher percent of Black and Latino residents were emotionally upset once or more per day compared to White residents.

Figure 2.47 Adults Who Experienced Physical Symptoms Based on Perceived Race-Related Treatment Once or More per Day by Race/Ethnicity, 2013



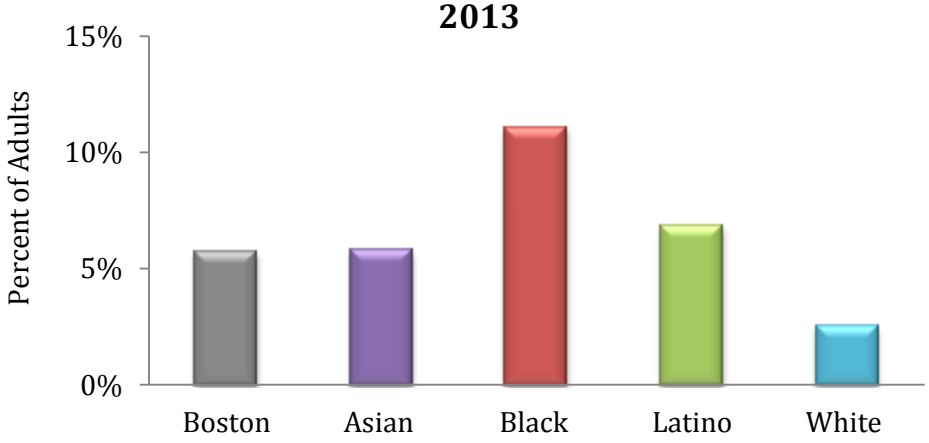
Boston	Asian	Black	Latino	White
7.1% (6.0-8.3)	9.6% (4.3-15.0)	12.5% (9.7-15.3)	11.6% (8.2-15.0)	2.7% (1.6-3.8)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 7% of Boston residents experienced physical symptoms once or more per day as a result of how they were treated based on their race. Compared to White residents, a higher percentage of Latino, Black and Asian residents reported experiencing physical symptoms once or more per day.

In 2013, 6% of Boston residents reported being treated worse than other races when seeking healthcare. Compared to White residents, a higher percentage of Black and Latino residents reported being treated worse than other races when seeking healthcare.

Figure 2.48 Treated Worse Than Other Races When Seeking Healthcare by Race/Ethnicity, 2013



Boston	Asian	Black	Latino	White
5.7% (4.7-6.8)	5.8% (1.4-10.2)	11.1% (8.3-13.9)	6.8% (4.4-9.3)	2.5% (1.6-3.5)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

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Chapter 3: Health Related Behaviors

Health Related Behaviors

Individual choices can either protect or put us at risk for disease. Many Americans know that eating fruits and vegetables, exercising, not smoking, and limiting the intake of alcohol are behaviors that promote health and well-being.. Today, despite knowledge to the contrary, Americans continue to practice unhealthy behaviors that contribute to poor health outcomes and premature death.

There is no doubt that individuals are responsible for their own behavior. However, mounting evidence indicates that the context of one's life (e.g., economic, historical, familial, and cultural) exerts important influences on the process of choice and options available (2, 3, 4, 5). In many instances, barriers to healthy choices exceed an individual's abilities to overcome them, regardless of motivation (5). For example in Boston, many individuals live in neighborhoods with limited access to fresh food or safe places to exercise, which present significant obstacles to making healthy choices. Children are especially vulnerable to the influences of these obstacles because they have limited control of their environment. Establishing healthful behaviors in childhood can set the precedent for such behaviors in adulthood (5).

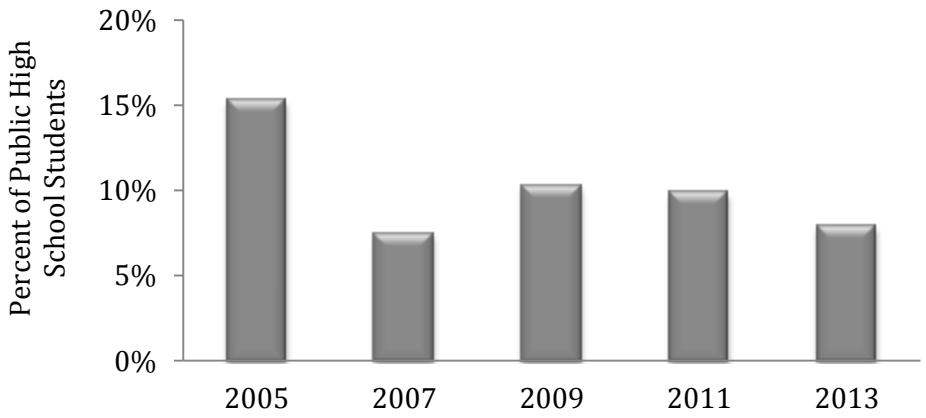
Research demonstrates that strategies aimed at helping people adopt and maintain healthy habits must go beyond the individual. Educating individuals about health promoting behaviors is necessary; however, the contextual factors that negatively influence these choices must also improve in order to create a lasting impact (2, 3, 4, 5).

Smoking

Cigarette smoking is the leading preventable cause of death in the United States, causing more deaths than HIV, illegal drug use, alcohol use, motor vehicle accidents, and firearm-related incidents combined (6). Smoking negatively impacts almost every organ of the body, and the effects begin immediately upon inhalation. Within ten seconds, nicotine reaches the brain, inducing cigarette addiction. Soon after, cancer-causing agents (carcinogens) bind to cells in the lungs and other organs. Tobacco smoke damages blood vessels, increasing the likelihood of blood clots. Carbon monoxide, another cigarette toxin, binds to red blood cells, preventing them from effectively circulating oxygen throughout the body (7). Long term damage from smoking includes chronic inflammation of the lungs, a weakened immune system, and DNA damage, all of which can lead to disease and death. The risk and severity of smoking-related illness depends on how long and how many cigarettes the smoker has smoked in his/her lifetime (8). Despite the well-known health risks, youth and young adult smoking rates in the United States have remained unchanged over the past few years (9). The reasons for this are complex and have to do with social and environmental factors that influence cigarette use as well as tobacco marketing tactics that entice people to start smoking. Today, nearly all adults who smoke on a regular basis started before the age of 26, making adolescents and young adults a key demographic in reducing smoking-related disease and death in the future (9).

Between 2005 and 2013, the percentage of Boston public high school students who smoked cigarettes decreased.

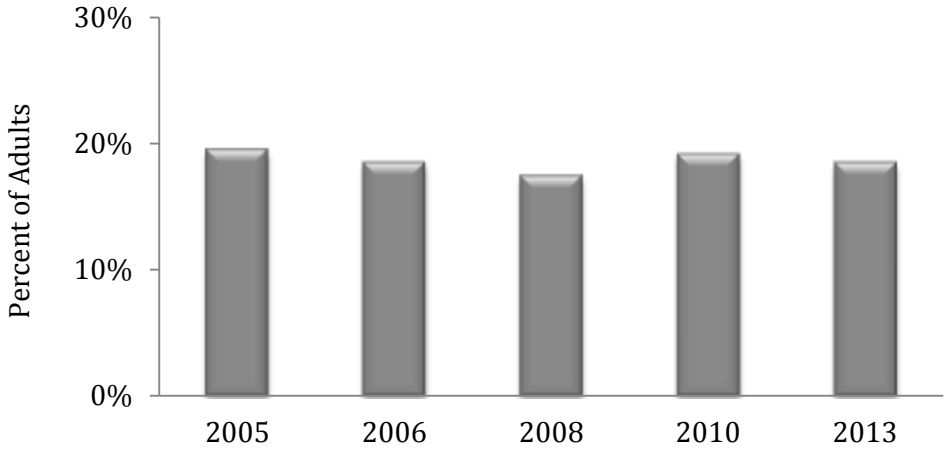
Figure 3.1 Public High School Students Who Smoke by Year



2005	2007	2009	2011	2013
15.3% (13.4-17.1)	7.5% (6.1-8.8)	10.3% (6.6-14.0)	10.0% (8.0-12.0)	7.9% (5.8-9.9)

DATA SOURCE: Youth Risk Behavior Survey (2005, 2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

Figure 3.2 Adults Who Smoke by Year

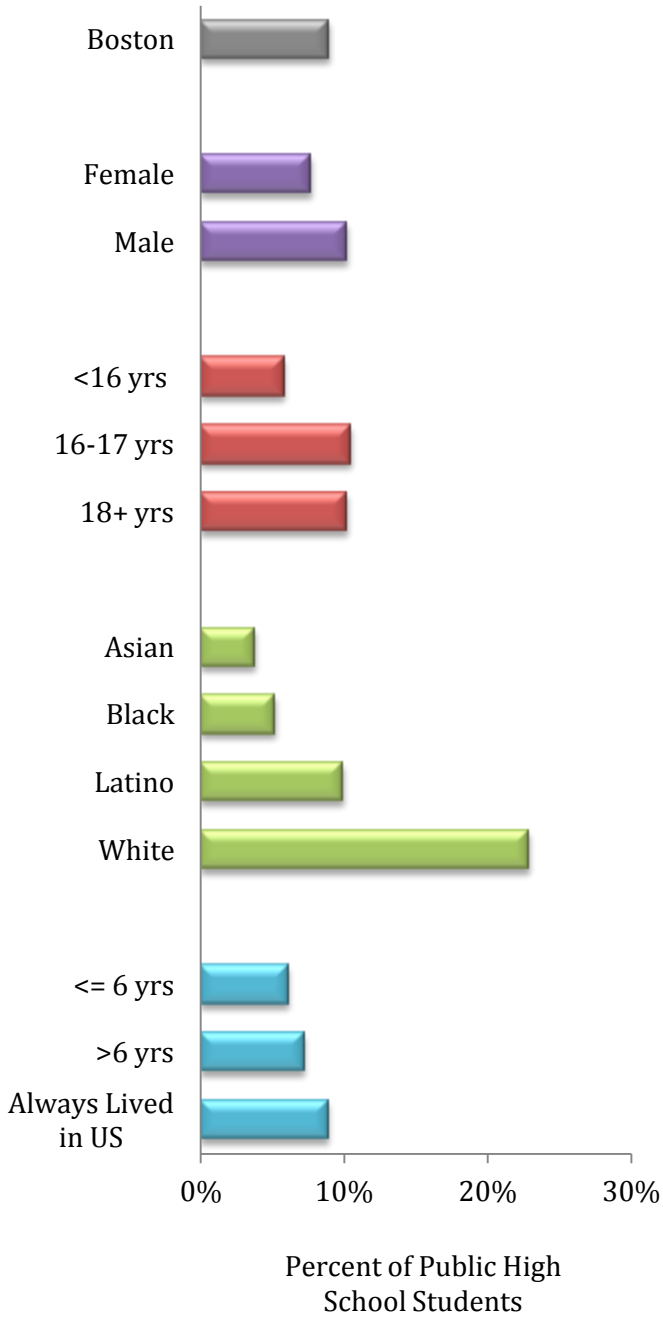


Between 2005 and 2013, there was no significant change in the percentage of Boston adults who reported smoking cigarettes.

2005	2006	2008	2010	2013
19.4% (17.0-21.9)	18.4% (16.2-20.6)	17.4% (15.1-19.6)	19.1% (16.6-21.5)	18.4% (16.6-20.2)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2005, 2006, 2008, 2010 and 2013), Boston Public Health Commission

Figure 3.3 Public High School Students Who Smoke by Selected Indicators, 2011 and 2013 Combined



Boston	9.0% (7.5-10.5)
Gender	
Female	7.7% (5.8-9.6)
Male	10.2% (7.7-12.7)
Age of Student	
<16 yrs	5.8% (3.7-7.9)
16-17 yrs	10.5% (8.1-12.8)
18+ yrs	10.2% (5.7-14.8)
Race/Ethnicity	
Asian	3.8% (1.4-6.2)
Black	5.2% (3.5-6.9)
Latino	10.0% (7.4-12.5)
White	22.9% (13.3-32.5)
Time Living in U.S.	
6 Years or Less	6.1% (2.8-9.4)
More than 6 Years	7.2% (4.0-10.3)
Always Lived in U.S.	8.9% (6.9-11.0)

DATA SOURCE: Youth Risk Behavior Survey (2011 and 2013), Centers for Disease Control and Prevention

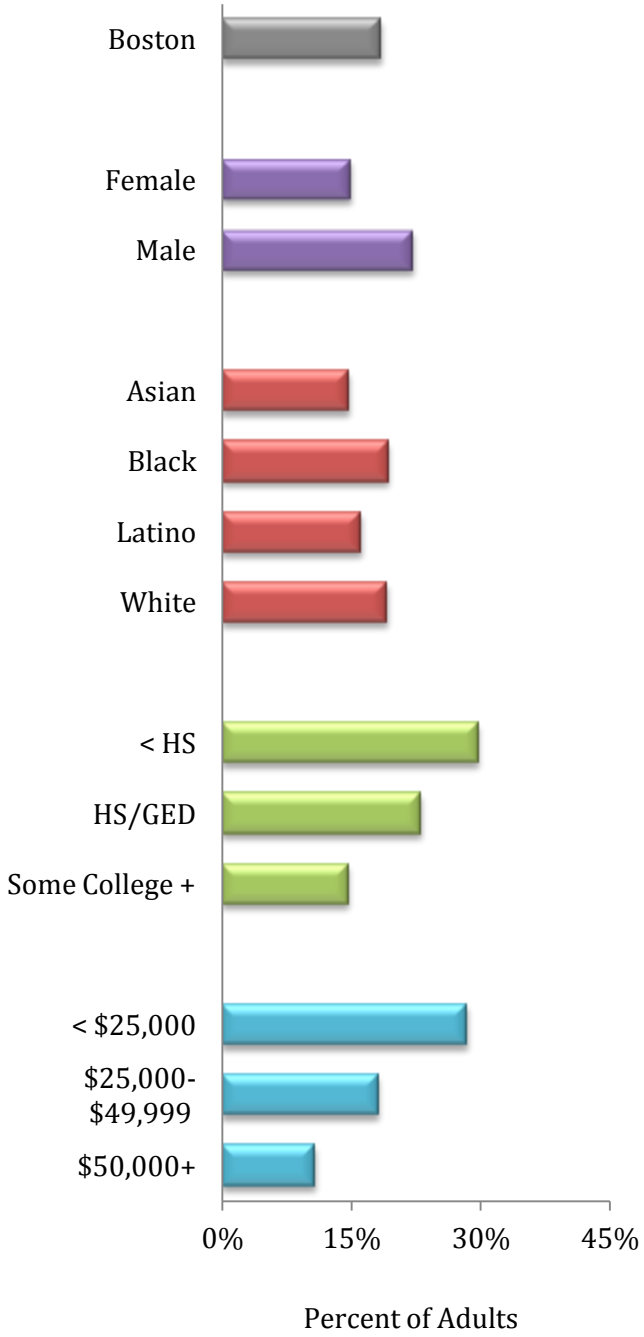
During 2011 and 2013 combined, 9% of Boston public high school students smoked cigarettes within the past 30 days. The percentage of students who smoked was similar for both males and females. Lower percentages of Asian, Black, and Latino students smoked cigarettes than White students. A higher percentage of students ages 16-17 smoked compared to students less than age 16.

Boston	18.4% (16.6-20.2)
Gender	
Female	15.0% (12.8-17.2)
Male	22.2% (19.3-25.2)
Race/Ethnicity	
Asian	14.7% (8.4-20.9)
Black	19.3% (16.0-22.5)
Latino	16.1% (12.2-20.0)
White	19.1% (16.2-22.0)
Educational Attainment	
Less than High School	29.7% (23.5-35.9)
High School Diploma or GED	23.1% (19.0-27.2)
At Least Some College/Bachelor's Degree or Higher	14.7% (12.6-16.7)
Income	
<$25,000	28.5% (24.6-32.4)
$25,000-$49,999	18.1% (14.0-22.3)
$50,000+	10.7% (8.4-13.1)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 18% of Boston adult residents reported they currently smoked cigarettes. The percentage of adults who smoked was lower for females as compared to males. The percentage of adults who smoked was similar between Asian, Black, Latino and White adults. Higher percentages of adults with a high school diploma or GED and those with less than a high school education reported smoking compared to adults with at least some college. A higher percentage of adults with an annual household income of less than $25,000 or between $25,000 and $49,999 reported current smoking compared with adults with annual household income of $50,000 or more.

Figure 3.4 Adults Who Smoke by Selected Indicators, 2013



Alcohol

Alcohol is the most commonly used drug in the United States (10). Although it is socially acceptable to drink alcohol, excessive consumption can have negative effects on a person ranging from poor judgment to increased risk of disease and death. Beyond the individual, the excessive use of alcohol significantly affects US economic costs related to health care, crime, and morbidity-associated productivity. Binge drinking, a form of excessive alcohol use, accounts for three-fourths of these costs. (11, 12).

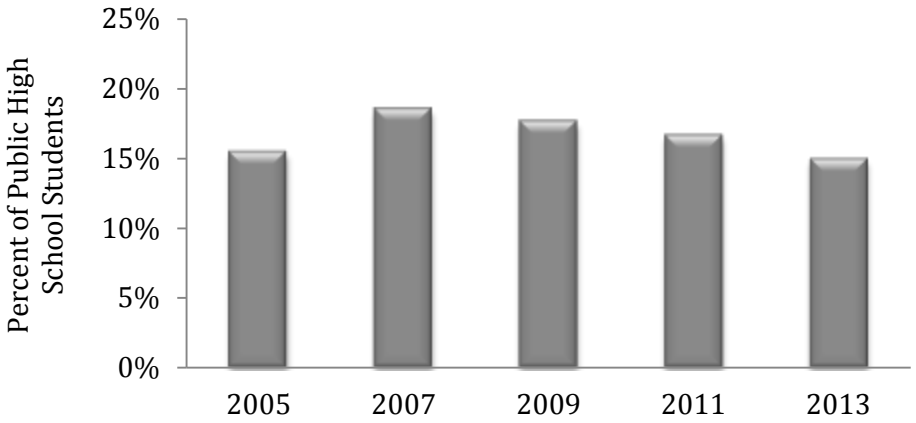
Binge drinking is defined as a pattern of alcohol consumption that brings the blood alcohol concentration level to 0.08% or more. It usually corresponds to 5 or more drinks for men and 4 or more drinks for women on a single occasion, generally within 2 hours. Drinking to extreme levels of intoxication is more prevalent among certain age groups such as adolescents and young adults. Because the brain is not fully developed until roughly the age of 25, young people who binge drink are at a greater risk for permanent brain damage due to the toxic effects of alcohol (13).

Research suggests that binge drinking in youth is associated with an increased risk of alcohol abuse or alcoholism later in life (14, 15, 16). Alcohol abuse is a pattern of drinking that results in harm to one's health, interpersonal relationships, or ability to work. Alcoholism is a chronic disease characterized by a strong craving for alcohol and the inability to limit drinking despite repeated physical, psychological, or interpersonal problems (16).

To reduce the risks associated with alcohol use, consumption should be moderated if not eliminated. Moderate drinking is defined as having up to one drink per day for women and up to two drinks per day for men. Strong evidence from observational studies has shown that moderate alcohol consumption is associated with a lower risk of cardiovascular disease and all-cause mortality. However, the *Dietary Guidelines for Americans* developed by the U.S. Department of Health and Human Services, states that it is not recommended that anyone begin drinking or drink more frequently on the basis of potential health benefits because moderate alcohol intake is also associated with increased risk of breast cancer, violence, drowning, and injuries (17).

Between 2005 and 2013, the percentage of Boston public high school students who engaged in binge drinking did not significantly change.

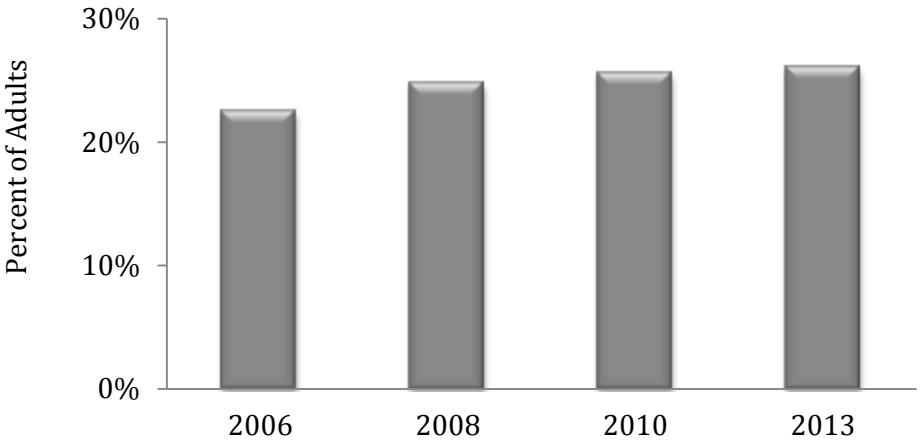
Figure 3.5 Binge Drinking Among Public High School Students by Year



2005	2007	2009	2011	2013
15.4% (13.1-17.6)	18.5% (15.6-21.4)	17.6% (13.8-21.3)	16.6% (13.3-19.9)	14.9% (12.5-17.3)

DATA SOURCE: Youth Risk Behavior Survey (2005,2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

Figure 3.6 Binge Drinking Among Adults by Year

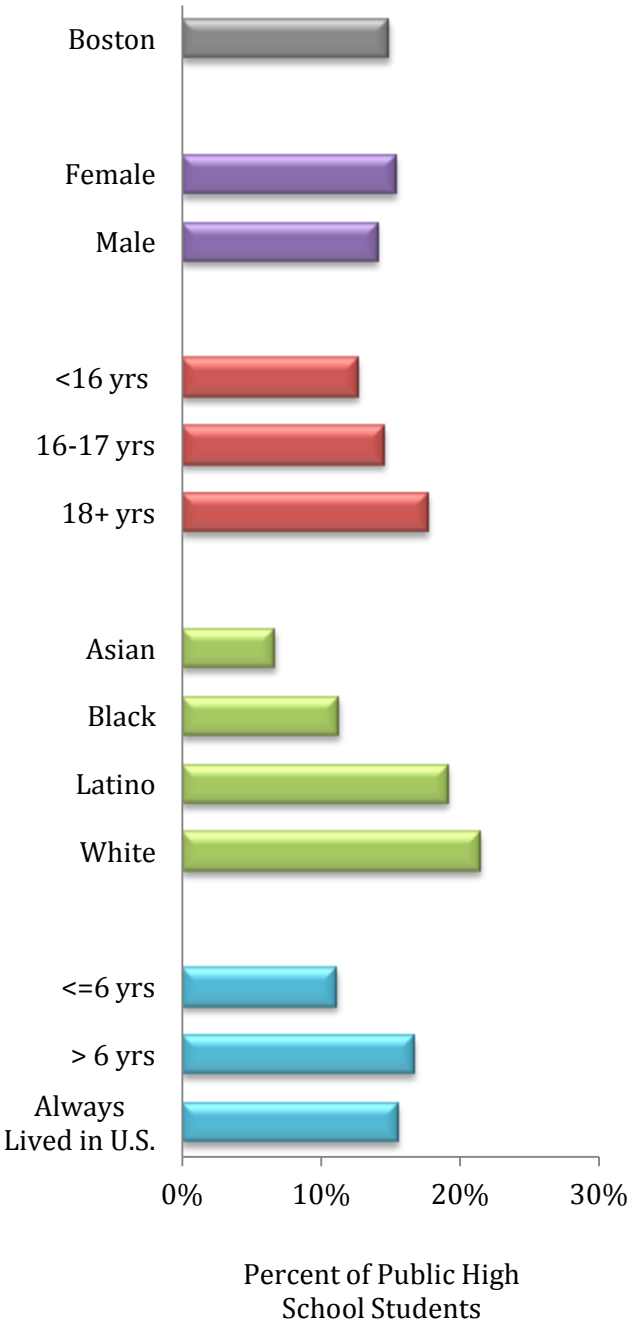


In 2006, 22% of adults reported binge drinking at least 1 time within the past 30 days, while in 2013, 25% of adults reported binge drinking.

2006	2008	2010	2013
22.4% (20.0-24.9)	24.7% (21.9-27.6)	25.5% (22.8-28.3)	25.4% (23.2-27.5)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2006, 2008, 2010 and 2013), Boston Public Health Commission

Figure 3.7 Binge Drinking Among Public High School Students by Selected Indicators, 2013

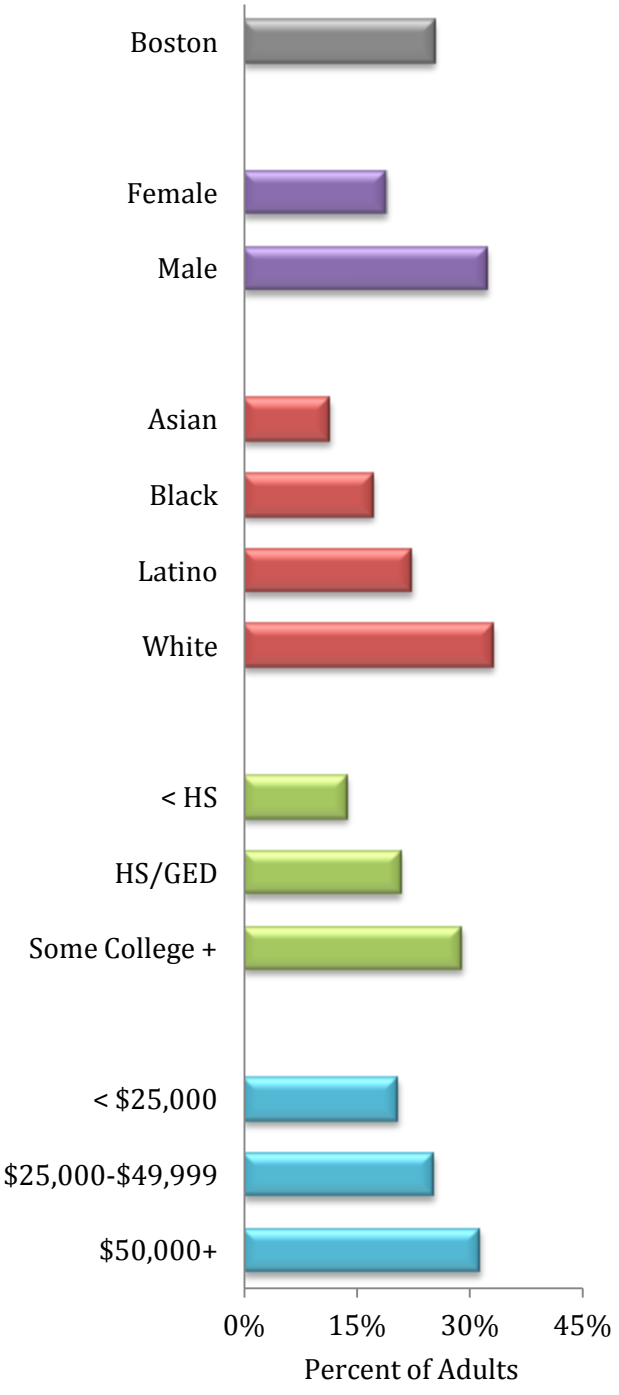


Boston	14.9% (12.4-17.3)
Gender	
Female	15.4% (12.0-18.8)
Male	14.1% (11.1-17.0)
Age of Student	
<16 yrs	12.7% (8.9-16.6)
16-17 yrs	14.6% (10.7-18.5)
18+ yrs	17.7% (10.6-24.8)
Race/Ethnicity	
Asian	6.7% (2.8-10.6)
Black	11.3% (7.8-14.9)
Latino	19.2% (15.1-23.3)
White	21.5% (12.6-30.4)
Time Living in U.S.	
6 Years or Less	11.2% (6.4-16.1)
More than 6 Years	16.7% (9.0-24.3)
Always Lived in U.S.	15.6% (12.5-18.7)

DATA SOURCE: Youth Risk Behavior Survey (2013), Centers for Disease Control and Prevention

In 2013, 15% of Boston public high school students engaged in binge drinking. The percentage of students who engaged in binge drinking was similar for both males and females. Lower percentages of Asian students engaged in binge drinking than White students. Binge drinking among students by age groups and time living in the U.S. was similar.

3.8 Binge Drinking Among Adults by Selected Indicators, 2013



Boston	25.4% (23.2-27.5)
Gender	
Female	19.1% (16.4-21.7)
Male	32.4% (29.8135.8)
Race/Ethnicity	
Asian	11.4% (6.4-16.5)
Black	17.2% (13.9-20.6)
Latino	22.3% (18.0-26.7)
White	33.1% (29.7-36.5)
Educational Attainment	
Less than High School	13.7% (8.8-18.7)
High School Diploma or GED	20.8% (16.5-25.2)
At Least Some College/Bachelor's Degree or Higher	29.0% (26.3-31.7)
Income	
<$25,000	20.6% (16.6-24.5)
$25,000-$49,999	25.3% (20.3-30.3)
$50,000+	31.4% (28.0-34.8)

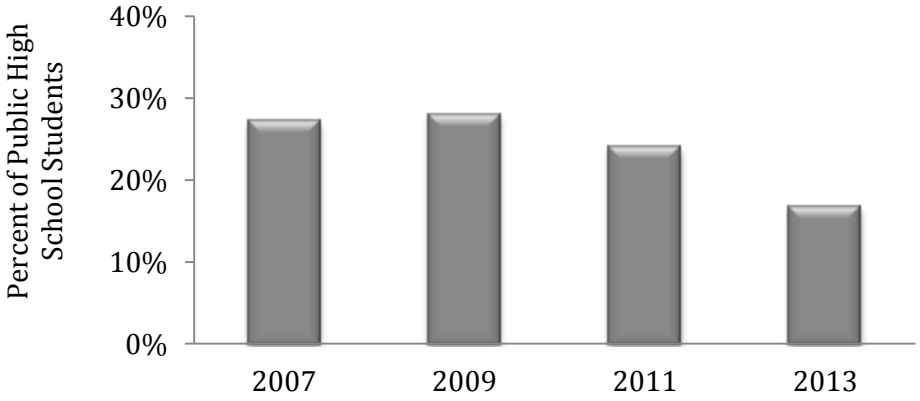
DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 25% of Boston adults reported binge drinking in the past month, with a higher percentage of males than females reporting this behavior. A higher percentage of White adults reported binge drinking than Asian, Black, and Latino adults. A higher percentage of adults with at least some college education reported binge drinking compared with adults who had less than a high school diploma or a high school diploma/GED. A higher percentage of adults with an annual household income of $50,000 or more reported binge drinking compared with adults who had an annual household income of less than $25,000.

Sugar-Sweetened Beverages

Sugar-sweetened beverages (SSBs) are drinks with added sugar. They are the largest source of empty calories for children and adolescents in the United States (18, 19). Although multiple environmental, social, and even biological factors influence obesity rates, the deciding factor is always an imbalance between energy consumed and energy used. Therefore, empty calories which provide energy but lack nutritional value are a major target in the fight to reduce obesity, especially among youth who consume 22% of their empty calories from SSBs (19). The Centers for Disease Control and Prevention, the American Academy for Pediatrics, and the American Heart Association have all called for the reduced consumption of sugary drinks for health-related reasons (19, 23, 24).

Figure 3.9 Daily Consumption of One or More Sodas Among Public High School Students by Year



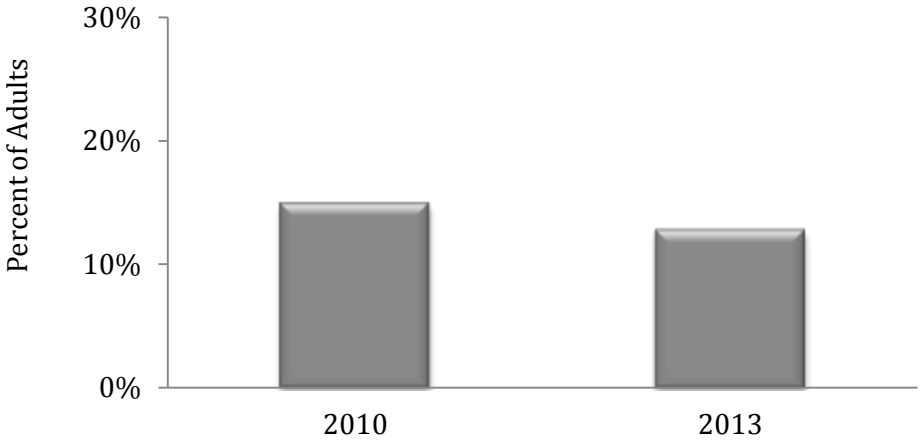
2007	2009	2011	2013
27.3% (24.9-29.7)	28.1% (25.3-30.9)	24.0% (19.9-28.2)	16.8% (13.8-19.8)

DATA SOURCE: Youth Risk Behavior Survey (2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

In 2013, 17% of Boston public high school students consumed one or more sodas a day. The percent of Boston public high school students who consumed one or more sodas a day was lower in 2013 than in 2011.

In 2013, 13% of adults reported drinking one or more sodas a day. From 2010 to 2013, the percentage of Boston adults who reported drinking one or more sodas a day did not significantly change.

Figure 3.10 Daily Consumption of One or More Sodas Among Adults by Year



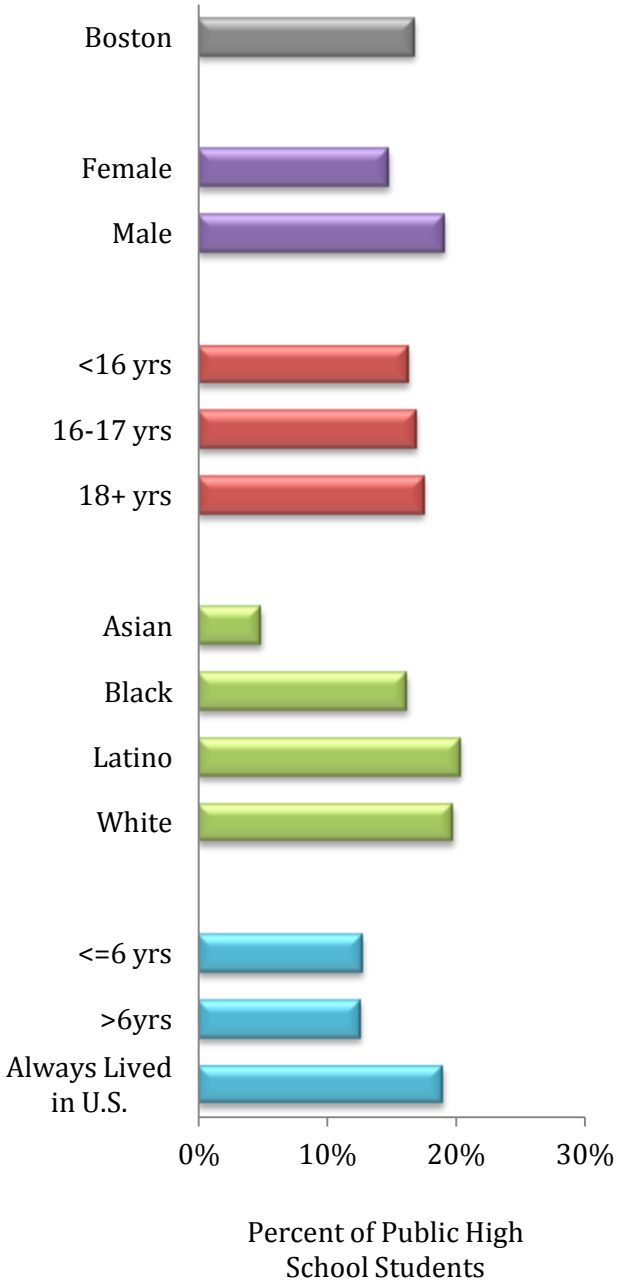
2010	2013
14.8% (12.8-16.9)	12.7% (11.0-14.3)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2010 and 2013), Boston Public Health Commission

Boston	16.8% (13.8-19.9)
Gender	
Female	14.8% (10.7-18.8)
Male	19.1% (15.0-23.1)
Age of Student	
<16 yrs	16.3% (11.5-21.1)
16-17 yrs	16.9% (12.3-21.6)
18+ yrs	17.5% (11.5-23.6)
Race/Ethnicity	
Asian	4.9% (0.0-10.0)
Black	16.2% (11.0-21.3)
Latino	20.3% (16.3-24.2)
White	19.8% (8.9-30.6)
Time Living in U.S.	
6 Years or Less	12.7% (8.3-17.1)
More than 6 Years	12.6% (7.1-18.1)
Always Lived in U.S.	19.0% (14.8-23.1)

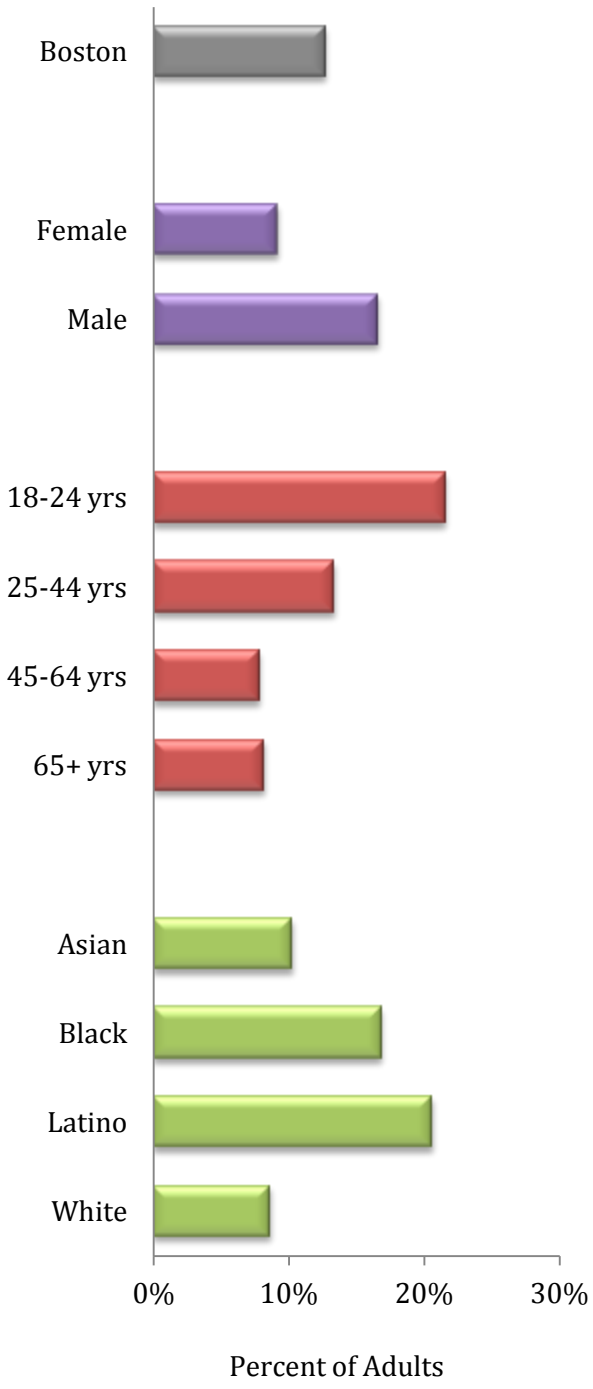
In 2013, 17% of Boston public high school students consumed one or more sodas a day. The percentage of students who consumed one or more sodas a day was similar for both males and females. Higher percentages of Black and Latino students consumed one or more sodas a day compared to Asian students. Percentages for students by years of residence in the U.S. and age were similar.

Figure 3.11 Daily Consumption of One or More Sodas Among Public High School Students by Selected Indicators, 2013



DATA SOURCE: Youth Risk Behavior Survey (2013), Centers for Disease Control and Prevention

Figure 3.12 Daily Consumption of One or More Sodas Among Adults by Selected Indicators, 2013



Boston	12.7% (11.0-14.3)
Gender	
Female	9.2% (7.4-11.0)
Male	16.6% (13.8-19.4)
Age	
18-24 yrs	21.5% (16.0-27.1)
25-44 yrs	13.4% (10.7-16.1)
45-64 yrs	7.8% (6.0-9.6)
65+ yrs	8.2% (5.6-10.8)
Race/Ethnicity	
Asian	10.3% (5.1-15.5)
Black	16.8% (13.6-20.1)
Latino	20.6% (16.1-25.1)
White	8.6% (6.3-10.9)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 13% of Boston adults reported daily consumption of one or more sodas. A higher percentage of males reported daily consumption of one or more sodas compared to females. A higher percentage of young adults ages 18-24, reported daily consumption of one or more sodas compared with adults ages 45-64 and those ages 65 and over. A higher percentage of Black and Latino adults reported daily consumption of one or more sodas compared to White adults.

Physical Activity

Regular physical activity is important to maintaining a healthy lifestyle. It can help control weight, strengthen bones and muscles, improve mental health, and reduce the risk of developing chronic diseases such as cancer, heart disease, diabetes, and obesity (25). To achieve an adequate amount of physical activity, a person must engage in both aerobic and muscle strengthening activities.

According to the CDC, children and adolescents need at least one hour of physical activity every day. Aerobic activity should make up the bulk of those 60 minutes. Muscle strengthening activities such as gymnastics or push-ups, and bone strengthening activities such as jumping rope or running, should be done at least three times a week as part of the 60 minutes of physical activity (25).

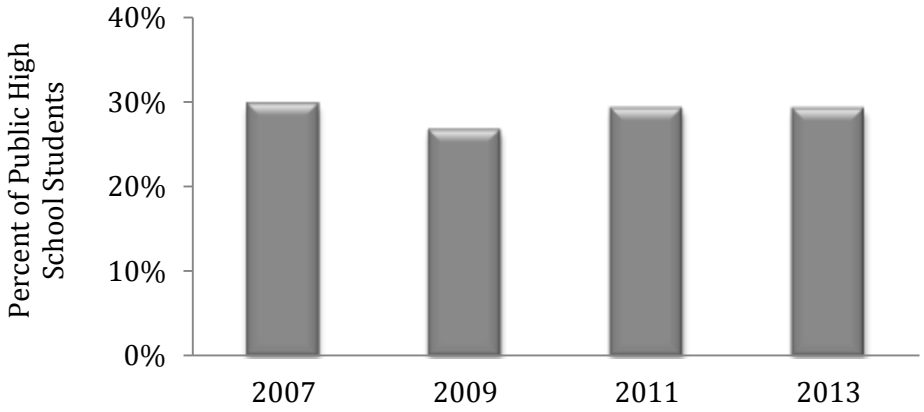
Adults require at least 150 minutes of moderate-intensity aerobic activity or 75 minutes of vigorous-intensity aerobic activity every week. Aerobic activities need not be done in one session; they can be broken up into smaller increments of at least 10 minutes and spread out throughout the week if it is easier. In addition to aerobic activities, muscle strengthening activities for all major muscle groups should be performed on two or more days a week (25).

Many of the health problems that come with age can be alleviated with regular physical activity. Adults 65 years and older with no limiting health conditions, should engage in the same amount of aerobic and muscle strengthening activity as younger adults (25).

There are many ways to meet the minimum requirements necessary to maintain a physically active lifestyle. See below for some examples:

Moderate Activity	Vigorous Activity	Muscle Strengthening
•Walking briskly	•Race walking, jogging, or running	•Lifting weights
•Bicycling (< 10 mph)	•Swimming laps	•Using resistance bands
•Water aerobics	•Aerobic dancing	•Heavy gardening (i.e., digging, shoveling)
•Ballroom dancing	•Bicycling (>10 mph)	•Yoga
•General gardening	•Jumping rope	•Push ups, sit ups, etc.

Figure 3.13 Public High School Students Who Engage in Regular Physical Activity by Year

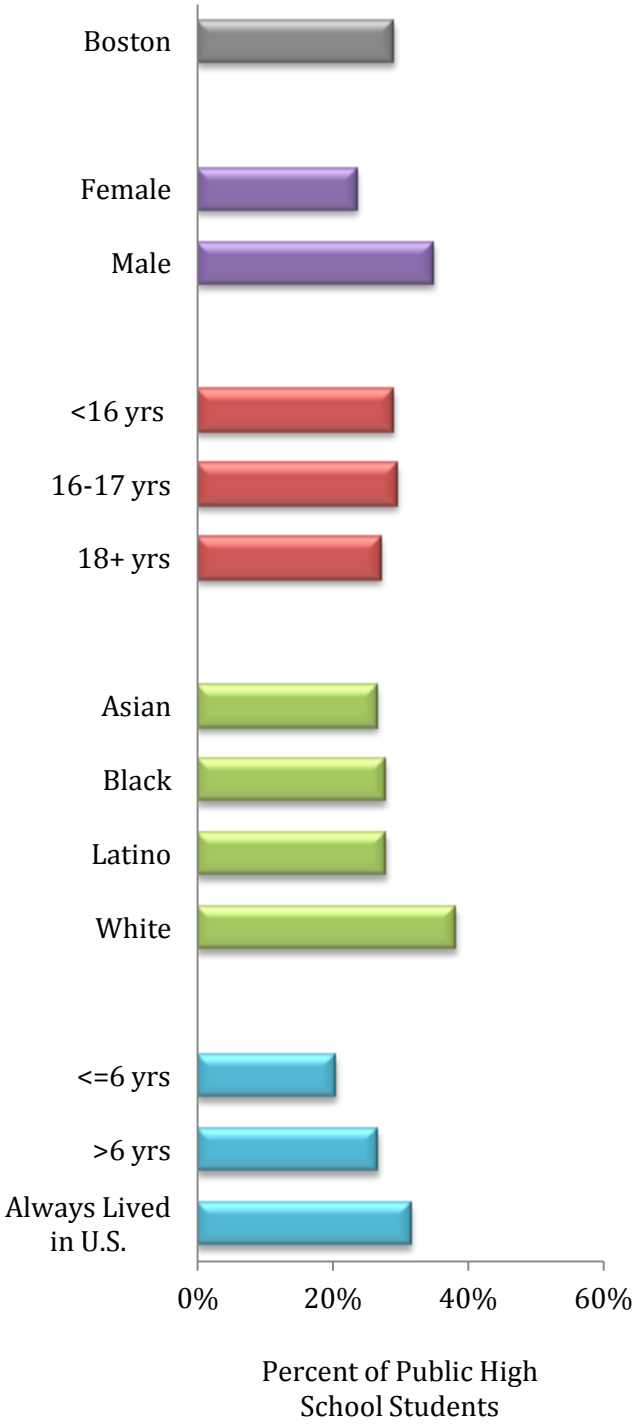


2007	2009	2011	2013
29.7% (26.9-32.6)	26.6% (23.4-29.8)	29.1% (26.0-32.3)	29.1% (24.0-34.1)

DATA SOURCE: Youth Risk Behavior Survey (2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

In 2013, 29% of Boston public high school students engaged in regular physical activity. The percentage of students who engaged in regular physical activity in 2011 was similar to the percentage in 2013.

Figure 3.14 Public High School Students Who Engage in Regular Physical Activity by Selected Indicators, 2013

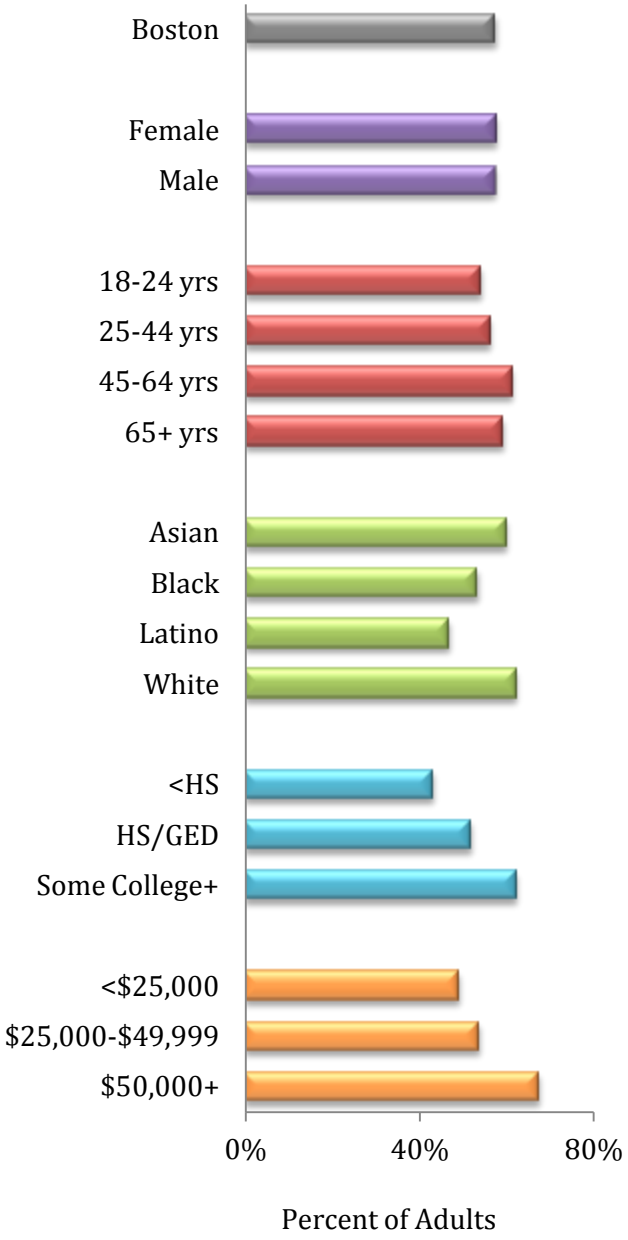


Boston	29.1% (24.0-34.4)
Gender	
Female	23.6% (17.5-29.8)
Male	35.0% (29.5-40.5)
Age of Student	
<16 yrs	29.0% (23.5-36.3)
16-17 yrs	29.6% (24.5-34.8)
18+ yrs	27.1% (13.5-40.7)
Race/Ethnicity	
Asian	26.6% (19.0-34.3)
Black	27.7% (20.7-34.7)
Latino	27.9% (21.5-34.3)
White	38.2% (25.4-51.1)
Time Living in U.S.	
6 Years or Less	20.5% (11.0-30.0)
More than 6 Years	26.7% (17.6-35.7)
Always Lived in U.S.	31.6% (25.4-37.8)

DATA SOURCE: Youth Risk Behavior Survey (2013), Centers for Disease Control and Prevention

In 2013, 29% of Boston public high school students engaged in regular physical activity. There were no significant differences in the percentages of students who engaged in regular physical activity by gender, age, race/ethnicity or time living in the U.S.

Figure 3.15 Adults Who Met CDC Guidelines for Aerobic Physical Activity (150 Minutes in the Past Week), 2013



Boston	57.5% (55.3-59.7)
Gender	
Female	57.6% (54.6-60.5)
Male	57.4% (54.0-60.7)
Age	
18-24 yrs	54.2% (47.6-60.8)
25-44 yrs	56.2% (52.5-60.0)
45-64 yrs	61.3% (58.1-64.4)
65+ yrs	59.1% (55.1-63.2)
Race/Ethnicity	
Asian	59.9% (51.9-68.0)
Black	53.4% (49.3-57.5)
Latino	46.9% (41.8-51.9)
White	62.3% (58.9-65.6)
Educational Attainment	
Less than High School Diploma	43.2% (36.7-49.6)
High School Diploma or GED	51.8% (46.8-56.7)
At Least Some College/Bachelor's Degree or Higher	62.1% (59.4-64.8)
Income	
<$25,000	49.2% (45.0-53.4)
$25,000-$49,999	53.8% (48.6-58.9)
$50,000+	67.6% (64.3-70.8)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 58% of Boston adults met the CDC recommendation for aerobic physical activity of 150 minutes in the past week. Lower percentages of Black and Latino residents met this requirement compared to White residents. Lower percentages of those with less than a high school diploma and those with a high school diploma or GED met the recommendation than those with at least some college education. Adults with incomes of $50,000 or more were more likely to meet the CDC recommendations than those who made less than $50,000. There were no significant differences by age group.

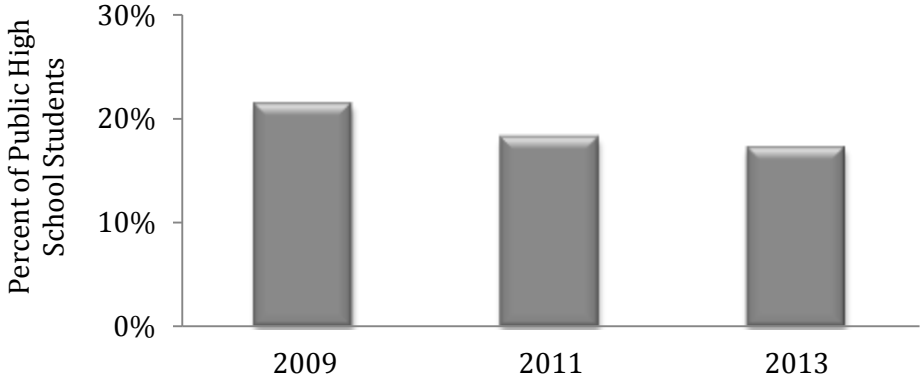
Fruits and Vegetables

Nearly everyone would benefit from eating more fruits and vegetables. Not only are they packed with nutrients, they are also naturally low in fat and calories, but still filling. A growing body of research indicates a diet rich in fruits and vegetables has many health benefits ranging from a lowered risk of heart disease to the prevention of aging-related eye diseases (26, 27, 28, 29). Despite the well-known benefits, intake of fruits and vegetables in the United States is extremely low. The median intake of fruits and vegetables for adults is 1.1 and 1.6 times a day respectively. For adolescents, the median intake is 1.0 and 1.3 times a day, respectively (30).

The minimum amount of fruits and vegetables a person should eat each day depends on age, gender, and physical activity. For example, a 30 year old male who gets less than 30 minutes a day of physical activity should eat two cups of fruits and three cups of vegetables each day, while a 60 year old female who gets 30-60 minutes of physical activity a day should have 1.5 cups of fruits and 2.5 cups of vegetables every day (31). To determine the right amount of fruits and vegetables for you, check out the fruits and vegetables calculator on the Centers for Disease Control and Prevention Website at www.cdc.gov.

How much is a serving of fruits or vegetable?

Figure 3.16 Public High School Students Who Consume Less Than One Daily Serving of Fruits and Vegetables by Year

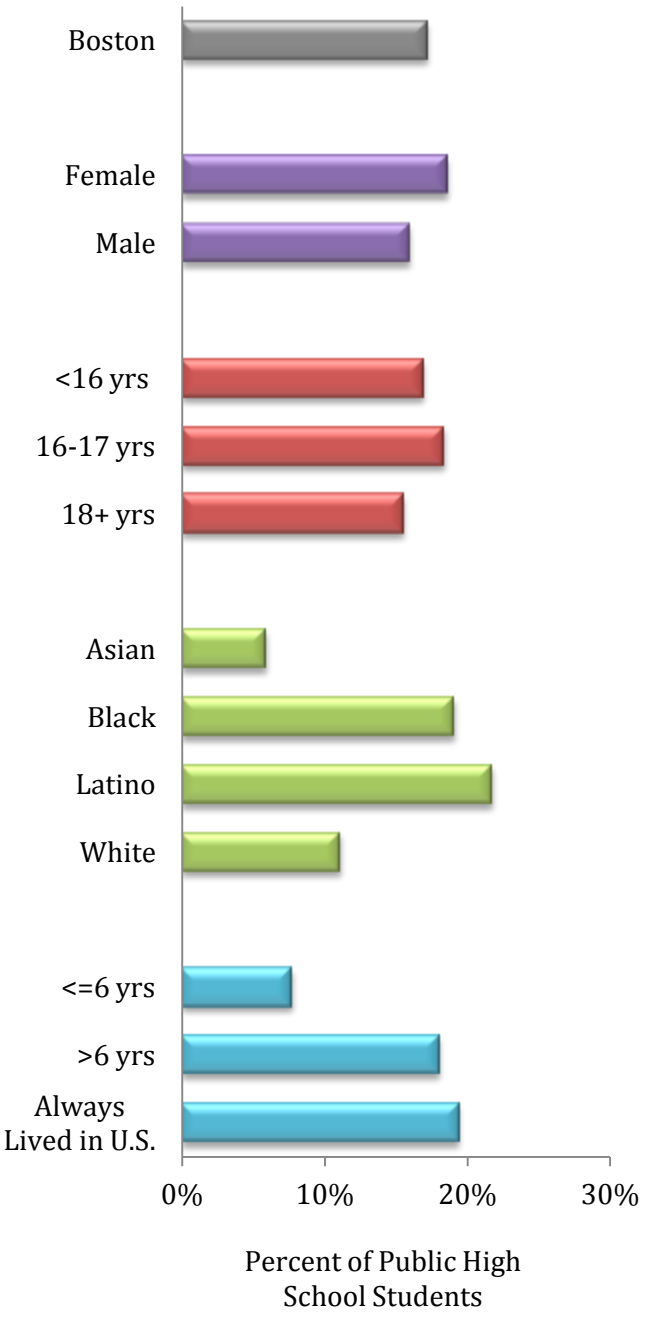


2009	2011	2013
21.4% (18.9-23.9)	18.2% (15.4-21.0)	17.2% (14.4-20.1)

DATA SOURCE: Youth Risk Behavior Survey (2009, 2011, and 2013), Centers for Disease Control and Prevention

In 2013, 17% of Boston public high school students consumed less than 1 daily serving of fruits and vegetables. The percentages for 2013 and 2011 were similar.

Figure 3.17 Public High School Students Who Consume Less than One Daily Serving of Fruits and Vegetables, 2013

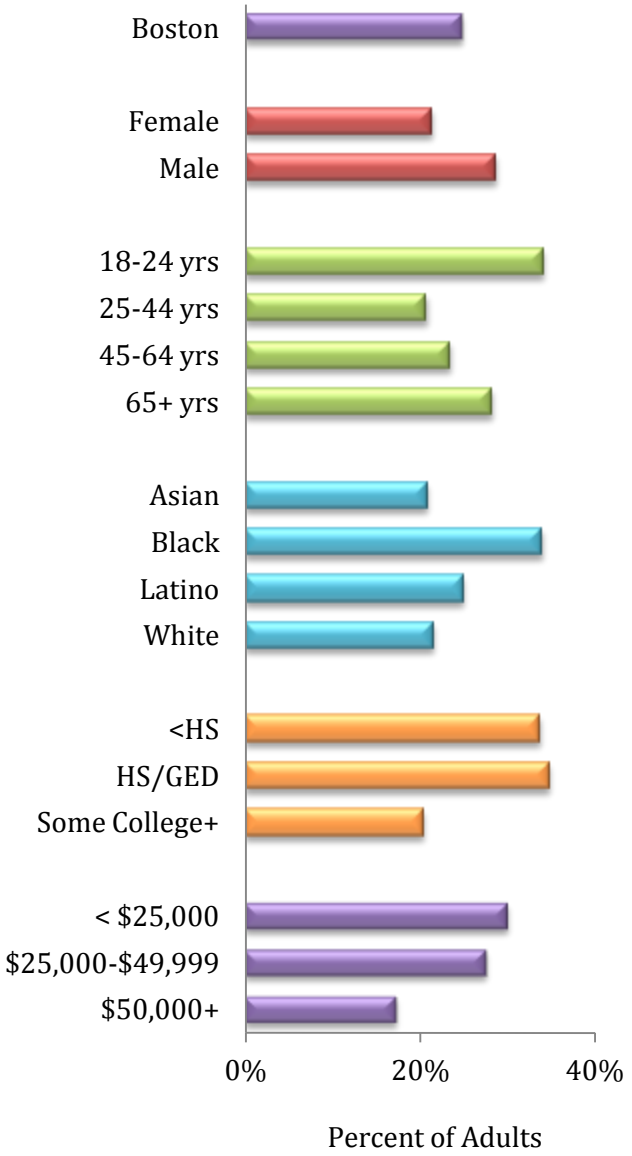


Boston	17.2% (14.3-20.1)
Gender	
Female	18.6% (14.2-23.1)
Male	16.0% (12.1-19.8)
Age of Student	
<16 yrs	16.9% (11.5-22.3)
16-17 yrs	18.4% (13.4-23.4)
18+ yrs	15.5% (7.9-23.2)
Race/Ethnicity	
Asian	5.9% (1.8-9.9)
Black	19.1% (13.5-24.6)
Latino	21.8% (16.3-27.2)
White	11.1% (5.0-17.2)
Time Living in U.S.	
6 Years or Less	7.7% (2.4-13.0)
More than 6 Years	18.0% (11.2-24.9)
Always Lived in U.S.	19.4% (16.0-22.9)

DATA SOURCE: Youth Risk Behavior Survey (2013), Centers for Disease Control and Prevention

In 2013, 17% of Boston public high school students consumed less than 1 daily serving of fruits and vegetables. The percentage for males and females was similar, as were the percentages for Asian, Black, and Latino students compared to White students. However, a lower percentage of students who consumed less than 1 daily serving of fruits and vegetables lived in the U.S. for 6 years or less compared to students who had always lived in the U.S.

Figure 3.18 Adults Who Consume Vegetables Less Than Once Per Day, 2013

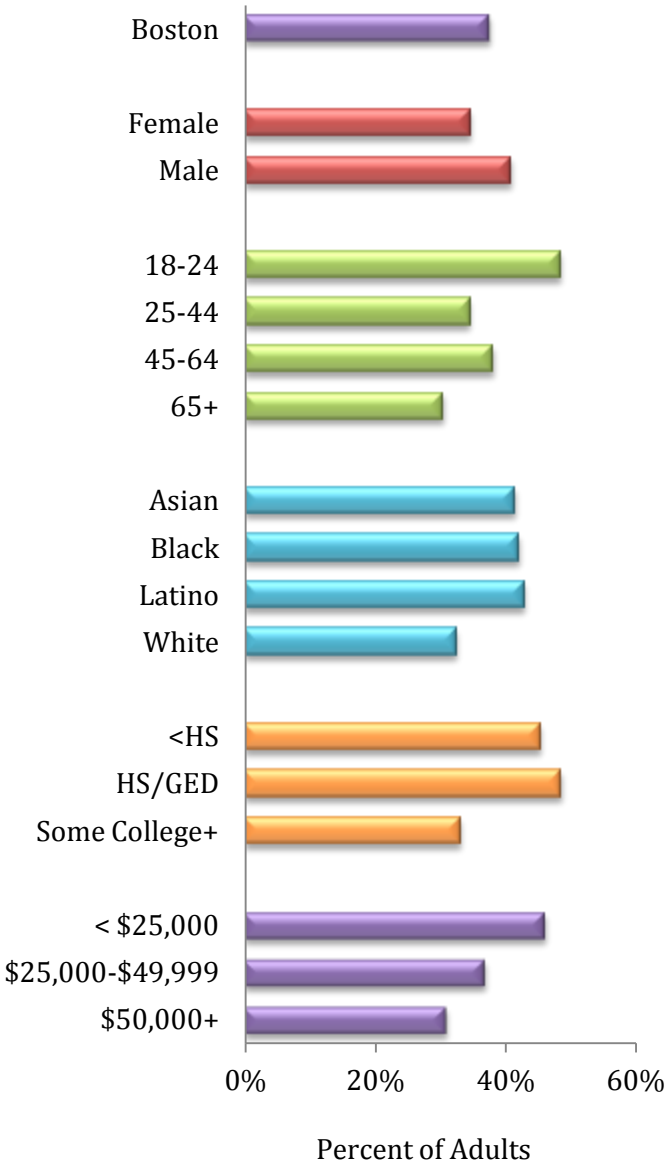


Boston	24.8% (22.9-26.8)
Gender	
Female	21.4% (19.0-23.8)
Male	28.7% (25.7-31.8)
Age	
18-24 yrs	34.2% (27.8-40.5)
25-44 yrs	20.7% (17.8-23.7)
45-64 yrs	23.4% (20.7-26.1)
65+ yrs	28.3% (24.6-32.0)
Race/Ethnicity	
Asian	20.8% (14.1-27.4)
Black	34.0% (30.1-37.9)
Latino	24.9% (20.5-29.3)
White	21.5% (18.7-24.4)
Educational Attainment	
Less than High School	33.8% (27.6-39.9)
High School Diploma or GED	34.8% (30.0-39.5)
At Least Some College/Bachelor's Degree or Higher	20.4% (18.2-22.6)
Income	
< $25,000	30.0% (26.3-33.8)
$25,000-$49,999	27.6% (23.1-32.1)
$50,000+	17.3% (14.7-20.0)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

During 2013, 25% of Boston adults reported consuming vegetables less than once a day. A higher percentage of Black adults reported consuming vegetables less than once a day compared to White adults. This was also true for those receiving a high school education or GED and those with less than a high school education compared to those with at least some college education. A higher percentage of males reported consuming vegetables less than once per day compared to females. Lower percentages of adults ages 25-44 and 45-65 consumed vegetables less than once per day compared with those between the ages of 18-24.

Figure 3.19 Adults Who Consumed Fruit Less Than Once Per Day, 2013



Boston	37.5% (35.4-39.7)
Gender	
Female	34.6% (31.8-37.4)
Male	40.8% (37.6-44.1)
Age	
18-24 yrs	48.4% (41.8-55.1)
25-44 yrs	34.5% (31.1-37.9)
45-64 yrs	38.1% (34.9-41.2)
65+ yrs	30.4% (26.7-34.2)
Race/Ethnicity	
Asian	41.5% (33.4-49.6)
Black	42.0% (38.0-46.0)
Latino	42.9% (37.9-47.9)
White	32.4% (29.3-35.6)
Educational Attainment	
Less than High School	45.3% (38.9-51.6)
High School Diploma or GED	48.5% (43.6-53.4)
At Least Some College/Bachelor's Degree or Higher	33.0% (30.5-35.5)
Income	
<$25,000	46.0% (41.9-50.2)
$25,000-$49,999	36.8% (31.9-41.8)
$50,000+	30.9% (27.8-34.0)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 38% of Boston adults reported consuming fruit less than once a day. Higher percentages of Black and Latino adults reported consuming fruit less than once a day compared to White adults. This was also true for those receiving a high school education or GED and those with less than a high school education compared to those with at least some college education. A higher percentage of males consumed fruit less than once per day compared to females. Lower percentages of adults ages 25-44, 45-64 and 65 and older consumed fruit less than once a day compared to those ages 18-24 years.

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Chapter 4:
Access to Care

Access to Care

Access to comprehensive and affordable quality health care services is vital to achieving health equity and the best possible quality of life. The Institute of Medicine defines access to health care as "the timely use of personal health services to achieve the best possible health outcomes" (1). Adequate health care is essential to disease prevention and management, and is important for every age group. Routine preventative care and easy access to treatment help individuals avoid sickness and disease, recover more quickly when ill, and manage chronic disease. When most needed, brief periods without health services can accumulate to produce long-term health issues, increasing the risk for the advancement of disease and even death by depriving individuals of life-saving monitoring and medical resources. In addition to health and economic consequences for individuals, a lack of access to consistent medical and preventative care leads to sicker individuals who require more resources, in turn contributing to rising healthcare costs and further burdening stressed emergency medical care systems (2).

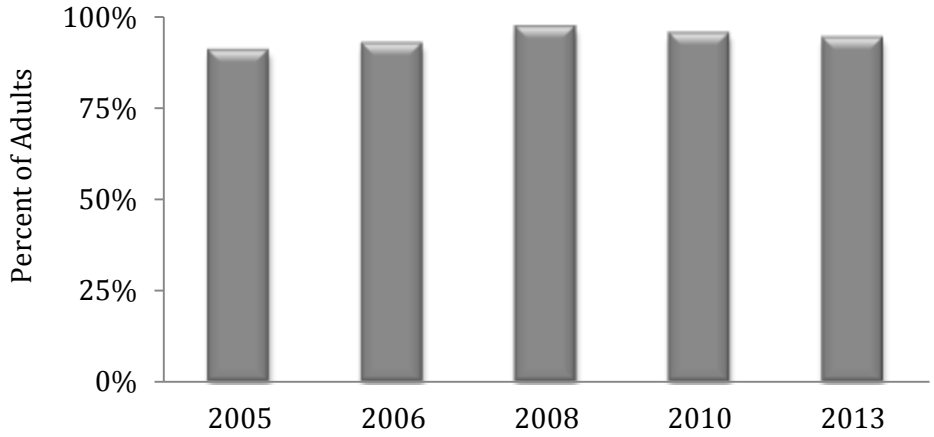
Access to care means more than being in close proximity to health services. Boston is home to world-renowned teaching hospitals and 25 community health centers, yet some residents still do not have access to regular health care. An individual's access to health care is affected by a myriad of social, economic, and environmental factors, including the cost of medical insurance, medical technology available, access to clinical, community, and preventative health services, and transportation to reach services (3). A person's tendency to access care is also influenced by socio-demographic factors, including age, gender, race/ethnicity, and country of birth. Barriers and perceived barriers to participating in our health-care system are disproportionately faced by low income residents, people with physical and mental disabilities, those whose primary language is not English, the uninsured and underinsured, recent immigrants, and certain racial/ethnic groups (2).

A key component of general health, oral health care is often neglected. Some may feel it is not as important as general health care, or find that oral health care is prohibitively expensive even with insurance. However, regular visits to the dentist offer an opportunity for the early diagnosis, prevention, and treatment of oral diseases and conditions (4).

In 2006, Massachusetts addressed a major barrier to health care access through enacting comprehensive health reform. The system was designed to provide near-universal health insurance coverage for state residents by promoting shared individual, employer, and government responsibility.

Massachusetts succeeded in expanding coverage to nearly all state residents, which resulted in more adults receiving preventative care services and reporting having a medical home (5). Between 2006 and 2010, the percentage of uninsured nonelderly adults decreased from 10.9% to 6.3%, while the national percentage increased from 17.1% to 18.4% during the same time period. Although not identical, Massachusetts reform served as a model for the nationally implemented Patient Protection and Affordable Care Act.

Figure 4.1 Adults with Health Insurance by Year

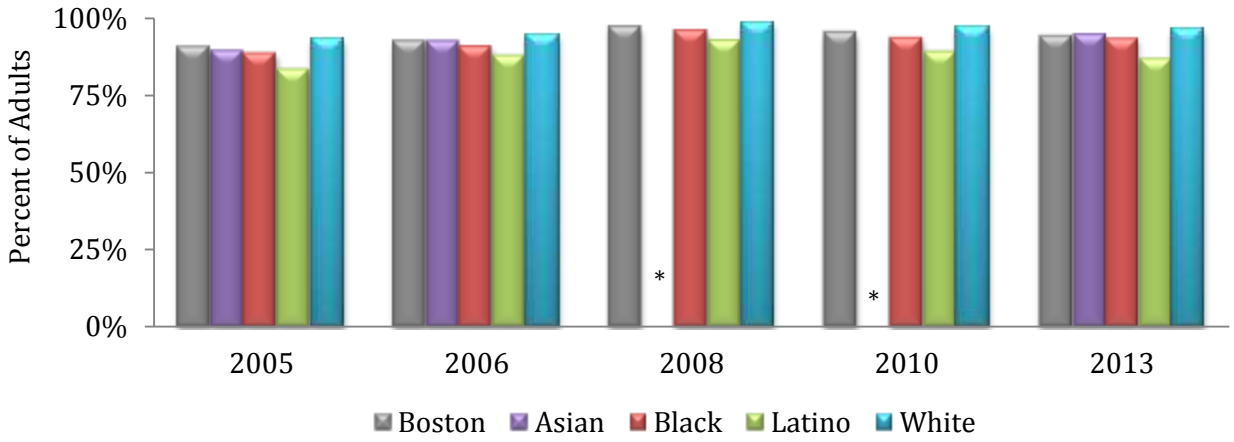


2005	2006	2008	2010	2013
90.6% (88.5-92.7)	92.5% (90.7-94.2)	97.1% (96.0-98.2)	95.3% (93.9-96.6)	94.0% (92.8-95.2)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2005, 2006, 2008, 2010 and 2013), Boston Public Health Commission

In 2013, 94% of Boston residents had health insurance coverage. Between 2005 and 2013, the percentage of residents with health insurance increased significantly.

Figure 4.2 Adults with Health Insurance by Race/Ethnicity and Year



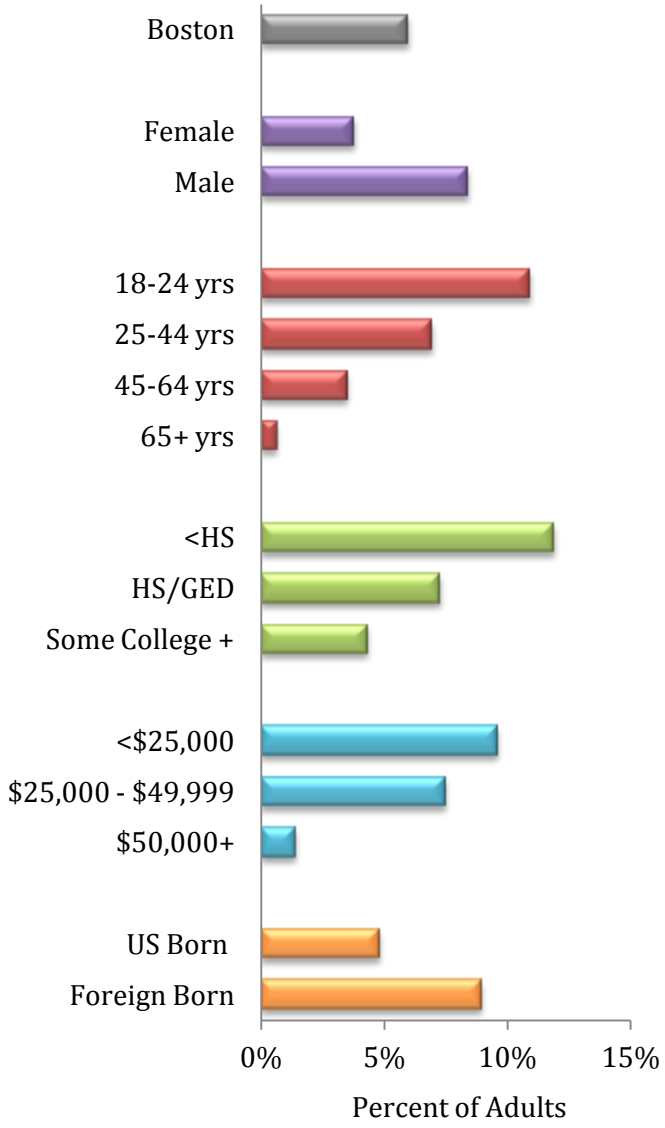
	2005	2006	2008	2010	2013
Boston	90.6% (88.5-92.7)	92.5% (90.7-94.2)	97.1% (96.0-98.2)	95.3% (93.9-96.6)	94.0% (92.8-95.2)
Asian	89.6% (82.0-97.1)	92.7% (86.8-98.6)	*	*	94.8% (91.2-98.5)
Black	88.9% (84.4-93.3)	91.1% (87.2-95.0)	96.3% (94.4-98.2)	93.8% (90.6-97.1)	93.6% (91.3-95.8)
Latino	83.6% (76.3-90.9)	88.1% (82.4-93.8)	93.0% (88.8-97.3)	89.4% (84.6-94.2)	87.0% (83.0-91.1)
White	93.4% (90.9-96.0)	94.7% (92.8-96.7)	98.9% (98.2-99.5)	97.5% (96.1-98.8)	96.4% (94.8-98.0)

*Insufficient sample size for Asian residents in 2008 and 2010.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2005, 2006, 2008, 2010 and 2013), Boston Public Health Commission

Over time, the percentage of Boston residents with health insurance varied by race/ethnicity. In 2013, a lower percentage of Latino residents were insured compared to White residents. Between 2005 and 2013, there was an increase in the percentage of White residents who were insured. There was no significant change in the percentage of Black or Latino residents with insurance from 2005 to 2013.

Figure 4.3 Uninsured by Selected Indicators, 2013

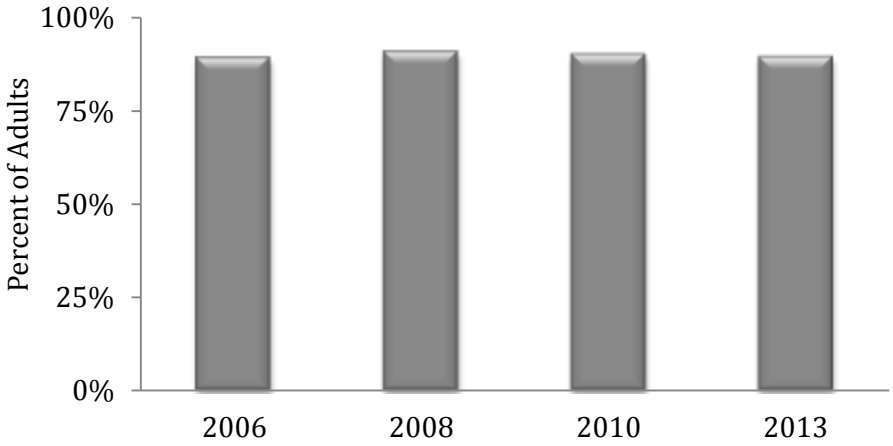


Boston	6.0% (4.8-7.2)
Gender	
Female	3.8% (2.6-5.0)
Male	8.4% (6.3-10.6)
Age	
18-24 yrs	10.9% (6.8-15.0)
25-44 yrs	7.0% (4.9-9.0)
45-64 yrs	3.5% (2.3-4.7)
65+ yrs	0.6% (0.1-1.2)
Educational Attainment	
Less than High School	11.9% (6.8-17.0)
High School Graduate or GED	7.3% (4.4-10.1)
At Least Some College/Bachelor's Degree or Higher	4.3% (3.1-5.5)
Income	
< $25,000	9.6% (7.0-12.2)
$25,000 - $49,999	7.5% (4.2-10.9)
$50,000+	1.4% (0.7-2.1)
Place of Birth	
US Born	4.8% (3.4-6.2)
Foreign Born	8.9% (6.1-11.8)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 6% of Boston residents had no health insurance coverage. Residents without health insurance coverage varied by gender, age, educational attainment, income and place of birth. The percentage of uninsured Boston female residents was lower than that of uninsured male residents. A lower percentage of those 45-64 years and those 65+ were uninsured than those ages 18-24 years. A higher percentage of residents with less than a high school education were uninsured compared to residents with at least some college. Higher percentages of adults with incomes of less than $50,000 were uninsured than those with incomes greater than $50,000. There was no statistical difference in the percentage of uninsured between US born and foreign born residents.

Figure 4.4 Routine Check-up within the Past 2 Years, by Year

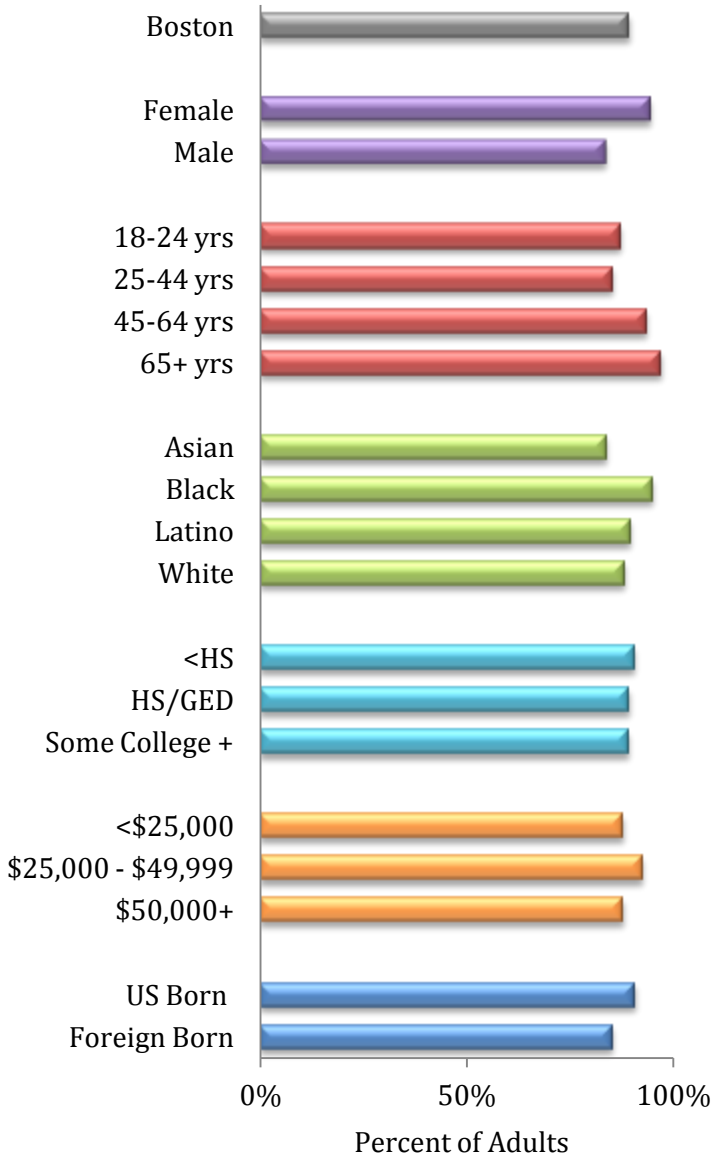


2006	2008	2010	2013
89.2% (87.3-91.1)	90.9% (89.0-92.8)	90.1% (88.0-92.1)	89.4% (87.9-90.9)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2006, 2008, 2010 and 2013), Boston Public Health Commission

In 2013, 89% of adults had a routine check-up within the past 2 years. There was no significant difference in the percent of adults who had a routine check-up between 2010 and 2013.

Figure 4.5 Routine Check-up within the Past 2 Years By Selected Indicators, 2013

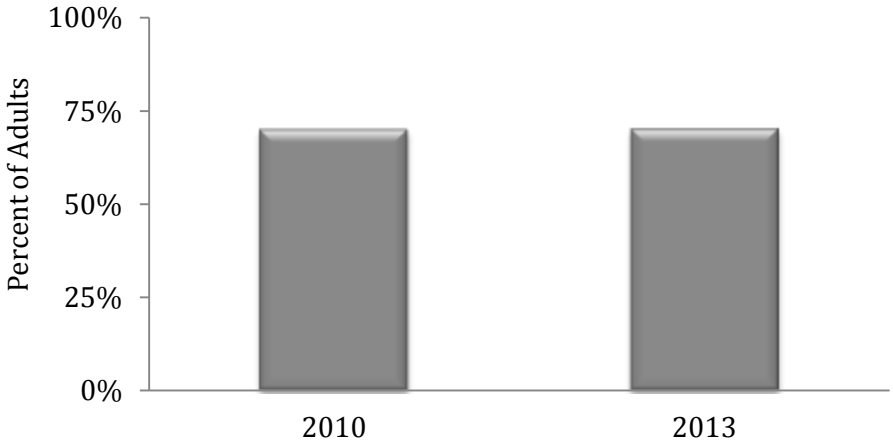


Boston	89.4% (87.9-90.9)
Gender	
Female	94.5% (93.1-95.9)
Male	83.7% (81.0-86.4)
Age	
18-24 yrs	87.2% (82.8-91.6)
25-44 yrs	85.3% (82.5-88.1)
45-64 yrs	93.5% (91.8-95.1)
65+ yrs	97.0% (95.9-98.1)
Race/Ethnicity	
Asian	83.8% (78.0-89.6)
Black	94.9% (93.2-96.7)
Latino	89.6% (86.2-93.1)
White	88.0% (85.6-90.4)
Educational Attainment	
Less than High School	90.5% (85.9-95.2)
High School Diploma or GED	89.4% (86.1-92.6)
At Least Some College/Bachelor's Degree or Higher	89.2% (87.4-91)
Income	
<$25,000	87.9% (84.8-91.1)
$25,000 - $49,999	92.4% (89.9-94.9)
$50,000+	87.9% (85.5-90.3)
Place of Birth	
US Born	90.9% (89.2-92.6)
Foreign Born	85.2% (81.7-88.7)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 89% of Boston residents had a routine health check-up within the past 2 years. A higher percentage of female residents than male residents had a check-up within the past 2 years. Among residents by age group, a higher percentage of residents ages 45-64 and those 65 and over had a check-up within the past 2 years compared to residents ages 18-24. A lower percentage of Boston residents born outside the United States reported a check-up within the past 2 years when compared to Boston residents born in the United States. No statistical differences were found by educational attainment or place of birth.

Figure 4.6 Teeth Cleaned in the Past Year by Year

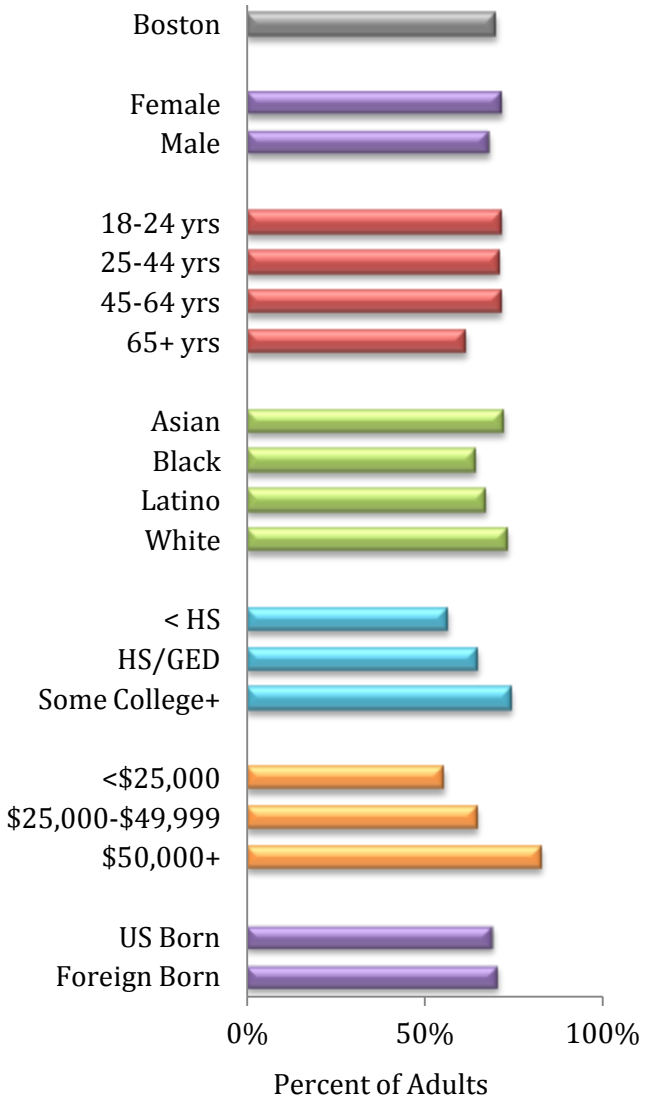


2010	2013
69.9% (67.3-72.6)	70.2% (68.1-72.2)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2010 and 2013), Boston Public Health Commission

Between 2010 and 2013, there was no significant change in the percentage of Boston residents who had their teeth cleaned within the past year.

Figure 4.7 Teeth Cleaned in the Past Year by Selected Indicators, 2013

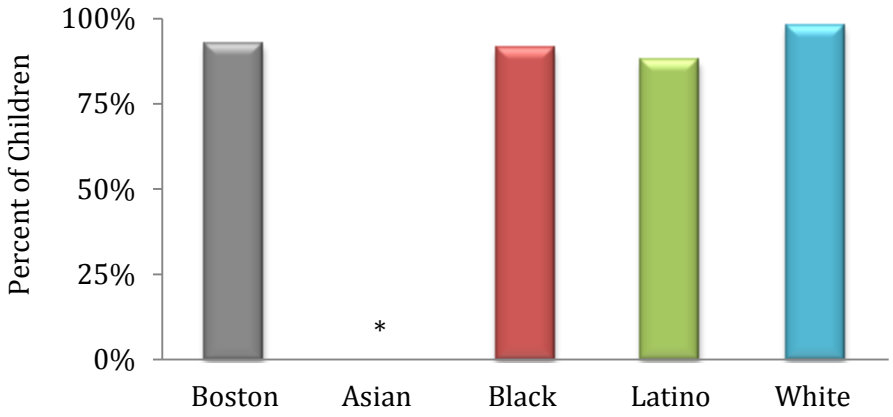


Boston	70.2% (68.1-72.2)
Gender	
Female	71.9% (69.2-74.6)
Male	68.3% (65.1-71.4)
Age	
18-24 yrs	72.0% (66.1-77.8)
25-44 yrs	70.9% (67.4-74.3)
45-64 yrs	71.5% (68.5-74.5)
65+ yrs	61.6% (57.5-65.8)
Race/Ethnicity	
Asian	72.5% (65.2-79.8)
Black	64.4% (60.6-68.2)
Latino	67.2% (62.4-72.1)
White	73.4% (70.3-76.5)
Educational Attainment	
Less than High School	56.7% (50.3-63.1)
High School Diploma or GED	65.0% (60.5-69.5)
At Least Some College/Bachelor's Degree or Higher	74.3% (71.9-76.7)
Income	
<$25,000	55.6% (51.5-59.8)
$25,000-$49,999	64.8% (59.9-69.8)
$50,000+	82.9% (80.3-85.5)
Place of Birth	
US Born	69.2% (66.7-71.8)
Foreign Born	70.6% (66.5-74.8)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 70% of Boston residents had their teeth cleaned during the past year. By age, a lower percentage of residents ages 65+ had their teeth cleaned in the past year compared to those in ages 18-24 years. Black adults were less likely to have had their teeth cleaned compared to White adults. A lower percentage of residents with less than a high school education and those who were high school graduates had their teeth cleaned compared to residents with at least some college. A lower percentage of residents with an annual income of less than $25,000 and between $25,000 and $49,999 had their teeth cleaned in the past year compared to residents with an annual income of $50,000 or more. There was no significant difference by place of birth.

Figure 4.8 Children with a Usual Place of Healthcare by Race/Ethnicity, 2012



Boston	Asian	Black	Latino	White
92.6% (90.5-94.6)	*	91.3% (87.2-95.3)	87.8% (83.0-92.6)	97.9% (96.5-99.2)

*Insufficient sample size

DATA SOURCE: Boston Survey of Children's Health, 2012, Boston Public Health Commission

Most of Boston's children had a usual place where they received health care in 2012. However, by race/ethnicity, percentages of Black and Latino children with a usual place of care were lower than for White children.

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5. Henry J. Kaiser Foundation. Massachusetts Health Care Reform: Six Years Later. Kaiser Family Foundation. [Online] May 2012. [Cited: February 19, 2014.] http://kaiserfamilyfoundation.files.wordpress.com/2013/01/8311.pdf.

Chapter 5: Maternal and Child Health

Maternal and Child Health

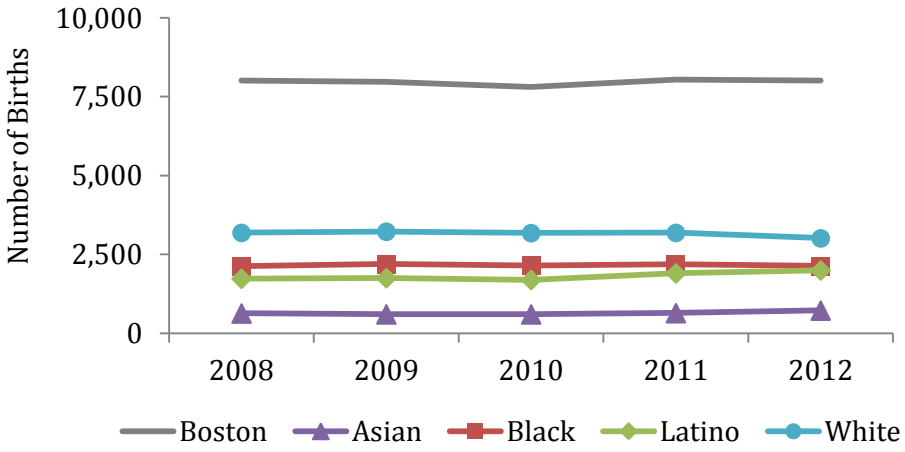
Birth rates, infant mortality rates (IMR), and infant characteristics of birth weight and gestational age provide important measures for the well-being of infants and pregnant women, and are often viewed as a reflection of the health status of a community. The IMR in particular is a key marker of maternal and child health, and serves as an important gauge for social and economic progress as well as the effectiveness of healthcare systems (1). Infant mortality is defined as the death of an infant before his or her first birthday. In the United States, substantial progress has been made throughout the 20th century in reducing the rate of infant mortality. Despite the progress, the IMR for the United States—one of the wealthiest countries in the world—is relatively high and above the 34 country-average for the Organization for Economic Cooperation and Development (1). Significant differences persist among racial and ethnic groups in the United States where Black infants continue to die at nearly twice the rate of non-Latino White infants (2). The majority of infant deaths in the United States occur from birth defects, being born too small or too soon, maternal pregnancy complications, injury to the child, or sudden infant death syndrome (3).

Low birth weight (birth weight less than 5 pounds, 8 ounces or 2,500 grams) and preterm birth (gestational age less than 37 weeks of completed pregnancy) are important predictors of infant survival. Preterm and low birth weight infants are at higher risk of early death and long-term health and developmental issues than infants born later in pregnancy and at a higher birth weight. In 2009, 35% of all infant deaths were related to preterm birth (4). Decreases in the percentage of preterm births and low birth weight births occurred nationwide from 2006 to 2011; however, substantial inequities persist between different racial and ethnic groups. In 2011, Black women were twice as likely to have a low birth weight infant (13.3 percent compared with 7.1 percent for White women) and 1.6 times more likely to have a preterm birth (16.8 compared with 10.5 percent) (5).

Rates of low birth weight (LBW), preterm births, and infant mortality are influenced by a variety of individual, socioeconomic, and environmental factors that impact children and families throughout their lives. Individual factors include the health status of the mother (e.g., diabetes, high blood pressure or nutritional status), and maternal health behaviors, such as smoking during pregnancy (6). Socioeconomic and environmental influences include low socioeconomic status, limited access to medical care, and residence in disadvantaged neighborhoods, all of which may contribute to maternal stress (7).

A number of studies indicate that the cumulative effect of chronic stressors endured by women over time may play a major role in adverse outcomes for mothers and their infants (8, 9). These stressors include, but are not limited to, domestic violence, racism, living in neighborhoods with poor housing and inadequate access to health resources and services. For example, women who are exposed to the chronic stress of racism may experience physiological changes in their body that are detrimental to their health and the healthy development of their fetus (9, 10). Hormonal changes that occur with persistent stressors during pregnancy can interfere with normal brain development, while parenting stress and environmental stressors are risk factors for childhood maltreatment and increased risk of health and social problems for children later in life (10,11, 12).

Figure 5.1 Birth Count by Race/Ethnicity and Year

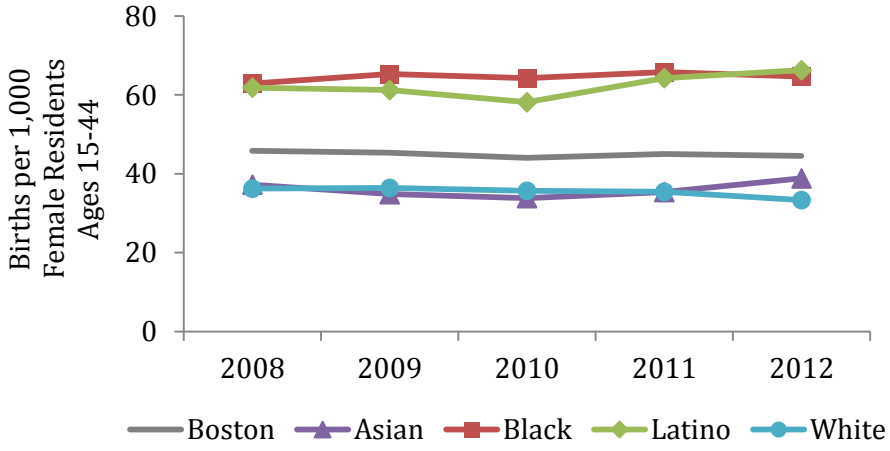


DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

In Boston in 2012, there were 8,011 births. Of the births with reported race/ethnicity, 726 were to Asian women, 2,136 to Black women, 1,998 to Latino women and 3,016 to White women.

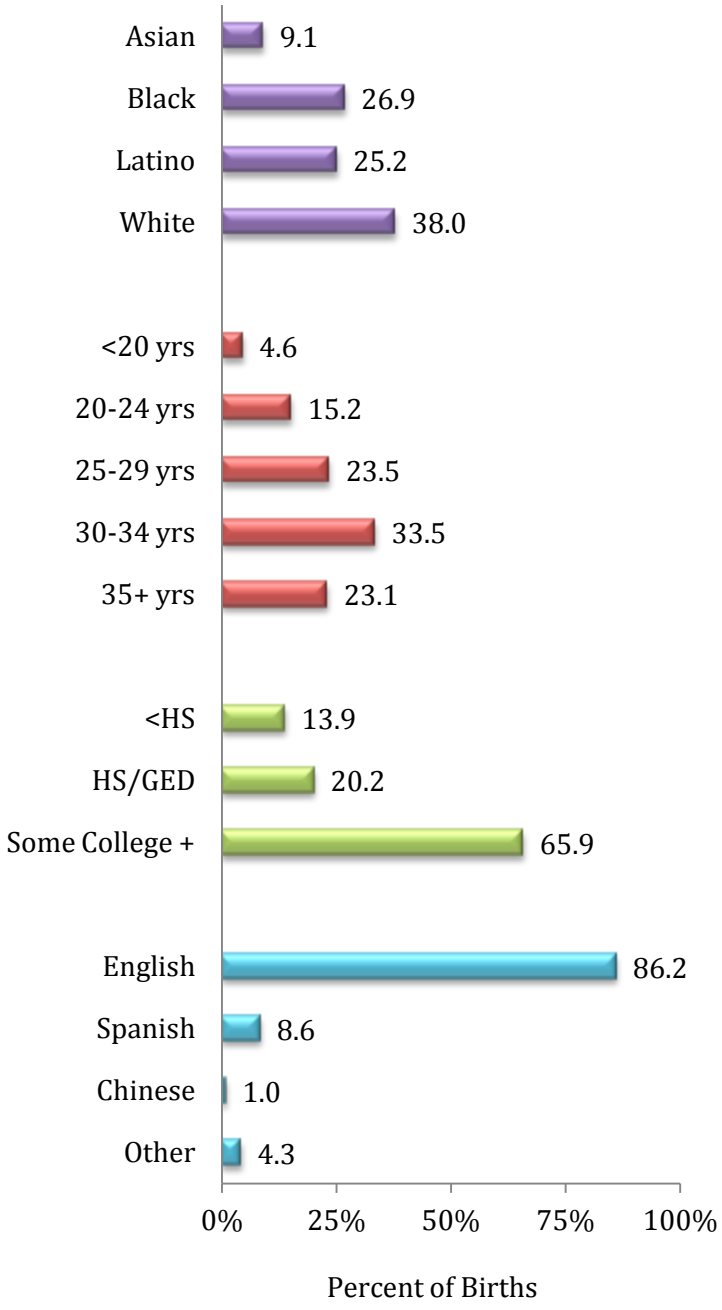
In 2012, there were 44.5 births per 1,000 female Boston residents , ages 15-44. There was no significant change in the Boston birth rate between 2008 and 2012. There was an increase in the birth rate among Latino women and a decrease in the birth rate among White women from 2008 to 2012. In 2012, the rate of births to Black (64.7), Latino (66.3) and Asian (38.8) women was higher compared to White women (33.3).

Figure 5.2 Birth Rate by Race/Ethnicity and Year



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

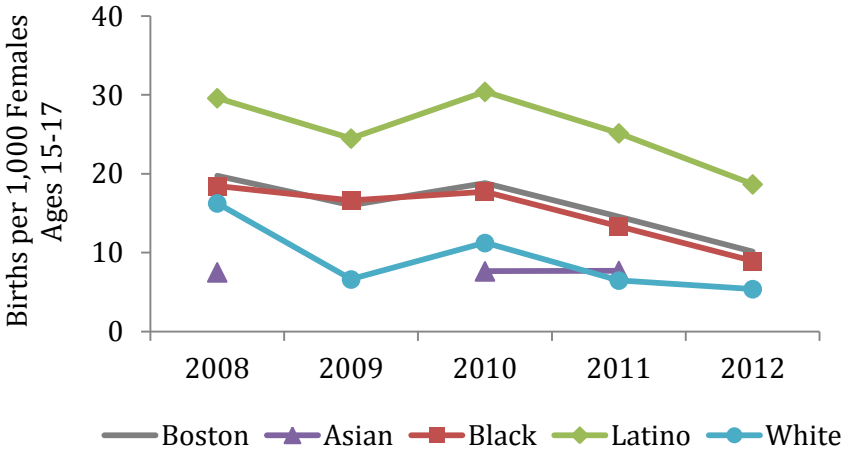
Figure 5.3 Births by Selected Indicators, 2012



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

In 2012, 38% of births were to White woman and 61% were to women of color. Fifty-seven percent of births were to women 30 years of age and over, and 66% of women who gave birth had a least some college education. Eighty-six percent of births were to women whose preferred spoken language was English.

Figure 5.4 Births Among Females Ages 15-17 by Race/Ethnicity and Year



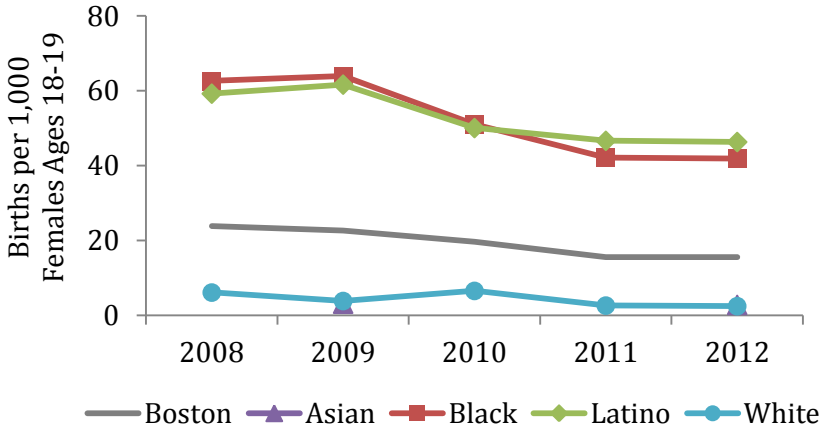
NOTES: Rates for Asian residents for the years 2008, 2010 and 2011, and for White residents for the years 2009-2012 were based on counts less than 20 and should be interpreted with caution. Rates are not presented for Asian residents for 2009 and 2012 due to the small number of cases.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

The birth rate among Boston female adolescents ages 15 to 17 years decreased from 19.7 births per 1,000 females 15-17 years of age in 2008 to 10.1 in 2012. A decrease in the birth rate from 2008 to 2012 was also observed among Black, Latino, and White adolescents. In 2012, the birth rate among Latino females 15-17 years of age was higher than that of White females.

From 2008 to 2012 the birth rate for Boston females ages 18 to 19 years decreased. The birth rate also decreased among Black, Latino and White females ages 18 to 19 years during the same time period. Black females had a birth rate of 41.9 births per 1,000 females ages 18 to 19 years and Latino females had a birth rate of 46.3 in 2012. These rates were higher than the rate of births to White residents (2.5) in 2012.

Figure 5.5 Births Among Females Ages 18-19 by Race/Ethnicity and Year

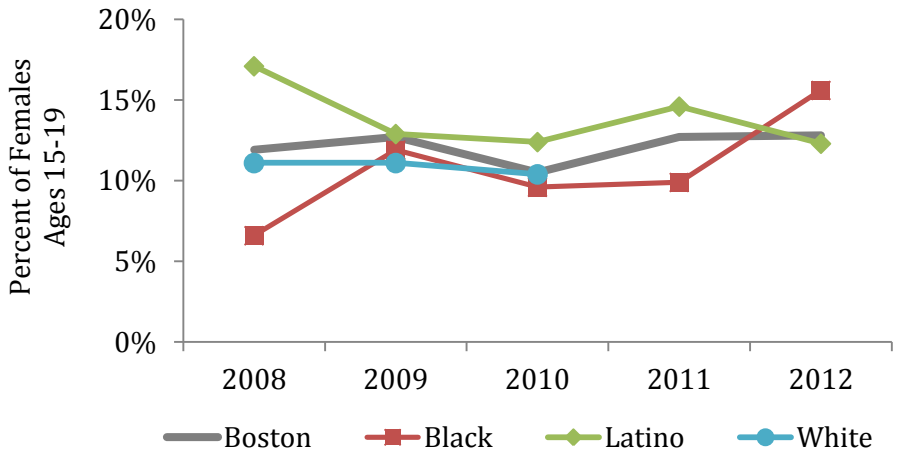


NOTES: Rates for Asian residents for the years 2009 and 2012 were based on counts less than 20 and should be interpreted with caution. Rates are not presented for Asian residents in 2008, 2010 or 2011 due to the small number of cases.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

Of the Boston females ages 15-19 who gave birth in 2012, 13% had given birth previously. There was no significant change in the percentage of teens with repeat births from 2008 to 2012. In 2012, the percentage of Black females ages 15-19 who had given birth previously was 16% and the percentage of Latino females who had given birth previously was 12%.

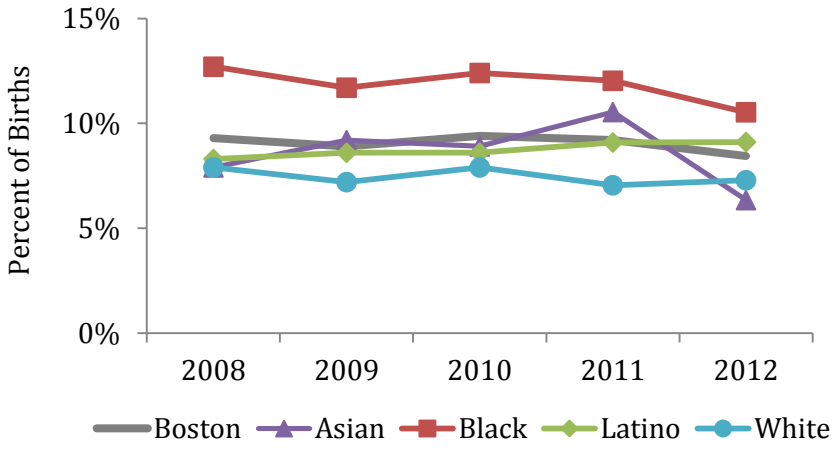
Figure 5.6 Repeat Adolescent Ages 15-19 Years Births by Race/Ethnicity and Year



NOTES: Rates for Black residents for the years 2008 , 2010, and 2011, and White residents for 2008-2010 were based on counts less than 20 and should be interpreted with caution. Rates are not presented for Asian residents from 2008-2012 and for White residents in 2011 and 2012 due to the small number of cases.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

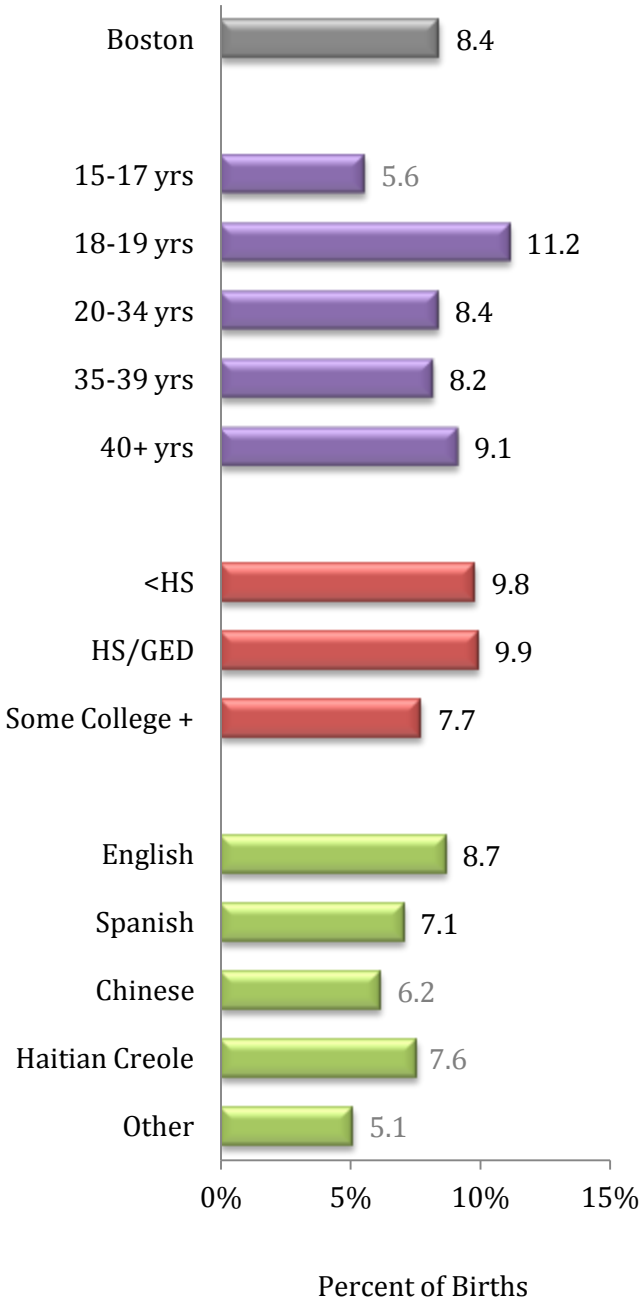
Figure 5.7 Low Birthweight Births by Race/Ethnicity and Year



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

From 2008 to 2012, the percentage of low birthweight births did not significantly change. There was also no significant change in the percentage of low birthweight births to Asian, Black, Latino or White women from 2008 to 2012. In 2012, Black and Latino women gave birth to higher percentages of low birthweight babies, 11% and 9% respectively, than White women, 7%. The percentage for Asian women (6%) was similar to that of White women.

Figure 5.8 Low Birthweight Births by Selected Indicators, 2012

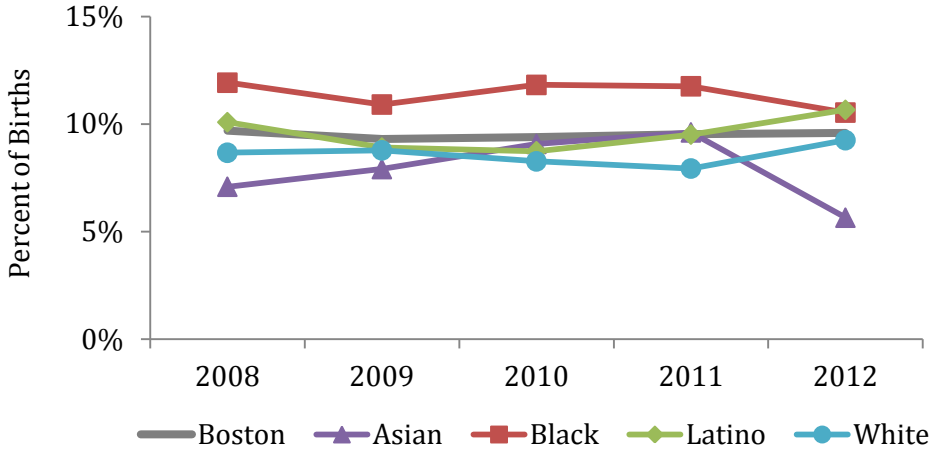


In 2012, a higher percentage of low birthweight births occurred to women with less than a high school diploma and those with a high school diploma or GED compared to those with at least some college. The percentages of low birthweight births among women whose preferred spoken language was not English were similar to that of mothers who preferred language was English. The percentages of low birthweight births were similar across all age groups.

NOTE: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

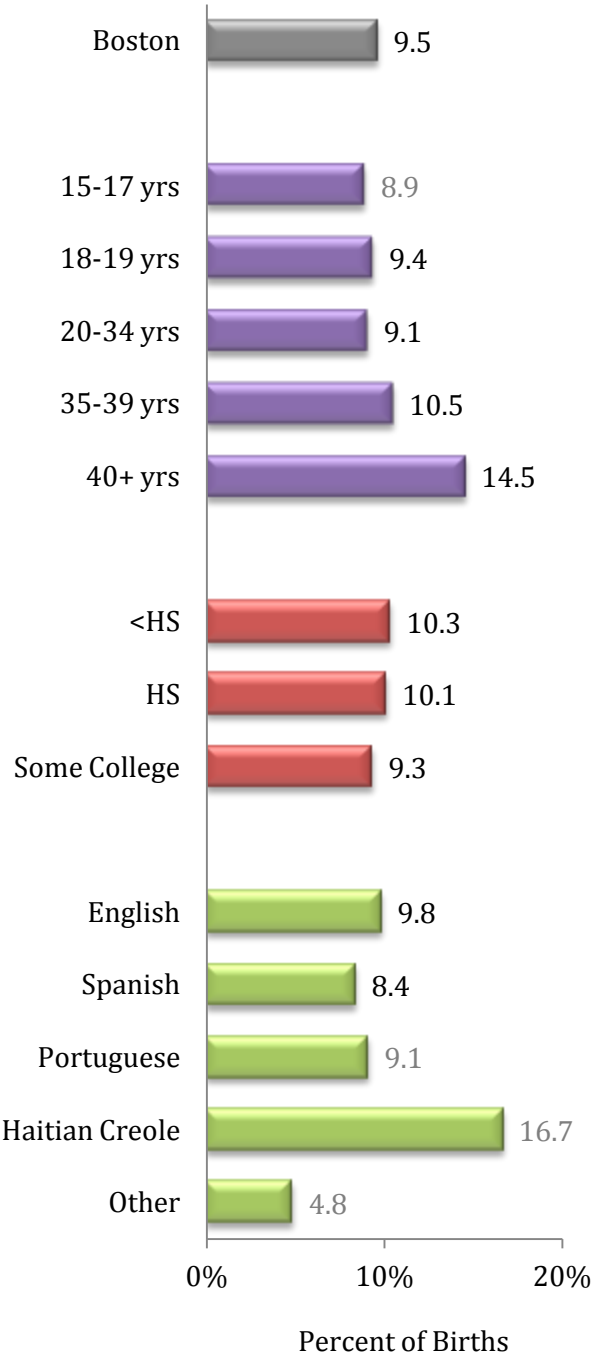
Figure 5.9 Preterm Births by Race/Ethnicity and Year



DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

In 2012, 9.6% of births were preterm. There was no significant change in the percentage of preterm births to Boston women from 2008-2012. This was also true for all racial/ethnic groups during the same time period. In 2012, the percentage of preterm births among Asian women (6%) was lower compared to White women (9%). The percentages of preterm births to Black (11%) and Latino (11%) women were similar to that of White women in 2012.

Figure 5.10 Preterm Births by Selected Indicators, 2012

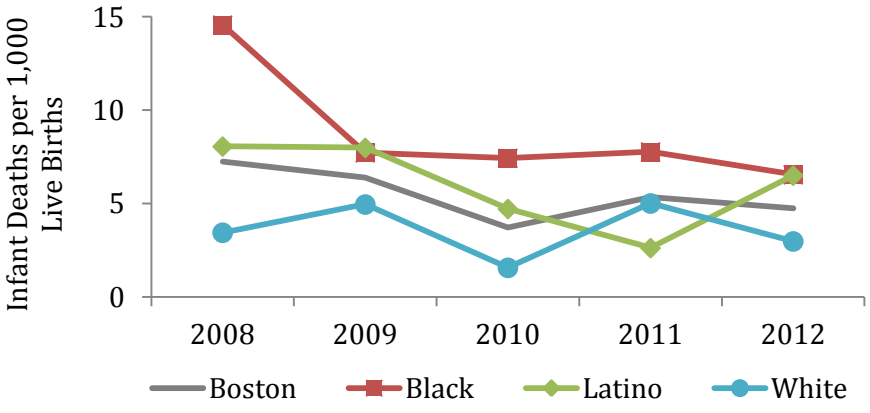


In 2012, there was a higher percentage of preterm births among women ages 40 years and over compared to women ages of 20-34. The percentages of preterm births by education level of the mother were similar. A lower percentage of preterm births occurred to women whose preferred spoken language was Other compared to women whose preferred spoken language was English.

NOTE: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

DATA SOURCE: Boston resident live births, Massachusetts Department of Public Health

Figure 5.11 Infant Deaths by Race/Ethnicity and Year



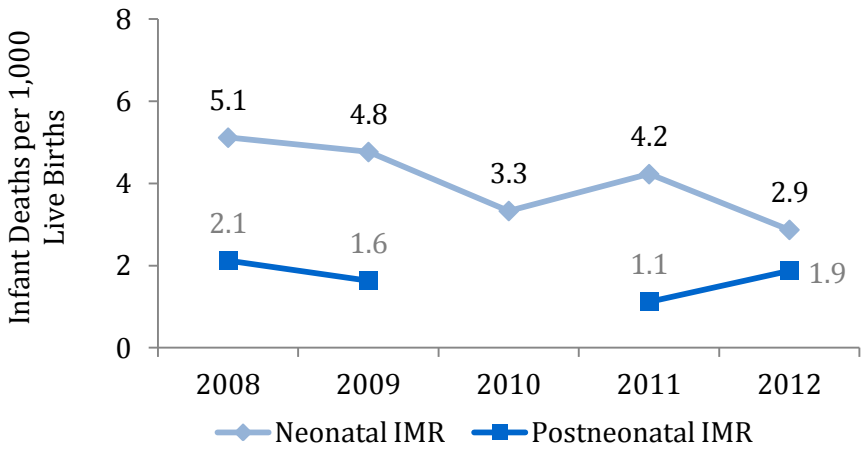
NOTES: Rates for Black infants for the years 2011 and 2012, Latino infants from 2008-2012 and White infants from 2008-2012 were based on counts less than 20 and should be interpreted with caution. Infant death rates for Asian infants were not presented due to the small number of cases.

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

From 2008 to 2012 there was a significant decrease in the Boston and the Black infant death rate. There was no change over time in the Latino or White infant death rate. In 2012, the rates for Black infant deaths (6.6 infants per 1,000 live births) and Latino infant deaths (6.5) were similar compared to White infant deaths (3.3).

In 2012, there were 2.9 neonatal infant deaths (deaths within the first 28 days of life) per 1,000 live births in Boston. From 2008-2012, there was a significant decrease in the rate of neonatal infant deaths. In 2012, there were 1.9 postneonatal infant deaths (deaths between 28 days up to 1 year after birth) per 1,000 live births in Boston.

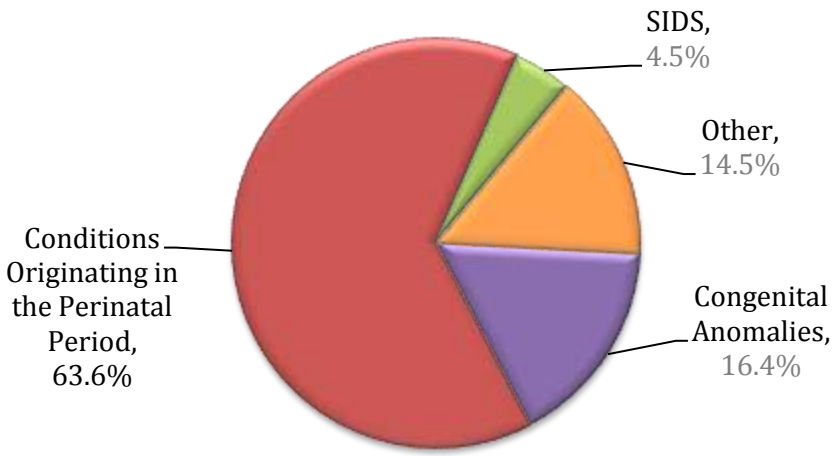
Figure 5.12 Neonatal and Postneonatal Infant Deaths by Year



NOTES: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20. Postneonatal infant death rates for 2010 were not presented due to the small number of cases.

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

Figure 5.13 Infant Deaths by Cause of Death, 2010-2012 Combined

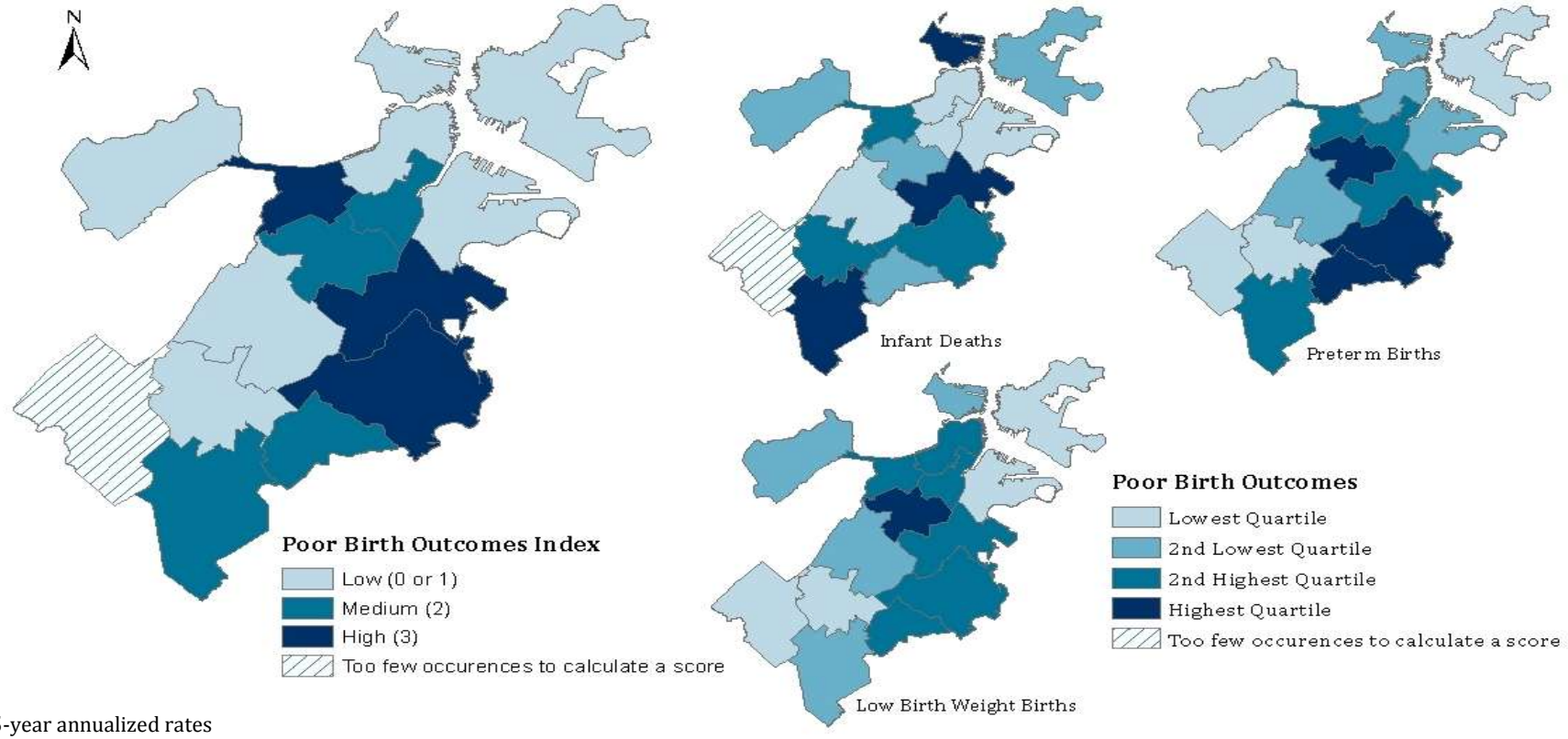


NOTE: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

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

For 2010 to 2012 combined, 64% of infant deaths among Boston residents were caused by conditions originating in the perinatal period and 16% of these deaths were a result of congenital anomalies.

Figure 5.14 Birth Outcomes by Neighborhood, 2008-2012*

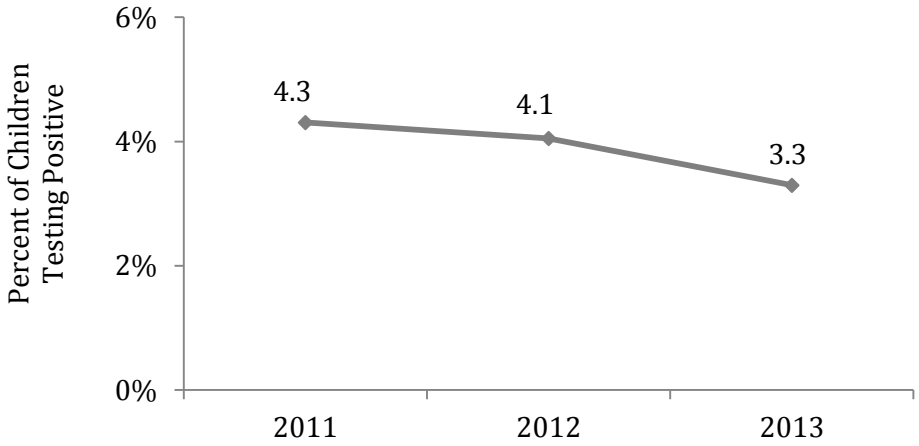


*5-year annualized rates
NOTE: This index was determined by the number of times (shown in parentheses in the legend) the neighborhood falls into the highest or 2nd highest quartile for each of the three birth outcomes shown.

DATA SOURCES: Infant Deaths: Boston resident live births and deaths, Massachusetts Department of Public Health.
Preterm births and low birthweight births: Boston resident live births, Massachusetts Department of Public Health.

Boston Infant Deaths: 5.5
Boston Preterm Births: 9.5% of live births
Boston Low Birth Weight Births: 9.0% of live births

Figure 5.15 Elevated Blood Lead Levels* by Year

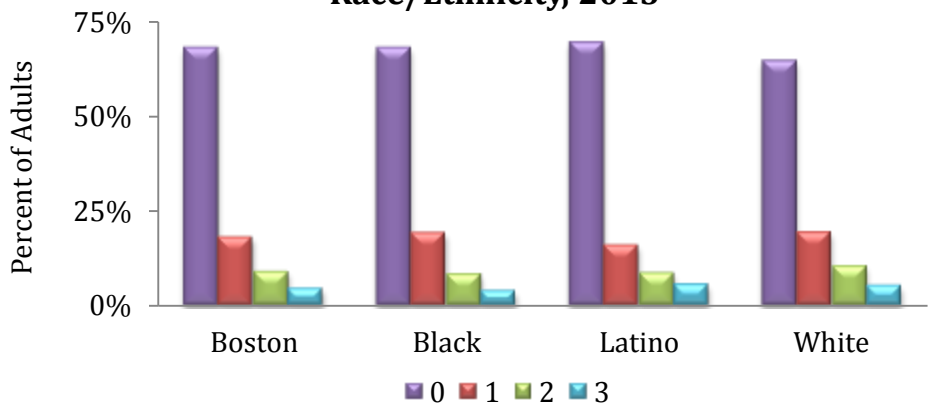


*Based on 2012 CDC recommendation of >=5 ug/dl. Elevated blood lead level data in this report are not comparable to data in previous Health of Boston reports due to definitional change. For more information see Blood-Lead Level in the Technical Notes.

DATA SOURCE: Childhood Lead Poisoning Prevention Program (CLPPP), Massachusetts Department of Public Health

In 2011, 4% of Boston children under age 6 tested positive for elevated blood lead levels. In 2013, 3% of Boston children under age 6 tested positive for elevated blood levels.

Figure 5.16 Total Number of Adverse Childhood Experiences (ACEs) Among Adults by Race/Ethnicity, 2013



	Boston	Black	Latino	White
0	68.3% (66.2-70.4)	68.3% (64.4-72.2)	69.7% (64.9-74.6)	64.8% (61.5-68.0)
1	18.2% (16.5-19.9)	19.4% (16.1-22.7)	16.1% (12.3-19.8)	19.5% (16.9-22.1)
2	9.0% (7.7-10.3)	8.4% (6.1-10.7)	8.6% (5.7-11.5)	10.5% (8.4-12.6)
3	4.5% (3.5-5.6)	3.9% (2.2-5.7)	5.6% (2.7-8.5)	5.2% (3.6-6.9)

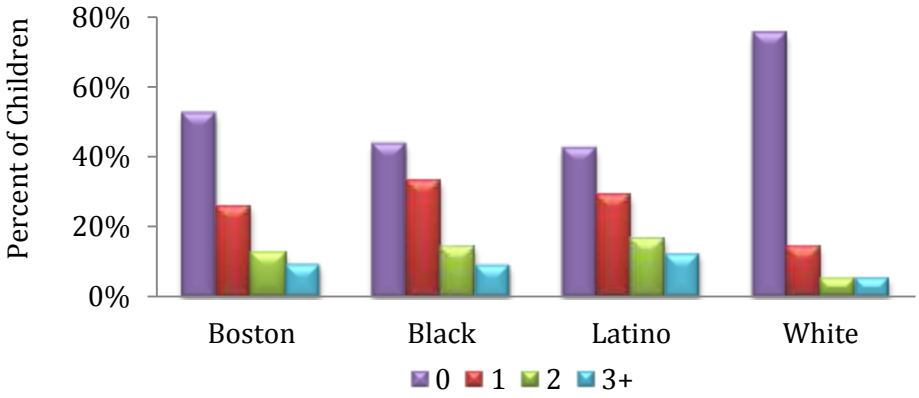
NOTE: Rates could not be presented for Asian residents due to an insufficient sample size.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

The Adverse Childhood Experiences (ACE) questions were asked of Boston residents to assess associations between childhood maltreatment, and health and well-being later in life. In 2013, Boston adults were asked 3 of the 10 questions from the original ACE module created by the Center for Disease Control (CDC). Adults participating in the survey were asked: 1) if they ever lived with a caregiver who was depressed, mentally ill, or suicidal; 2) if they ever lived with a caregiver who was a problem drinker or alcoholic, or someone who abused drugs; and 3) if their parents were ever physically violent towards each other. This chart captures the number of ACEs experienced by adults by race/ethnicity and for Boston overall.

In Boston in 2013, 5% of adult residents reported three ACEs. There were no significant differences in the number of ACEs experienced by Black and Latino adults compared to White adults.

Figure 5.17 Total Number of Adverse Childhood Experiences (ACEs) Among Children by Race/Ethnicity, 2012



	Boston	Black	Latino	White
0	52.5% (49.0-56.0)	43.8% (37.3-50.3)	42.6% (35.7-49.4)	75.4% (71.3-79.4)
1	25.9% (22.8-29.0)	33.0% (26.8-39.3)	28.9% (22.7-35.1)	14.2% (11.0-17.4)
2	12.5% (10.1-15.0)	14.3% (10.0-18.6)	16.6% (11.0-22.2)	5.0% (3.1-6.9)
3+	9.0% (7.0-11.0)	8.9% (5.4-12.4)	12.0% (7.8-16.2)	5.4% (3.4-7.4)

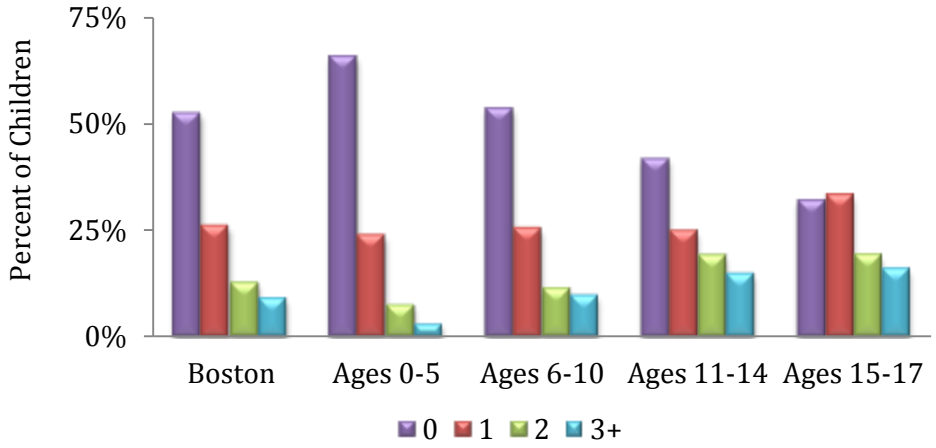
NOTE: Rates could not be presented for Asian residents due to an insufficient sample size.

DATA SOURCE: Boston Survey of Children's Health, 2012, Boston Public Health Commission

In 2012, parents/caregivers of Boston children were asked nine of the 10 questions from the original ACE module.

The percentage of parents who report their child had experienced one or two ACEs was higher for Black and Latino children compared to White children. The percentage who reported three or more ACEs similar between Black and White children, but higher for Latino children compared to White children.

Figure 5.18 Total Number of Adverse Childhood Experiences (ACEs) by Age, Children Ages 0-17, 2012

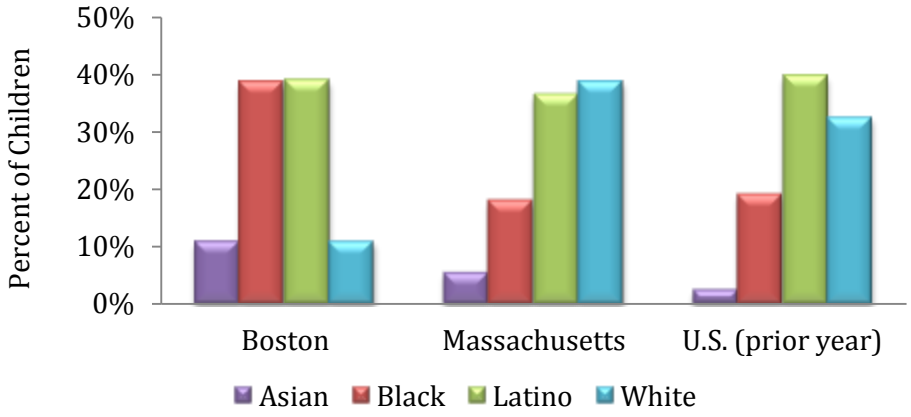


	Boston	Ages 0-5	Ages 6-10	Ages 11-14	Ages 15-17
0	52.5% (49.0-56.0)	65.8% (60.2-71.4)	53.7% (46.7-60.8)	41.8% (34.6-49.0)	32.2% (25.0-39.5)
1	25.9% (22.8-29.0)	23.8% (18.6-29.0)	25.4% (19.3-31.6)	24.8% (18.3-31.4)	33.2% (25.7-40.7)
2	12.5% (10.1-15.0)	7.4% (4.2-10.7)	11.2% (6.8-15.5)	18.8% (12.5-25.1)	18.9% (11.9-25.9)
3+	9.0% (7.0-11.0)	3.0% (1.4-4.6)	9.6% (5.7-13.6)	14.5% (9.1-20.0)	15.7% (8.9-22.4)

DATA SOURCE: Boston Survey of Children's Health, 2012, Boston Public Health Commission

In every age group, a significantly higher percentages of parents/caregivers reported their child experienced zero ACEs compared to those who reported one or more ACEs.

Figure 5.19 Women, Infants and Children (WIC) Enrollment (Children 0-5 Years) by Race/Ethnicity, 2011



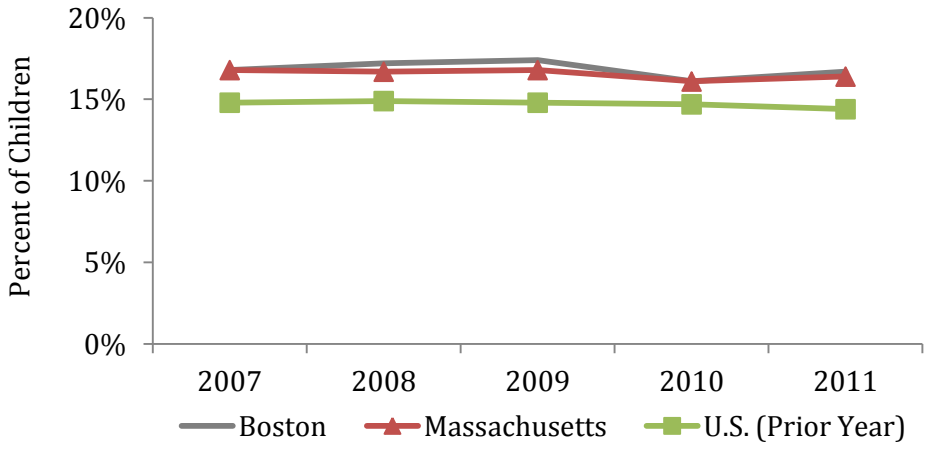
NOTE: Boston totals exclude Charlestown.

DATA SOURCE: Nutrition Division, Massachusetts Department of Public Health

In Boston, of the 23,870 children (ages 0-5) enrolled in WIC, 11% were Asian. Thirty-seven percent of children were Black, 39% were Latino and 11% were White. Compared to Massachusetts, which served 132,651 children, and the United States which served 8,672,965 children, Boston served larger percentages of Asian and Black children, but fewer White children.

In 2011, among the children ages 2-5 who were enrolled in WIC in Boston, 17% were obese. In Massachusetts during the same year, 16% were obese while in the United States, 14% were obese.

Figure 5.20 Obesity Among 2-5 Year Olds Enrolled in WIC by Year



NOTE: Boston totals exclude Charlestown.

DATA SOURCE: Nutrition Division, Massachusetts Department of Public Health

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Chapter 6:
Chronic Disease

Chronic Disease

Chronic disease, sometimes referred to as "diseases of civilization," has replaced infectious disease as the major cause of illness (2). By their very nature, once diagnosed, chronic diseases require management rather than a cure, which also contributes to the rise in prevalence. Methods of chronic disease management include medications, medical procedures, and lifestyle changes. Clearly, preventing chronic disease is the key to reducing their burden of disease. Prevention depends on healthy lifestyle choices such as participating in adequate physical activity, eating a balanced diet, refraining from tobacco use, and limiting alcohol consumption (3). Unfortunately, the modern environment is often not supportive of these healthy habits, encouraging sedentary behavior, overeating, and alcohol consumption. Some researchers believe that the increasing prevalence of chronic disease—specifically obesity and its related complications –will lead to a decline in life expectancy in the United States within the first half of this century (4).

Changing the environment to promote healthier behaviors requires strategic vision and planning. Implementing systems and policies that increase opportunities for physical activity, provide support to live tobacco free, and improve access to healthy foods are strategies that have been used to create healthier environments. A healthier environment can support an individual's choice to walk or bike instead of drive, to quit smoking, and to limit sugary beverage consumption. Ultimately, building healthier environments for individuals to choose a healthy lifestyle will improve the population's health and longevity.

Asthma

What is Asthma?

Asthma is a common respiratory disease characterized by episodes of coughing, wheezing, difficulty breathing, and chest tightness. The symptoms of asthma result from inflammation and the narrowing of a person's airways in response to triggers. Triggers include allergens (e.g., mold, pet dander, dust mites, and cockroaches), certain chemicals, exposure to tobacco smoke, and infections. Although asthma is a long-term disease, the signs and symptoms can be minimized by avoiding triggers, adhering to prescribed medication, identifying and treating attacks early, and developing an asthma action plan with a health care provider (5).

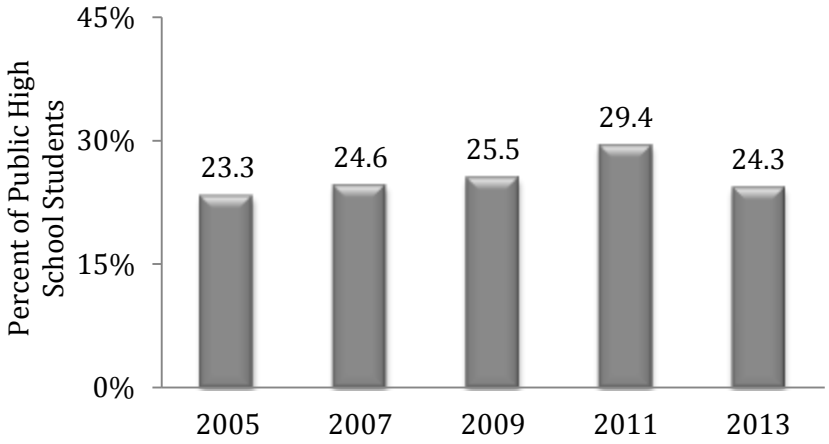
Populations at Risk

Among adults, women are more likely to have asthma than men. However in children, the relationship is reverse; boys are more likely to have asthma than girls. Adults who do not finish high school are more likely to have asthma than adults who graduate from high school or college. Adults with an annual household income of $75,000 or less are more likely to have asthma than adults with higher incomes. Smokers are more likely to have asthma than non-smokers. Obese adults are more likely to have asthma than adults in other weight categories (5).

Prevention

Although asthma cannot be cured, it can be controlled by avoiding contact with asthma triggers and seeking proper medical care. Continuous monitoring of the disease, patient education, and having a medical management plan is recommended (5). Creating healthy environments in homes and neighborhoods that reduce exposure to known triggers is vital to preventing exacerbations of the disease.

Figure 6.1 Asthma Among Public High School Students by Year



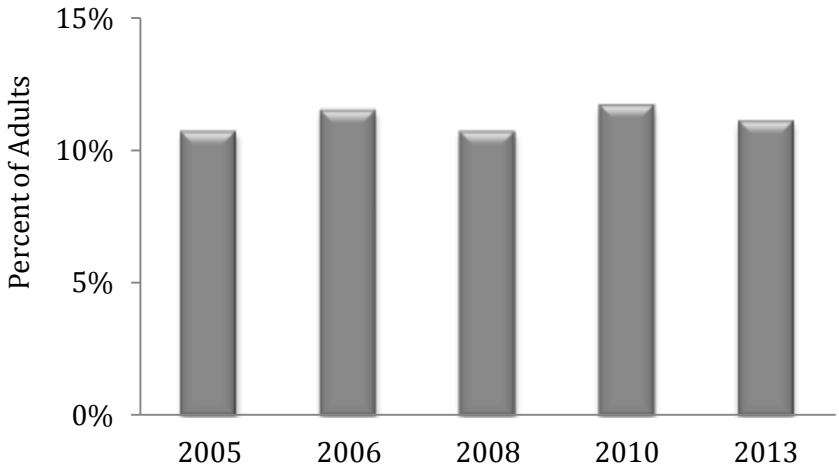
In 2013, 24% of Boston public high school students reported having been diagnosed with asthma. There was no significant change in the percentage of Boston public high school students who reported asthma between 2005 and 2013.

2005	2007	2009	2011	2013
23.3% (20.5-26.1)	24.6% (22.1-27.0)	25.5% (22.5-28.5)	29.4% (25.9-32.8)	24.3% (21.1-27.6)

DATA SOURCE: Youth Risk Behavior Survey (2005, 2007, 2009, 2011, 2013), Centers for Disease Control and Prevention

In 2013, 11% of the Boston adult residents reported having asthma. There was no significant change in the percentage of adults with asthma between 2005 and 2013.

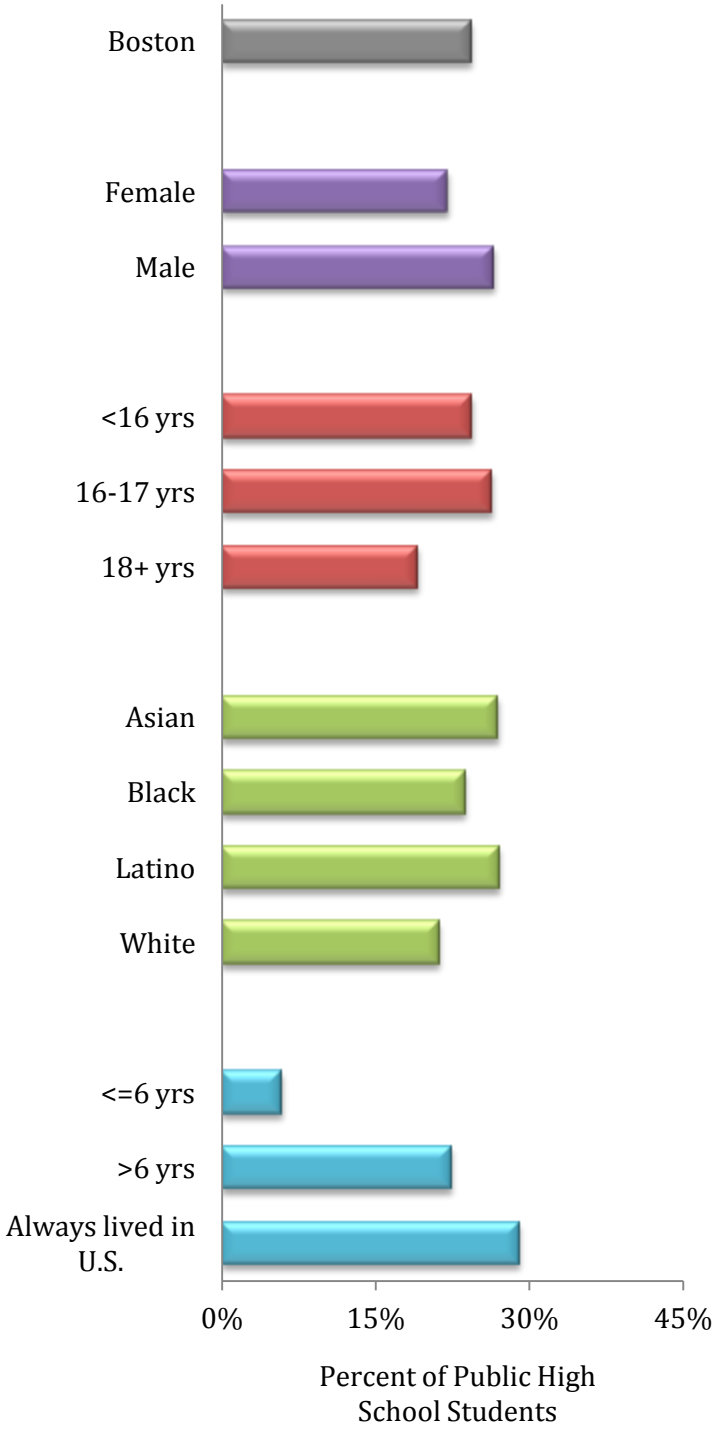
Figure 6.2 Asthma Among Adults by Year



2005	2006	2008	2010	2013
10.7% (8.9-12.4)	11.5% (9.8-13.2)	10.7% (9.1-12.4)	11.7% (9.8-13.5)	11.1% (9.7-12.5)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2003, 2005, 2006, 2008, 2010), Boston Public Health Commission

Figure 6.3 Asthma Among Public High School Students by Selected Indicators, 2013



Boston	24.3% (21.1-27.6)
Gender	
Female	22.1% (17.5-26.8)
Male	26.6% (22.0-31.3)
Age of Student	
<16 yrs	24.4% (18.3-30.6)
16-17 yrs	26.4% (21.8-30.9)
18+ yrs	19.2% (11.9-26.6)
Race/Ethnicity	
Asian	27.0% (18.5-35.6)
Black	23.8% (16.4-31.3)
Latino	27.1% (20.7-33.4)
White	21.2% (13.2-29.3)
Time Living in U.S.	
6 Years or Less	5.9% (0.9-11.0)
More than 6 Years	22.4% (15.0-29.8)
Always Lived in U.S.	29.0% (24.6-33.4)

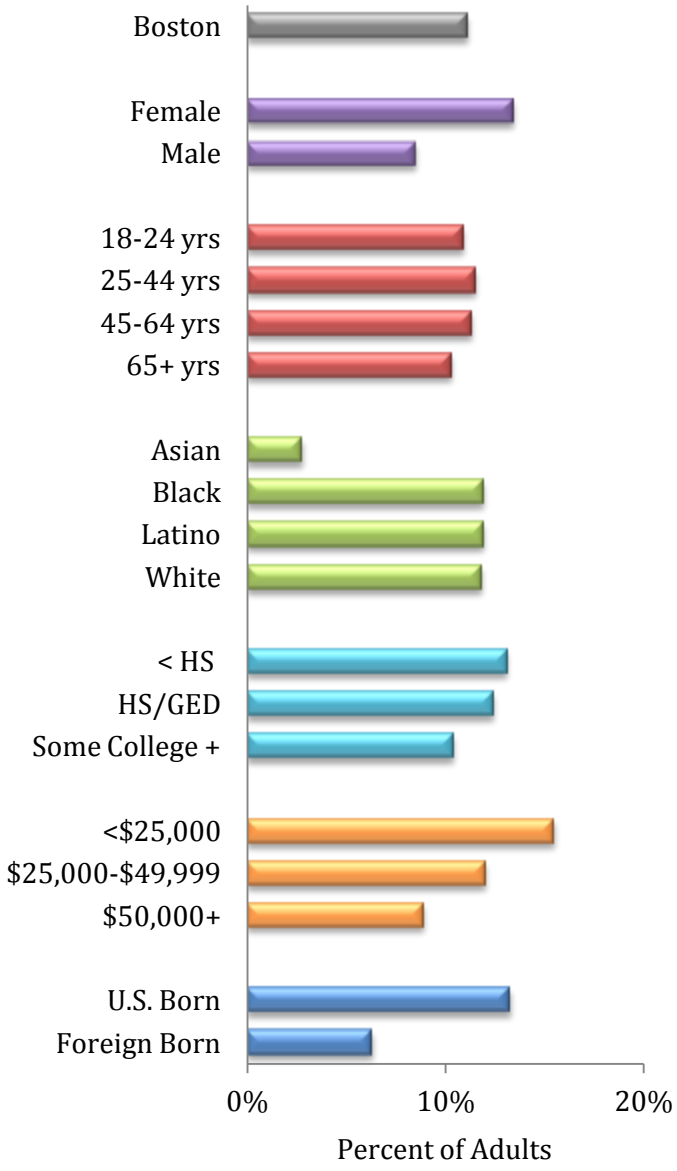
DATA SOURCE: Youth Risk Behavior Survey (2013), Centers for Disease Control and Prevention

In 2013, 24% of Boston public high school students reported having been diagnosed with asthma. There were no significant differences between female and male students, age groups, or racial/ethnic groups. A lower percentage of students who had lived in the US for less than six years reported having been diagnosed with asthma compared to students who had always lived in the US.

Boston	11.1% (9.7-12.5)
Gender	
Female	13.4% (11.4-15.4)
Male	8.5% (6.5-10.6)
Age	
18-24 yrs	10.9% (6.8-15.0)
25-44 yrs	11.5% (8.9-14.0)
45-64 yrs	11.3% (9.2-13.4)
65+ yrs	10.3% (8.1-12.5)
Race/Ethnicity	
Asian	2.8% (0.2-5.3)
Black	11.9% (9.4-14.4)
Latino	11.9% (8.8-15.1)
White	11.8% (9.5-14.2)
Educational Attainment	
Less Than High School	13.1% (8.6-17.6)
High School Diploma or GED	12.4% (9.2-15.5)
At Least Some College/Bachelor's Degree or Higher	10.4% (8.7-12.1)
Income	
<$25,000	15.5% (12.3-18.8)
$25,000-$49,999	12.0% (8.6-15.4)
$50,000+	8.9% (6.9-10.8)
Place of Birth	
US Born	13.3% (11.4-15.3)
Foreign Born	6.3% (4.4-8.2)

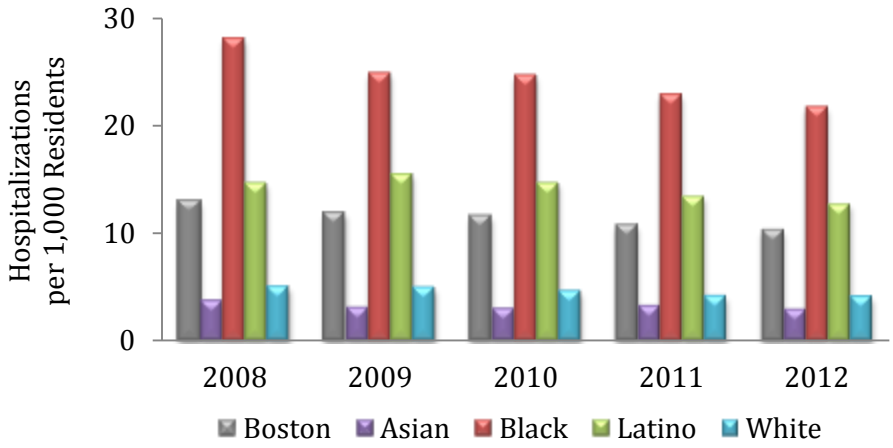
DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

Figure 6.4 Asthma Among Adults by Selected Indicators, 2013



In 2013, 11% of Boston adult residents reported having asthma. A higher percentage of females reported having asthma compared to males. A lower percentage of Asian residents reported having asthma compared to White residents. A higher percentage of residents living in households with an annual income of $25,000 or less reported having asthma compared to residents living in households with an annual income of $50,000 or more. A lower percentage of residents who were foreign-born reported having asthma compared to residents who were US-born. There were no significant differences among age groups or education levels.

Figure 6.5 Asthma Emergency Department Visits* by Race/Ethnicity and Year

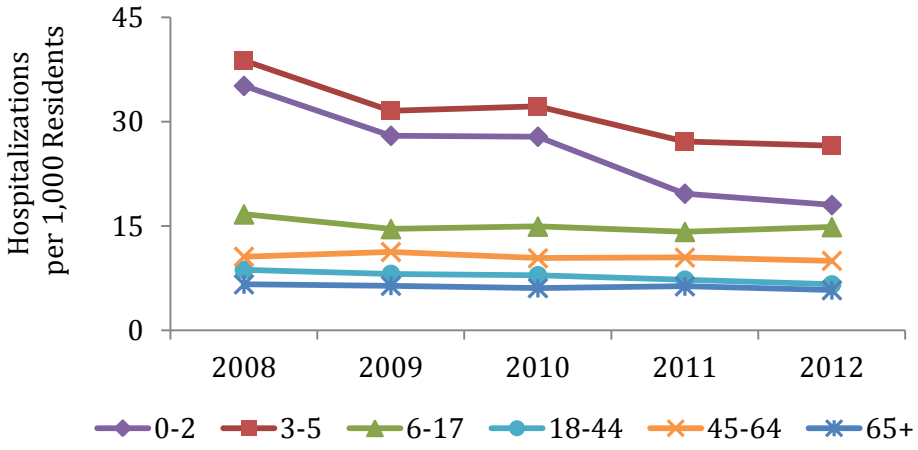


*Age-adjusted rates

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

From 2008 to 2012, asthma emergency department (ED) visits decreased significantly in Boston. While there was no significant change over time for Asian residents, rates of asthma ED visits significantly decreased for Black, Latino and White residents. In 2012, rates were lower for Asian residents and higher for Black and Latino residents compared to White residents.

Figure 6.6 Asthma Emergency Department Visits by Age and Year



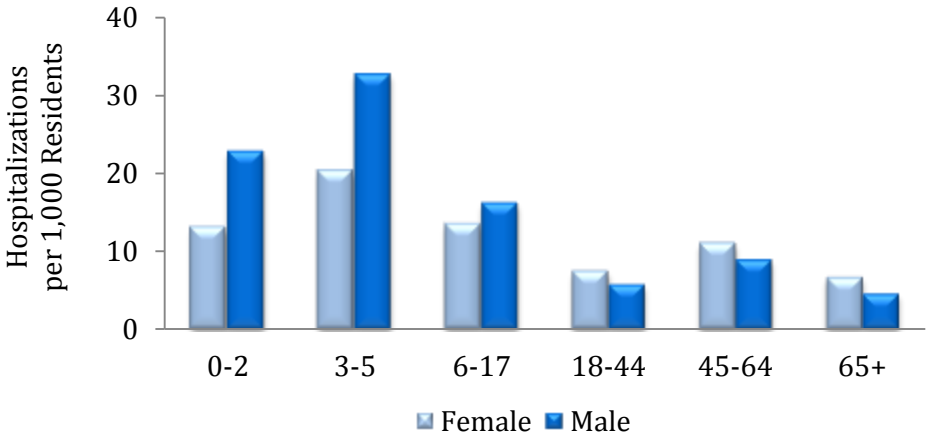
DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

From 2008-2012, asthma emergency department (ED) visits for Boston residents across all age groups under 65 significantly decreased over time. For residents ages 65 and older, there was no significant change over time.

In 2012, Boston residents had 5,572 asthma ED visits; 85% (4,746) of these were anonymously linked to 3,274 unique individuals. Of these individuals, 77% had 1 asthma ED visit, 14% had 2 asthma ED visits, and 8% had 3 or more asthma ED visits.

Of note, a high percentage of visits for children, Asian residents, and Latino residents could not be linked to unique individuals.

Figure 6.7 Asthma Emergency Department Visits by Age and Gender, 2012

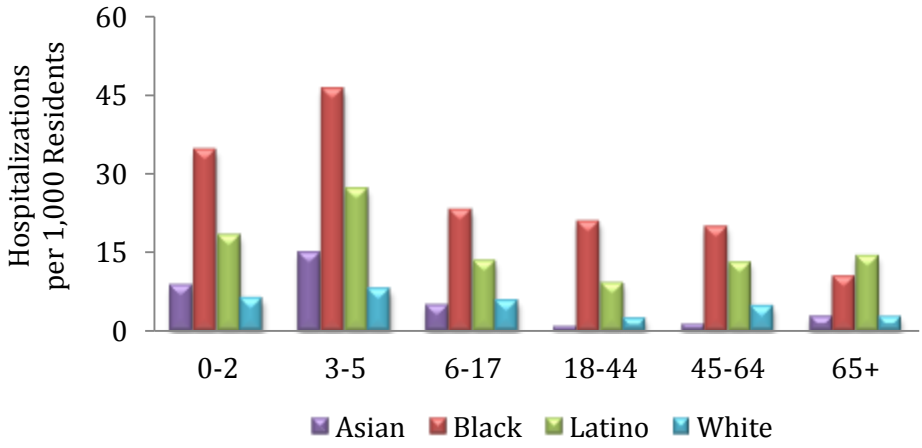


DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

In 2012, the rates for asthma emergency department (ED) visits varied by gender across age groups. Female residents under the age of 18 had lower age-specific asthma ED visits than males. Female residents 18 and older had higher age-specific asthma ED visit rates than males.

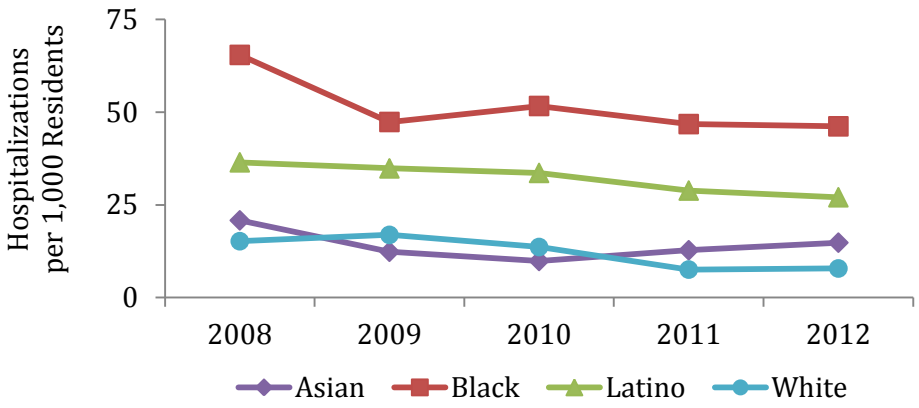
In 2012, Black and Latino residents in all age groups had higher asthma emergency department (ED) visits compared to White residents. Asian residents ages 18-64 had lower rates of asthma ED visits while Asian children ages 3-5 had higher rates of asthma ED visits compared to White residents.

Figure 6.8 Asthma Emergency Department Visits by Age and Race/Ethnicity, 2012



DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

Figure 6.9 Asthma Emergency Department Visits Among 3-5 Year Olds by Race/Ethnicity and Year

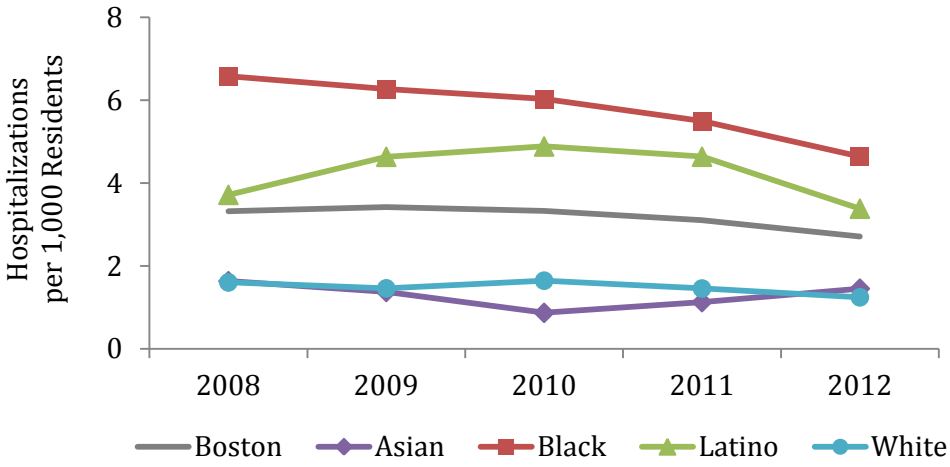


DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

The age-specific asthma emergency department (ED) visit rate for children ages 3 to 5 decreased significantly from 2008 to 2012 for Black, Latino and White residents. There was no significant change in asthma ED visits over time for Asian children. In 2012, Asian, Black and Latino children had higher rates of asthma ED visits compared to White children.

From 2008 to 2012, asthma hospitalization rates significantly decreased for Black and White residents. There was no significant change over time for Asian and Latino residents. In 2012, the asthma hospitalization rate for Boston was 2.7 per 1,000 residents. Black and Latino residents had higher asthma hospitalization rates compared to White residents in 2012.

Figure 6.10 Asthma Hospitalizations* by Race/Ethnicity and Year

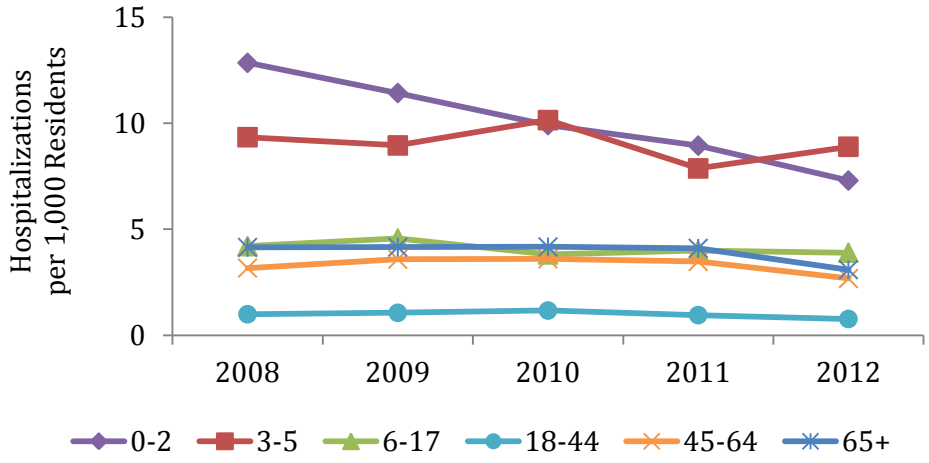


*Age-adjusted rates

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

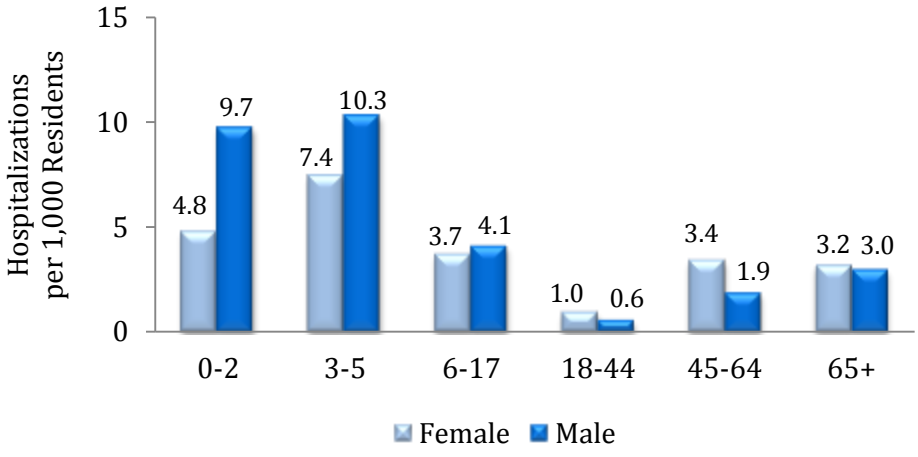
From 2008 to 2012, asthma hospitalization rates significantly decreased for the age groups 0-2, 18-44, 45-64 and 65+. There was no significant difference over time for the age groups 3-5 and 6-17. In 2012, hospitalization rates were higher for residents in all age groups compared to residents ages 18-44.

Figure 6.11 Asthma Hospitalizations by Age and Year



DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

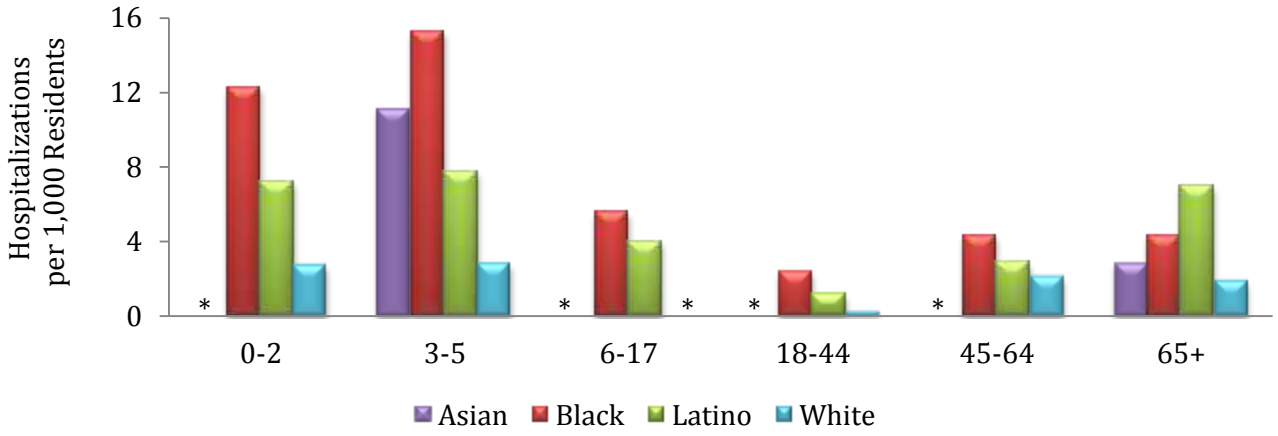
Figure 6.12 Asthma Hospitalizations by Age and Gender, 2012



DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

In 2012, the asthma hospitalization rate varied by gender across age groups. Female residents in the age groups 0-2 and 3-5 had lower hospitalization rates than male residents, while females ages 18-44 and 45-64 had higher hospitalization rates than males.

Figure 6.13 Asthma Hospitalizations by Age and Race/Ethnicity, 2012



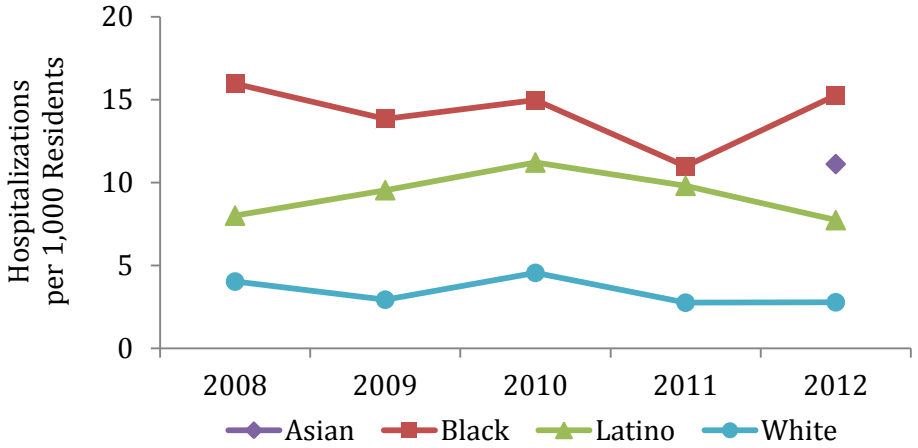
*Rates are not presented for Asian residents ages 0-2, 6-17, 18-44, and 45-64 and White residents ages 6-17 due to the small number of cases.

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

In 2012, the asthma hospitalization rate varied by race/ethnicity across age groups. Asthma hospitalization rates for Black and Latino residents were higher than White residents for all age groups except 6-17 which was not tested. Asian children ages 3-5 had higher asthma hospitalization rates compared to White children in the same age group.

From 2008 to 2012, no significant change over time was observed for asthma hospitalization rates among Black, Latino or White children ages 3 to 5. In all years, rates for Black and Latino children were higher compared to White children. This was also true for Asian children in 2012.

Figure 6.14 Asthma Hospitalizations Among 3-5 Year Olds by Race/Ethnicity and Year



NOTE: Rates are not presented for Asian residents from 2008-2011 due to the small number of cases.

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

Diabetes

What is Diabetes?

Diabetes is a disease in which the body cannot effectively regulate its blood glucose (sugar) levels because it is unable to produce or properly utilize a hormone called insulin. Normally, insulin moves glucose from blood into cells where it is used as energy. In people with diabetes, the excess glucose in the bloodstream causes numerous adverse effects on multiple organs, including the heart, kidneys, eyes, skin and peripheral nerves. Mild to moderate signs and symptoms of diabetes include frequent urination, excessive thirst, weight loss, fatigue, and increased susceptibility to infection. Poorly controlled diabetes can lead to several debilitating complications including blindness, kidney damage, stroke, peripheral vascular disease, and heart disease including heart attack. There are three main categories of diabetes: type 1, type 2, and gestational diabetes. Type 2 diabetes accounts for 90 to 95% of most cases and occurs when the body (usually because of obesity) becomes less sensitive to the insulin the pancreas produces. Type 1 diabetes occurs when the pancreas itself stops making enough insulin to regulate blood glucose levels (7).

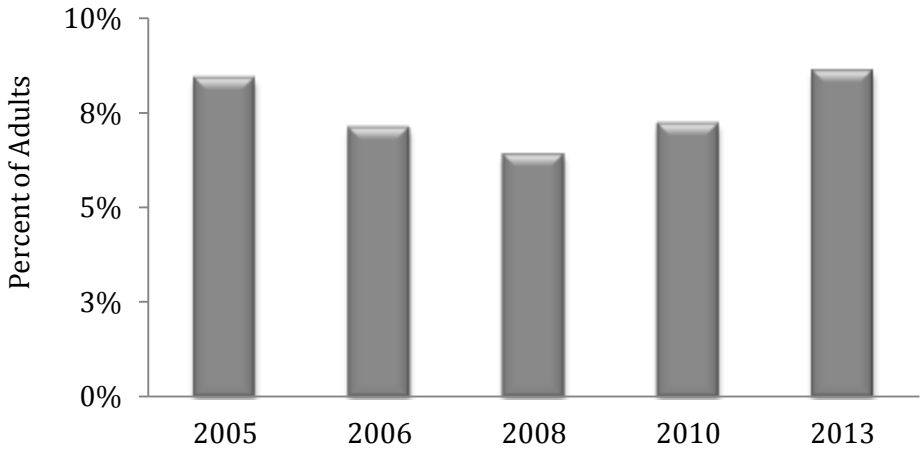
Populations at Risk

People who are overweight or obese are at highest risk of developing type 2 diabetes. Other modifiable risk factors include avoiding a sedentary lifestyle and tobacco exposure. Studies have shown that particular racial and ethnic groups are also associated with higher risk of developing type 2 diabetes. Asian, Latino, and Black populations have higher risk than their White counterparts of similar weight. Having a close family member with diabetes is also a risk factor for developing type 2 diabetes (8).

Prevention

Lifestyle changes can prevent or delay the onset of diabetes and help control diabetes once diagnosed. Eating a healthy diet, maintaining a healthy weight, and exercising regularly can help prevent diabetes (7).

Figure 6.15 Diabetes Among Adults by Year

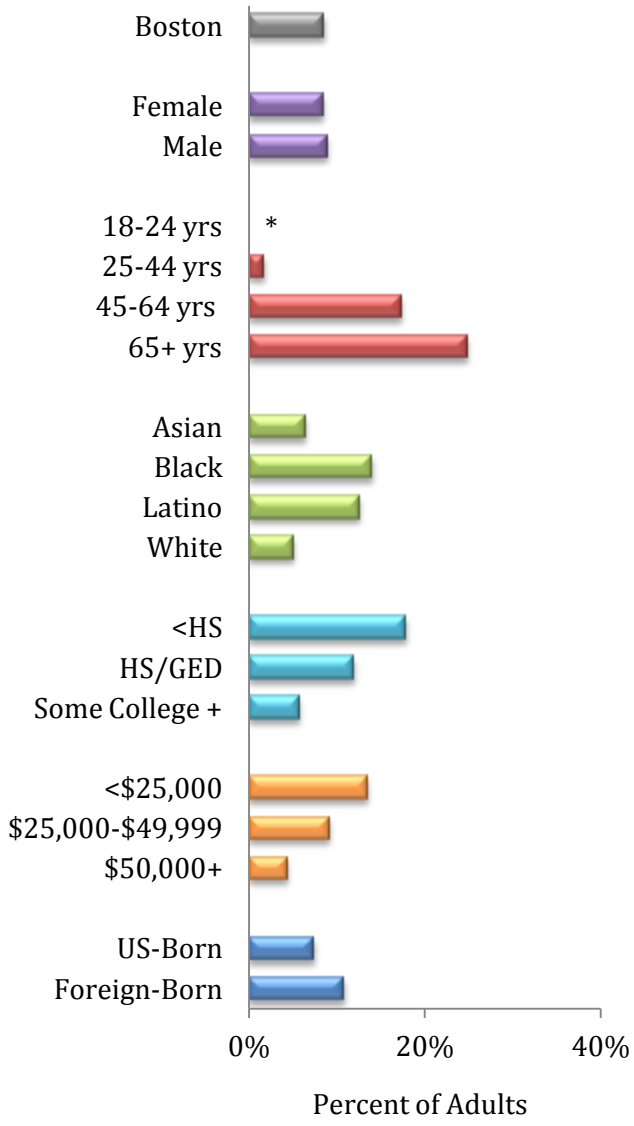


2005	2006	2008	2010	2013
8.4% (6.9-9.9)	7.1% (6.1-8.1)	6.4% (5.4-7.3)	7.2% (6.1-8.3)	8.6% (7.7-9.6)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2005, 2006, 2008, 2010, 2013), Boston Public Health Commission

In 2013, 9% of Boston adult residents reported having diabetes. There was no significant change in the percentage of adults who reported having diabetes between 2005 and 2013.

Figure 6.16 Diabetes Among Adults by Selected Indicators, 2013



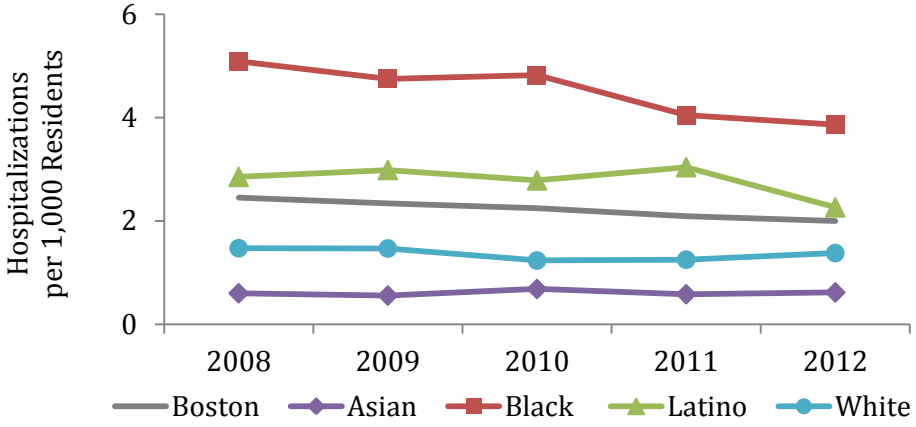
Boston	8.6% (7.7-9.6)
Gender	
Female	8.4% (7.1-9.6)
Male	8.9% (7.4-10.4)
Age	
18-24 yrs	*
25-44 yrs	1.8% (1.1-2.5)
45-64 yrs	17.3% (14.8-19.9)
65+ yrs	24.9% (21.2-28.5)
Race/Ethnicity	
Asian	6.4% (2.3-10.5)
Black	14.1% (11.6-16.6)
Latino	12.6% (9.7-15.5)
White	5.1% (4.2-6.1)
Educational Attainment	
Less than High School	17.9% (13.7-22.1)
High School Diploma or GED	12.0% (9.8-14.3)
At Least Some College/ Bachelor's or Higher	5.8% (4.8-6.7)
Income	
<$25,000	13.5% (11.1-15.9)
$25,000-$49,999	9.1% (7.0-11.2)
$50,000+	4.4% (3.4-5.5)
Place of Birth	
US-Born	7.5% (6.5-8.5)
Foreign-Born	10.9% (8.5-13.3)

*Insufficient sample size

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 9% of Boston adult residents reported having diabetes. A higher percentage of those ages 45-64 and those 65 and over had diabetes compared to those ages 25-44. A higher percentage of Black residents and Latino residents had diabetes compared to White residents. A higher percentage of residents with a high school degree and with less than a high school degree had diabetes compared with residents with any college education. A higher percentage of residents living in households with an annual income of less than $25,000 and between $25,000-$49,999 had diabetes compared to residents living in households with an annual income of $50,000 or more. There was no significant differences by place of birth or gender.

Figure 6.17 Diabetes Hospitalizations* by Race/Ethnicity and Year



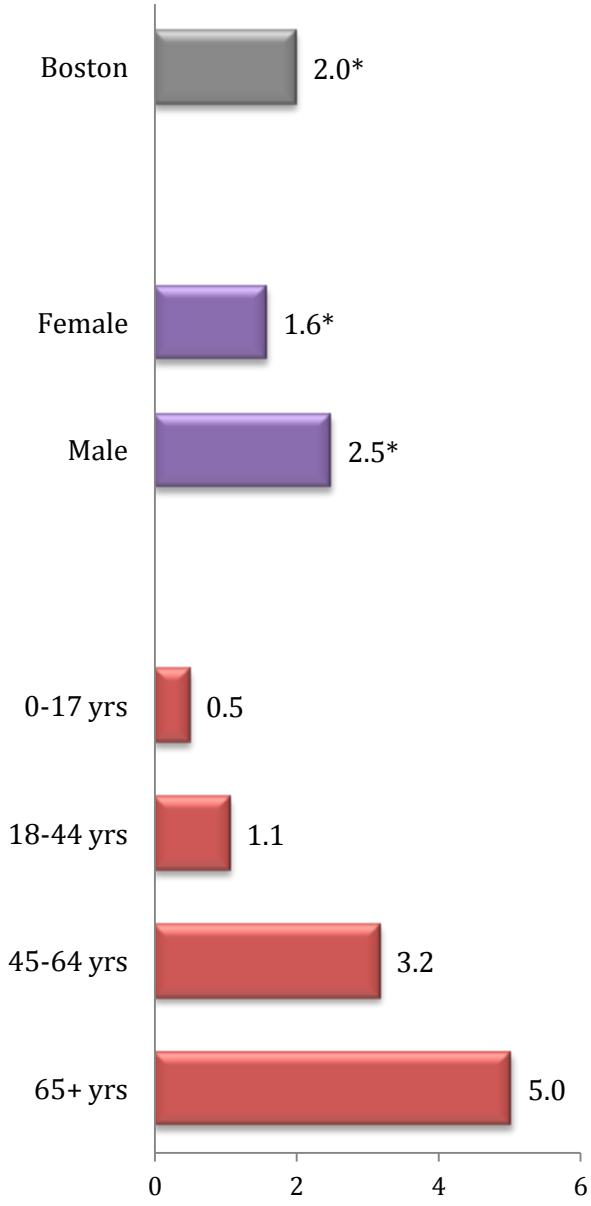
*Age-adjusted rates

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

Since 2008, the rate of diabetes hospitalizations has decreased for Boston overall. In 2012 the rate was 2.0 per 1,000 residents. The rates for Black and Latino residents has also decreased over time, however, there was no significant change over time for Asian and White residents. In 2012, diabetes hospitalization rates for Black and Latino residents was higher than the rate for White residents.

In 2012, Boston residents had 1,123 diabetes hospitalizations; 1,062 (95%) of these were anonymously linked to 782 unique individuals. Of these individuals, 82% had a single diabetes-related hospitalization, 11% had 2 diabetes hospitalizations, and 7% had 3 or more diabetes hospitalizations.

Figure 6.18 Diabetes Hospitalizations by Age and Gender, 2012

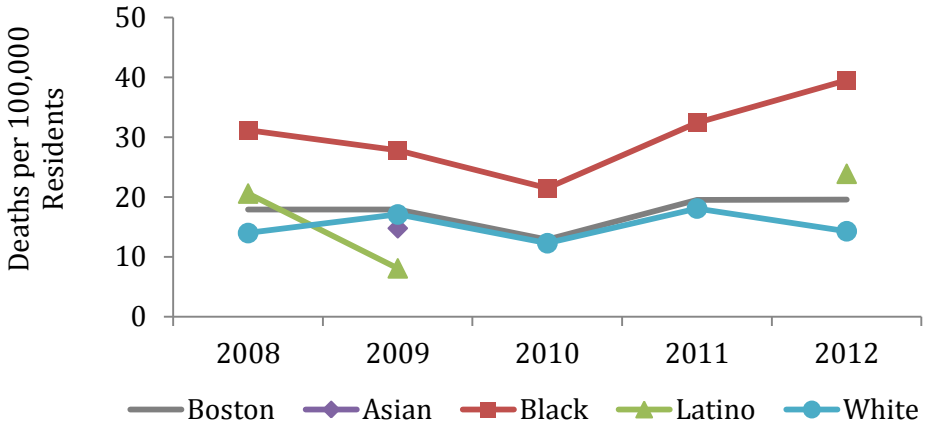


*Age-adjusted rates

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

In 2012, females had a lower diabetes hospitalization rate than males. Residents 45-64 years of age and those 65 and over had higher rates of hospitalizations compared to those ages 18-44, while those ages 0-17 had lower rates of hospitalizations compared to 18-44 year olds.

Figure 6.19 Diabetes Deaths by Race/Ethnicity and Year*



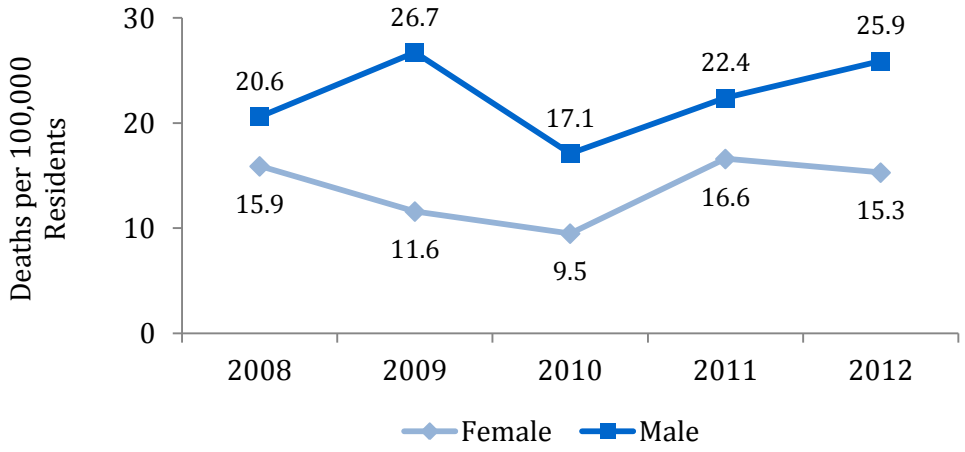
*Age-adjusted rates

NOTE: Rates for Asian residents in 2009 and Latino residents for 2008-2009, and 2012 are based on counts less than 20 and should be interpreted with caution. Rates are not presented for Asian residents for 2008 and 2010-2012, and Latino residents for 2010-2011 due to the small number of cases.

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

In 2012, there were 19.6 deaths per 100,000 Boston residents due to diabetes. There was no significant change over time in the rate of diabetes deaths for Boston overall, Black residents, and White residents from 2008-2012. The rate of diabetes deaths among Black (39.5) and Latino (23.9) residents in 2012 were higher than the rate of deaths for White residents (14.3).

Figure 6.20 Diabetes Deaths by Gender and Year*



*Age-adjusted rates

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

In 2012, there were 15.3 per 100,000 deaths due to diabetes among female residents. The rate of female deaths was lower than the rate of male deaths (25.9) in 2012. From 2008-2012, there were no significant changes in the diabetes death rates for either males or females.

Heart Disease

What is Heart Disease?

Heart disease is an umbrella term that covers several conditions related to the heart, including coronary artery disease, arrhythmias, and heart failure. The most common type of heart disease in the United States is coronary artery disease (CAD) (9). CAD is caused by cholesterol deposits that build-up in the blood vessels that supply the heart with blood. As these deposits accumulate over time, the blood vessels narrow and blood flow is reduced. Symptoms of heart disease depend on the specific condition, but common, worrisome symptoms include heaviness or pressure in the chest, shortness of breath, and feeling weak or lightheaded (9).

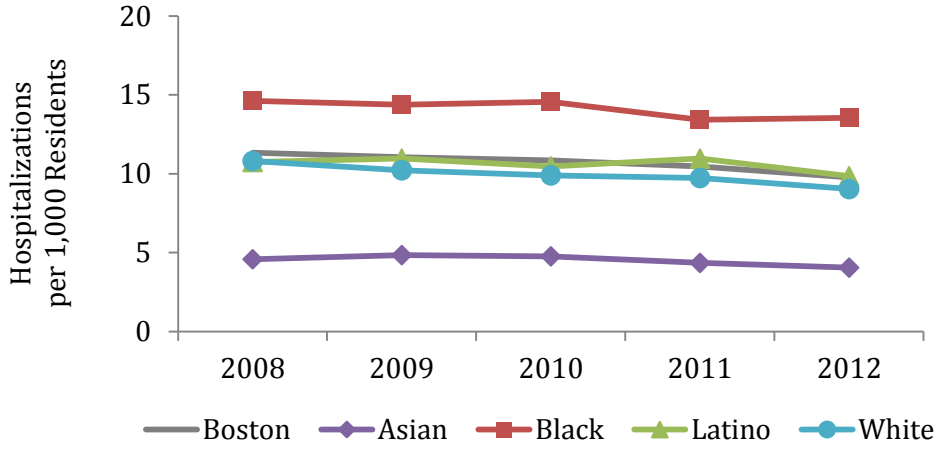
Populations at Risk

Heart disease is the leading cause of death for Black, Latino, and White populations in the United States; and it is the second leading cause of death for Asian Americans. Nearly half of Americans have at least one of the three key risk factors for developing CAD: high blood pressure, high LDL cholesterol, and cigarette smoking (9). Other risk factors include diabetes, overweight/obesity, diet with few fruits and vegetables, physical inactivity, and excessive alcohol use (9).

Prevention

Lowering blood pressure, quitting smoking, exercising regularly, and maintaining a healthy diet can help reduce the risk of developing heart disease (9).

Figure 6.21 Heart Disease Hospitalizations* by Race/Ethnicity and Year



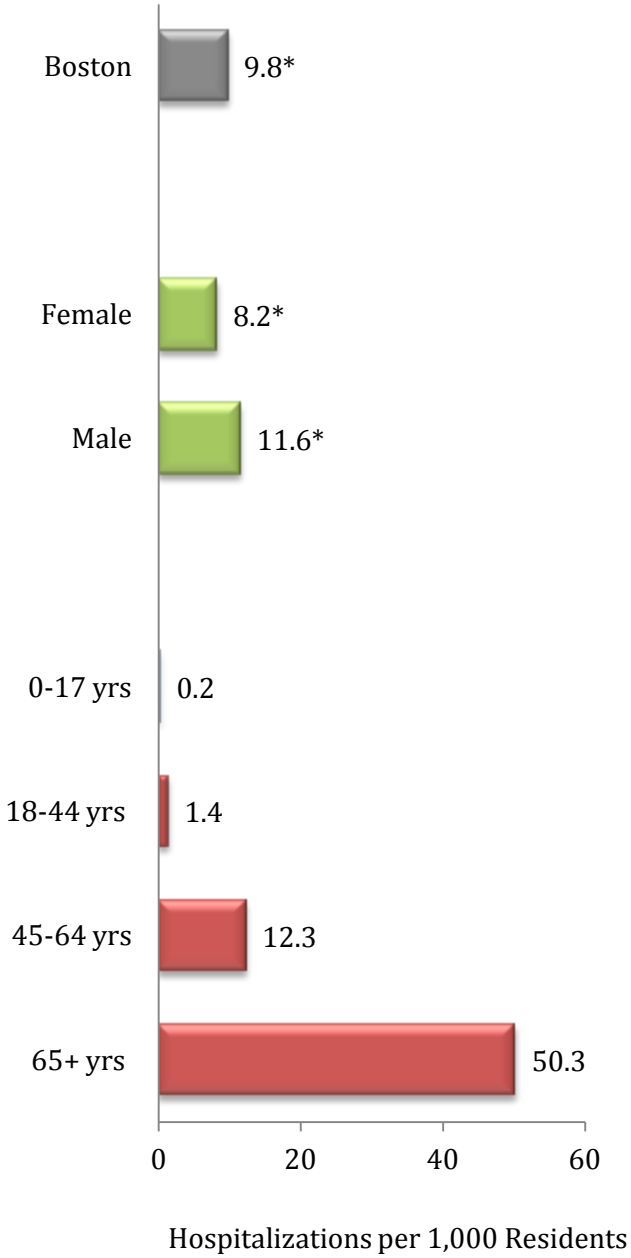
*Age-adjusted rates

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

From 2008-2012 there was a decrease in the rate of heart disease hospitalizations for Boston residents, from 11.3 in 2008 to 9.8 in 2012. There was also a decrease over time in the rate among Black and White residents. In 2012, Black and Latino residents had higher rates of heart disease hospitalizations compared to White residents, 13.6 and 9.9 versus 9.0 respectively.

In 2012, Boston residents had 5,220 heart disease hospitalizations; 5,004 (96%) of these were anonymously linked to 3,785 unique individuals. Of these individuals, 79% had 1 heart disease hospitalization, 15% had 2 heart disease hospitalizations, and 6% had 3 or more heart disease hospitalizations.

Figure 6.22 Heart Disease Hospitalizations by Age and Gender, 2012

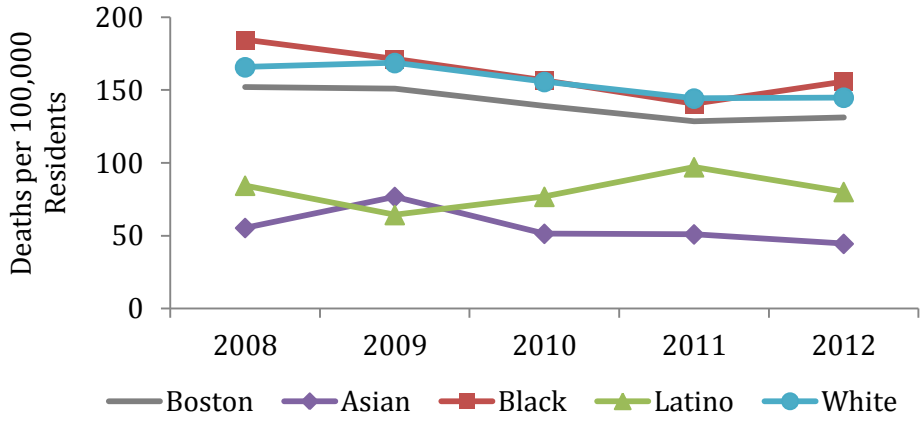


In 2012, female residents had a lower rate of heart disease hospitalizations than males, 8.2 versus 11.6 per 1,000 residents respectively. Compared to those 18-44 years, those ages 45-64 and 65 years and over had higher rates of hospitalizations. Those 17 years of age and under had lower rates of hospitalizations compared to residents ages 18-44.

*Age-adjusted rates

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

Figure 6.23 Heart Disease Deaths by Race/Ethnicity and Year*



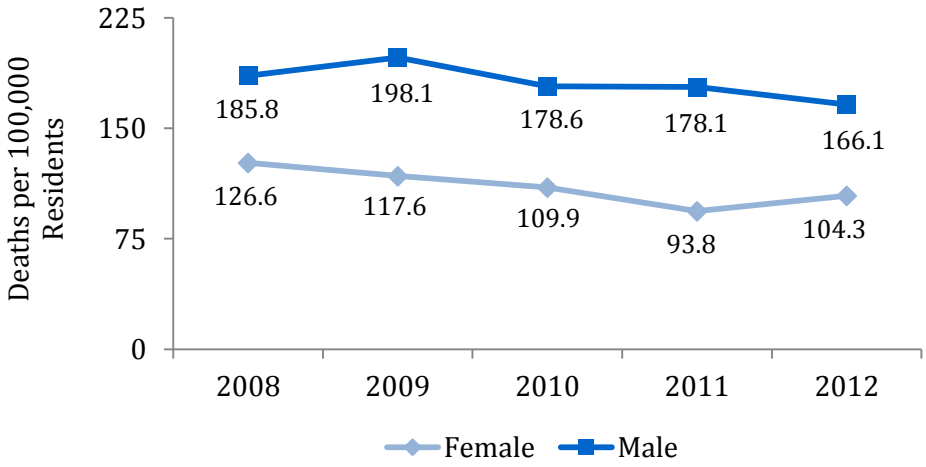
*Age-adjusted rates

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

In 2012, there were 131.1 deaths per 100,000 Boston residents due to heart disease; a significant decrease since 2008. The rate of Black and White resident heart disease deaths also decreased over time. There were no significant changes over time for Asian and Latino residents.

In 2012, the heart disease death rate for White residents was 144.9. This was higher than the rate for Asian (44.6) and for Latino (80.2) residents. There was no significant difference between the rate for Black residents (155.9) and that of White residents in 2012.

Figure 6.24 Heart Disease Deaths by Gender and Year*



*Age-adjusted rates

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

From 2008 to 2012 the rate of heart disease deaths for both females and males decreased. In 2012, there were 104.3 deaths per 100,000 female residents; this rate was lower than the rate for male residents (166.1).

Hypertension

What is Hypertension?

Hypertension is another word for high blood pressure. As blood is pumped throughout the body, it generates a force against the walls of the blood vessels that carry it. This force is known as blood pressure. A healthy person's blood pressure varies with age and gender, and also fluctuates within a normal range throughout the day (10).

Blood pressure is recorded as two numbers: the higher number is called systolic pressure and the lower number is called diastolic pressure. Normal values for systolic pressure are less than 120 mmHg and for diastolic pressure are less than 80 mmHg (10). This is also written as 120/80 mmHg. The CDC defines high blood pressure, or hypertension, for adults as a systolic blood pressure of 140 mmHg or higher or a diastolic blood pressure of 90 mmHg or higher (or 140/90 mmHg) (10). A person with high blood pressure may not have any signs or symptoms until they develop a serious health complication. Complications such as heart disease, heart attacks, stroke, heart failure, kidney disease, and peripheral artery disease can be prevented through early diagnosis and management of blood pressure (10).

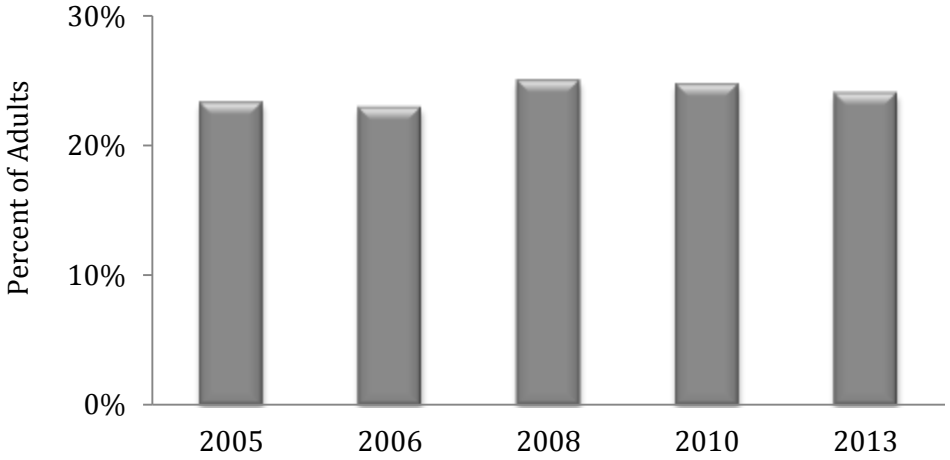
Populations at Risk

Compared to White Americans, Black Americans have a higher prevalence of high blood pressure. High blood pressure is also associated with increasing age. Pre-hypertension (blood pressure above the normal range but below the hypertensive range) and diabetes also increase the risk of developing high blood pressure. Family history of hypertension is another important risk factor, especially when combined with smoking and a diet high in sodium (10).

Prevention

Maintaining a healthy lifestyle is the key to keeping blood pressure normal. Eating a healthy diet, which includes fruits and vegetables and is low in sodium, engaging in regular physical activity, maintaining a healthy weight, avoiding tobacco and excess alcohol consumption, and controlling diabetes can help to maintain a healthy blood pressure. In addition, regular check-ups with a health care provider can help detect hypertension before complications develop (10).

Figure 6.25 Hypertension Among Adults by Year

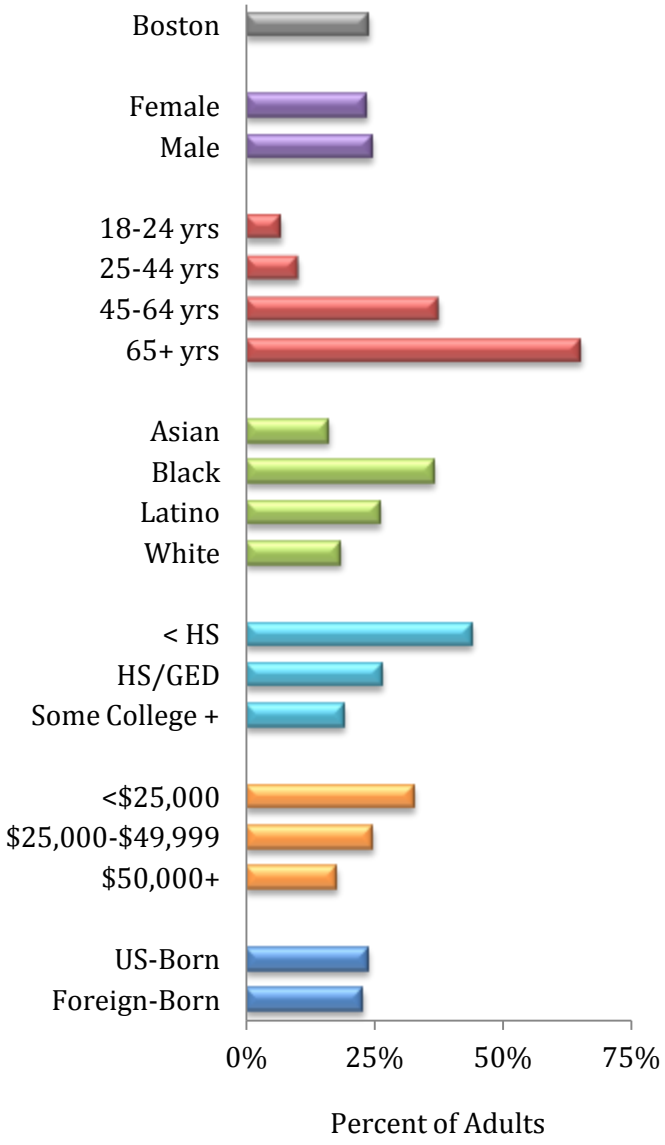


2005	2006	2008	2010	2013
23.3% (21.1-25.5)	22.9% (20.9-24.8)	25.0% (22.8-27.2)	24.7% (22.6-26.8)	24.0% (22.3-25.6)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2005, 2006, 2008, 2010 and 2013), Boston Public Health Commission

In 2013, 24% of Boston adult residents reported having hypertension (high blood pressure). There was no significant change in the percentage of adults who reported having hypertension between 2005 and 2013.

Figure 6.26 Hypertension Among Adults by Selected Indicators, 2013



Boston	24.0% (22.3-25.6)
Gender	
Female	23.5% (21.4-25.5)
Male	24.5% (22.0-27.1)
Age	
18-24 yrs	7.0% (3.4-10.6)
25-44 yrs	10.3% (8.4-12.3)
45-64 yrs	37.6% (34.5-40.7)
65+ yrs	65.3% (61.7-69.0)
Race/Ethnicity	
Asian	16.2% (9.9-22.4)
Black	36.7% (33.0-40.5)
Latino	26.2% (22.0-30.3)
White	18.6% (16.7-20.6)
Educational Attainment	
Less than High School	44.0% (37.9-50.2)
High School Diploma or GED	26.5% (23.0-29.9)
At Least Some College/ Bachelor's or Higher	19.1% (17.4-20.9)
Income	
<$25,000	32.8% (29.2-36.3)
$25,000-$49,999	24.8% (20.8-28.7)
$50,000+	17.8% (15.6-20.1)
Place of Birth	
US-Born	23.9% (22.0-25.9)
Foreign-Born	22.9% (19.5-26.3)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 24% of Boston residents reported having hypertension. A higher percentage of residents ages 45-64 and 65 and over reported having hypertension than residents ages 18-24. A higher percentage of Black and Latino residents reported having hypertension than White residents. A higher percentage of residents with a high school degree or less than a high school degree reported having hypertension than residents with at least some college education. A higher percentage of residents living in households with an annual income of $25,000 or less and $25,000-$49,999 reported having hypertension than residents living in households with an annual income of $50,000 or more . There was no significant difference in reported hypertension by gender or place of birth.

Overweight and Obesity

What is Overweight and Obesity?

Overweight and obesity are categories of weight based on Body Mass Index (BMI), which is a tool for comparing the weights of people of different heights. For adults, BMI is calculated using a standard formula that incorporates an individual's height and weight. A BMI between 25.0 and 29.9 is classified as overweight and a BMI of 30 or higher is classified as obese. Over a third of adults in the United States are obese according to measurements taken from the National Health and Nutrition Examination Survey between 2009 and 2010 (11).

For children and adolescents (2-19 years), weight categories are determined using an age and sex-specific percentile for BMI. The percentile indicates where the BMI falls relative to children or adolescents of the same sex and age. Youth with a BMI between the 85th and 95th percentile are considered overweight and those at the 95th percentile or higher are considered obese. Almost one-third of children and adolescents in the United States are either overweight or obese (13).

Being overweight or obese is a risk factor for many chronic diseases including coronary artery disease, type 2 diabetes, hypertension, cancer, sleep apnea and other respiratory problems, and liver and gallbladder disease (11).

Populations at Risk

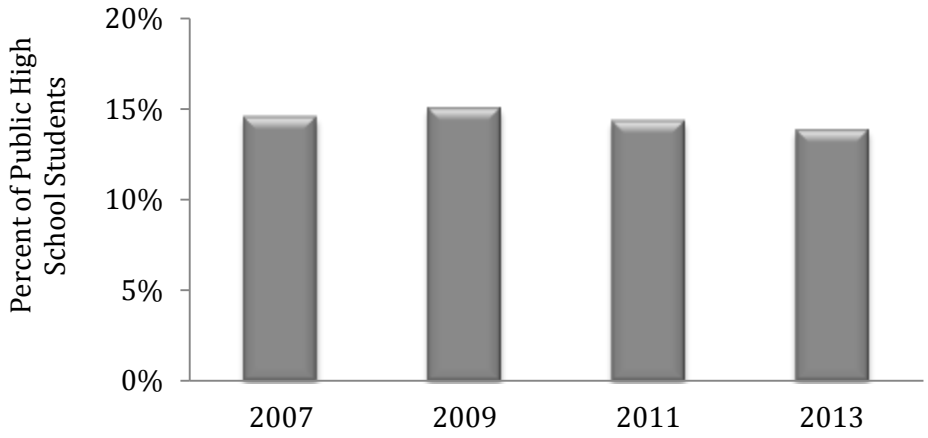
Obesity and being overweight occur when a person consumes more calories than they used. This surplus of calories leads to excess fat being stored in the body. Although genetics and certain medical conditions predispose some people to develop obesity, many lifestyle factors also play a role. These include physical inactivity, overeating, sleep deprivation, social influences, and some medications (14). Any environment that makes these factors more difficult to control increases the risk of obesity (11).

Prevention

Adopting health-promoting behaviors that combine regular physical activity and a balanced diet may help maintain or reduce an individual's weight (11).

In 2007, 15% of Boston public school students were obese. In 2013, 14% of Boston public school students were obese.

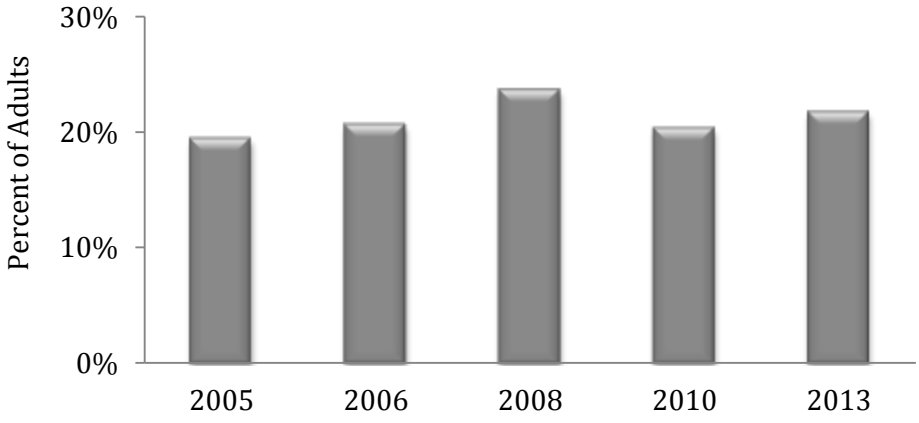
Figure 6.27 Obesity Among Public High School Students by Year



2007	2009	2011	2013
14.5% (12.5-16.5)	15.0% (12.4-17.7)	14.3% (11.7-16.9)	13.8% (11.4-16.2)

DATA SOURCE: Youth Risk Behavior Survey (2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

Figure 6.28 Obesity Among Adults by Year

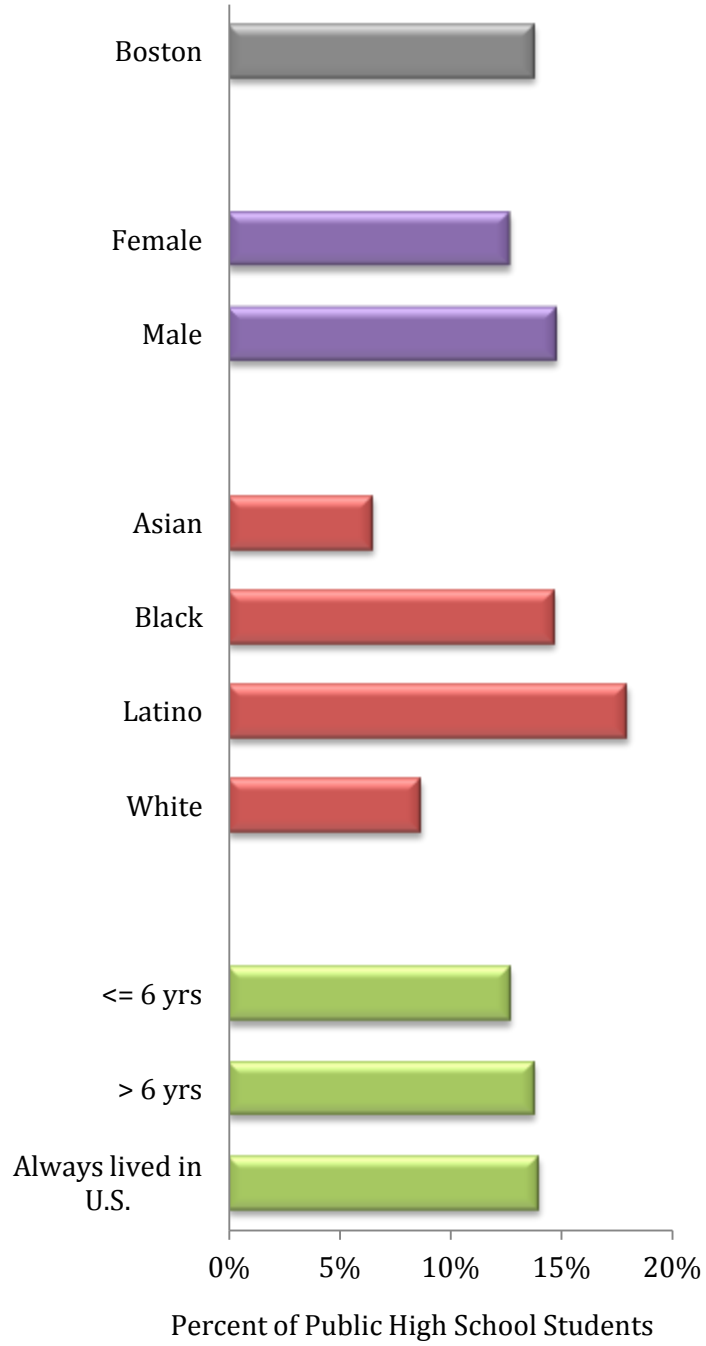


In 2005, 19% of Boston adults were obese while in 2013 22% of Boston adults were obese. From 2005 to 2013, there was no significant change in the percentage of Boston adults who were obese.

2005	2006	2008	2010	2013
19.4% (17.1-21.7)	20.6% (18.4-22.7)	23.6% (21.1-26.2)	20.3% (18.1-22.5)	21.7% (20.0-23.4)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2003, 2005, 2006, 2008, and 2010), Boston Public Health Commission

Figure 6.29 Obesity Among Public High School Students by Selected Indicators, 2013



Boston	13.8% (11.4-16.2)
Gender	
Female	12.7% (9.3-16.1)
Male	14.8% (11.3-18.4)
Race/Ethnicity	
Asian	6.5% (2.0-11.0)
Black	14.7% (10.9-18.6)
Latino	18.0% (14.0-22.1)
White	8.7% (3.5-13.8)
Years in the U.S.	
6 Years or Less	12.7% (5.3-20.1)
More than 6 Years	13.8% (7.8-19.9)
Always lived in U.S.	14.0% (11.1-16.9)

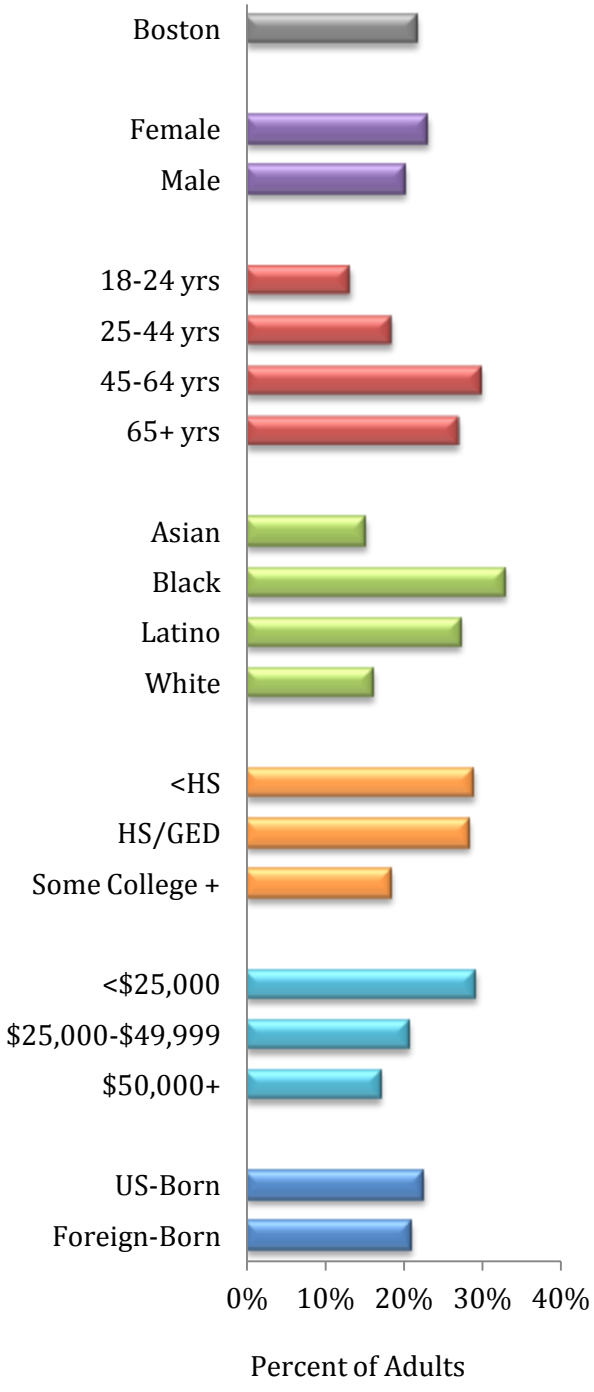
DATA SOURCE: Youth Risk Behavior Survey (2013), Centers for Disease Control and Prevention

In 2013, the percent of Boston public high school females who were obese was not significantly different as compared to male students. Compared to White students, the percent of Latino students who were obese was higher. There were no significant differences between the percent of Asian and Black students who were obese as compared to White students. There were also no significant differences by years the student has lived in the U.S.

Boston	21.7% (20.0-23.4)
Gender	
Female	23.1% (20.7-25.4)
Male	20.2% (17.7-22.7)
Age	
18-24	13.3% (9.1-17.5)
25-44	18.5% (15.7-21.3)
45-64	29.9% (26.9-32.9)
65+	27.0% (23.4-30.6)
Race/Ethnicity	
Asian	15.3% (8.9-21.6)
Black	33.0% (29.3-36.8)
Latino	27.3% (23.1-31.6)
White	16.2% (13.9-18.4)
Educational Attainment	
Less than High School	29.0% (23.4-34.6)
High School Degree/GED	28.4% (24.4-32.5)
At Least Some College/ Bachelor's or Higher	18.4% (16.5-20.4)
Income	
<$25,000	29.3% (25.6-33.0)
$25,000-<$50,000	20.7% (17.1-24.3)
$50,000+	17.1% (14.6-19.5)
Place of Birth	
US-Born	22.6% (20.5-24.8)
Foreign-Born	21.0% (17.6-24.4)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

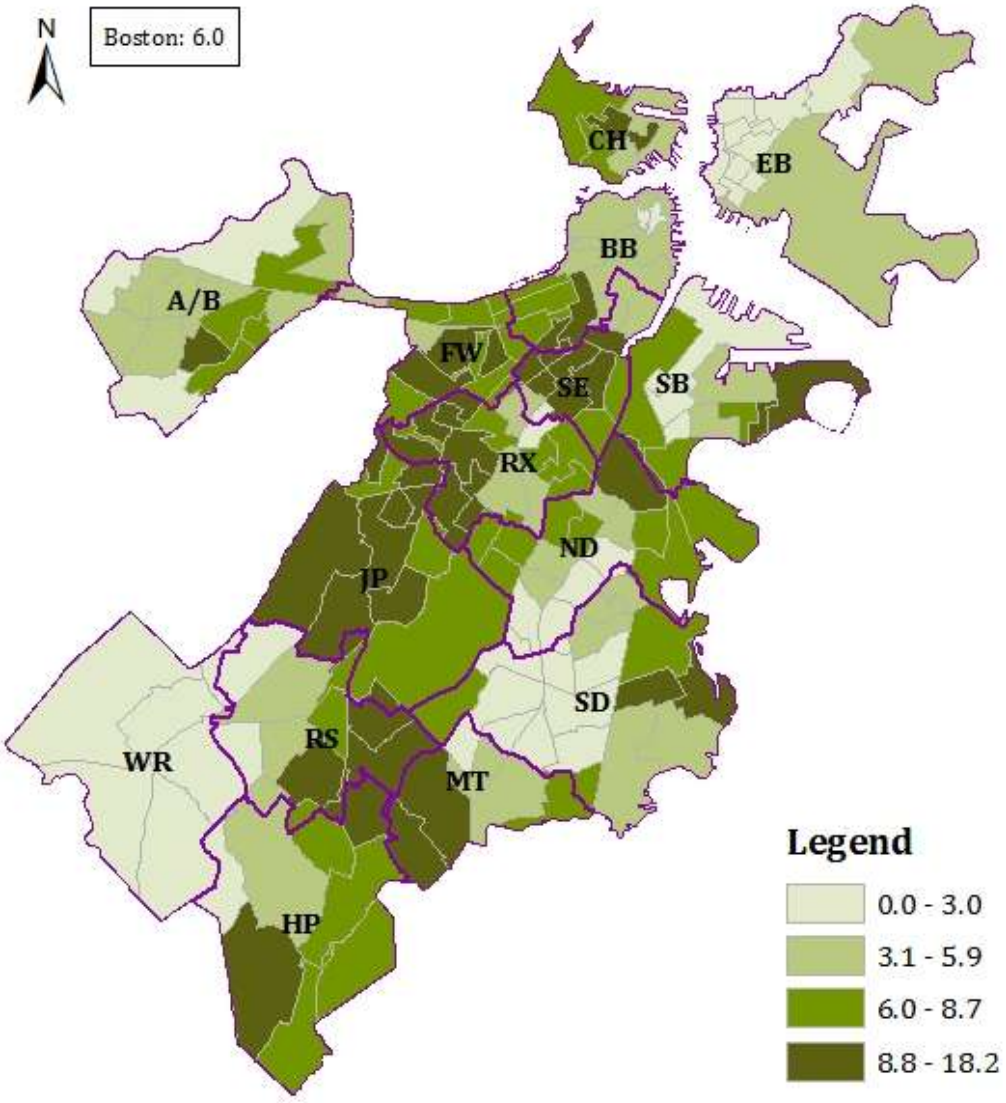
Figure 6.30 Obesity Among Adults by Selected Indicators, 2013



In 2013, there was no significant difference in the percentage of males and females who were obese. A higher percentage of adults ages 45-64 (30%) and 65 and over (27%) were obese compared with adults ages 18-24 (13%). A higher percentage of Black (33%) and Latino (27%) residents were obese compared to White residents (16%).

A higher percentage of those who were high school graduates (28%) and those with less than a high school education (29%) were obese compared to those with at least some college education (18%). A higher percentage of adults living in households with an annual income of less than $25,000 (29%) were obese compared to those living in households with an annual income of $50,000 or more (17%). There was no significant difference in obesity between those who were US- or foreign-born.

Figure 6.31 Modified Retail Food Environment Index (mRFEI) by Census Tract, 2008-2009



NOTE: mRFEI scores are calculated for census tracts from the 2000 decennial census. Neighborhood outlines are based on zip codes. mRFEI scores are grouped into quartiles.

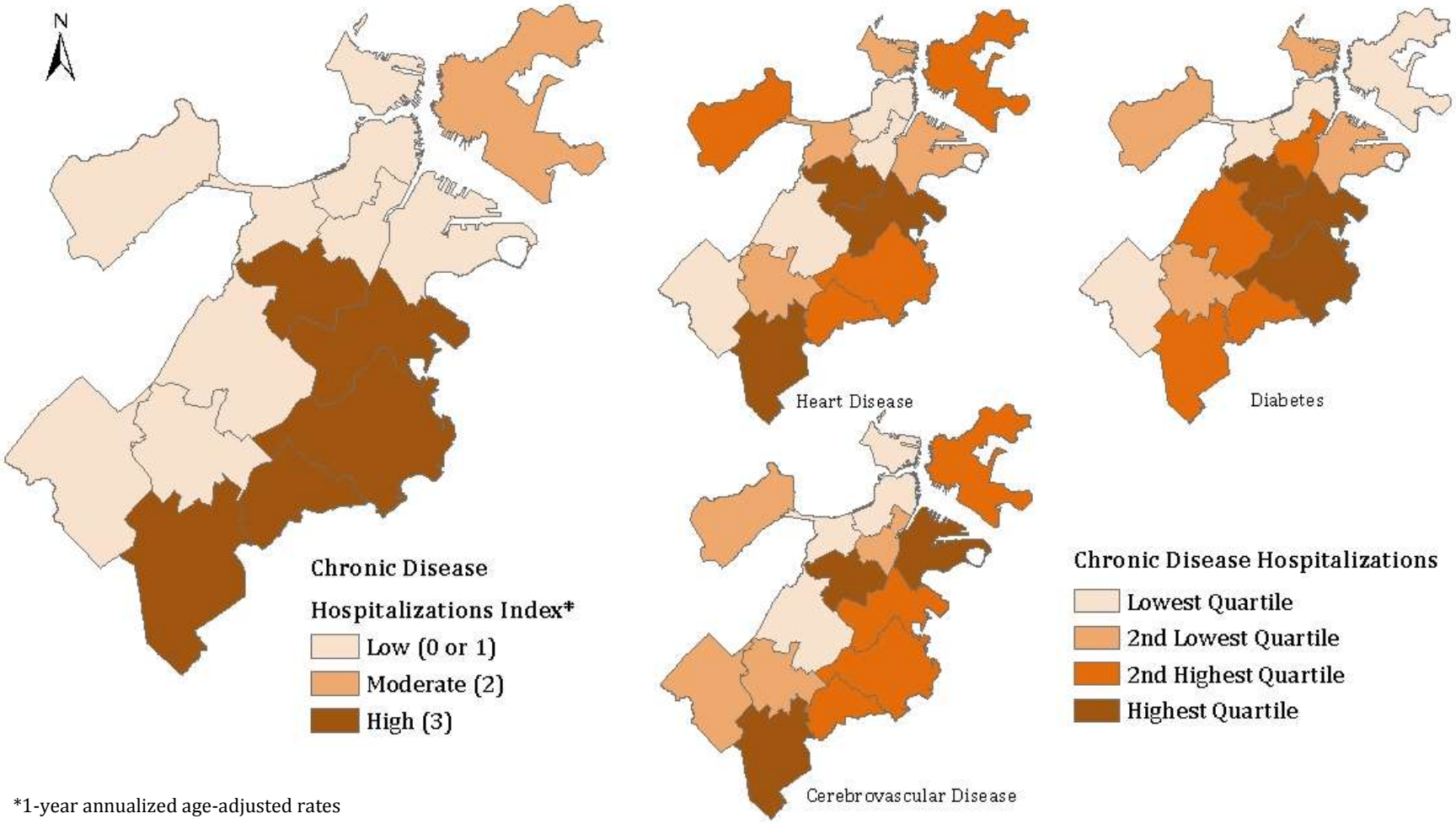
DATA SOURCE: Modified Retail Food Environment Index, Centers for Disease Control and Prevention

The Modified Retail Food Environment Index (mRFEI) indicates the percentage of food retailers in a census tract or within a one-half mile boundary of a census tract that are healthy food retailers. A higher score indicates that a higher percentage of food retailers are healthy food retailers.

The median mRFEI score for Boston census tracts was 6.0, and the median mRFEI score for Massachusetts census tracts was 7.1. In the United States, the median mRFEI score for the 50 states and Washington, D.C., was 10.0.

Fifty-eight percent of Boston census tracts had a score below 7.1 while 87% had a score below 10.0.

Figure 6.32 Chronic Disease Hospitalizations* by Neighborhood, 2012

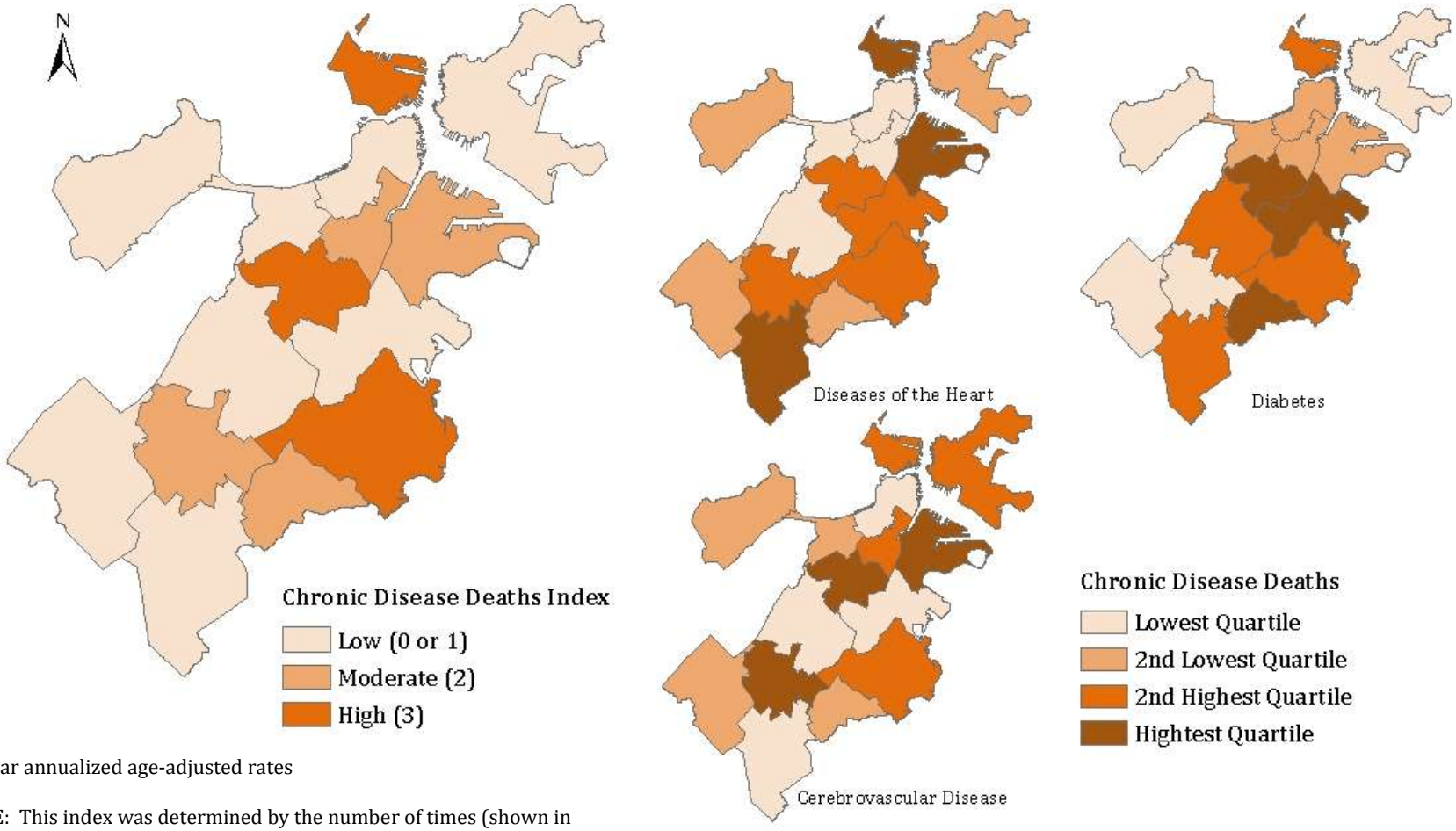


*1-year annualized age-adjusted rates

NOTE: This index was determined by the number of times (shown in parentheses in the legend) the neighborhood falls into the highest or 2nd highest quartile for each of the three birth outcomes shown.
DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

2012 Boston heart disease hospitalzations rate: 9.8 per 1,000 residents
2012 Boston diabetes hospitalizations rate: 2.0 per 1,000 residents
2012 Boston cerebrovascular hospitalzations rate: 2.3 per 1,000 residents

Figure 6.33 Chronic Disease Deaths* by Neighborhood, 2010-2011 Combined



*2-year annualized age-adjusted rates

NOTE: This index was determined by the number of times (shown in parentheses in the legend) the neighborhood falls into the highest or 2nd highest quartile for each of the three types of chronic disease deaths shown.
DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

Boston Diseases of the Heart Deaths: 129.9 per 100,000 residents
Boston Diabetes Deaths: 19.5 per 100,000 residents
Boston Cerebrovascular Deaths: 30.1 per 100,000 residents

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Chapter 7:
Sexual Health

Sexual Health

Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality (1). Achieving this state of well-being requires the prevention of, and when necessary, effective treatment of sexually transmitted infections (STIs) (2).

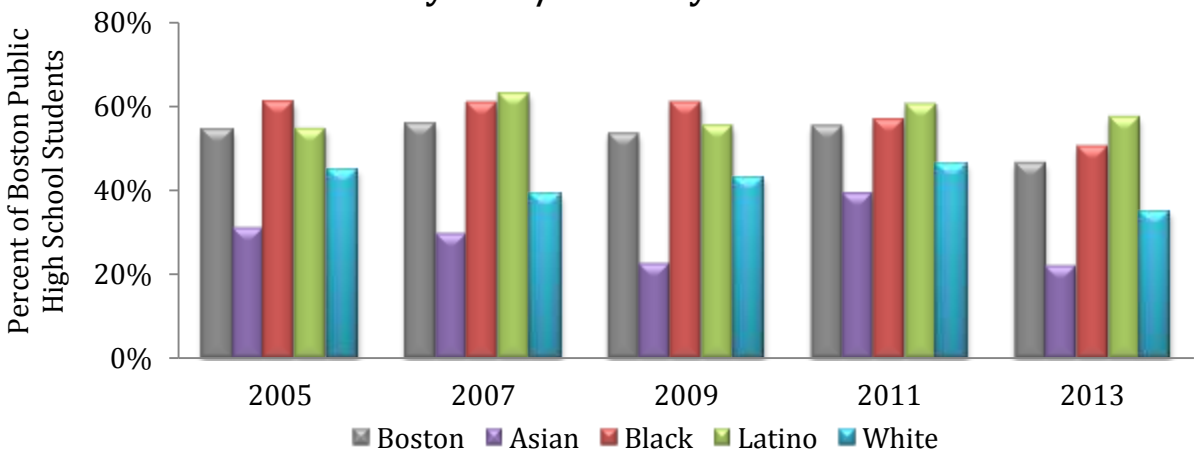
The CDC estimates that 19 million sexually transmitted infections occur each year, with half of new diagnoses estimated to occur in adolescents ages 15-24 (3). Many people are unaware they are infected with an STI since symptoms are often absent or when present, may be attributed to another cause. Symptoms as benign as non-specific abdominal pain or itching can be the first signs of an infection with the potential to cause serious long-term complications (4). Uncontrolled infections can make an individual more vulnerable to other STIs, including HIV (5).

Although anyone can experience serious health effects from STIs, they impact women more frequently and extensively than men. Infections can cause pelvic inflammatory disease, infertility and ectopic pregnancy if left untreated. Infections may also be passed on to an unborn child, causing serious harm including brain damage, blindness, or stillbirth (6). Often times, women do not have noticeable symptoms when infected with the most common STIs, whereas symptoms for men are more obvious (3).

Reducing the risk of becoming infected with an STI is the goal of recommended prevention strategies. Using condoms can prevent infection. Having honest conversations with new partners about infection and being aware of common STI symptoms can prevent STIs from spreading (5). Abstaining from sexual activity or being active in a long-term, monogamous relationship with an uninfected partner can prevent infection. . High-risk behaviors for contracting an STI include having multiple partners, unprotected intercourse with infected persons, and injection drug use (2).

After prevention, seeking medical care immediately after a potential infection is the next best approach. Although many STIs do not present with obvious symptoms, they can be detected through targeted medical screening tests. Since bacteria are often responsible for infections, most STIs can be effectively treated with antibiotics. Even STIs caused by viruses, such as Herpes and HIV, can be medically managed (2).

Figure 7.1 High School Students Who Have Ever Had Sex by Race/Ethnicity and Year

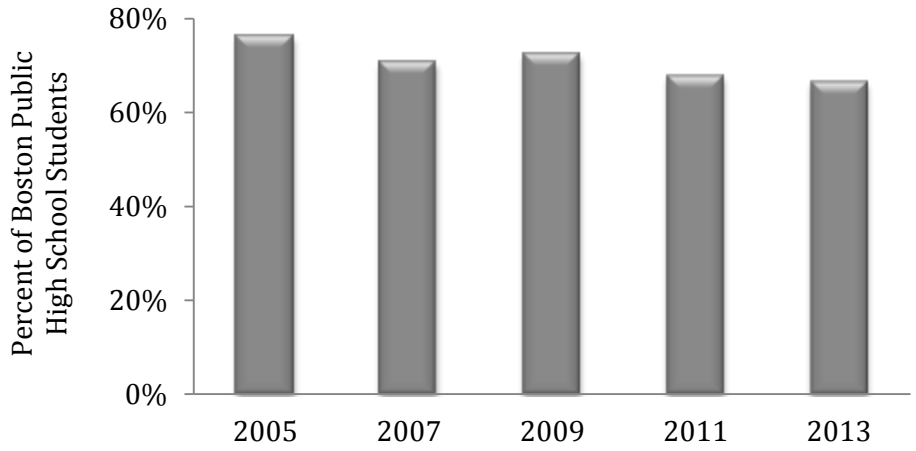


	2005	2007	2009	2011	2013
Boston	54.4% (50.5-58.2)	56.0% (52.7-59.4)	53.6% (49.4-57.7)	55.5% (50.7-60.2)	46.6% (41.4-51.8)
Asian	31.0% (22.5-39.5)	29.7% (22.0-37.3)	22.5% (13.9-31.1)	39.3% (29.1-49.5)	22.0% (12.8-31.2)
Black	61.1% (55.4-66.8)	60.8% (56.2-65.3)	60.8% (55.3-66.4)	56.8% (49.0-64.6)	50.4% (43.3-57.4)
Latino	54.6% (49.5-59.7)	63.1% (57.0-69.2)	55.4% (48.6-62.2)	60.5% (54.8-66.2)	57.4% (50.8-64.0)
White	45.0% (37.0-53.0)	39.0% (30.4-47.5)	43.0% (31.6-54.5)	46.5% (31.4-61.7)	35.0% (25.4-44.6)

DATA SOURCE: Youth Risk Behavior Survey (2005, 2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

Between 2005 and 2013, the percentage of Boston public high school students who had ever had sex significantly decreased over time. While the percentage of Black students who had ever had sex decreased over time from 61% in 2005 to 50% in 2013, there were no significant changes over time among Asian, Latino, or White students. In 2013, the percentage of Latino students who had ever had sex was higher than that of White students.

Figure 7.2 Condom Use During Last Sex Among High School Students by Year



2005	2007	2009	2011	2013
76.3% (72.6-80.0)	70.9% (67.6-74.1)	72.6% (69.2-76.0)	67.8% (62.4-73.2)	66.5% (61.5-71.6)

DATA SOURCE: Youth Risk Behavior Survey (2005, 2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

Between 2005 and 2013, the percentage of sexually active Boston public high school students who used a condom during the last time they had sex significantly decreased over time.

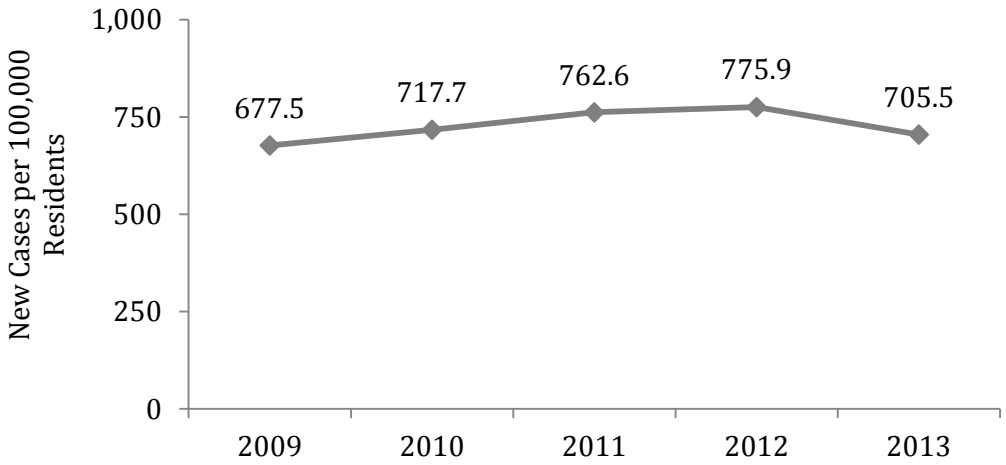
Chlamydia

Chlamydia is the most frequently reported STI in the United States, and is caused by the bacterium *Chlamydia trachomatis*. It is considered a silent infection because most infected people are asymptomatic with normal physical examination findings. Symptomatic infections can be characterized by vaginal discharge for women and burning during urination for both men and women. Untreated infections can lead to serious consequences including pelvic inflammatory disease, infertility, and complications during pregnancy. Infection can also be spread from an untreated mother to her baby during childbirth. This can result in conjunctivitis or pneumonia in the infant (7).

Sexually active young people are at higher risk of acquiring chlamydia for several reasons related to behavior and biology. Nevertheless, any sexually active person can become infected. CDC recommends yearly chlamydia screening of all sexually active women ages 25 and younger, and older women with new or multiple sex partners (2). Due to the disease's asymptomatic nature, a laboratory test is usually necessary to identify an infection and requires the collection of vaginal swabs or urine samples (2).

Chlamydia infections can effectively be treated with antibiotics, which stop the infection, but sometimes the damage caused by the infection is irreversible. Therefore, treatment is most effective when delivered as soon as possible after exposure. Repeated infection is common and can occur if a person's sex partners have not been treated (7). Chlamydia infection can be prevented by using barrier contraception. In Massachusetts, partners of patients with chlamydia can be treated without needing to be tested to prevent reinfection.

Figure 7.3 Chlamydia by Year

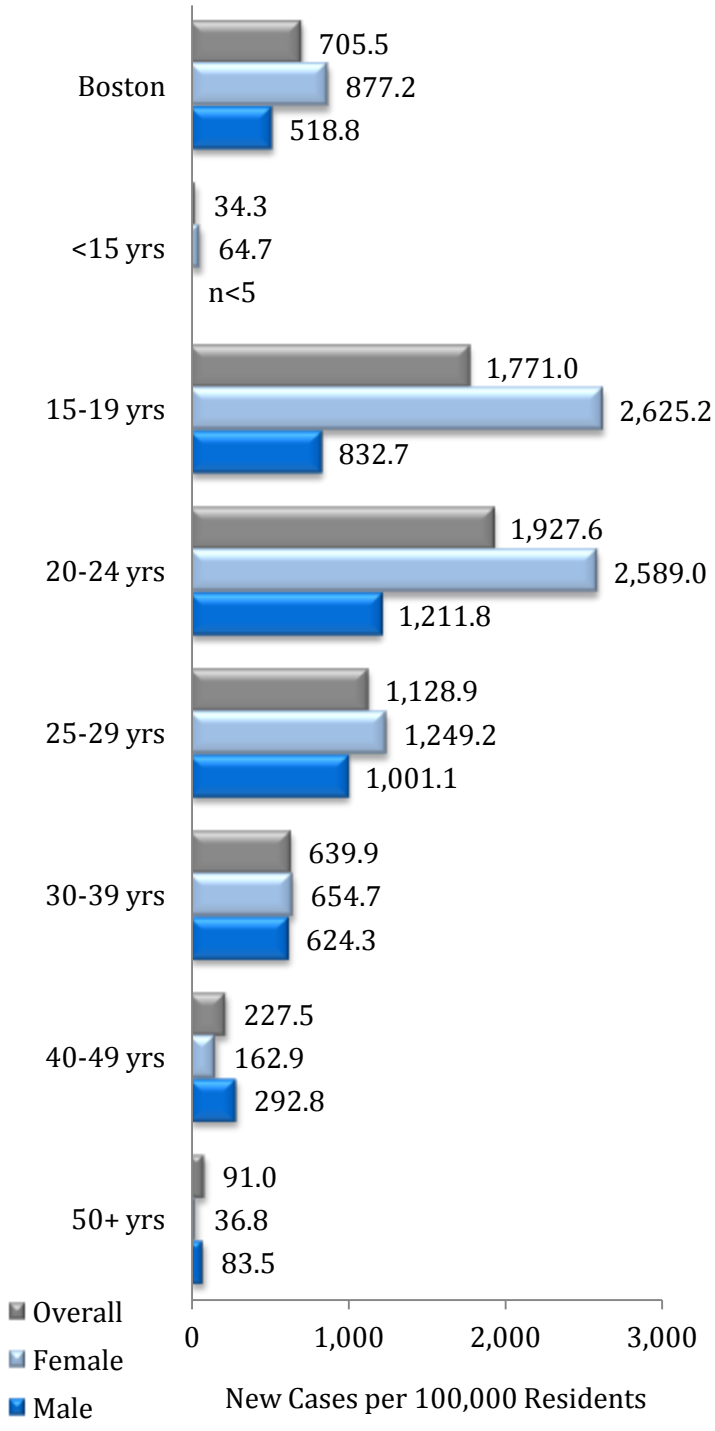


DATA SOURCE: Division of STD Prevention, Massachusetts Department of Public Health

In 2009, the Chlamydia rate in Boston was 677.5 new cases per 100,000 residents. In 2013 the rate was 705.5.

The rate of new Chlamydia infections was highest among Boston females ages 15-19. For both genders, compared to ages 30-39, the incidence rates were higher for residents ages 15-19, and lower for all other age groups.

Figure 7.4 Chlamydia by Gender Within Age, 2013



DATA SOURCE: Division of STD Prevention, Massachusetts Department of Public Health

Gonorrhea

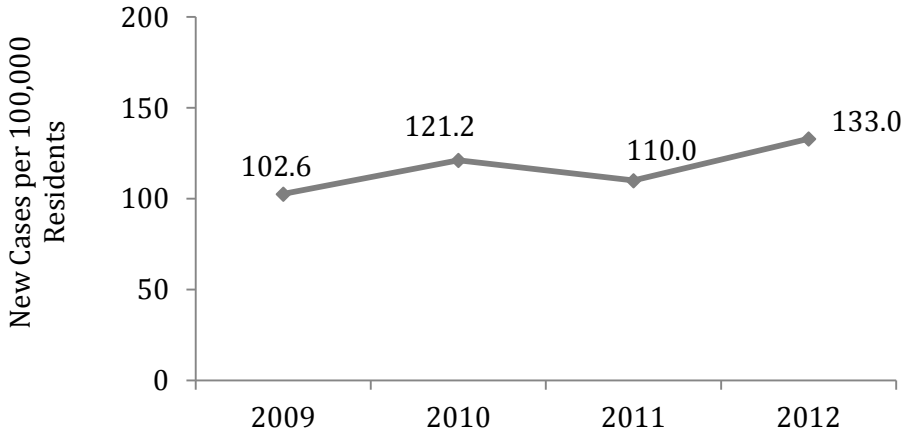
Gonorrhea is a sexually transmitted infection caused by the bacterium *Neisseria gonorrhea*. It is the second most commonly reported communicable disease in the United States (after chlamydia) (8). Many infections are asymptomatic; however, symptoms can include sore throat, painful urination, or abnormal vaginal/urethral discharge. Symptoms among women are generally mild and may be mistaken for bladder or vaginal infections. Men sometimes experience testicular pain or pain with urination. If left untreated, gonorrheal infection can lead to several serious complications including joint infections, pelvic inflammatory disease, infertility, and ectopic pregnancies. Transmission of infection to newborns is possible during childbirth, which can result in blindness, joint infection, and blood infection (4). In addition, people with gonorrhea are at higher risk of becoming infected with HIV.

The prevalence of gonorrhea varies widely among communities and populations. In Boston, health-care providers are urged to consider local patterns of infection when making screening decisions, including targeted screening of all sexually active women under age 25, those who have unprotected sex with multiple partners, and pregnant women (2) .

Gonorrhea can be diagnosed by testing urine, urethral, or vaginal specimens. If a person has had oral or anal sex, cottons swabs of the throat or anus are tested (4).

Gonorrhea can be effectively treated with antibiotics. Evidence indicates that patients with gonorrhea are frequently co-infected with chlamydia. For this reason, CDC recommends treating both conditions simultaneously. Many strains of gonorrhea have developed resistance to antibiotics, making it important to be retested for gonorrhea following treatment (4).

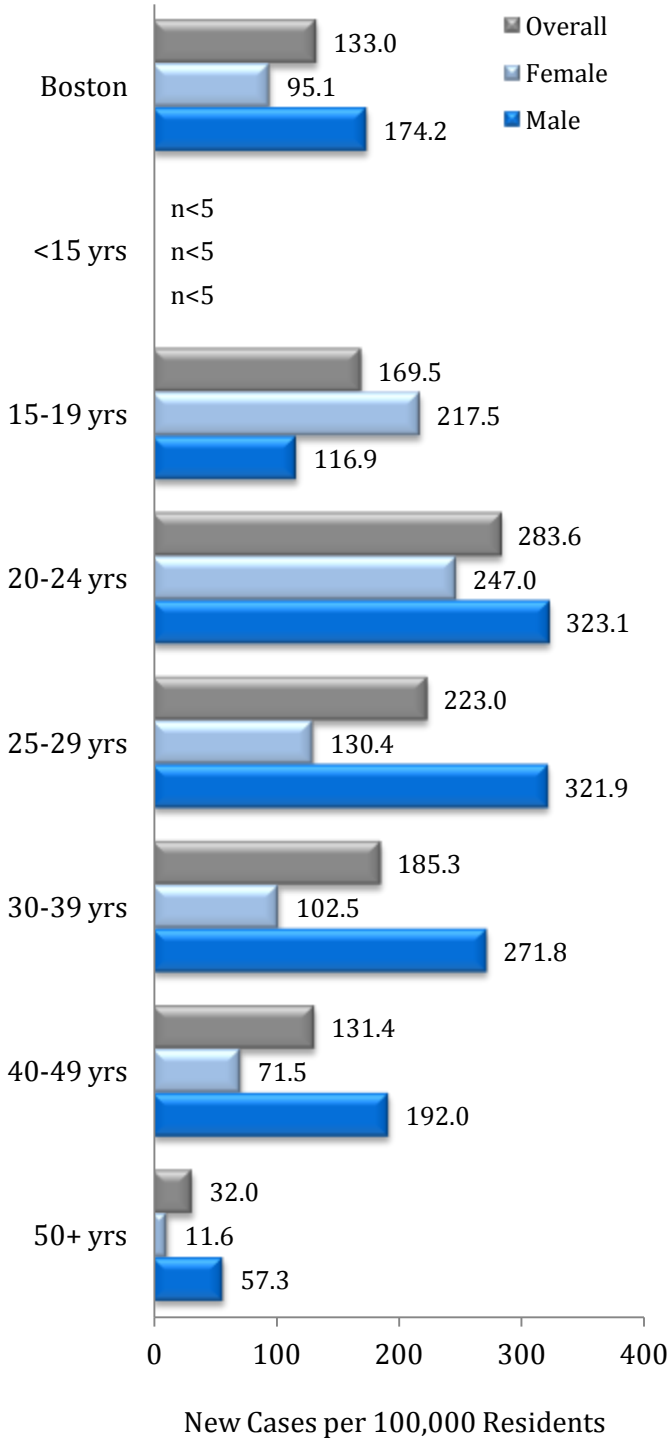
Figure 7.5 Gonorrhea by Year



DATA SOURCE: Division of STD Prevention, Massachusetts Department of Public Health

In 2009, the rate of Gonorrhea in Boston was 102.6 new cases per 100,000 residents. The rate was 133.0 in 2012.

Figure 7.6 Gonorrhea by Gender within Age, 2012



In 2012, the gonorrhea incidence rate among Boston females ages 15-19 was higher than females ages 30-39. While the rate was lower for Boston males ages 15-19, 40-49 and 50+ compared to those ages 30-39, there was no statistical difference in gonorrhea rates for males ages 20-24 or 25-29 compared to males ages 30-39.

DATA SOURCE: Division of STD Prevention, Massachusetts Department of Public Health

Syphilis

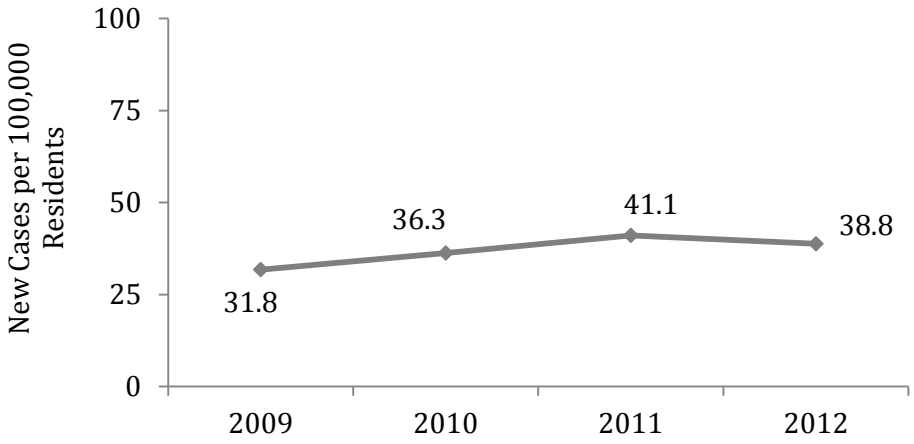
Syphilis is a sexually transmitted illness caused by the bacterium *Treponema pallidum* and is characterized by four stages: primary, secondary, latent, and late. Every year, about 55,000 Americans get new syphilis infections (9).

Symptoms associated with the primary stage usually appear 21 days after infection, but can range from 10-90 days after infection (9). The initial stage is marked by painless sores that appear near the location where syphilis entered the body (e.g., genitalia, mouth, or anus). The sores last three to six weeks and heal regardless of treatment (9). However without treatment, 25% of syphilis cases progress to the secondary stage, which can be marked by a host of signs and symptoms including rash, fever, headache, weight loss, enlarged lymph nodes, hair loss, hepatitis, kidney injury, and eye problems (10). Like primary syphilis, the symptoms of secondary syphilis often disappear without treatment but the infection can remain latent. The latent stage of syphilis can last for several years and is not associated with any signs or symptoms, but 15% of untreated cases can develop into late, or tertiary, syphilis (9). Late stage syphilis is characterized by difficulty coordinating movement, paralysis, blindness, and dementia. The disease may also damage internal organs, resulting in death. At any stage of infection, syphilis can invade the nervous system and cause a wide range of symptoms (9).

Mother-to-child transmission during pregnancy is possible and poses an extreme risk to the child's survival. Babies that survive pregnancy are at high risk for developing serious problems within a few weeks of birth, which may lead to developmental delays, seizures, or death (9).

Syphilis is diagnosed through blood tests. Routine screening is recommended for all pregnant women early in pregnancy and during the third trimester because treatment can prevent transmission of the disease (2). In its early stages, syphilis can be treated with a single intramuscular injection of penicillin. Later stages require at least three doses at weekly intervals. Although treatment will kill the bacteria in the body, it will not repair any existing damage (9). Therefore, it is important to prevent infection with safe sex practices that include the use of condoms, and to seek treatment as soon as possible if there are signs of infection.

Figure 7.7 Syphilis by Year

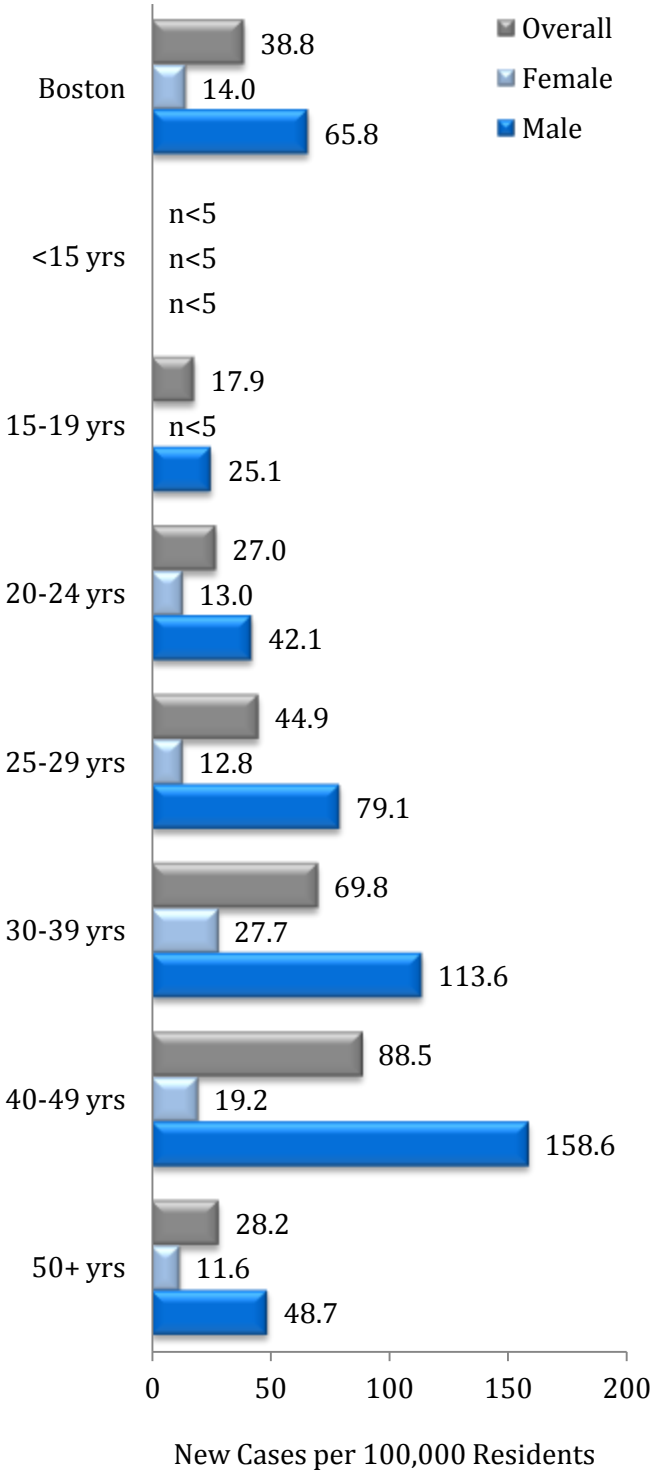


DATA SOURCE: Division of STD Prevention, Massachusetts Department of Public Health

In 2009, the rate of syphilis in Boston was 31.8 new cases per 100,000 residents. The rate was 38.8 in 2012.

In 2012, the syphilis incidence rate among Boston males ages 15-19, 20-24, and 50+ was lower than males ages 30-39. While it was higher for females ages 50+ compared to females ages 30-39, there was no statistical difference in syphilis rates among Boston females ages 20-24, 25-29 and 40-49 compared to females ages 30-39.

Figure 7.8 Syphilis by Gender within Age, 2012



NOTE: Rates are not presented for ages <15 and females ages 15-19 due to the small number of cases.

DATA SOURCE: Division of STD Prevention, Massachusetts Department of Public Health

HIV/AIDS

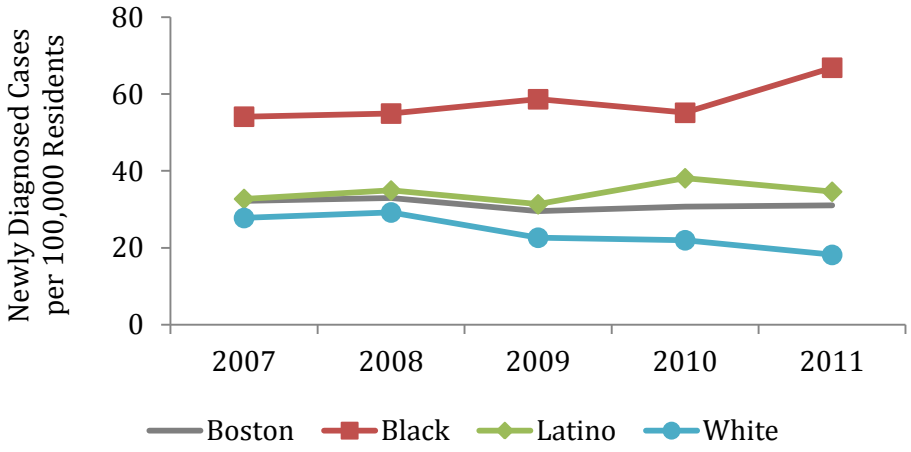
Human immunodeficiency virus (HIV) is a virus that affects the CD4 cells of the immune system and can eventually lead to acquired immunodeficiency syndrome (AIDS). Overtime HIV destroys the CD4 cells (or T cells), preventing the body from fighting off infections. Once infected, the body does not get rid of HIV. This means that HIV is considered an incurable infection (11).

Over a million people in the United States have been infected with HIV, and nearly a half million have developed AIDS (12). Transmission of HIV occurs when bodily fluids from an infected person come into contact with mucous membranes (found inside the vagina, penis, rectum, or mouth), damaged tissue, or blood stream of an uninfected person. Examples of bodily fluids that carry the virus include blood, semen, vaginal fluids, rectal fluids, and breast milk (12).

Within two to four weeks of HIV infection, acute retroviral syndrome can develop, which may or may not have symptoms similar to a common cold (11). During this early stage of infection, large amounts of HIV are produced in the body and one's ability to spread the infection is very high. Eventually, the immune system will stabilize the amount of virus in the body. The next stage of HIV infection is known as clinical latency, in which HIV reproduces at very low levels. Depending upon responses to treatment, clinical latency can last several decades. Over time, the viral load in the body begins to rise again, and the CD4 cell count begins to drop. This final stage of HIV infection is known as AIDS when the number of CD4 cells falls below 200 cells per cubic millimeter of blood [200 cells/mm3] (normal CD4 counts are between 500 and 1,600 cells/mm3) (11). AIDS can also be defined by a person developing one or more opportunistic infections. Opportunistic infections take advantage of the weakened immune system and cause serious health consequences in people with HIV infection. Examples of opportunistic infections include fungal infections, tuberculosis, and pneumonia (11).

Although there is no cure for HIV infection, people can live long, productive lives with antiretroviral therapy (ART) and preventive treatment for opportunistic infections. Prevention of HIV infection is possible through consistent condom use during sex, refraining from needle sharing during intravenous drug use, and avoiding breastfeeding if infected. CDC recommends HIV screening for all persons who seek evaluation and treatment of STIs. Screening can also be performed at home with HIV test kits that are available over the counter (11).

Figure 7.9 Newly Diagnosed Cases of HIV/AIDS by Year of Diagnosis

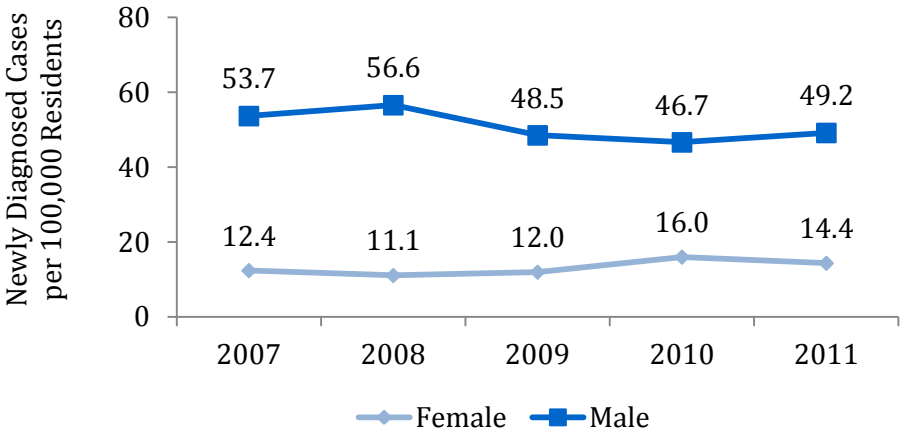


NOTE: Data values for Asian residents were suppressed for confidentiality. Prisoners are excluded from these data.

DATA SOURCE: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health

In 2011, the incidence rate for newly diagnosed HIV/AIDS cases among Boston residents was 31.0 per 100,000 residents. In Boston, there was no significant change over time from 2007 to 2011. The incidence rate for both Black residents (66.9) and Latino residents (34.6) was higher in 2011 than it was for White residents (18.2).

Figure 7.10 Newly Diagnosed Cases of HIV/AIDS by Gender and Year of Diagnosis



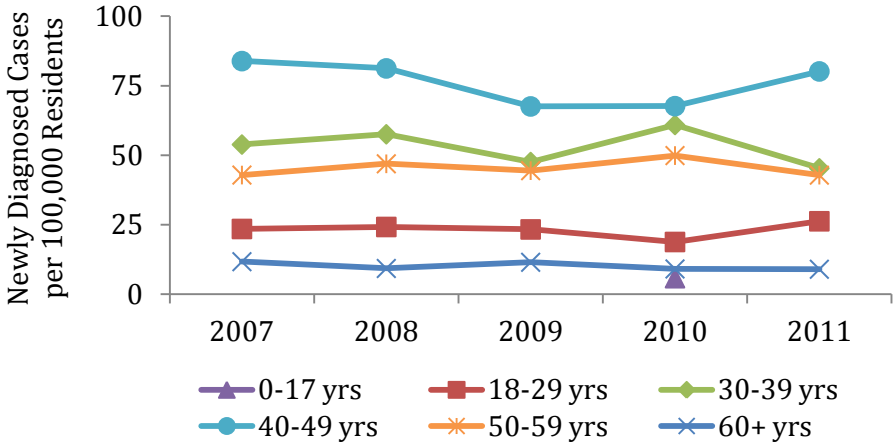
In 2011, the incidence rate for newly diagnosed HIV/AIDS cases among females in Boston was 14.4 per 100,000 residents. For males in Boston, the rate was higher than females at 49.2.

NOTE: Prisoners are excluded from these data.

DATA SOURCE: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health

In 2011, the incidence rate for newly diagnosed HIV/AIDS cases among residents ages 18-29 years was 26.3 per 100,000. The rate was higher for those ages 30-39 (45.3), 40-49 (80.2) and 50-59 (42.9) compared to 18-29 year olds. The rate was lower for those 60 years of age and older (9.0) compared to 18-29 year olds.

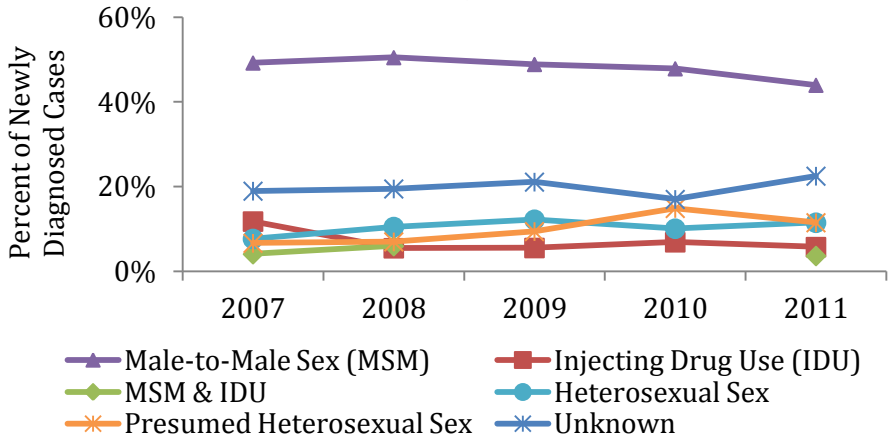
Figure 7.11 Newly Diagnosed Cases of HIV/AIDS by Age at Diagnosis and Year



NOTES: Values for ages 0-17 were suppressed for the years 2007, 2008, 2009, and 2011 for confidentiality. Prisoners are excluded from these data.

DATA SOURCE: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health

Figure 7.12 Newly Diagnosed Cases of HIV/AIDS by Mode of Transmission and Year of Diagnosis



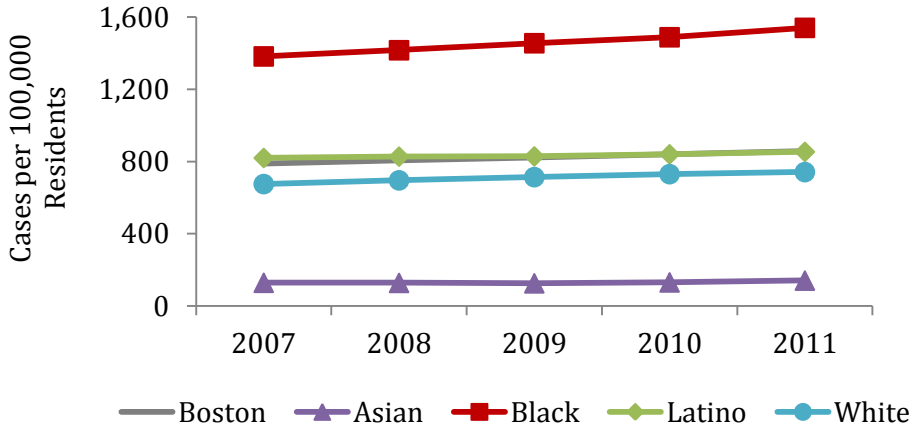
NOTE: Values for MSM & IDU in 2009 and 2010 were suppressed for confidentiality. Prisoners are excluded from these data.

DATA SOURCE: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health

In 2011, 44% of all newly diagnosed cases of HIV/AIDS in Boston were reported as male-to-male sex (MSM) as the mode of transmission. Additionally, 23% of newly diagnosed cases of HIV/AIDS were reported as an unknown mode of transmission. Presumed heterosexual sex as the reported mode of transmission for HIV/AIDS among Boston residents significantly increased from 2007 to 2011.

From 2007 to 2011 the number of people living with HIV/AIDS in Boston increased. In 2011, the rate for people living with HIV/AIDS in Boston was 858.3 per 100,000 residents. The rate among Black and Latino residents was higher than that of White residents. The rate among Asian residents was lower than that of White residents.

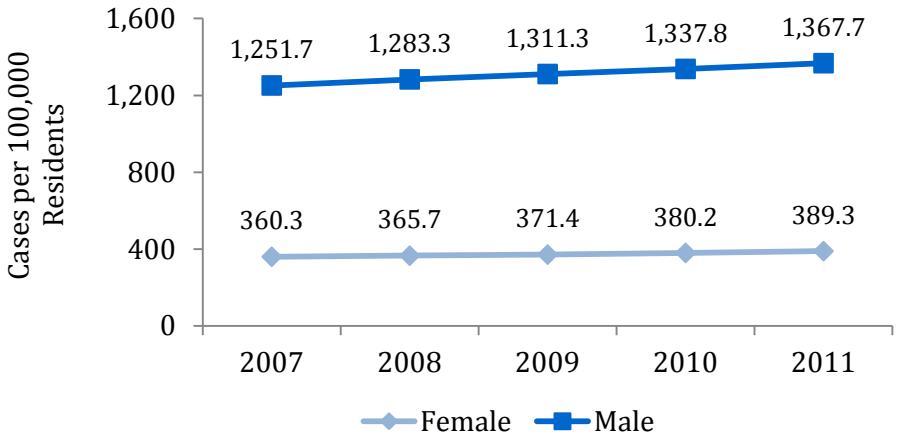
Figure 7.13 People Living with HIV/AIDS by Race/Ethnicity and Year



NOTE: Prisoners are excluded from the data.

DATA SOURCE: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health

Figure 7.14 People Living with HIV/AIDS by Gender and Year



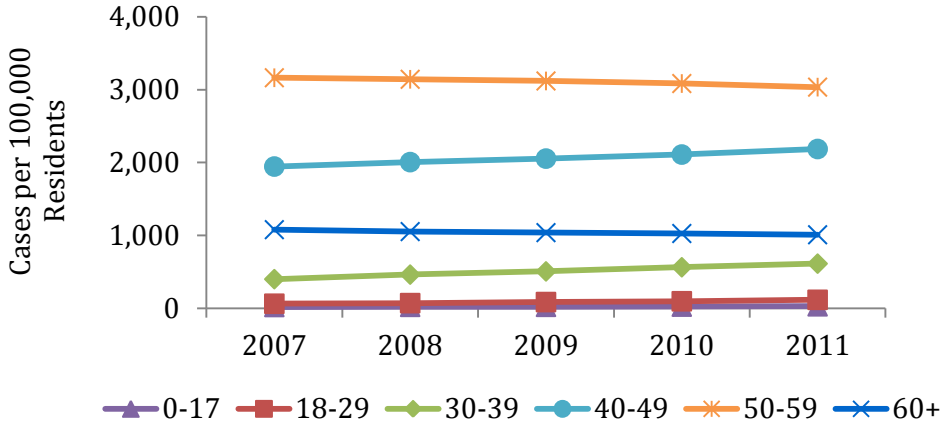
In 2011, the rate among females living with HIV/AIDS in Boston was 389.3 per 100,000 residents. The rate among males was higher than females, at 1,367.7 per 100,000 residents.

NOTE: Prisoners are excluded from these data.

DATA SOURCE: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health

In 2011, the rate among Boston residents 18-29 years of age living with HIV/AIDS was 115.9 per 100,000 residents. The rates among residents ages 30-39 (613.0), 40-49 (2,186.6), 50-59 (3,035.8), and 60 years or older (1,009.1) were higher than that of 18-29 year olds. The rate of those ages 0-17 (27.4) was lower than that of 18-29 year olds.

Figure 7.15 People Living with HIV/AIDS by Age and Year



NOTE: Prisoners are excluded from these data.

DATA SOURCE: HIV/AIDS Surveillance Program, Massachusetts Department of Public Health

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Chapter 8:
Infectious Disease

Infectious Disease

Infectious diseases are caused by microbes, tiny organisms like bacteria and viruses that require a microscope to see. These microscopic organisms are everywhere; from aerosolized droplets in the air we breathe to nearly everything we touch. Many live naturally in the human body; there are more microbial cells inside of a human body than there are human cells (1,2). Many microbes are essential for maintaining good health by helping us digest food and produce vitamins (2).

The human-microbe relationship is complex: some promote health, and others promote disease. Microbes that cause infectious disease are called pathogens. Some pathogens make a person very sick and then leave him/her immune to future attacks, while others can cause a long-term infection resulting in death. Some infectious diseases last a lifetime and cause infrequent symptoms. The discovery of antibiotics in the 20th Century is considered one of the greatest medical achievements in human history because it helped cure previously deadly infections.

Today, misuse of antibiotics (i.e. not finishing a prescribed course or unnecessary usage) contributes to the development of drug-resistant bacteria (3). Drug-resistance makes us vulnerable to infections we might otherwise be able to cure with conventional antibiotics (3).

Vaccines prevent infectious disease without contributing to disease-resistance (4). A vaccine contains part of a disease-causing microbe that has been killed or weakened and thus is no longer able to make a person sick. When a person receives a vaccine, the body's immune system develops protective antibodies that will attack the disease-causing microbes if it tries to infect a person in the future.

Despite the use of vaccines and antibiotics, infectious diseases are responsible for more deaths worldwide than any other single cause. The estimated annual cost of medical care for infectious disease treatment in the United States is about $120 billion (5).

Hepatitis B & C

Hepatitis, which means inflammation of the liver, results most frequently from heavy alcohol use or viral infections (6). Hepatitis A, B, and C are types of viral infections. Hepatitis A is an acute diarrheal disease, and people usually recover without treatment. Hepatitis B and C begin as acute infections, but have the potential to become chronic. Vaccines are available for Hepatitis A and B, but not Hepatitis C. In the United States, more than 4 million people have chronic Hepatitis B or C, but many people do not know they are infected (6,7).

Hepatitis B is spread when bodily fluids from an infected person enter the body of an uninfected person. This can occur through sexual contact, mother-to-child transmission at birth, sharing of personal items that carry fluids (i.e. toothbrushes, razors, etc.), and direct contact with blood or open sores of an infected person. Hepatitis B is a vaccine preventable disease and routine vaccination is recommended for all infants and children as well as adults at high risk for exposure to the virus.

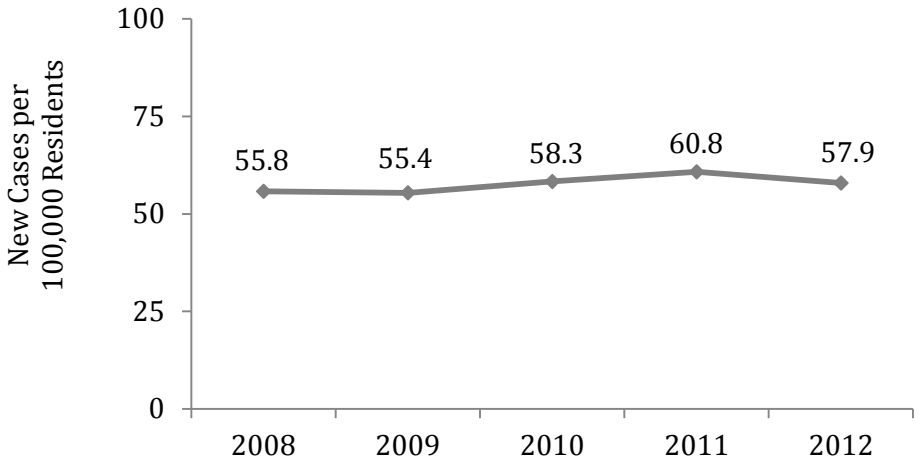
Transmission of Hepatitis C is similar to Hepatitis B, although the likelihood of transmission via sexual contact and sharing of personal items is much lower (7).

People with acute Hepatitis B and C infections do not always have symptoms. However, when present, symptoms include fever, vomiting, stomach pain, dark urine, and being jaundiced (having yellow skin and eyes). Chronic infections may eventually produce symptoms similar to acute infections and develop into irreversible liver damage or liver cancer (6,7).

The likelihood of a Hepatitis B infection becoming chronic depends upon the age of infection. Infants and children are more likely to develop chronic Hepatitis B compared with adults. Approximately 25%–50% of children infected between the ages of 1 and 5 years develop chronic hepatitis. The development of chronic Hepatitis C is not age-dependent. Approximately 75%–85% of people who become infected with the Hepatitis C virus develop chronic infection (7).

Hepatitis B and C infections are detected with blood tests. There is no medicine to treat acute viral hepatitis infections, and there are limited treatment options for chronic hepatitis, all of which require close consultation with medical professionals. (6,7)

Figure 8.1 Hepatitis B by Year

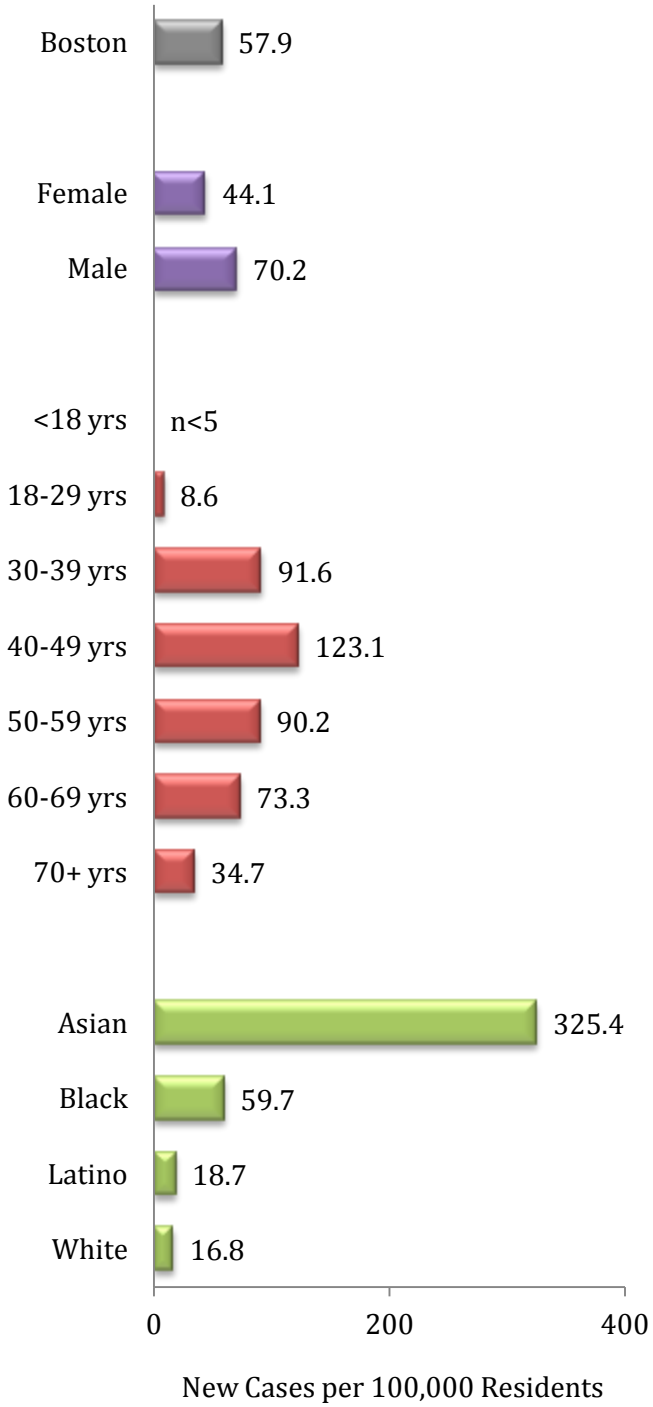


DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

Between 2008 and 2012, there was no significant change in the incidence rate for reported Hepatitis B among Boston residents.

The incidence rate for reported Hepatitis B infection among Boston residents overall in 2012 was 57.9 new cases per 100,000 residents. However, the rate varied within gender, age group, and race/ethnicity. The Hepatitis B incidence rate for females was lower than for males. The rates for all age groups presented were higher than the rate for those ages 18-29. Also, the rates for Asian and Black residents were higher than the rate for White residents.

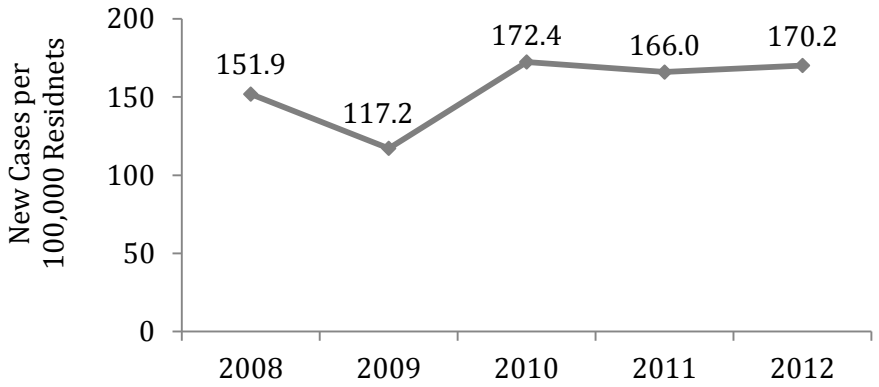
Figure 8.2 Hepatitis B by Selected Indicators, 2012



NOTE: Rates are not presented for ages <18 due to the small number of cases.

DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

Figure 8.3 Hepatitis C by Year

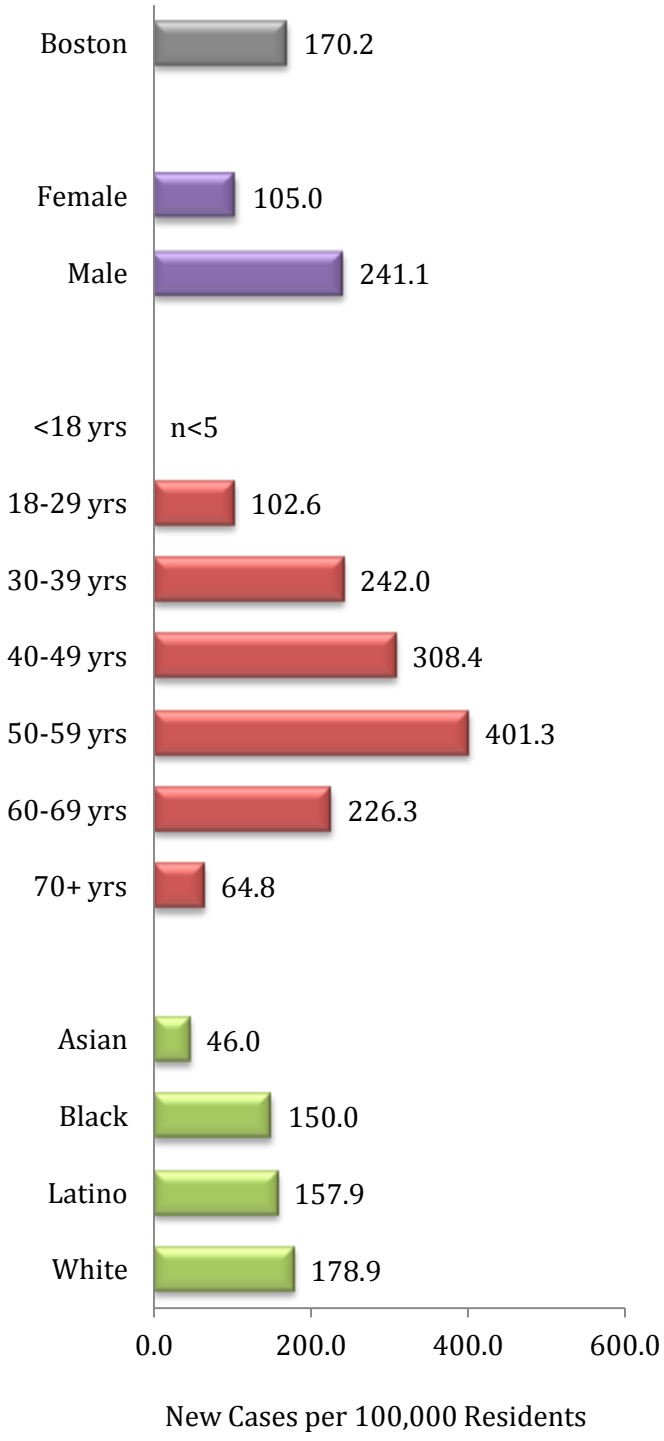


DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

From 2008 to 2012, the incidence rate of reported Hepatitis C infection among Boston residents significantly increased by 12%.

In 2012, the Hepatitis C incidence rate among Boston residents overall was 170.2 new cases per 100,000 residents. However, the rate varied within gender, age group, and race/ethnicity. The rate for females was lower compared to the rate for males. Rates for all age groups presented, except for those 69 years or older, were higher compared to the rate for those ages 18-29. Rates for Asian and Black residents were lower than for White residents.

Figure 8.4 Hepatitis C by Selected Indicators, 2012



NOTE: Rates are not presented for ages <18 due to the small number of cases.

DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

Influenza

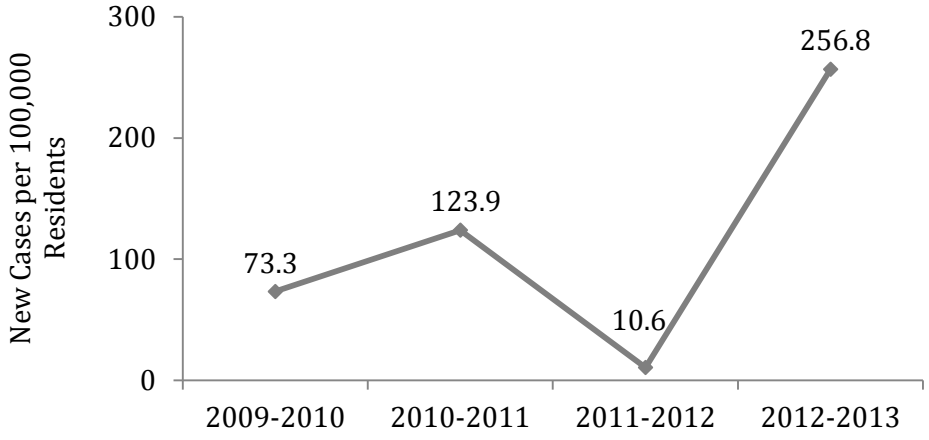
Influenza, or the "flu," is a respiratory system (nose, throat, and lungs) infection caused by the influenza virus. Every year, a flu epidemic hits the United States during the fall and winter months, commonly referred to as flu season. Flu is very contagious, and an infected individual can spread it to people up to 6 feet away in the form of respiratory droplets released during coughing, sneezing, or talking (8).

The flu and common cold have similar symptoms that include fever, cough, sore throat, runny nose, body aches, and fatigue. However, the flu is different from the common cold in that symptoms are usually more intense and the severity of illness is less predictable, sometimes resulting in hospitalization or death. Although most people who get the flu recover within a few days to two weeks, complications such as pneumonia, bronchitis, and sinus and ear infections may occur. People with certain chronic medical conditions, pregnant women, young children, and the elderly, are especially vulnerable to developing serious flu-related complications (8).

The flu vaccine and frequent hand washing are the best ways to prevent becoming infected with the flu. Influenza vaccines must be developed each year to accommodate the ever-changing genetic code of the influenza virus, so the vaccine must be obtained every year accordingly (8). While the flu vaccine prevents infection of the influenza virus, there are many other circulating viruses that cause similar nonspecific flu-like symptoms. These common cold viruses can also be prevented with frequent hand washing and limiting exposure to people who have cold symptoms.

CDC guidelines suggest that people with flu-like symptoms should stay home for at least 24 hours after their fever is gone (the fever should be gone without the use of a fever-reducing medicine), except to get medical care or for other necessities. Furthermore, it is recommended that a sick individual covers his/her nose and mouth with a tissue when coughing or sneezing, and then throws the tissue in the trash thereafter. We can all minimize transmission of flu-like viruses by minimizing the amount we touch our eyes, noses, and mouths, and by cleaning and disinfecting surfaces and objects that may be contaminated by frequent touching (keyboards, telephones, etc.) (8) .

Figure 8.5 Influenza by Year (November 1 - March 31)

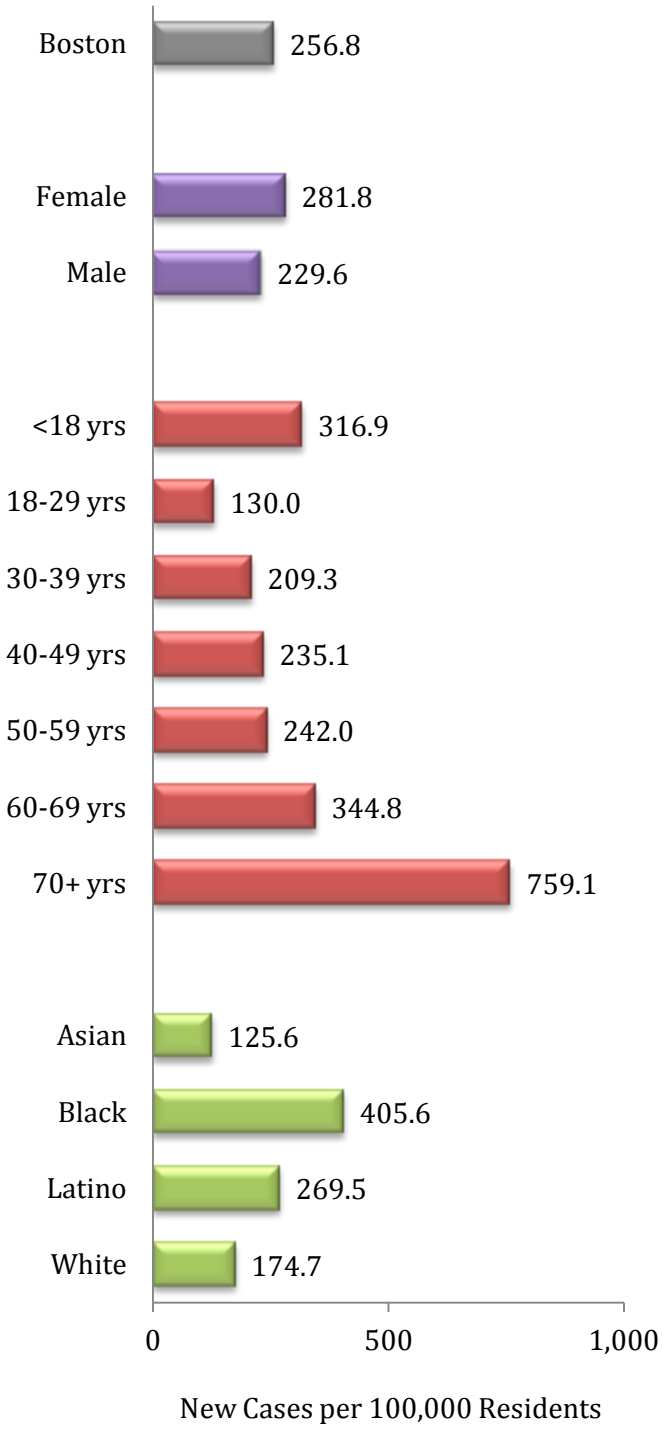


DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

The incidence rate of reported influenza among Boston residents fluctuated by year. The influenza rate during the 2012-2013 season was significantly higher than in 2011-2012 season.

During the period of November 1, 2012-March 31, 2013, the incidence rate of reported influenza among Boston residents overall was 256.8 new cases per 100,000 residents. However, the rate varied within gender, age group, and race/ethnicity. The rate for females was higher than the rate for males, and the rate was higher for all age groups presented compared to the rate for those ages 18-29. Black and Latino residents had higher rates of influenza than White residents, while the rate for Asian residents was lower than that of White residents.

Figure 8.6 Influenza by Selected Indicators, November 1, 2012-March 31, 2013



DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

Salmonella Infection

Salmonella bacteria live in the intestinal tracts of infected humans and animals. Most people infected with *Salmonella* develop diarrhea, fever, vomiting, and abdominal cramps 12 to 72 hours after infection. Most *Salmonella* infections (salmonellosis) are mild, and an individual is able to recover in four to seven days without treatment. In rare instances, hospitalization may be required (9).

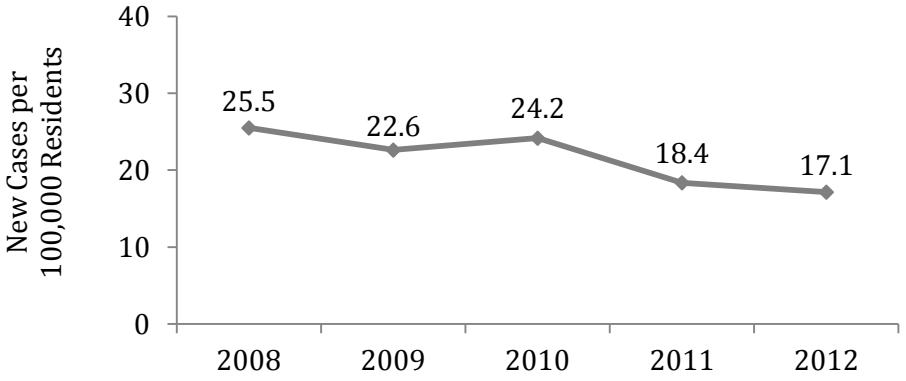
Salmonellosis occurs when a person eats microscopic fecal material that contains the *Salmonella* bacteria. Contamination of food with fecal material may occur during food processing or handling. Poultry , beef, milk, and eggs are often the source of *Salmonella* infection. Pets such as reptiles, baby chicks and ducklings, and small rodents are particularly likely to carry *Salmonella* even when they are healthy. Salmonellosis is more common in children than in adults (9).

There is no vaccine for salmonellosis. The best ways to prevent *Salmonella* infection are to:

- Carefully wash hands with soap and water before and after preparing food, after using the toilet, and after handling pets.
- Wash food surfaces and utensils including knives, cutting boards, counter tops, and dishes with clean soapy water before and after preparing food. Keep everything that touches food clean.
- Wash all fruits and vegetables with clean drinking water and use a brush if necessary;
- Refrigerate or freeze appropriate foods without delay. Refrigerator temperatures should be at 40°F or below. Freezer temperatures should be below 0°F.
- Heat foods to hot enough temperatures to kill bacteria.

Because most cases are mild, medical intervention is often not needed and cases go undocumented and unreported to the health department (9). For this reason, the actual number of infections in Boston is estimated to be much higher than what is included in this report.

Figure 8.7 Salmonella by Year

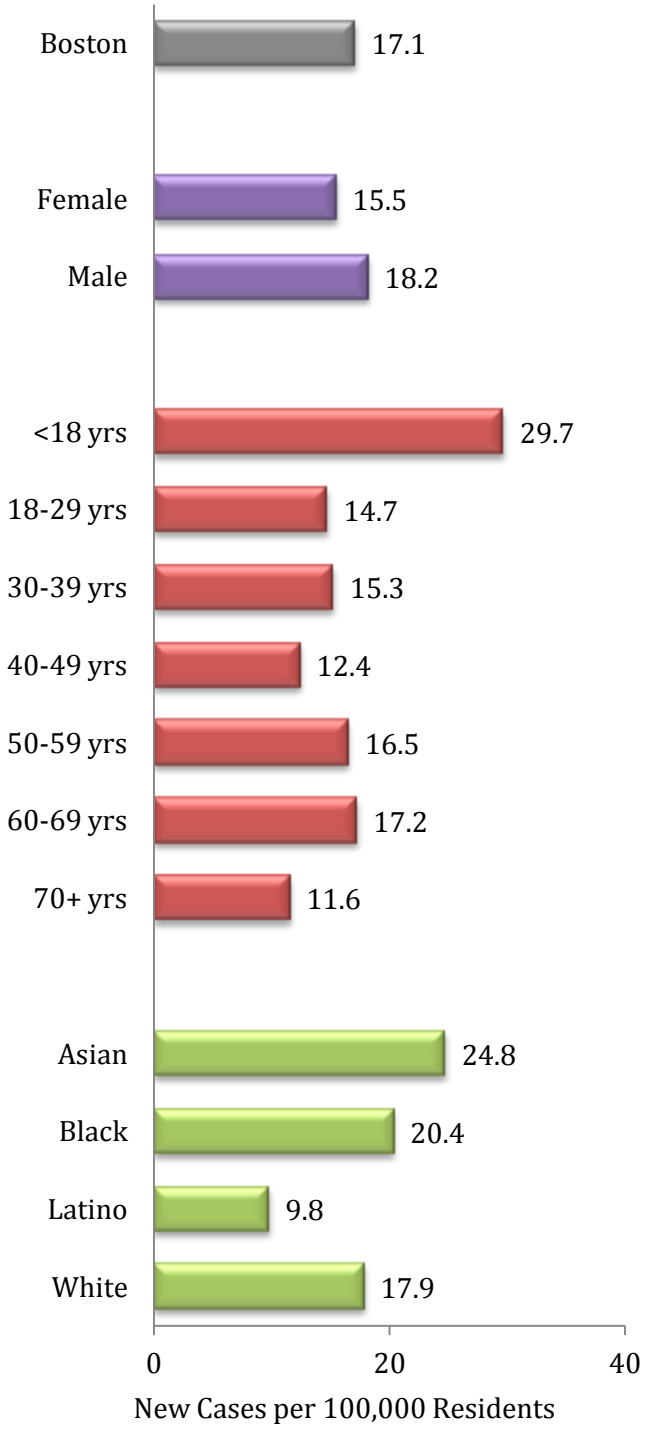


DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

Between 2008 and 2012, the incidence rate of reported salmonella infection among Boston residents decreased significantly by 33%.

In 2012, the incidence rate of reported salmonella infection among Boston residents overall was 17.1 new cases per 100,000 residents. The rate was higher for residents under the age of 18 compared to those ages 18-29. Rates within gender were similar to each other, as were those within race/ethnicity.

Figure 8.8 Salmonella by Selected Indicators, 2012



DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

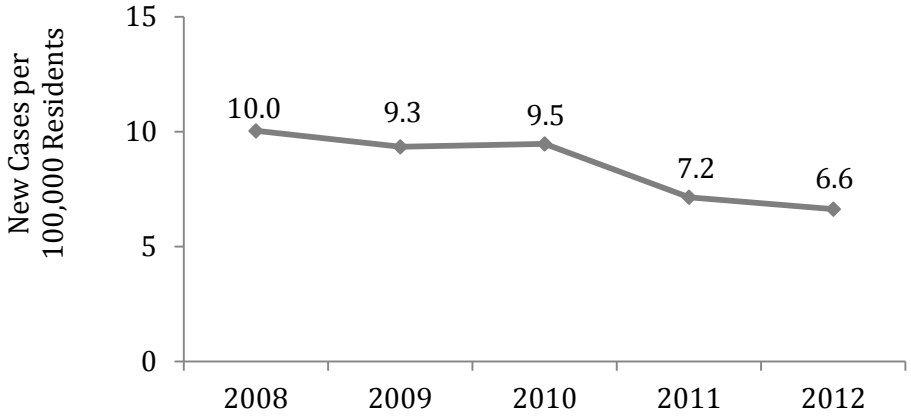
Tuberculosis

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. The bacteria usually infect the lungs but can infect other parts of the body as well. TB is spread through the air when a person with an active infection releases respiratory particles into the air by coughing or sneezing. Not everyone exposed to TB becomes infected, and not everyone infected with TB becomes sick. In fact, most people who are infected are able to fight the bacteria, prevent it from spreading, and avoid symptoms altogether, in what is known as latent TB. A person with latent TB cannot spread the infection. However, the latent form can become active over time, at which point the infected person will become symptomatic and infectious to others. Although latent TB is often asymptomatic, treatment of latent TB is recommended to prevent the development of active TB. TB symptoms include severe cough with blood or sputum, chest pain, weakness, weight loss, chills, fever, and night sweats (10).

Tests to determine TB infection include a skin test and a blood test. A positive test result usually indicates that a person has been infected with the TB bacteria but does not necessarily mean that the person has an active TB infection. In some instances, because of cross-reactivity, people who received the BCG-vaccine will have a positive skin test even though they are not infected with the TB bacteria. BCG, or bacille Calmette-Guerin, is a vaccine for tuberculosis, which is most commonly used in countries with high prevalence of TB. It is not generally recommended for use in the United States because of the low risk of infection domestically, that it is not consistently effective at preventing the disease, and that it interferes with the skin test reactivity. In these cases, other diagnostic tests, such as blood tests, chest x-rays, and sputum samples are needed to see whether the person has TB (10).

TB can be treated by taking several drugs for 6 to 9 months. There are currently 10 drugs approved by the U.S. Food and Drug Administration (FDA) for treating TB (10). Latent TB infection can also be treated with drugs in order to prevent active TB from developing. The treatment of latent TB infection is essential for controlling and eliminating TB infection in the United States, where it has been in decline since 1992. In the United States, most cases occur within the foreign born population, often as a result of emigration from tuberculosis endemic areas (10). Although the TB incidence rate in the United States is lower than many other nations, TB represents one of the leading causes of death around the world, particularly among those infected with HIV (11).

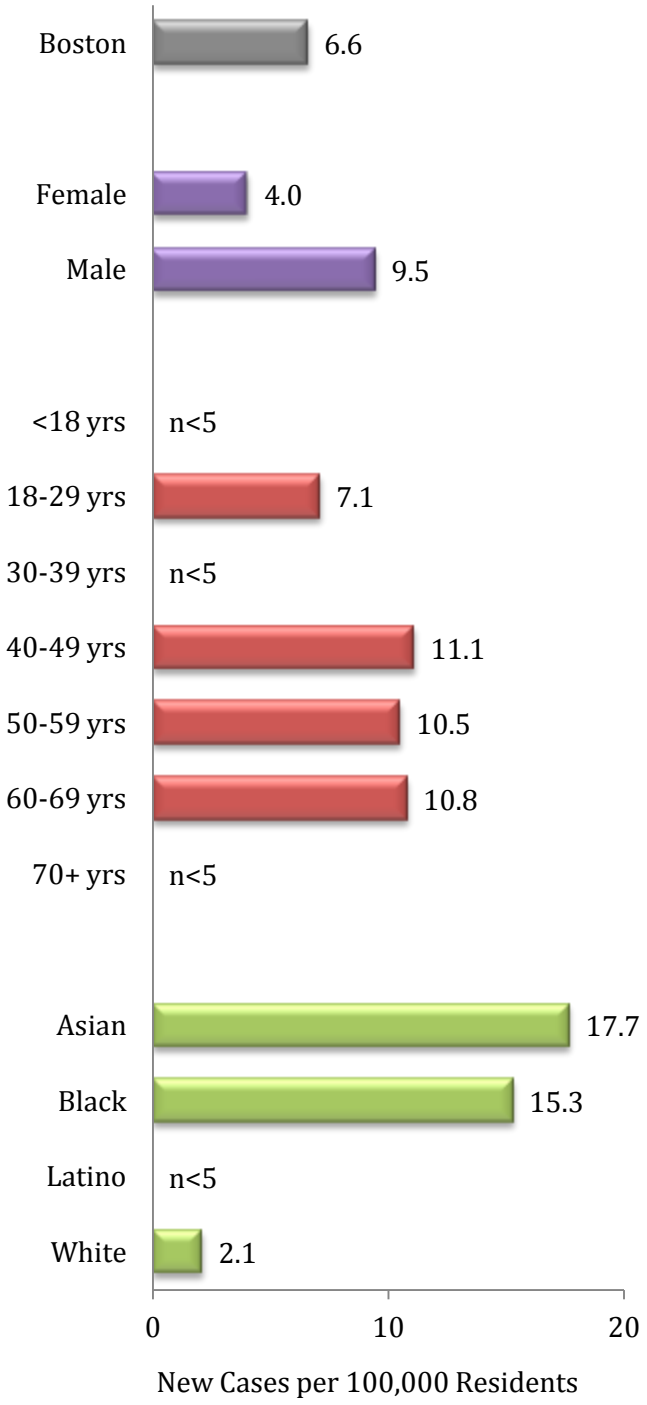
Figure 8.9 Tuberculosis by Year



DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

Between 2008 and 2012, the incidence rate of reported tuberculosis among the Boston population significantly decreased by 34%.

Figure 8.10 Tuberculosis by Selected Indicators, 2012



In 2012, the incidence rate of reported tuberculosis for Boston residents overall was 6.6 new cases per 100,000 residents. The incidence rate varied within gender and race/ethnicity. The incidence rate for females was lower than for males, and the rates for Asian and Black residents were higher compared to White residents. Rates within age groups were similar for those ages 40-49, 40-59, and 60-69 compared to those ages 18-29.

NOTE: Rates are not presented for those aged less than 18, 30-39, and 70 or older, as well as Latino residents due to the small number of cases.

DATA SOURCE: Communicable Disease Control Division, Boston Public Health Commission

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Chapter 9:
Mental Health

Mental Health

Mental wellness is a fundamental component of overall health. The World Health Organization defines mental health as "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (1). Individuals can experience a small or large degree of impairment in their mental wellness. Although mental disorders are the "end point" of the spectrum, more moderate degrees of impairment can still darken the way that people feel, reason, and relate to others (2).

Impaired mental health is common, and attributed to a variety of genetic, environmental, psychological, and developmental factors. In a given year, an estimated 26% of Americans ages 18 and older—about one in four adults—suffer from a diagnosable mental illness such as depression or anxiety (3). Improvements in mental health lead to more positive health behaviors, such as improved sleep and diet, as well as decreases in smoking and alcohol intake (2). Difficulty with reasoning and impaired social relationships can directly and indirectly influence physical health. For example, the impulsiveness and poor judgment inherent in Borderline Personality disorder makes individuals more likely to be a victim of violence (4). Individuals who struggle with eating disorders are at risk for brain damage, anemia, infertility, and multi-organ failure (5).

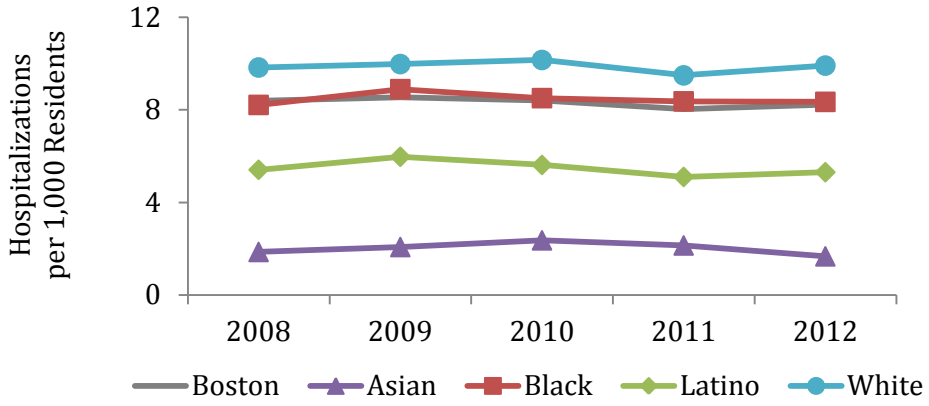
There are marked differences in the distribution of mental disorders by gender, race/ethnicity, and socioeconomic status (6). Anxiety disorders alone impact about 40 million adults every year, with women 60% more likely than men to experience the symptoms of generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, post-traumatic stress disorder, and social phobia. With regards to race, White individuals are more likely than Black individuals to experience depression and anxiety in their lifetime.

Exposure to stressors may explain, in part, why certain groups suffer from poorer mental and physical health outcomes than others (7). Economic difficulties, physical deprivation, job strain, family responsibilities, material disadvantage and discrimination can have detrimental effects on mental health (8, 9). In addition, chronic stress shares a well-established connection with morbidity and mortality (8). A growing body of evidence demonstrates how chronic stress levels, even low levels, "get under the skin" and influence the release of stress hormones that affect cholesterol levels, blood pressure, and inflammation. These markers of high stress are connected with both depression and

heart disease, demonstrating how mental health is integrated with the “whole person” health experience (2).

All too often, the stigma surrounding mental health prevents individuals from seeking the help they need. In 2008, The Mental Health Parity and Addiction Equity Act proved a major step in ending discrimination against those seeking mental health services. The Act required insurance companies that offer coverage for mental health disorders to provide the same level of benefits that they do disorders related to physical health (10). The Act originally applied to group health plans and group health insurance coverage, but the Patient Protection and Affordable Care Act of 2010 extended it to include individual health insurance coverage (11).

Figure 9.1 Mental Health Hospitalizations by Race/Ethnicity and Year*



*Age-adjusted rates

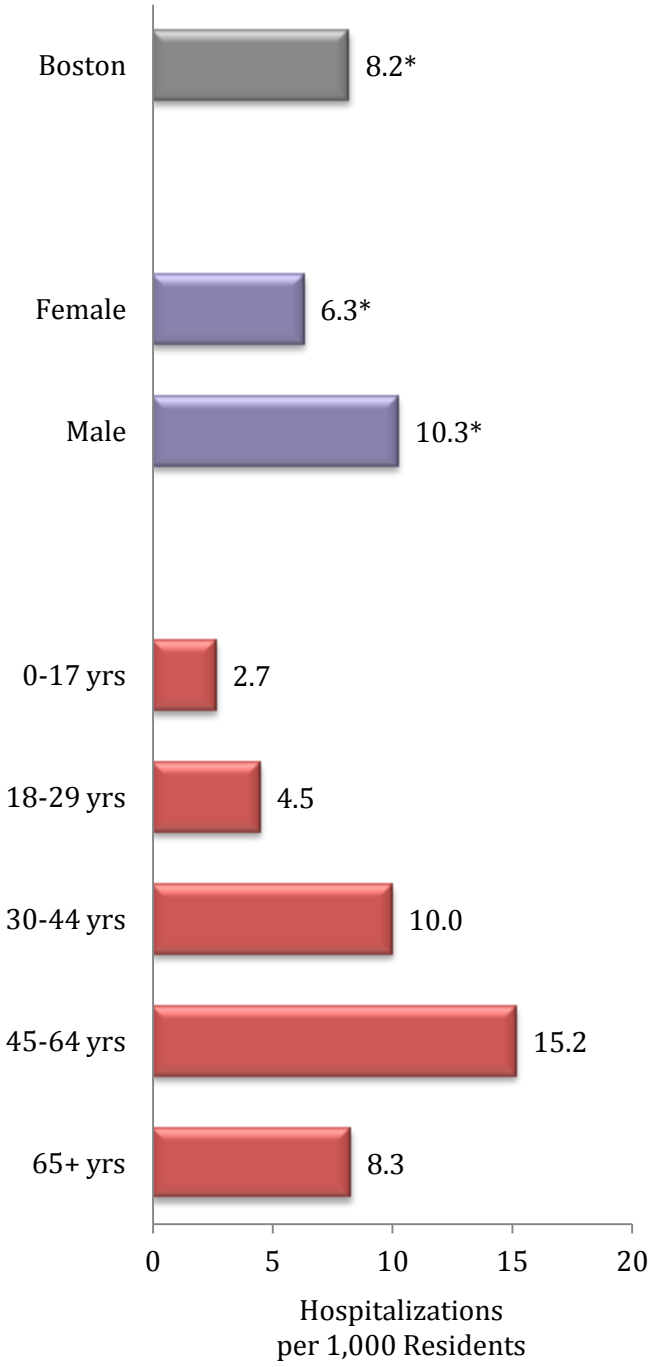
DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

From 2008 to 2012, the rate of mental health hospitalizations in Boston decreased over time (8.4 vs. 8.2 hospitalizations per 1,000 residents), however, there were no significant changes over time within each racial/ethnic group. In 2012, mental health hospitalization rates were lower for Asian, Black, and Latino residents compared to White residents.

In 2012, Boston residents had 4,921 mental health hospitalizations; 4,525 (92%) of which were anonymously linked to 3,201 unique individuals. Of these individuals, 76% had 1 mental health hospitalization, 15% had 2 mental health hospitalizations, and 8% had 3 or more mental health hospitalizations.

As a note, a high percentage of hospitalizations for children and Latino residents could not be linked to unique individuals.

Figure 9.2 Mental Health Hospitalizations by Gender and Age, 2012

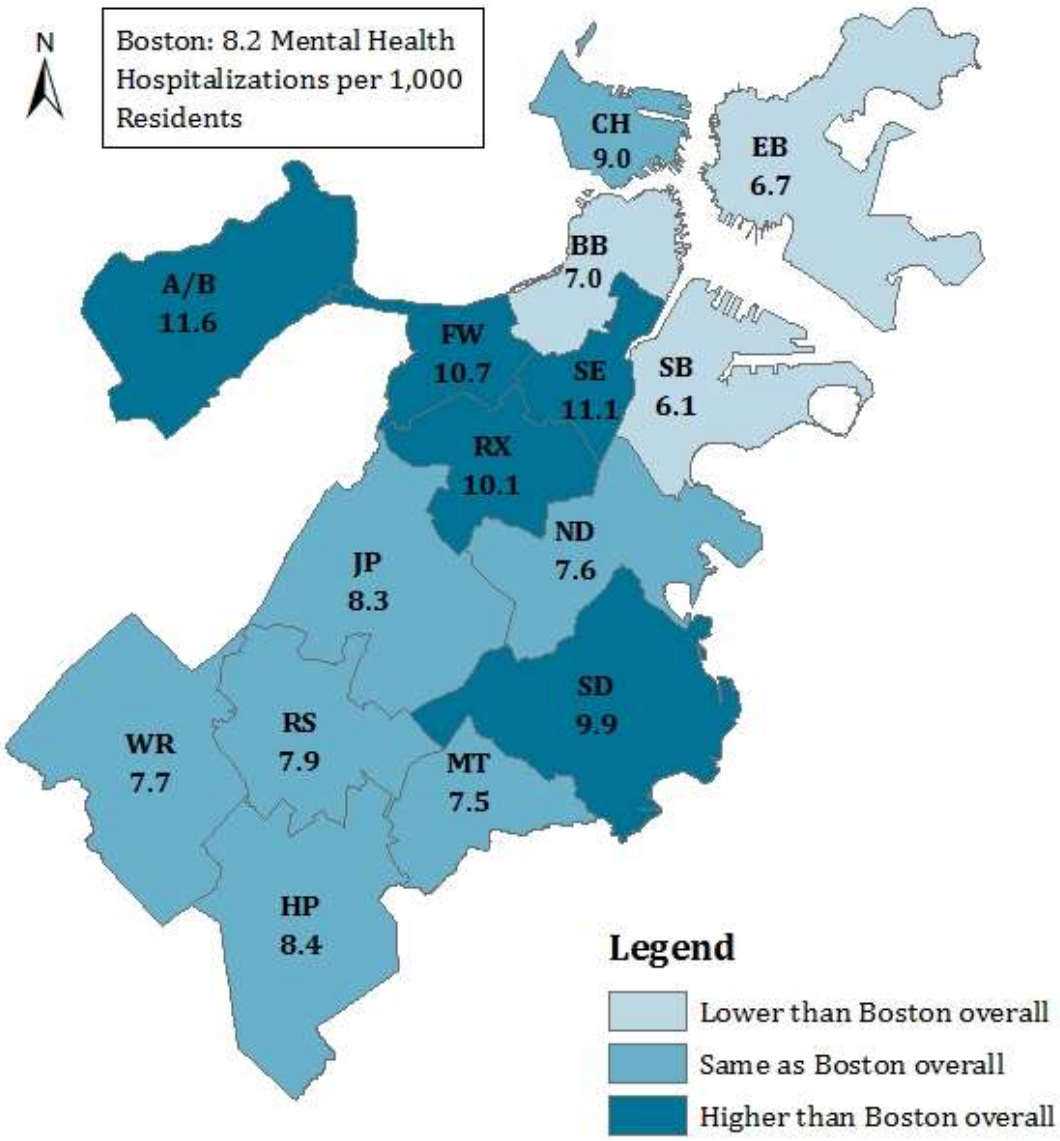


*Age-adjusted rates

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

In 2012, the rate of mental health hospitalizations for female residents was lower than the rate for male residents. Boston's mental health hospitalization rates varied by age group. Residents under the age of 18 had a lower rate than residents between the ages of 18 and 29 years. All other age groups shown had a higher rate than residents 18 to 29 years of age.

Figure 9.3 Mental Health Hospitalizations by Neighborhood*, 2012



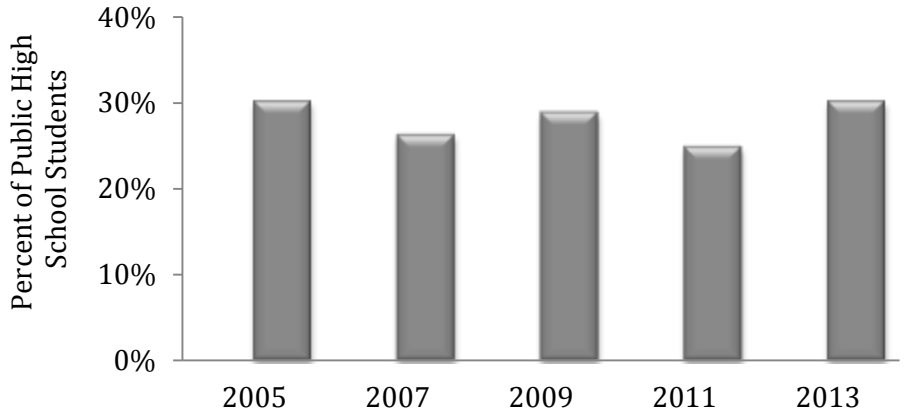
*Age-adjusted rates

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis

The mental health hospitalization rate for Boston residents in 2012 was 8.2 hospitalizations per 1,000 residents. Rates differed by neighborhood and were higher for Allston/Brighton, Fenway, Roxbury, South Dorchester, and the South End than the rate for Boston. Back Bay, East Boston, and South Boston had lower rates than Boston overall.

Students were asked if during the past 12 months they felt sad or hopeless everyday for 2 weeks or more. In 2013, 30% of Boston public high school students reported persistent sadness. Between 2005 and 2013, there was no significant change in the percentage of those who experienced persistent sadness.

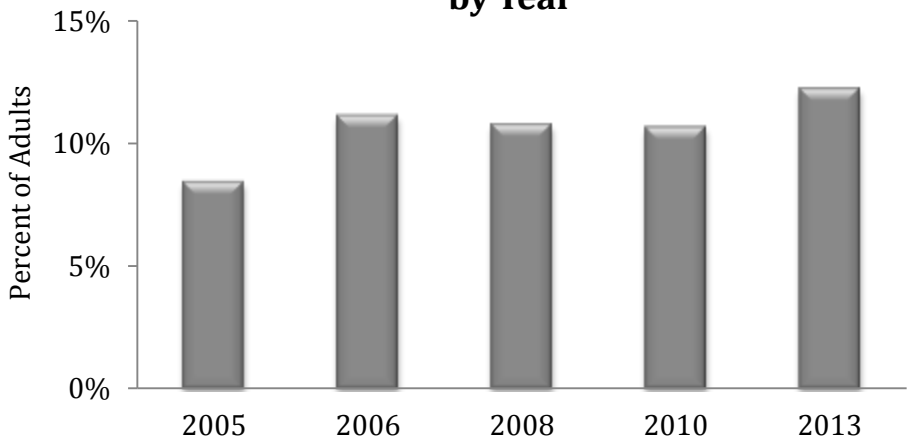
Figure 9.4 Persistent Sadness Among Public High School Students by Year



2005	2007	2009	2011	2013
30.1% (27.8-32.4)	26.2% (23.6-28.8)	28.8% (26.1-31.5)	24.8% (20.6-28.9)	30.1% (26.5-33.8)

DATA SOURCE: Youth Risk Behavior Survey (2005, 2007, 2009, 2011, and 2013), Centers for Disease Control and Prevention

Figure 9.5 Persistent Sadness Among Adults by Year

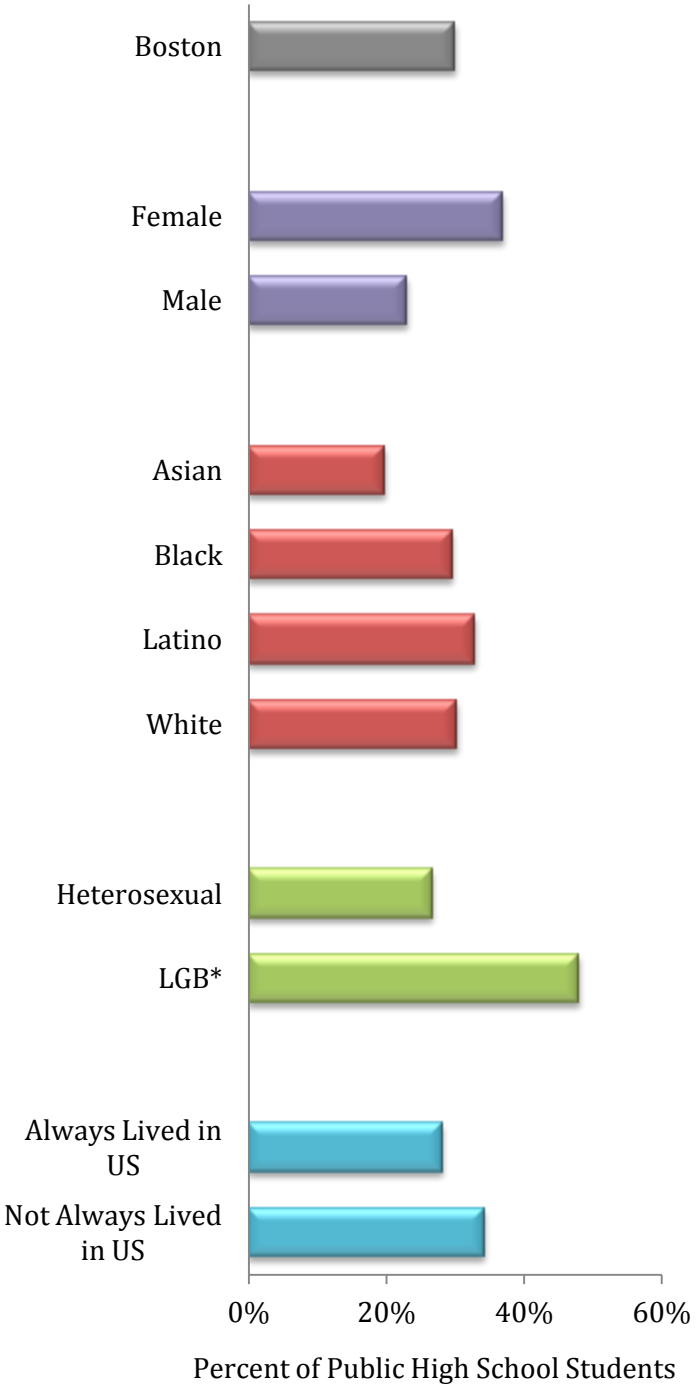


2005	2006	2008	2010	2013
8.4% (6.8-10.1)	11.1% (9.4-12.8)	10.8% (9.0-12.5)	10.6% (8.9-12.4)	12.2% (10.7-13.7)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2005, 2006, 2008, 2010 and 2013), Boston Public Health Commission

In 2008, 8% of Boston adults experienced persistent sadness (being sad, blue, or depressed more than 15 days within the past month) while in 2013, 12% experienced persistent sadness. This was a significant increase in the percentage of adults who experienced persistent sadness.

Figure 9.6 Persistent Sadness Among Public High School Students by Selected Indicators, 2013



Boston	30.1% (26.5-33.8)
Gender	
Female	37.0% (33.0-41.0)
Male	23.1% (18.4-27.8)
Race/Ethnicity	
Asian	19.8% (11.4-28.3)
Black	29.6% (24.1-35.1)
Latino	32.9% (27.3-38.4)
White	30.3% (20.9-39.7)
Sexual Orientation	
Heterosexual	26.7% (22.9-30.5)
LGB*	48.1% (39.3-56.8)
Time Living in U.S.	
Always Lived in US	28.2% (24.2-32.2)
Not Always Lived in US	34.3% (27.1-41.5)

*Includes lesbian, gay, bisexual, and 'Not Sure'

DATA SOURCE: Youth Risk Behavior Survey (2013), Centers for Disease Control and Prevention

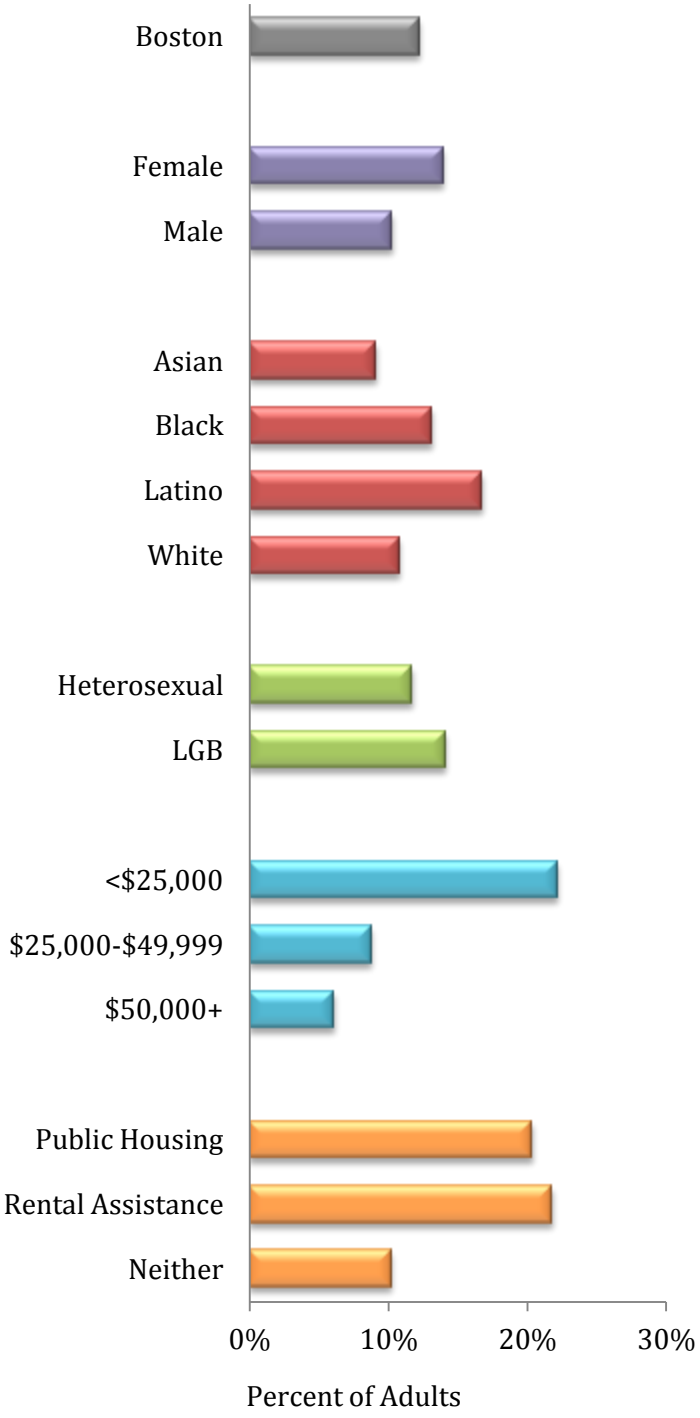
In 2013, 30% of Boston public high school students experienced persistent sadness. The percentage varied by gender, race/ethnicity, sexual orientation, and time living in the U.S. The percentage for female students was higher than for male students. The percentage for LGB students was higher compared to heterosexual students. The percentages of Asian, Black, and Latino students who experienced persistent sadness were similar compared to the percentage for White students.

Boston	12.2% (10.7-13.7)
Gender	
Female	14.0% (11.9-16.0)
Male	10.3% (8.0-12.5)
Race/Ethnicity	
Asian	9.1% (4.6-13.7)
Black	13.1% (10.3-16.0)
Latino	16.7% (12.8-20.6)
White	10.8% (8.5-13.0)
Sexual Orientation	
Heterosexual	11.7% (10.2-13.3)
LGB	14.1% (7.0-21.2)
Income	
<$25,000*	22.2% (18.6-25.8)
$25,000-$49,999*	8.7% (5.9-11.6)
$50,000+*	6.1% (4.4-7.8)
Housing Assistance	
Public Housing	20.4% (14.4-26.3)
Rental Assistance	21.8% (15.8-27.8)
Neither	10.2% (8.6-11.8)

* 15-20% of unweighted sample was missing data.

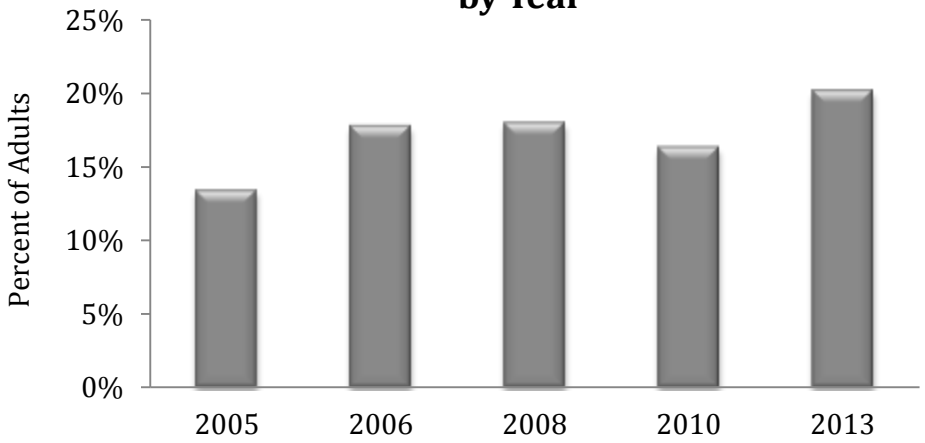
Twelve percent of Boston adults experienced persistent sadness during 2013. The percentage varied by gender, race/ethnicity, sexual orientation, annual household income, and subsidized housing status. The percentage of adults who experienced persistent sadness was higher for adults with annual household incomes of less than 25,000 compared to adults with annual household incomes of $50,000 or more. It was also higher for adults who lived in public housing or received rental assistance compared to adults in neither situation. Within race/ethnicity, a higher percentage of Latino adults experience persistent sadness compared to White adults. There were no significant differences by gender or sexual orientation.

Figure 9.7 Persistent Sadness Among Adults by Selected Indicators, 2013



DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

Figure 9.8 Persistent Anxiety Among Adults by Year

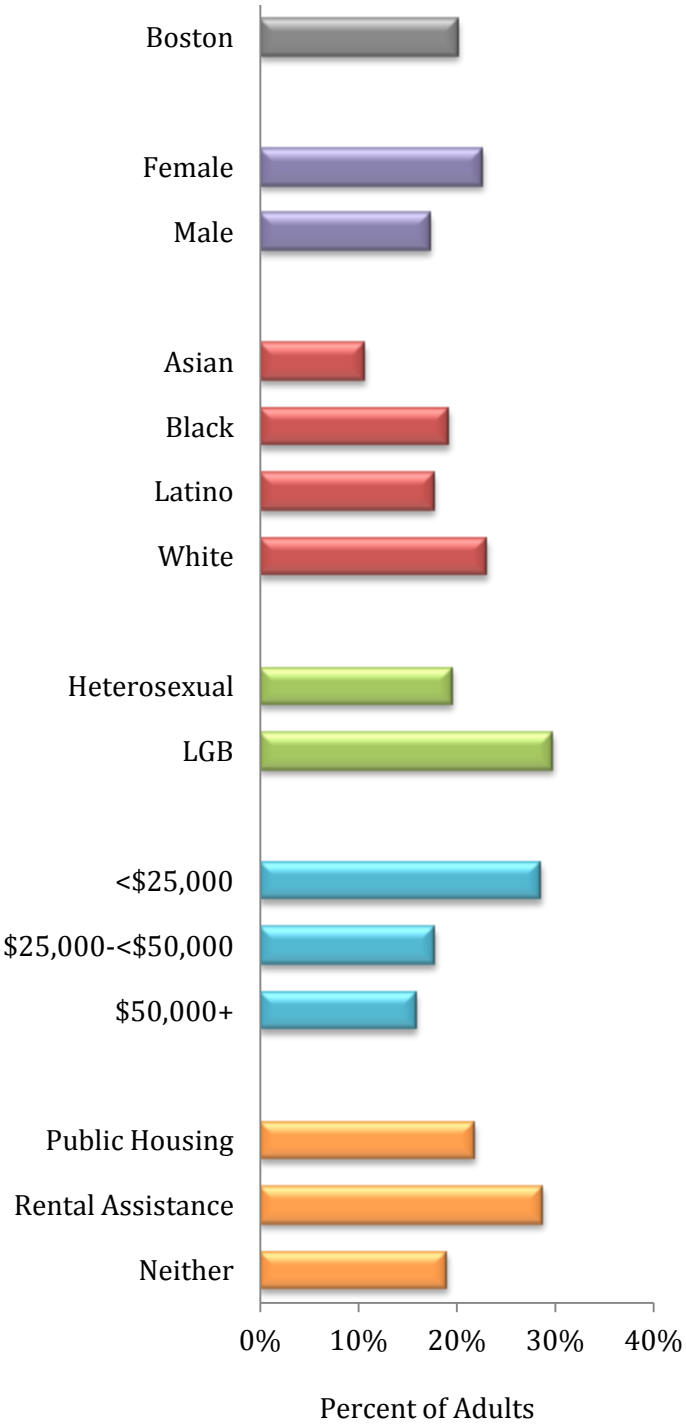


2005	2006	2008	2010	2013
13.4% (11.4-15.4)	17.8% (15.7-19.8)	18.0% (15.8-20.1)	16.3% 14.3-18.4)	20.2% (18.3-22.1)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2005, 2006, 2008, 2010 and 2013), Boston Public Health Commission

In 2005, 13% of Boston adults experienced persistent anxiety (feeling worried, tense, or anxious for more than 15 days within the past 30 days). By 2013, that percentage had significantly increased to 20%.

Figure 9.9 Persistent Anxiety Among Adults by Selected Indicators, 2013



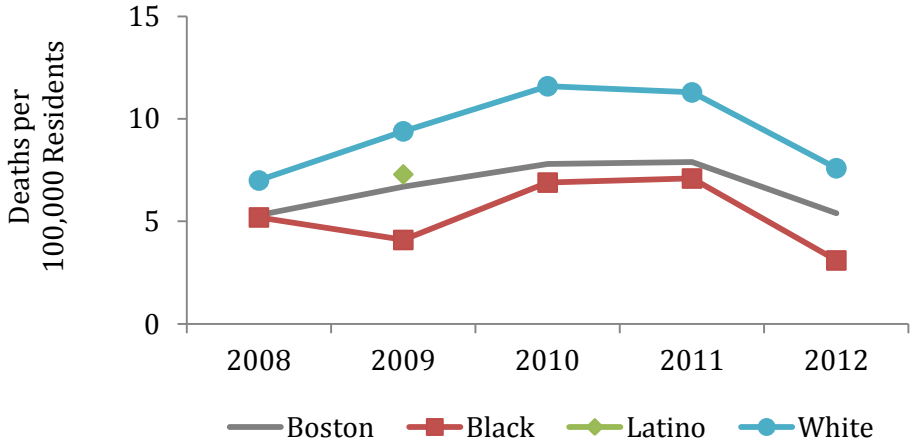
Boston	20.2% (18.3-22.1)
Gender	
Female	22.7% (20.1-25.3)
Male	17.4% (14.6-20.2)
Race/Ethnicity	
Asian	10.7% (5.7-15.7)
Black	19.2% (16.0-22.5)
Latino	17.7% (13.6-21.8)
White	23.1% (20.0-26.1)
Sexual Orientation	
Heterosexual	19.6% (17.6-21.6)
LGB	29.8% (21.1-38.4)
Income	
<$25,000*	28.6% (24.5-32.7)
$25,000-$49,999*	17.8% (13.7-21.9)
$50,000+*	15.9% (13.2-18.5)
Housing Assistance	
Public Housing	21.8% (15.7-28.0)
Rental Assistance	28.8% (22.3-35.3)
Neither	19.0% (16.9-21.2)

*15-20% of unweighted sample was missing data.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

The percentage of Boston adults who experienced persistent anxiety during 2013 varied by gender, race/ethnicity, sexual orientation, annual household income, and subsidized housing status. The percentage of residents who experienced anxiety was higher for those who received rental assistance compared to residents who were in neither situation. The percentage of residents who experienced persistent anxiety was also higher among those who reported an annual household income of less than $25,000 as compared to those with an annual household income of $50,000 or more. Percentages were similar within gender and sexual orientation.

Figure 9.10 Suicide by Race/Ethnicity and Year*



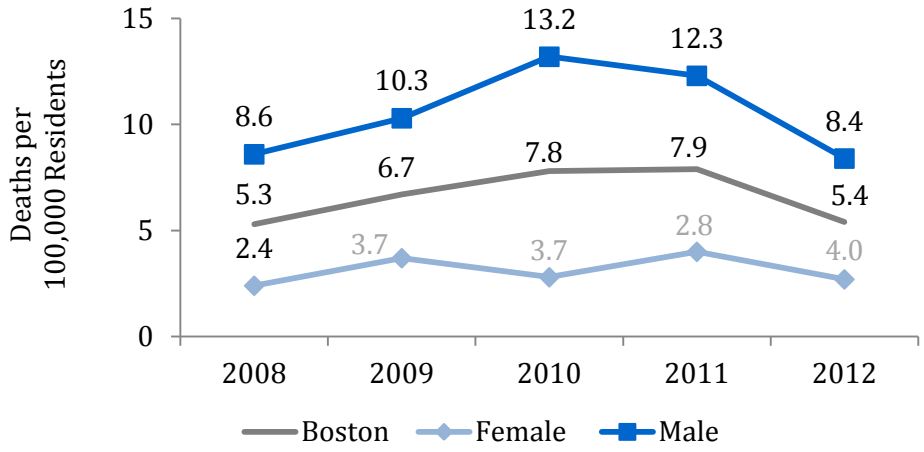
*Age-adjusted rates

NOTES: Rates for Asian residents for the years 2008-2012 and for Latino residents for the years 2008 and 2010-2012 were not presented due to the small number of cases.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

Between 2008 and 2012, the age-adjusted suicide rate for Boston residents did not change. Age-adjusted suicide rates among Boston residents were similar between Black and White residents in 2012. There was no significant increase over time in the suicide mortality rate among Black or White residents.

Figure 9.11 Suicide by Gender and Year*



*Age-adjusted rates

NOTES: Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

In 2008, the age-adjusted suicide rate for Boston residents was 5.3 per 100,000, and 5.4 in 2012. Rates for female residents were lower than those of male residents.

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Chapter 10:
Substance Abuse

Substance Abuse

Substance abuse involves the excessive use of alcohol or illicit substances (e.g., marijuana, cocaine, heroin, methamphetamine, ecstasy), or the use of licit substances (e.g., prescription drugs such as Vicodin and OxyContin) in a non-prescribed manner to achieve an altered physiological state.

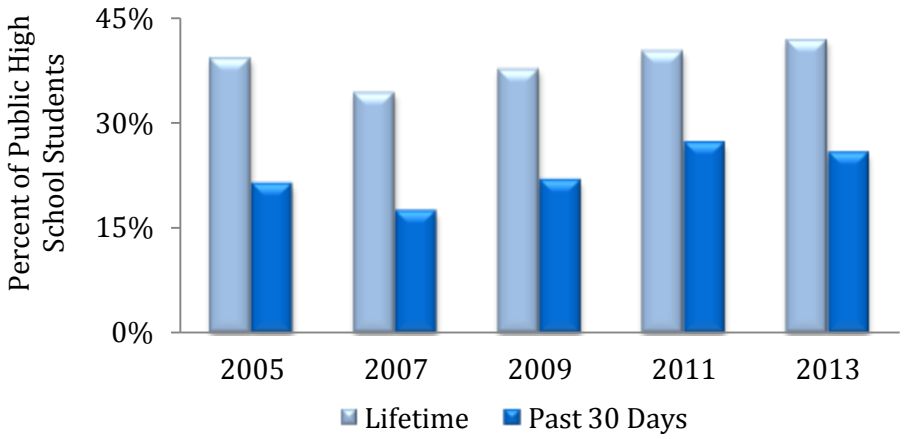
In 2012, an estimated 22.2 million people ages 12 or older were classified with substance dependence or abuse in the United States (1). A person is said to have an addiction to a substance when the nature and intensity of the cravings for the substance contributes to a pattern of unhealthy or self-destructive behaviors in order to satisfy the perceived need for the substance. Individual-level risk factors such as socioeconomic status, family history, incarceration, and stressful life events (e.g., psychological distress, death of a loved one) are associated with drug use (2). Increasingly, evidence suggests that social factors may contribute to one's decision to initiate drug use and shape other substance use behaviors (3). For example, the lack of a supportive social network or circumstances related to neighborhood poverty may influence substance use behaviors (3).

Abuse of alcohol or other drugs over time can lead to physical and/or psychological dependence on these substances, despite negative consequences. Substance abuse alters judgment, perception, attention, and physical control (4), which can lead to the repeated failure to fulfill responsibilities and increase social and interpersonal problems (5). There is a substantial increased risk of morbidity and death associated with alcohol and drug abuse (3). The effects of substance abuse are cumulative, significantly contributing to costly social, physical, mental, and public health problems. These problems include: teenage pregnancy, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), other sexually transmitted infections (STIs), domestic violence, child abuse, motor vehicle crashes, physical fights, crime, homicide, and suicide (4).

Depending on the substance(s) involved, treatment of substance abuse and addiction may include medications, behavioral treatments, or a combination of both. A doctor, substance abuse counselor, or other health professional can determine the right treatment for an individual (6).

From 2005 to 2013, there was an increase in the percentage of Boston public high school students who reported using marijuana within the past 30 days. Lifetime use of marijuana during this same period did not change significantly.

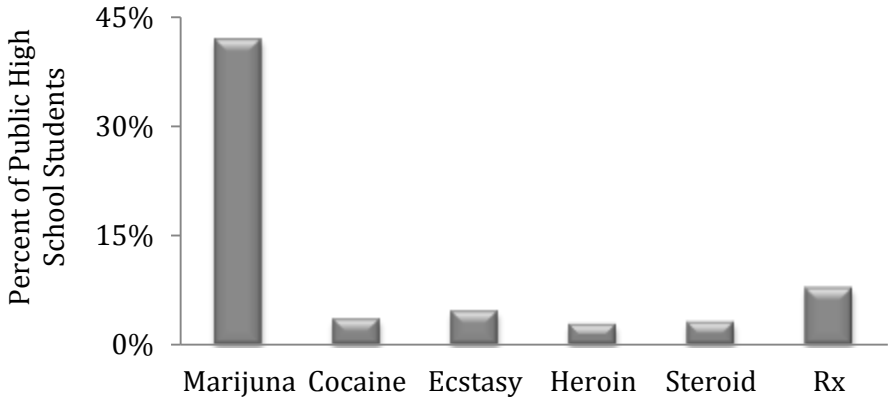
Figure 10.1 Lifetime and Past 30 Day Use of Marijuana by Public High School Students by Year



	2005	2007	2009	2011	2013
Lifetime Use	39.3% (35.6-43.0)	34.3% (31.1-37.6)	37.7% (33.7-41.6)	40.3% (36.9-43.7)	41.9% (37.6-46.2)
Past 30 Days Use	21.2% (18.8-23.7)	17.4% (15.0-19.8)	21.7% (18.6-24.8)	27.0% (24.1-30.0)	25.6% (22.0-29.2)

DATA SOURCE: Youth Risk Behavior Survey (2005, 2007, 2009, 2011 and 2013), Centers for Disease Control and Prevention

Figure 10.2 Lifetime Drug Use Among Public High School Students by Type, 2013

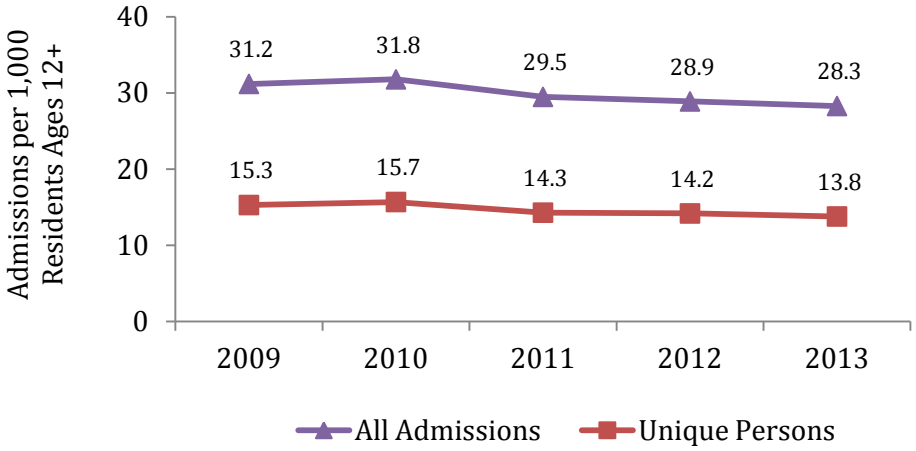


In 2013, 42% of Boston public high school students reported ever having used marijuana during their lifetime. Rx (prescription drugs used without a prescription or not as prescribed) and ecstasy (MDMA) were the next most commonly tried drugs among public high school students.

Marijuana	Cocaine	Ecstasy	Heroin	Steroid	Rx
41.9% (37.5-46.3)	3.5% (2.0-5.0)	4.6% (3.3-6.0)	2.8% (1.5-4.1)	3.1% (2.0-4.3)	7.8% (6.0-9.6)

DATA SOURCE: Youth Risk Behavior Survey (2005, 2007, 2009, 2011 and 2013), Centers for Disease Control and Prevention

Figure 10.3 Treatment Admissions by Year*



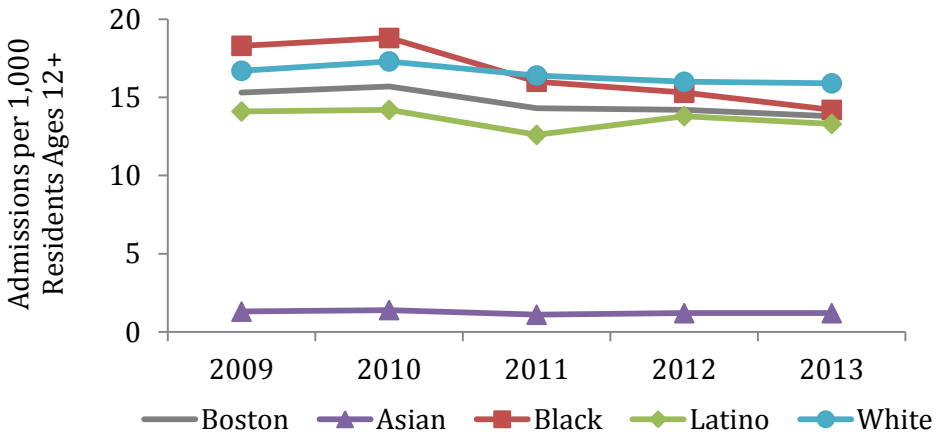
*Age-adjusted rates

DATA SOURCE: Bureau of Substance Abuse Services, Massachusetts Department of Public Health

The rate of total substance abuse treatment admissions (alcohol and/or drugs) among Boston residents decreased significantly from 31.2 admissions per 1,000 residents 12 years of age and older in 2009, to 28.3 admissions in 2013. The rate of unique-person admissions also decreased significantly.

Between 2009 and 2013, unique-person substance abuse treatment admission rates varied by race/ethnicity. In 2013, rates for Asian, Black, and Latino residents were significantly lower than for White residents.

Figure 10.4 Unique-Person Treatment Admissions by Race/Ethnicity and Year*

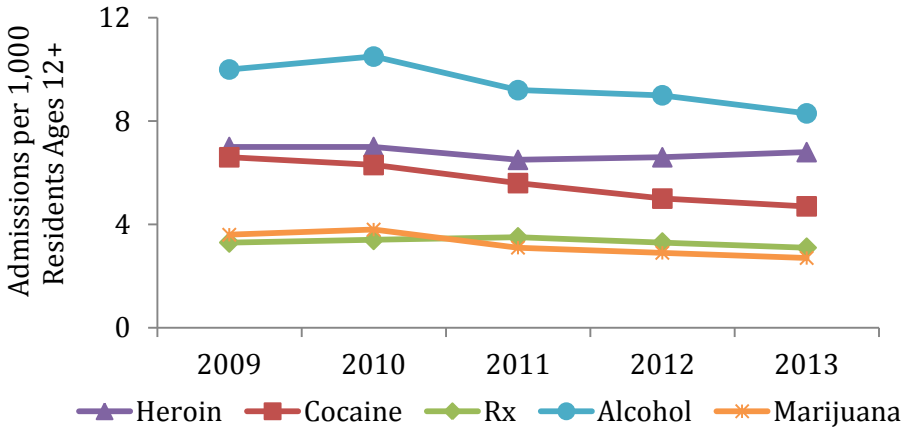


*Age-adjusted rates

DATA SOURCE: Bureau of Substance Abuse Services, Massachusetts Department of Public Health

In 2013, unique-person treatment admission rates for substances identified as primary, secondary, or tertiary drugs of abuse were highest for alcohol, followed by heroin, and cocaine. For heroin, cocaine, prescription drugs, alcohol, and marijuana, unique treatment admission rates decreased significantly between 2009 and 2013.

Figure 10.5 Unique-Person Treatment Admissions* by Drug† and Year

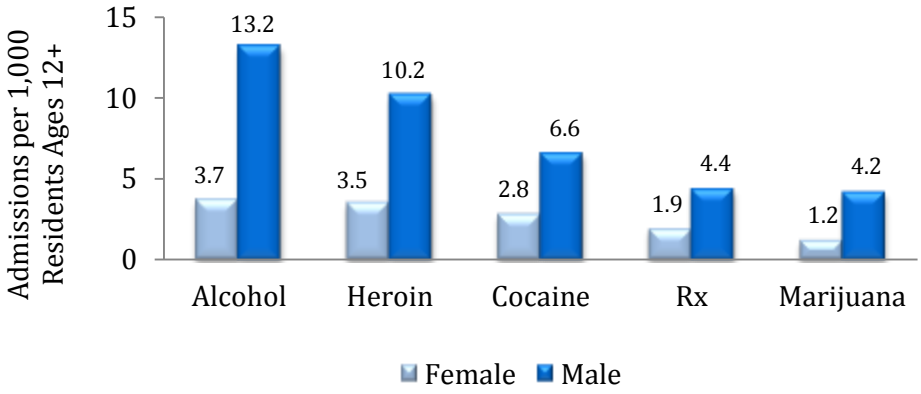


*Age-adjusted rates

†Self-identified as primary, secondary, or tertiary drug of abuse.

DATA SOURCE: Bureau of Substance Abuse Services, Massachusetts Department of Public Health

Figure 10.6 Unique-Person Treatment Admissions* by Drug† and Gender, 2013



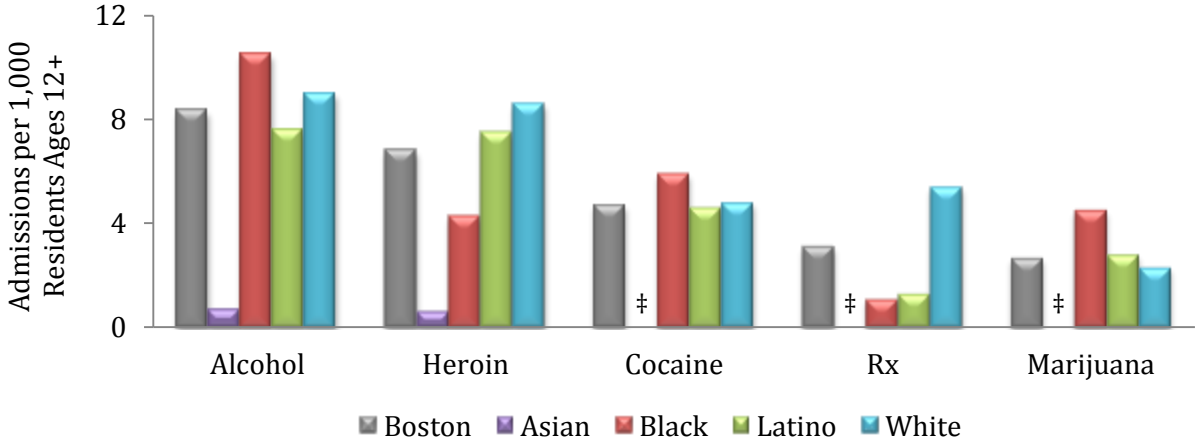
*Age-adjusted rates

†Self-identified as primary, secondary, or tertiary drug of abuse.

DATA SOURCE: Bureau of Substance Abuse Services, Massachusetts Department of Public Health

In 2013, the average age of Boston residents admitted for substance abuse treatment varied by type of drug. The highest average age was 39.3 years, for clients citing alcohol as a primary, secondary, or tertiary drug of abuse (data not shown). Treatment admission rates for individuals were also different by gender. Unique-person treatment admission rates for males were significantly higher than females for alcohol, heroin, cocaine, prescription drugs, and marijuana.

Figure 10.7 Unique-Person Treatment Admissions* by Drug† and Race/Ethnicity, 2013



*Age-adjusted rates

†Self-identified as primary, secondary, or tertiary drug of abuse

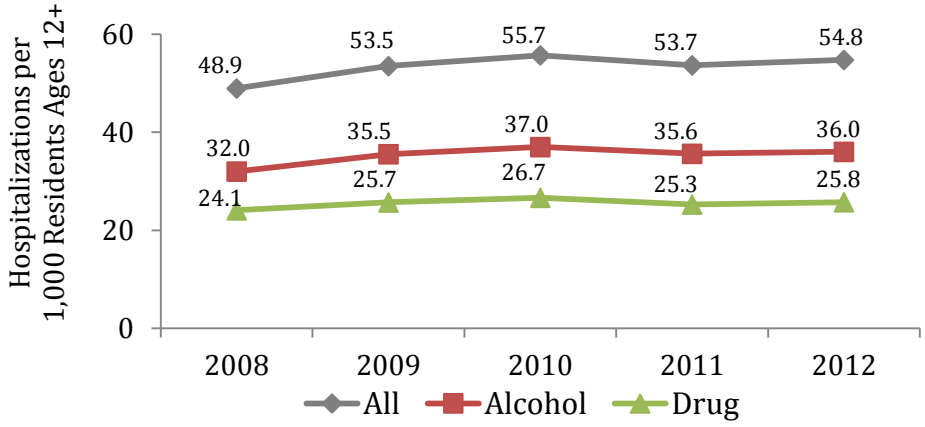
‡ Rates are not presented for Asian residents for cocaine, Rx, and marijuana due to the small number of cases

DATA SOURCE: Bureau of Substance Abuse Services, Massachusetts Department of Public Health

In 2013, unique-person treatment admission rates for alcohol were significantly higher for Black residents compared to White residents, but rates were significantly lower for Asian and Latino residents compared to White residents. Unique-person treatment admission rates for heroin were significantly lower for Asian, Black, and Latino residents compared to White residents. Rates for prescription drugs were significantly lower for Black and Latino residents compared to White residents. Rates for cocaine were significantly higher for Black residents compared to White residents as were rates for marijuana. Additionally, rates for marijuana were significantly higher for Latino residents compared to White residents.

Substance abuse hospital patient encounters rates (including emergency department visits, observational stays, and inpatient hospitalizations) significantly increased from 48.9 hospitalizations per 1,000 residents in 2008 to 54.8 hospitalizations per 1,000 in 2012. In 2012, there were more hospitalizations for alcohol abuse than drug abuse.

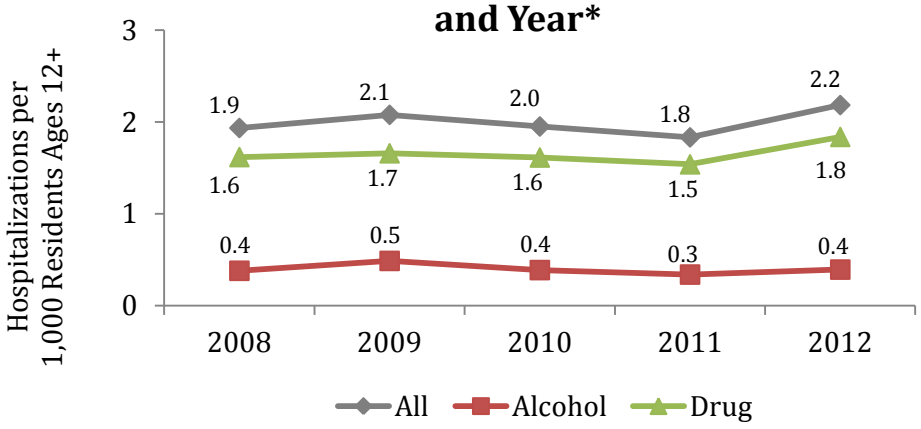
Figure 10.8 Substance Abuse Hospital Patient Encounters by Type (Overall, Alcohol, Drug) and Year*



*Includes emergency department visits, observational stays and inpatient hospitalizations; Age-adjusted rates

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

Figure 10.9 Unintentional Overdose/Poisoning Hospital Patient Encounters by Type (Overall, Alcohol, Drug) and Year*

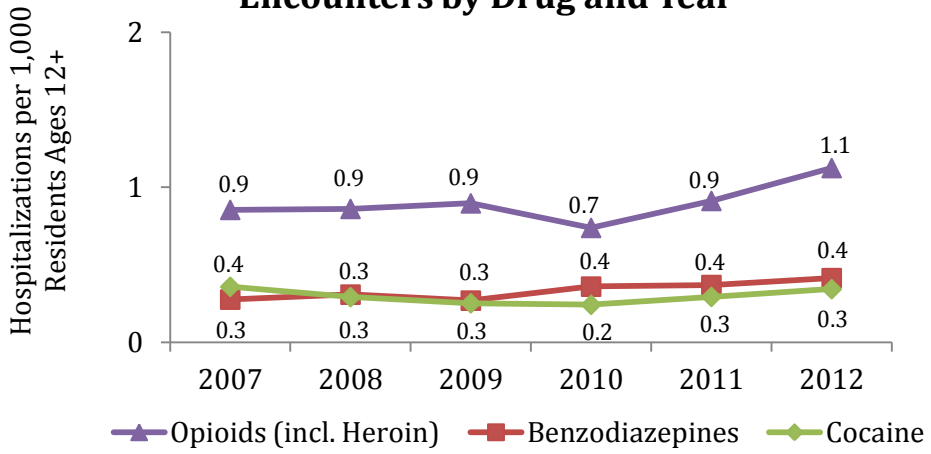


*Includes emergency department visits, observational stays and inpatient hospitalizations; Age-adjusted rates

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

Unintentional overdose/poisoning hospital patient encounter rates significantly increased among Boston residents from 2008 to 2012. There were fewer unintentional alcohol related overdose/poisoning hospital patient encounters than drug related.

Figure 10.10 Unintentional Overdose/Poisoning Hospital Patient Encounters by Drug and Year*

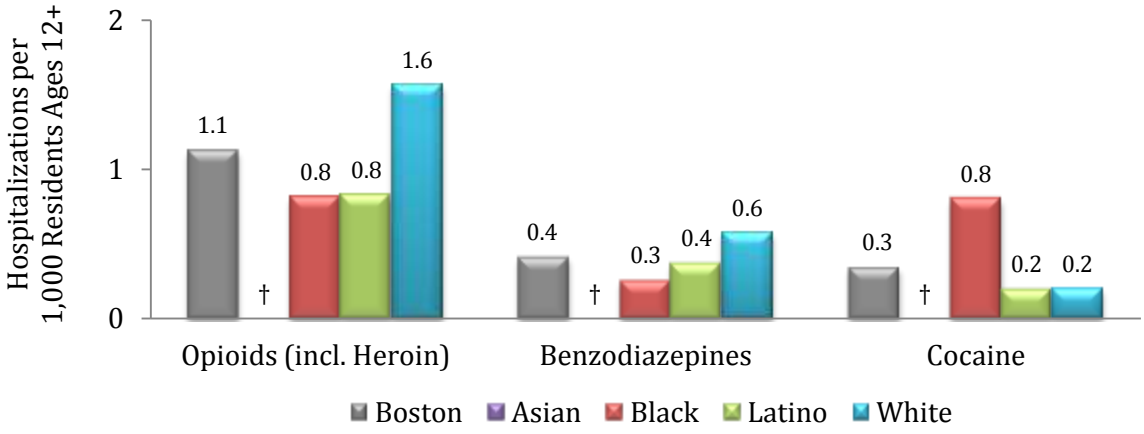


*Includes emergency department visits, observational stays and inpatient hospitalizations; Age-adjusted rates

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

From 2007 to 2012, unintentional overdose/poisoning hospital patient encounter rates among Boston residents significantly increased for opioids (incl. heroin) and for benzodiazepines. There was no significant change over time in the hospital patient encounter rate for cocaine.

Figure 10.11 Unintentional Overdose/Poisoning Hospital Patient Encounters by Drug and Race/Ethnicity*, 2012



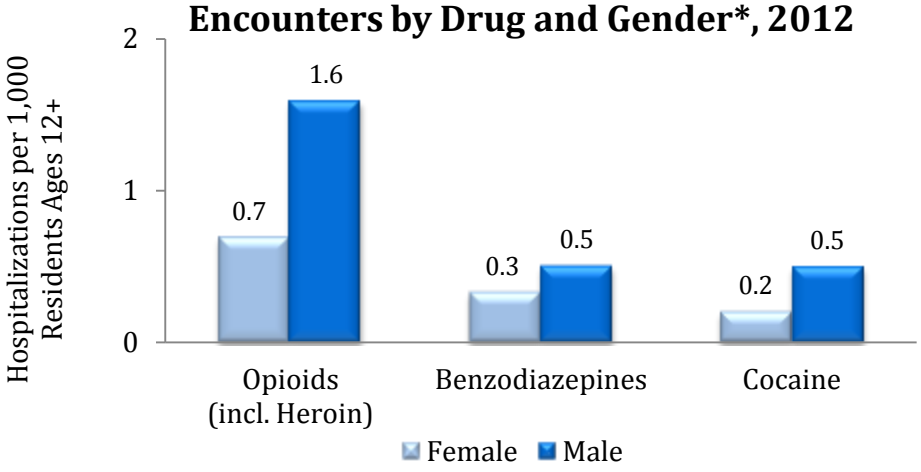
*Age-adjusted rate

†Rates are not presented for Asian residents for opioids (incl. heroin), benzodiazepines, or cocaine due to the small number of cases.

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

In 2012, unintentional overdose/poisoning hospital patient encounter rates for opioids (incl. heroin) and for benzodiazepines were significantly lower for Black residents and Latino residents compared to White residents. The rate for cocaine was significantly higher for Black residents compared to White residents.

Figure 10.12 Unintentional Overdose/Poisoning Hospital Patient Encounters by Drug and Gender*, 2012



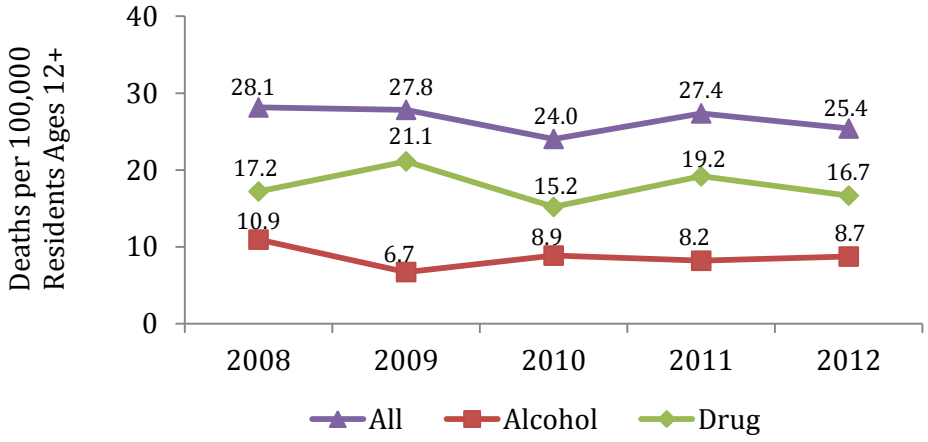
*Age-adjusted rate

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

In 2012, the average age of Boston resident hospital patient encounters for unintentional overdose/poisoning differed depending on the type of drug. The highest average age was 44.9 for residents seen for cocaine overdose/poisonings, followed by 43.6 for benzodiazepines and 40.0 for opioids (including heroin) (data not shown). The rates for all three drug types were higher for males than for females.

The overall substance abuse age-adjusted mortality rate for Boston residents was 28.1 deaths per 100,000 residents in 2008 and 25.4 deaths in 2012. However, there was no significant decrease in rates between 2008 and 2012. Also, there was no significant decrease in mortality rates for alcohol and for drugs separately.

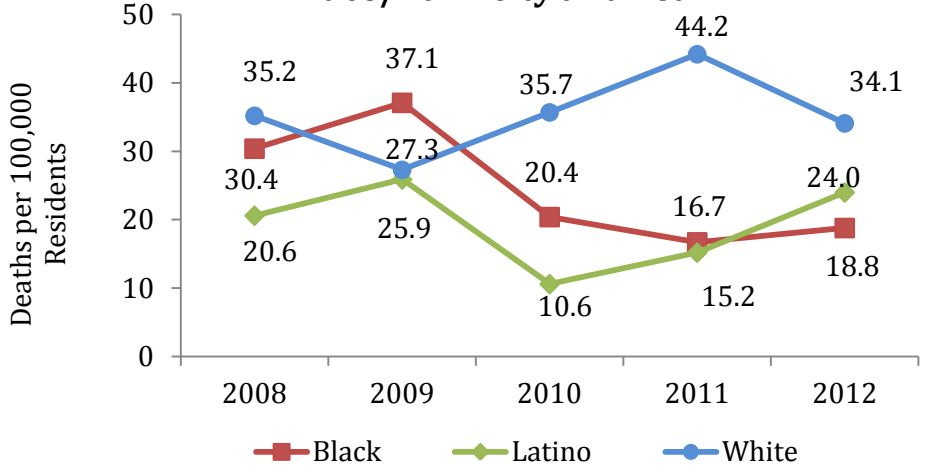
Figure 10.13 Substance Abuse Deaths by Type (Overall, Alcohol, Drug) and Year*



*Age-adjusted rates

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

Figure 10.14 Substance Abuse Deaths by Race/Ethnicity and Year*



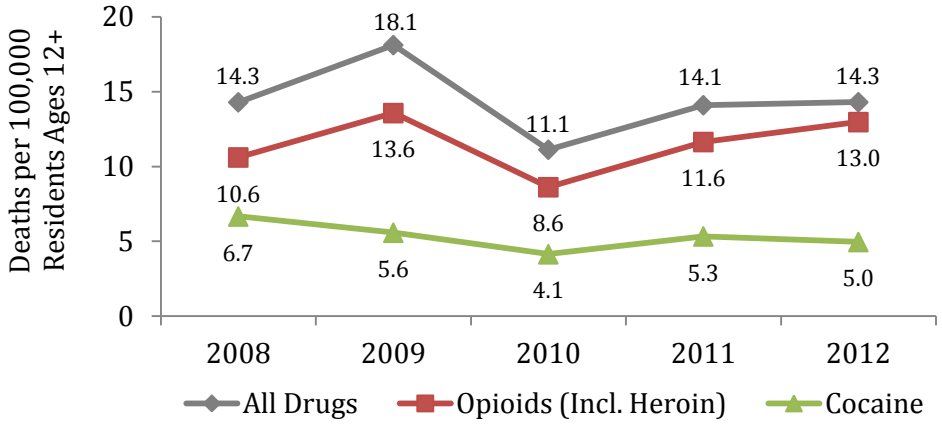
*Age-adjusted rates per 100,000 residents 12 years of age and older

NOTE: Asian residents death rates cannot be presented as the number of deaths for each year was too few to present a rate.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

From 2008 to 2012, the overall substance abuse age-adjusted mortality rate for Black Boston residents decreased significantly, from 30.4 deaths per 100,000 residents in 2008 to 18.8 deaths in 2012. There was no significant change in the White and Latino rates between 2008 and 2012.

Figure 10.15 Unintentional Drug Overdose Deaths by Drug and Year*

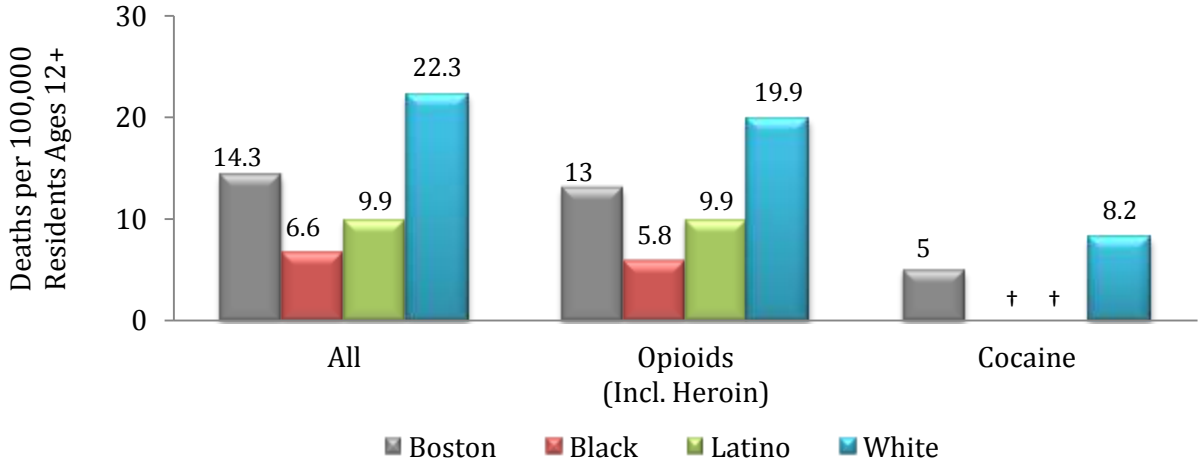


*Age-adjusted rates

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

The unintentional drug overdose death rate for Boston residents ages 12 and older fluctuated between 2008 and 2012, from 14.3 deaths per 100,000 residents in 2008 to 18.2 in 2009, and then back to 14.3 in 2012. However, overall there was no significant trend in unintentional drug overdose rates in Boston between 2008 and 2012. The same is true for rates specific for cocaine and opioids (incl. heroin).

Figure 10.16 Unintentional Drug Overdose Deaths by Drug and Race/Ethnicity*, 2012



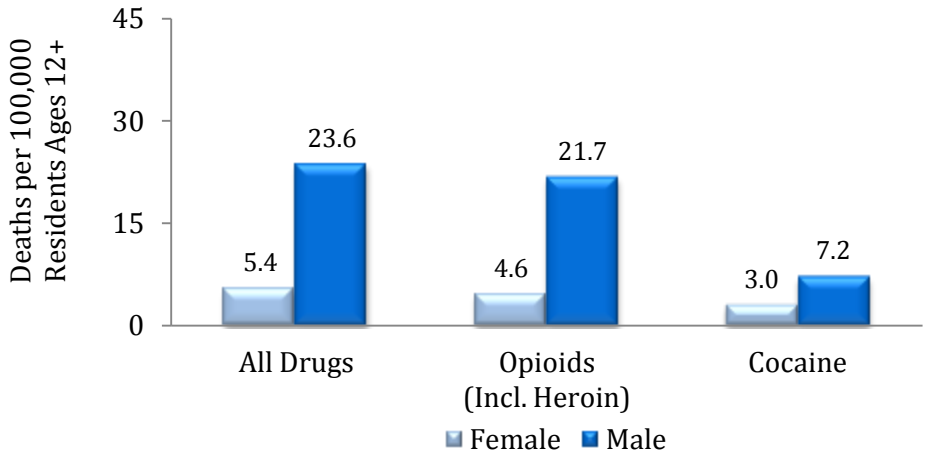
*Age-adjusted rates

†Rates are not presented for Asian by drug, and for Black and Latino in cocaine overdose mortality due to the small number of cases.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

In 2012, the overall and opioid unintentional drug overdose mortality rates were significantly lower for Black residents than for White residents. Overall unintentional drug overdose mortality rates were significantly lower for Latino residents than for White residents.

Figure 10.17 Unintentional Drug Overdose Deaths by Drug and Gender*, 2012



*Age-adjusted rates

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

The average age for unintentional drug overdose mortality was 43.3. However, for opioids (including heroin) and for cocaine, the average ages were 42.3 and 42.6, respectively (data not shown). The unintentional overdose mortality rate for opioids, cocaine, and all drugs combined for females was lower than for males.

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Chapter 11: Violence

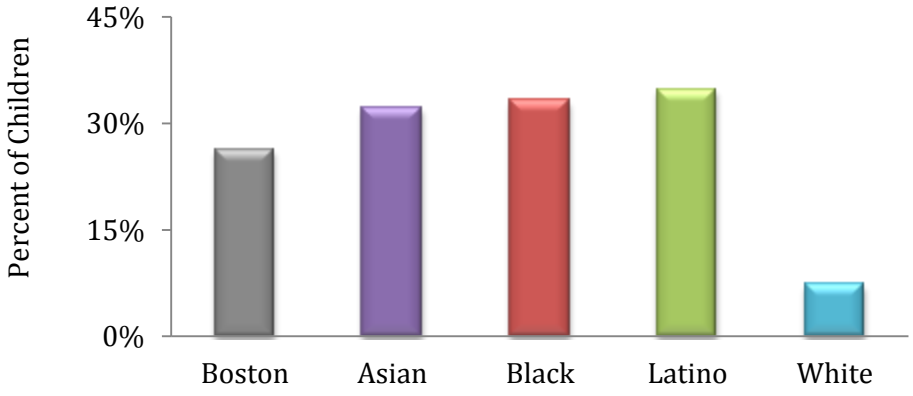
Violence

Violence is the use of physical force with the intention of causing death, disability, injury, or harm (1). Low income communities, people of color, women, and youth are all disproportionately affected by violence (1). Stopping the cycle of violence requires a change in the societal structures that perpetuate it. Acts of violence most often occur in areas of chronic poverty, community disorganization, and low school connection, where high rates of violence seem "normal". Violent acts are a type of learned behavior in response to environmental influences and social norms that can be reversed or not learned at all (2).

When an individual is constantly exposed to violence, one method of processing the experiences is to accept the act as a normal part of social life (3). Chronic exposure to violence, at home (even from what is seen on television) (4), or in the community, can lead to desensitization (32). As they are bombarded with images of violence, it may be difficult for young minds to make sense of them. The stress and internal conflict can lead to aggression, but it may also manifest in other harmful ways. Substance abuse, learning problems, anxiety, depression, and/or disordered eating habits and obesity have all been tied to victimization and exposure to violence (6) (7). In addition, many adolescents who commit violent crimes have often been victimized as children. Such experiences are connected to delinquency and violent behaviors in later life (8) (9). Furthermore, adolescents may feel pressure from peers to engage in gang violence, drug use, or petty crime, which may discourage healthy relationships and academic achievement. Sometimes, violence is spurred by a desire for coercion, belonging, and power, as is often the case with bullying (10).

Violence makes it difficult to feel safe, leading to anxiety and depression, less physical activity in communities, and increasing social isolation coupled with community distrust (1,11). When parents living in Boston were surveyed by the Boston Public Health Commission in 2012, up to 37% of parents said that they never or only sometimes felt their child was safe where they live and play (12). Violence prevention requires comprehensive solutions and attention from multiple stakeholders and sectors: public health, law enforcement, the healthcare community, schools, and community-based organizations. Most importantly, prevention needs to include families and neighborhoods who hold the power and potential to positively change their environments (13). Prevention efforts can focus on developing individual skills to avoid violence and strengthening community linkages to create more protective systems. For instance, universal , school-based programs to reduce violence by developing skills to reduce aggression and emphasize emotional self-awareness, emotional control, self-esteem, positive social skills, social problem solving, conflict resolution, or team work have been shown to decrease rates of violence among school-aged children and youth (14, 15).

Figure 11.1 Parents/Caregivers Who Felt Child was Unsafe* in Neighborhood by Race/Ethnicity, Ages 0-17, 2012



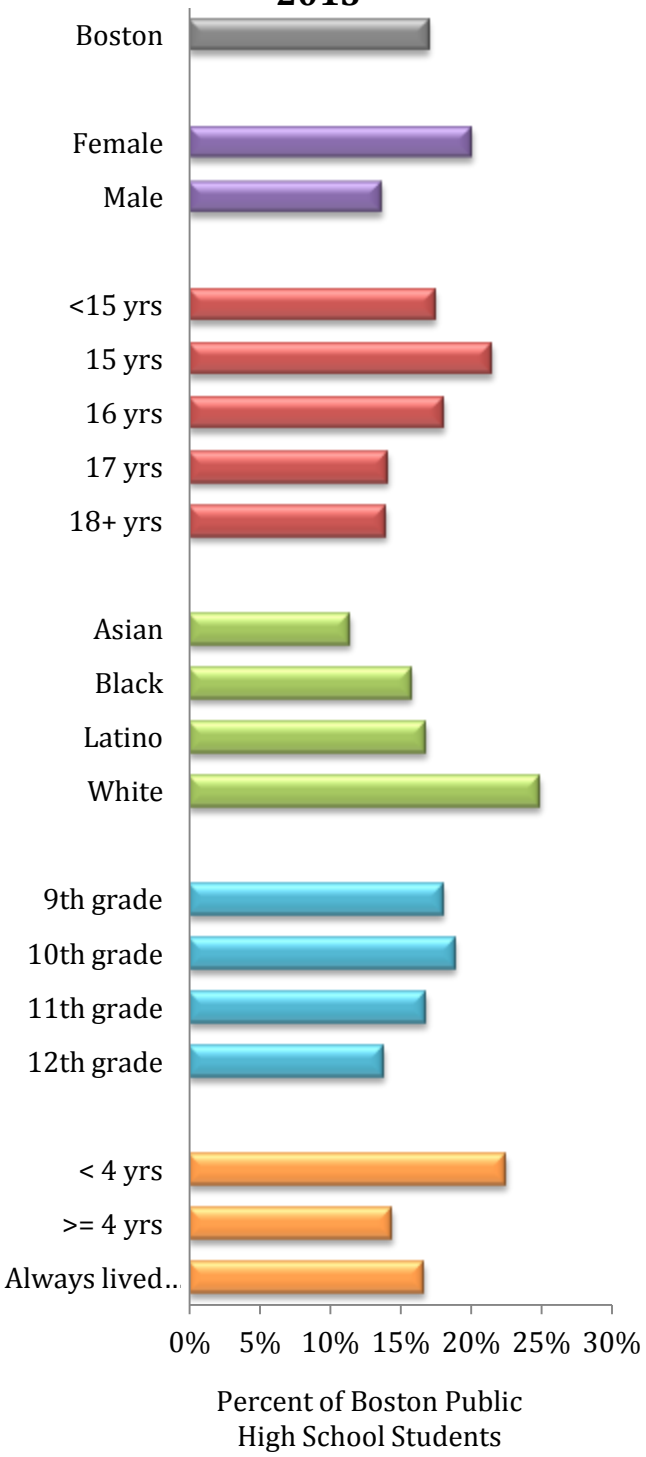
Boston	Asian	Black	Latino	White
26.3% (23.2-29.4)	32.2% (12.1-52.3)	33.3% (27.3-39.2)	34.8% (28.3-41.3)	7.3% (4.5-10.2)

*Parents/caregivers reported that they felt that child is either sometimes or never safe in community or neighborhood.

DATA SOURCE: Boston Survey of Children's Health, 2012, Boston Public Health Commission

In 2012, 26% of Boston children ages 0-17 lived in households where their parent/caregiver felt that his or her child was unsafe in their neighborhood. Higher percentages of Asian, Black, and Latino children compared to White children lived in households where their parent/caregiver felt his/her neighborhood was unsafe.

Figure 11.3 Bullied at School or Electronically in the Past 12 months by Selected Indicators, 2013



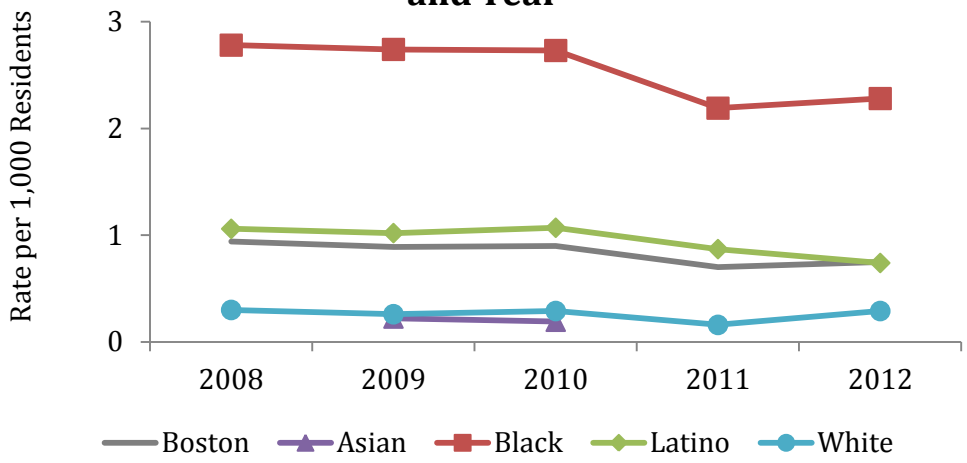
Boston	17.0% (13.9-20.1)
Gender	
Female	20.1% (15.8-24.4)
Male	13.7% (10.2-17.2)
Age of Student	
14 years or Younger	17.5% (8.9-26.1)
15 years	21.5% (15.4-27.7)
16 years	18.1% (11.7-24.6)
17 years	14.1% (9.6-18.6)
18 years or Older	14.0% (7.9-20.1)
Race/Ethnicity	
Asian	11.4% (5.8-17.0)
Black	15.8% (11.2-20.3)
Latino	16.8% (12.7-20.9)
White	24.9% (18.0-31.9)
Grade Level	
9th grade	18.0% (11.7-24.2)
10th grade	18.9% (13.1-24.7)
11th grade	16.8% (12.4-21.3)
12th grade	13.8% (7.4-20.1)
Time Living in U.S.	
Less than 4 years	22.5% (13.0-31.9)
4 years or more	14.4% (10.0-18.9)
Always lived in US	16.7% (13.4-20.1)

DATA SOURCE: Youth Risk Behavior Survey,2013, Centers for Disease Control and Prevention

In 2013, 17% of Boston public high school students had been bullied either in school or electronically in the past 12 months.

The percentage of students who had been bullied either at school or electronically was similar for males and females, among age groups, among grade levels, and for number of years of residence in the U.S. With respect to race/ethnicity, the percentage of students who were bullied either at school or electronically was significantly lower for Asians when compared with Whites.

Figure 11.4 Nonfatal Assault-Related Gunshot/Stabbing Emergency Department Visits by Race/Ethnicity and Year*



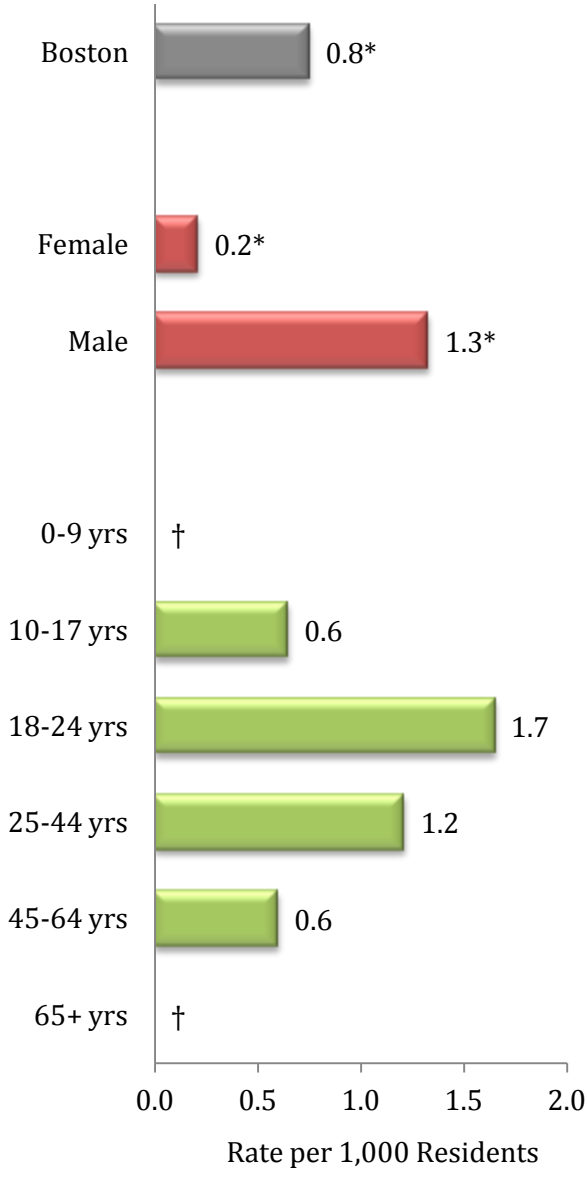
*Age-adjusted rates, per 1,000 residents

NOTE: Rates were not presented for Asian residents for 2008, 2011, and 2012 due to the small number of cases.
Rates for Asian residents for 2009 and 2010 are based on counts of less than 20 and should be interpreted with caution.

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

In 2012, the Boston nonfatal assault-related gunshot/stabbing emergency department visit rate was 0.8 per 1,000 residents. This rate has decreased since 2008. The rate for Black and Latino residents has also decreased from 2008-2012. The rate for White residents did not change over these 5 years and was 0.3 in 2012. In 2012, the rate for Black (2.3) and Latino (0.7) residents was higher compared to the rate for White residents.

Figure 11.5 Nonfatal Assault-Related Gunshot/Stabbing Emergency Department Visits by Selected Indicators, 2012



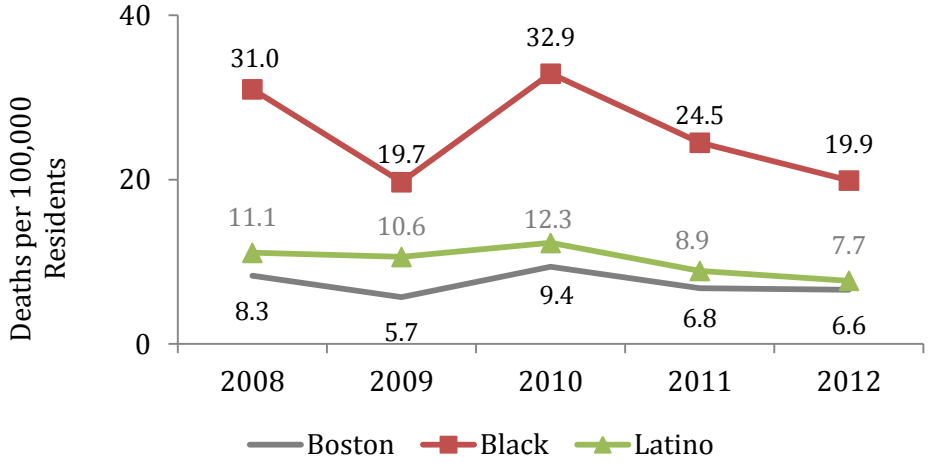
In 2012, the nonfatal assault-related gunshot/stabbing emergency department visit rate for Boston was 0.8 per 1,000 residents. The age-adjusted rate for females (0.2) was lower than the rate for males (1.3). The crude rate for residents ages 18-24 years was 1.7. The rates for those ages 10-17(0.6), 25-44 (1.2), and 45-64 (0.6) were all lower than the rate for 18-24 years in 2012.

*Age-adjusted rates, per 1,000 residents

† Rates are not presented for those ages 0-9 and 65 years or older due to the small number of cases.

DATA SOURCE: Acute Hospital Case Mix Databases, Massachusetts Center for Health Information and Analysis

Figure 11.6 Homicide by Race/Ethnicity and Year*



*Age-adjusted rates

NOTE: Rates are not presented for Asian residents for 2008-2012 or for White residents for 2008-2011 due to the small number of cases.
Gray text represents rates based on counts less than 20 and should be interpreted with caution. Black text represents rates based on counts of at least 20.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

In 2012 the Boston homicide rate was 6.6 per 100,000 residents. In 2012 the homicide rate was 19.9 for Black residents and 7.7 for Latino residents, which were both significantly higher than the rate of 2.0 for White residents. There was no significant change in the Boston, Black or Latino homicide rate from 2008 to 2012.

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Chapter 12:
Cancer

Cancer

Cancer is a disease in which normal, healthy cells are damaged or changed, and begin to multiply abnormally. Since 1998, the incidence of cancer has slowly declined and stabilized in the U.S. (1), but some types have been more difficult to control than others. Nationally, the most commonly diagnosed cancers are prostate, lung, and colorectal cancers in men and breast, lung, and colorectal cancers in women (2).

Cancer Prevention

Many risk factors for cancer have been identified. About a third of cancer cases are estimated to be preventable (3). The largest contributor to preventable cancer is tobacco use and exposure (including exposure to cigarette smoke, cigarettes, and smokeless tobacco products), which cause about 22% of cancers every year (3). Alcohol consumption is another risk factor. Both alcohol and smoking damage DNA and block the use of many protective antioxidants and vitamins (4, 5). Many environmental chemicals and toxins encourage cancer formation, in addition to excessive exposure to sunlight or tanning beds, ionizing radiation, exposure to some viruses and bacteria, and certain hormones (7). Daily physical activity, regular intake of fruits and vegetables, and a healthy weight diminish risk for some of the most common cancers (6).Some risk factors are out of our control, like having a family history of cancer, or older age.

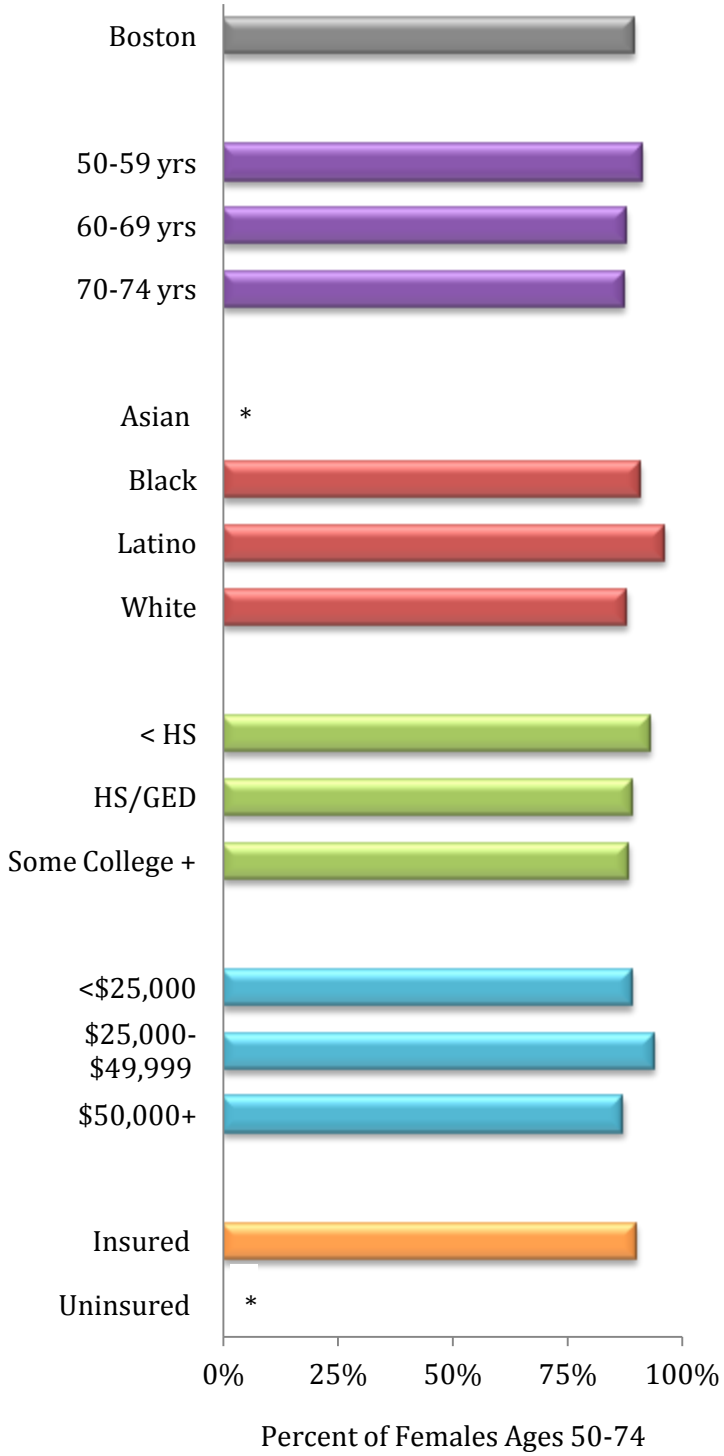
Screening recommendations

For those who are at the highest risk of developing cancer, evidence-based guidelines have been developed to ensure that any abnormal cells are caught early. For instance, those with a history of smoking are encouraged to be screened for lung cancer up to 15 years after they quit smoking. Cancer screening has been especially successful with detecting breast, cervix, rectum, and colon cancer, and consistent screening has contributed significantly to the decrease in cancer rates over the past twenty years. Although screening methods are not perfect, knowing your individual risk for developing cancer will help you and your doctor determine whether screening is right for you.

Boston	89.5% (86.8-92.2)
Age	
50-59 yrs	91.3% (88.0-94.7)
60-69 yrs	87.9% (83.6-92.1)
70-74 yrs	87.5% (76.7-98.2)
Race/Ethnicity	
Asian	*
Black	90.8% (86.7-95.0)
Latino	96.3% (92.7-99.9)
White	88.2% (84.8-91.5)
Educational Attainment	
Less than High School	93.2% (88.2-98.1)
High School Degree/GED	89.3% (83.1-95.4)
At Least Some College/ Bachelor's or Higher	88.5% (85.0-92.0)
Income	
<$25,000	89.2% (84.4-93.9)
$25,000-$49,999	93.9% (89.9-97.8)
$50,000+	87.3% (82.0-92.5)
Insurance Status	
Insured	90.1% (87.4-92.8)

In 2013, 90% of females ages 50-74 had a mammogram within the past two years. A significantly higher percentage of Latino females reported having a mammogram within the past 2 years when compared to White females.

Figure 12.1 Mammogram within the Past 2 Years by Selected Indicators, 2013



*Insufficient sample size

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

Figure 12.2 Pap Test within the Past 3 Years by Selected Indicators, 2013

Boston	86.1% (83.7-88.5)
Age	
21-29 yrs	79.5% (73.6-85.4)
30-44 yrs	94.8% (92.4-97.2)
45-59 yrs	85.6% (81.4-89.8)
60-65 yrs	75.7% (67.5-83.8)
Race/Ethnicity	
Asian	61.8% (49.2-74.3)
Black	85.8% (81.6-90.1)
Latino	84.4% (78.8-90.1)
White	92.3% (89.7-94.8)
Educational Attainment	
Less than High School	82.3% (73.8-90.7)
High School Degree/GED	85.2% (79.8-90.6)
At Least Some College/Bachelor's or Higher	86.9% (84.1-89.6)
Income	
<$25,000	78.1% (72.2-83.9)
$25,000-$49,999	88.6% (84.0-93.2)
$50,000+	92.6% (90.2-95.0)
Insurance Status	
Insured	86.7% (84.3-89.1)
Uninsured	*

*Insufficient sample size

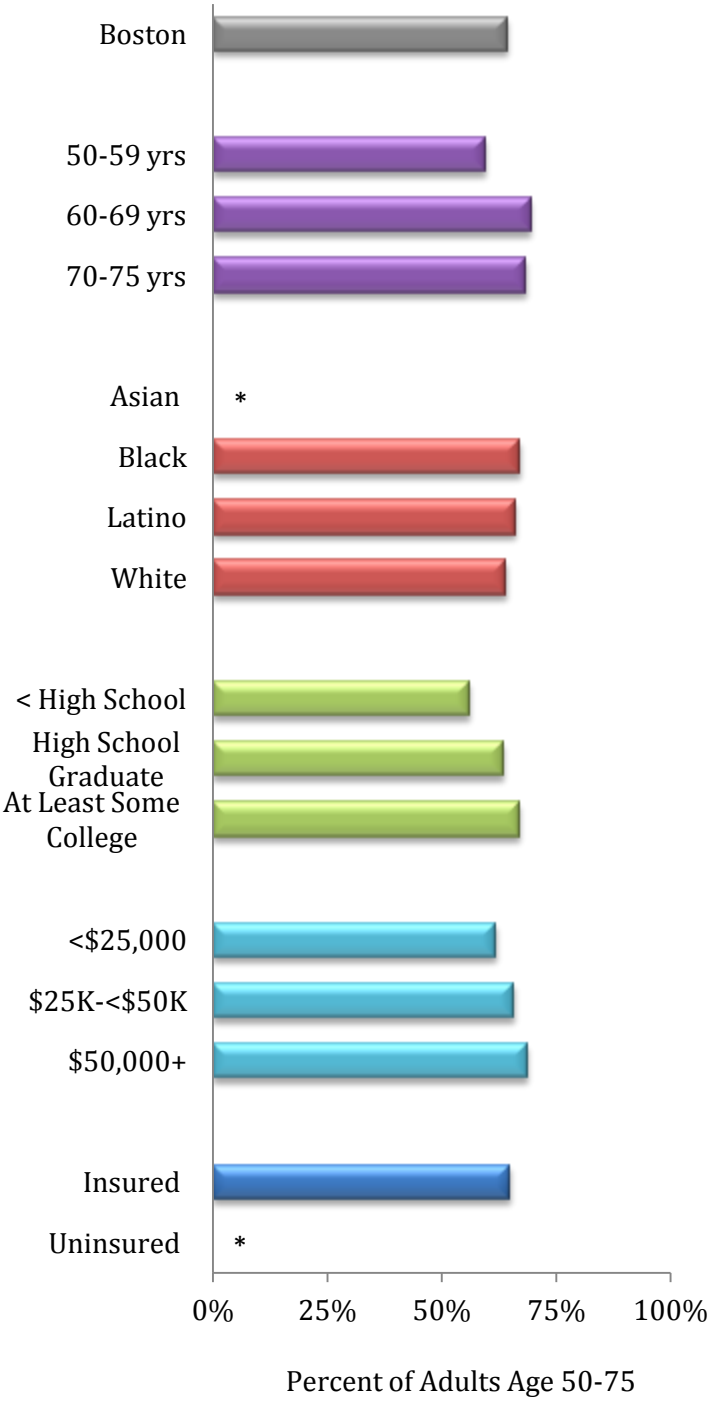
DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

In 2013, 86% of Boston females ages 21-65 had a pap test within the past three years. No statistical differences were found by level of educational attainment. Compared to females ages 30-44, a lower percentage of all age groups presented had a pap test within the past three years. By race, the percentage was lower for Asian residents compared to White residents, and by income level, the percentage was lower for residents with less than $25,000 annual income compared to residents with an income of $50,000 or more.

Boston	64.4% (61.5-67.4)
Age	
50-59 yrs	59.6% (55.2-63.9)
60-69 yrs	69.5% (64.9-74.1)
70-75 yrs	68.4% (60.7-76.1)
Race/Ethnicity	
Asian	*
Black	67.2% (61.7-72.7)
Latino	66.2% (57.5-74.9)
White	64% (60.4-67.6)
Educational Attainment	
Less than High School	56.2% (47.3-65.0)
High School Degree/GED	63.6% (56.9-70.3)
At Least Some College/ Bachelor's or Higher	67.0% (63.7-70.4)
Income	
<$25,000	61.8% (56.1-67.6)
$25,000-$49,999	65.8% (58.6-73.1)
$50,000+	68.7% (64.5-73.0)
Insurance Status	
Insured	64.9% (61.9-67.9)
Uninsured	*

In 2013, 64% of Boston adults ages 50-75 reported receiving either a sigmoidoscopy or colonoscopy in the past 5 years. A significantly higher percentage of adults age 60-69 had a sigmoidoscopy or colonoscopy in the past 5 years when compared to adults age 50-59. No significant differences were found across race/ethnicity, educational attainment or annual income.

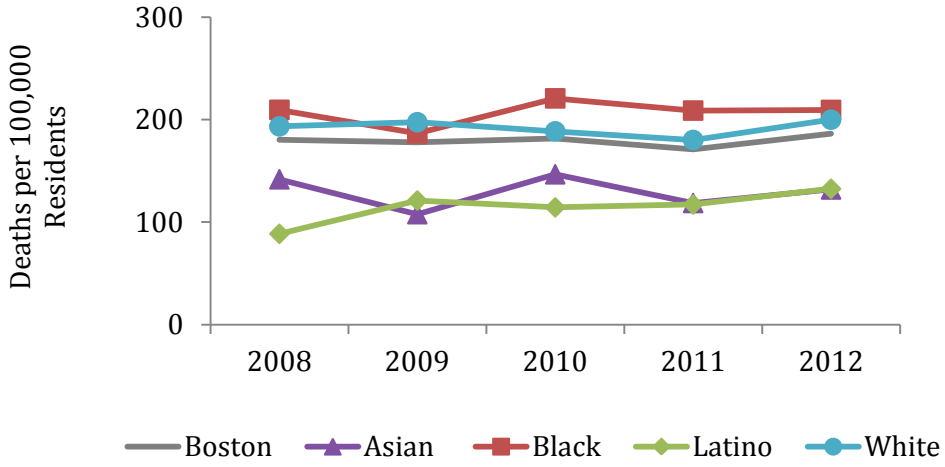
Figure 12.3 Sigmoidoscopy or Colonoscopy in the Past 5 Years, 2013



*Insufficient sample size

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013), Boston Public Health Commission

Figure 12.4 Cancer Deaths by Race/Ethnicity and Year*



*Age-adjusted rates

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

From 2008 to 2012, there was no significant change in the cancer death rate for Boston overall. In 2012, the cancer death rate for Boston was 186.3. Both Asian and Latino residents had lower cancer death rates compared with White residents, although the cancer death rate for Latino residents has increased since 2008.

Figure 12.5 Leading Types of Cancer Deaths by Year*

	2008	2009	2010	2011	2012
1	Lung 226 (45.1)	Lung 236 (45.7)	Lung 224 (43.2)	Lung 214 (42.1)	Lung 238 (45.2)
2	Colon 105 (20.6)	Colon 83 (15.8)	Colon 92 (17.6)	Colon 82 (15.4)	Colon 91 (16.8)
3	Pancreas 69 (13.6)	Female Breast 67 (21.6)	Female Breast 63 (21.2)	Pancreas 55 (9.8)	Pancreas 69 (13.2)
4	Female Breast 66 (22.1)	Pancreas 63 (12.0)	Prostate 53 (27.3)	Female Breast 53 (17.4)	Prostate 56 (27.4)
5	Prostate 48 (26.5)	Liver 48 (9.0)	Liver 53 (9.5)	Prostate 49 (24.8)	Female Breast 52 (17.7)
Counts (Rate per 100,000 residents)					

*Age-adjusted rates

NOTE: Rank is based on number of deaths. Both counts and rates are presented.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

From 2008 to 2012, lung cancer was the most common cause of cancer deaths in Boston accounting for more than 40% of all leading types of cancer deaths for the years presented. The next most common cause of cancer death was colon cancer for the years presented.

Figure 12.6 Leading Types of Cancer Deaths by Race/Ethnicity and Year*

Asian Residents, Counts (Rate per 100,000 residents)					
	2008	2009	2010	2011	2012
1	Lung 16 (38.6)	Liver 12 (27.2)	Lung 19 (43.7)	Lung 11 (24.2)	Lung 20 (42.1)
2	Colon 9 (22.2)	Lung 9 (22.1)	Liver 11 (24.5)	Pancreas 7 (15.6)	Colon 11 (22.3)
3	Liver 8 (17.9)	†	Colon 5 (11.5)	Liver 6 (13.0)	Liver 9 (18.2)
4	Non-Hodgkin Lymphoma 5 (11.7)	†	†	Colon 5 (10.7)	†
5	†	†	†	†	†

Black Residents, Counts (Rate per 100,000 residents)					
	2008	2009	2010	2011	2012
1	Lung 50 (41.9)	Lung 46 (36.7)	Lung 55 (41.9)	Lung 59 (48.8)	Lung 51 (37.8)
2	Colon 30 (25.4)	Colon 27 (21.7)	Colon 26 (21.8)	Colon 36 (29.5)	Prostate 25 (58.9)
3	Pancreas 24 (20.8)	Female Breast 25 (33.7)	Prostate 25 (66.7)	Female Breast 23 (29.1)	Colon 21 (16.6)
4	Female Breast 24 (32.3)	Pancreas 17 (13.3)	Pancreas 21 (17.0)	Prostate 19 (52.2)	Liver 20 (13.5)
5	Prostate 19 (55.3)	Prostate 13 (32.3)	Female Breast 19 (24.9)	Pancreas 15 (11.5)	Pancreas 17 (14.3)

Latino Residents, Counts (Rate per 100,000 residents)					
	2008	2009	2010	2011	2012
1	Lung 7 (13.5)	Lung 14 (31.4)	Lung 12 (23.1)	Lung 11 (19.9)	Lung 14 (22.2)
2	Liver 6 (11.7)	Colon 6 (12.4)	Colon 7 (13.1)	Colon 6 (14.1)	Pancreas 7 (13.2)
3	Female Breast 5 (11.5)	Pancreas 5 (12.1)	Prostate 7 (45.6)	Prostate 5 (23.7)	Colon 7 (12.7)
4	†	Brain 5 (6.1)	†	Liver 5 (7.9)	Stomach 7 (8.3)
5	†	†	†	Leukemia 5 (7.3)	Non-Hodgkin Lymphoma 6 (10.2)

Continued on next page.

White Residents, Counts (Rate per 100,000 residents)					
	2008	2009	2010	2011	2012
1	Lung 152 (53.7)	Lung 164 (57.0)	Lung 137 (48.3)	Lung 132 (47.8)	Lung 151 (54.3)
2	Colon 62 (21.0)	Colon 46 (15.5)	Colon 53 (17.8)	Colon 35 (11.8)	Colon 51 (16.9)
3	Pancreas 38 (12.9)	Pancreas 37 (12.7)	Female Breast 39 (26.2)	Pancreas 29 (9.5)	Pancreas 42 (14.9)
4	Female Breast 37 (22.7)	Female Breast 34 (19.0)	Liver 28 (9.5)	Female Breast 28 (17.7)	Female Breast 35 (22.3)
5	Prostate 26 (22.7)	Prostate 30 (26.1)	Pancreas 25 (9.0)	Liver 25 (9.0)	Prostate 23 (20.1)

*Age-adjusted rates

†Not calculated, n<5

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

From 2008 to 2012, lung cancer was the most common cause of cancer deaths in Boston for Black, Latino and White residents. This was also true for Asian residents except in 2009.

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Chapter 13:
Death

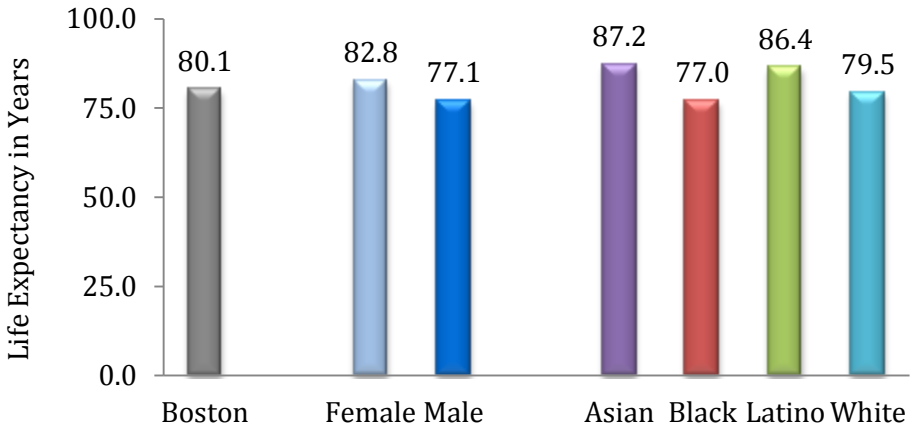
Death

The increase in life expectancy over the last century has been remarkable. In the 1900s, infant mortality was so high that the average life expectancy was not much more than 50 years (1). Today, the life expectancy in the United States is 78.7 years (2). This increase is mostly due to improvements in infant survival with important shifts in the leading causes of death from infectious disease to chronic conditions which cause death later in life (3). Vaccines against smallpox, polio, and major childhood killers like measles, as well as better living standards, cleaner drinking water, and more nutritious diets have significantly reduced the number of serious infections in the United States (3). In earlier time periods, the risk of death from infection was high at every age and only a small proportion of people reached old age. Today, most people live past middle age, and death is highly concentrated among older individuals (3).

Over the last decade in the United States, increases in life expectancy have varied by race/ethnicity and gender, with the largest increase (6%) among Black males to 72.1 years. Life expectancy increased 4% among Black females to 78.2 years; 3% among White males to 76.6 years; and 2% among White females to 81.3 years. Despite higher percent (or relative) gains in life expectancy among Black males and females, racial inequities in absolute life span persist – the Black U.S. population dies 3.8 years younger, on average, than the White U.S. population. This difference is explained by a higher death rate from heart disease, cancer, homicide, diabetes, and perinatal conditions within the Black U.S. population compared with the White U.S. population (4). These differences in mortality rates by racial group underscore the importance of efforts to examine health delivery and public health systems with a health equity focus.

Today, all people in older age groups, regardless of race/ethnicity, are living longer. The most recent research shows life expectancy continuing to increase for people over the age of 80 (3). These gains in life expectancy for the oldest among us raise questions about how we plan for an aging population as families and as a society (3).

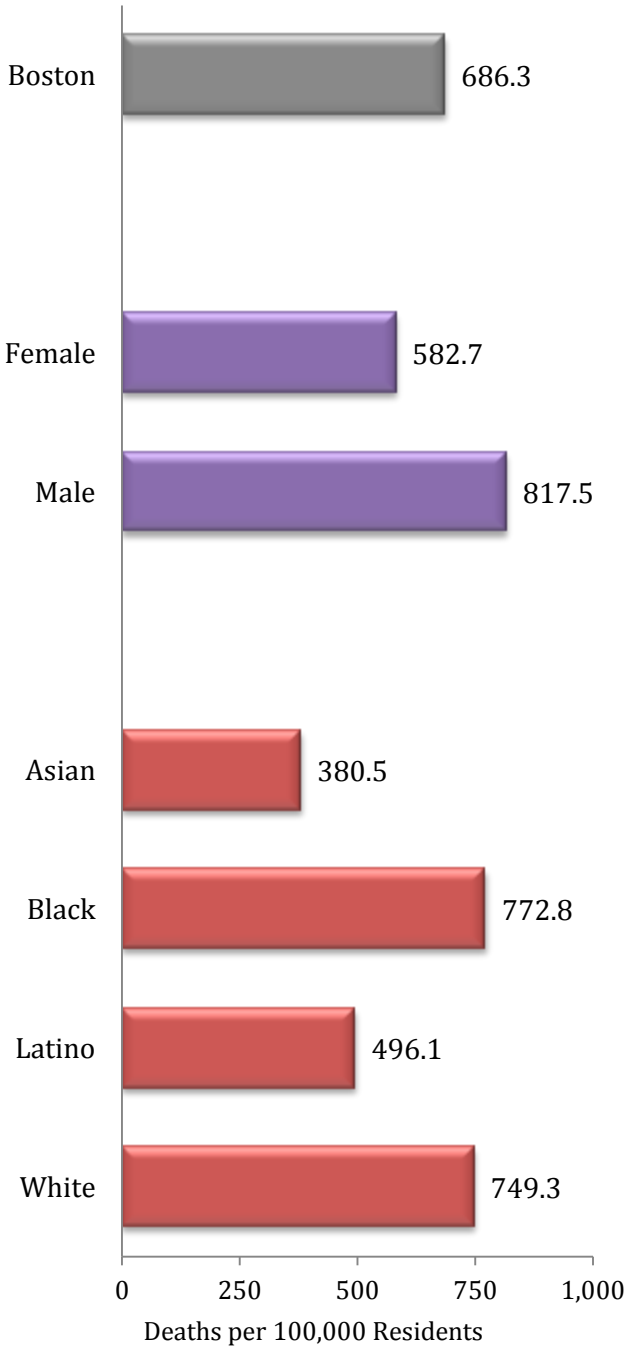
Figure 13.1 Life Expectancy by Gender and Race/Ethnicity, 2008-2012



DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

During the period of 2008-2012, the life expectancy for a Boston resident was 80.1 years. For females the life expectancy was 82.8 per 100,000; it was 77.1 for males. For Asian residents the rate was 87.2, for Black residents it was 77.0, for Latino residents it was 86.4 and for White residents the rate was 79.5 per 100,000.

Figure 13.2 All-Cause Mortality by Gender and Race/Ethnicity*, 2012



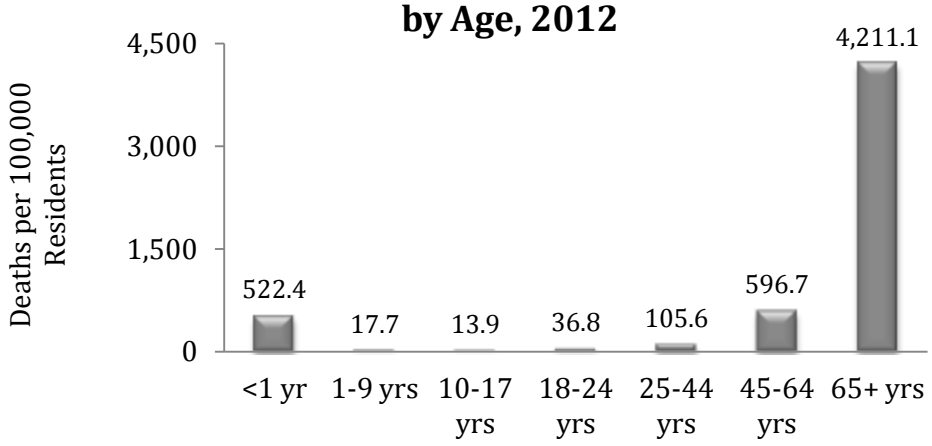
*Age-adjusted rates

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

The age-adjusted all-cause mortality rate for Boston residents in 2012 was 686.3 deaths per 100,000. Females had a lower mortality rate than males with 582.7 deaths per 100,000 versus 817.5 for males. The mortality rate for Asian residents (380.5) and Latino residents (496.1) was lower than that of White residents (749.3). There was no statistical difference in the all-cause mortality rate between Black and White residents.

In 2012, Boston residents ages 65 years and over had an all-cause mortality rate of 4211.1 per 100,000. The rate for residents under 1 year of age was 522.4 per 100,000.

Figure 13.3 All-Cause Mortality by Age, 2012



DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

Figure 13.4 Top Five Leading Causes of Death by Year*

	2008	2009	2010	2011	2012
1	Cancer 927 (180.5)	Cancer 935 (178.0)	Cancer 951 (181.6)	Cancer 905 (171.1)	Cancer 996 (186.3)
2	Diseases of the Heart 801 (152.0)	Diseases of the Heart 797 (151.0)	Diseases of the Heart 748 (139.0)	Diseases of the Heart 692 (128.6)	Diseases of the Heart 709 (131.1)
3	Cerebrovascular Disease 174 (33.1)	Other Injuries 194 (34.4)	Cerebrovascular Disease 182 (34.6)	Other Injuries 181 (31.4)	Other Injuries 189 (33.2)
4	Other Injuries 172 (30.7)	Cerebrovascular Disease 163 (30.6)	Other Injuries 156 (27.9)	COPD 147 (28.7)	Cerebrovascular Disease 183 (34.0)
5	COPD 154 (30.1)	COPD 128 (24.6)	COPD 148 (28.7)	Cerebrovascular Disease 139 (26.0)	COPD 123 (23.4)

*Age-adjusted rates per 100,000 deaths

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

Cancer was the leading cause of death for Boston residents from 2008 to 2012. Diseases of the heart was the second leading cause of death during these 5 years.

Figure 13.5 Top Five Leading Causes of Death by Gender and Year*

Females					
	2008	2009	2010	2011	2012
1	Cancer 460 (151.7)	Cancer 448 (144.9)	Cancer 465 (150.5)	Cancer 428 (138.1)	Cancer 493 (159.0)
2	Diseases of the Heart 420 (126.6)	Diseases of the Heart 395 (117.6)	Diseases of the Heart 374 (109.9)	Diseases of the Heart 318 (93.8)	Diseases of the Heart 348 (104.3)
3	Cerebrovascular Disease 104 (30.2)	Cerebrovascular Disease 95 (27.6)	Cerebrovascular Disease 107 (32.2)	COPD 88 (28.2)	Cerebrovascular Disease 113 (32.9)
4	COPD 84 (26.6)	COPD 82 (25.6)	COPD 85 (26.6)	Cerebrovascular Disease 79 (23.0)	Alzheimer's Disease 82 (23.0)
5	Alzheimer's Disease 81 (21.3)	Alzheimer's Disease 78 (21.0)	Alzheimer's Disease 83 (23.1)	Alzheimer's Disease 75 (20.4)	COPD 74 (23.1)

Males					
	2008	2009	2010	2011	2012
1	Cancer 467 (222.0)	Cancer 487 (229.8)	Cancer 486 (226.1)	Cancer 477 (222.6)	Cancer 503 (226.5)
2	Diseases of the Heart 381 (185.8)	Diseases of the Heart 402 (198.1)	Diseases of the Heart 374 (178.6)	Diseases of the Heart 374 (178.1)	Diseases of the Heart 361 (1661.1)
3	Other Injuries 109 (43.1)	Other Injuries 133 (51.3)	Other Injuries 97 (38.0)	Other Injuries 117 (43.9)	Other Injuries 124 (47.9)
4	COPD 70 (36.4)	Cerebrovascular Disease 68 (36.0)	Cerebrovascular Disease 75 (38.0)	Cerebrovascular Disease 60 (29.0)	Cerebrovascular Disease 70 (34.2)
5	Cerebrovascular Disease 70 (36.2)	Nephritis/ Nephrosis 59 (30.6)	Homicide 65 (17.5)	COPD 59 (30.1)	Diabetes 57 (25.9)

*Age-adjusted rates per 100,000 deaths

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

Cancer and heart disease remained the top two leading causes of death for both males and females from 2008 to 2012. For males, in 2012, the top five leading causes of death in order were: cancer, diseases of the heart, other injuries, cerebrovascular and diabetes. For females, in 2012, the top five leading causes of death in order were: cancer, diseases of the heart, cerebrovascular, Alzheimer's and COPD.

Figure 13.6 Top Five Leading Causes of Death by Race/Ethnicity and Year*

Asian Residents					
	2008	**2009**	**2010**	**2011**	**2012**
1	Cancer 60 (141.8)	Cancer 48 (107.8)	Cancer 65 (146.7)	Cancer 55 (118.7)	Cancer 66 (131.9)
2	Diseases of the Heart 23 (55.5)	Diseases of the Heart 32 (76.8)	Diseases of the Heart 23 (51.5)	Diseases of the Heart 23 (51.1)	Diseases of the Heart 22 (44.6)
3	Cerebrovascular Disease 12 (29.5)	Cerebrovascular Disease 12 (29.1)	Cerebrovascular Disease 14 (31.7)	Alzheimer's Disease 12 (27.0)	Cerebrovascular Disease 12 (25.3)
4	Other Injuries 8 (21.0)	Pneumonia/ Influenza 9 (21.9)	Alzheimer's Disease 7 (16.4)	Cerebrovascular Disease 12 (26.7)	COPD 10 (21.4)
5	Pneumonia/ Influenza 7 (16.9)	Diabetes 6 (14.8)	Essential Hypertension and Hypertensive Renal Disease 6 (14.0)	Nephritis/ Nephrosis 9 (20.3)	Other Injuries 10 (20.2)

Black Residents					
	2008	**2009**	**2010**	**2011**	**2012**
1	Cancer 248 (209.6)	Cancer 229 (186.6)	Cancer 270 (220.8)	Cancer 259 (208.9)	Cancer 269 (209.5)
2	Diseases of the Heart 209 (184.5)	Diseases of the Heart 196 (171.5)	Diseases of the Heart 184 (156.7)	Diseases of the Heart 169 (140.6)	Diseases of the Heart 192 (155.9)
3	Cerebrovascular Disease 48 (44.6)	Other Injuries 49 (37.4)	Cerebrovascular Disease 52 (45.9)	Diabetes 39 (32.4)	Cerebrovascular Disease 51 (43.7)
4	Homicide 48 (31.0)	Cerebrovascular Disease 46 (40.3)	Homicide 49 (32.9)	Homicide 38 (24.5)	Diabetes 51 (39.5)
5	Other Injuries 42 (33.2)	Nephritis/ Nephrosis 42 (37.2)	Other Injuries 38 (29.0)	Other Injuries 37 (27.0)	Other Injuries 40 (29.6)

*Age-adjusted rates per 100,000 deaths

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Latino Residents					
	2008	2009	2010	2011	2012
1	Cancer 43 (88.6)	Cancer 64 (121.1)	Cancer 60 (114.4)	Cancer 68 (117.2)	Cancer 81 (132.6)
2	Diseases of the Heart 36 (84.5)	Diseases of the Heart 32 (64.4)	Diseases of the Heart 38 (76.9)	Diseases of the Heart 42 (97.2)	Diseases of the Heart 42 (80.2)
3	Homicide 16 (11.1)	Other Injuries 29 (42.0)	Cerebrovascular Disease 17 (40.0)	Other Injuries 20 (22.9)	Cerebrovascular Disease 15 (31.7)
4	Other Injuries 14 (19.5)	Homicide 12 (10.6)	Homicide 15 (12.3)	Homicide 13 (8.9)	Other Injuries 15 (17.9)
5	Nephritis/ Nephrosis 11 (27.1)	Perinatal 8 (6.0)	Other Injuries 11 (11.2)	Cerebrovascular Disease 9 (16.9)	Diabetes 12 (23.9)

White Residents					
	2008	2009	2010	2011	2012
1	Cancer 570 (193.5)	Cancer 585 (197.5)	Cancer 547 (188.6)	Cancer 517 (180.2)	Cancer 568 (200.0)
2	Diseases of the Heart 532 (165.8)	Diseases of the Heart 532 (168.7)	Diseases of the Heart 499 (155.7)	Diseases of the Heart 455 (144.3)	Diseases of the Heart 445 (144.9)
3	COPD 126 (40.6)	Other Injuries 111 (37.9)	COPD 118 (39.4)	Other Injuries 117 (40.8)	Other Injuries 118 (40.8)
4	Other Injuries 107 (35.8)	COPD 97 (31.0)	Other Injuries 103 (35.1)	COPD 110 (37.4)	Cerebrovascular Disease 103 (32.6)
5	Cerebrovascular Disease 102 (30.9)	Cerebrovascular Disease 97 (28.8)	Cerebrovascular Disease 99 (31.1)	Cerebrovascular Disease 83 (26.3)	COPD 94 (31.9)

*Age-adjusted rates per 100,000 deaths

NOTES: Rates based on counts <20 should be interpreted with caution.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

In Boston, cancer and diseases of the heart remained the top two leading causes of death for all racial/ethnic groups presented from 2008 to 2012. For Asian residents, in 2012, the top five leading causes of death in order were: cancer, diseases of the heart, cerebrovascular, COPD, and other injuries . For Black residents, in 2012, the top five leading causes of death in order were: cancer, diseases of the heart, cerebrovascular disease, diabetes, and other injuries. For Latino residents, in 2012, the top five leading causes of death in order were: cancer, diseases of the heart, cerebrovascular, other injuries, and diabetes. For White residents, in 2012, the top five leading causes of death in order were: cancer diseases of the heart, other injuries, cerebrovascular disease, and COPD.

Figure 13.7 Top Five Leading Causes of Death by Age

2008-2012			
	<1 yr	**1-9 yrs**	**10-17 yrs**
1	Perinatal 131 (1,814.2)	Cancer 7 (13.4)	Homicide 26 (58.4)
2	Congenital Anomalies 46 (637.0)	Congenital Anomalies 6 (11.5)	Other Injuries 5 (11.2)
3	*	Other Injuries 5 (9.6)	*
4	*	*	*
5	*	*	*

2012				
	18-24 yrs	**25-44 yrs**	**45-64 yrs**	**65+ yrs**
1	Homicide 22 (17.6)	Other Injuries 52 (25.4)	Cancer 273 (208.8)	Cancer 678 (1,079.9)
2	Other Injuries 7 (5.6)	Cancer 40 (19.6)	Diseases of the Heart 143 (109.4)	Diseases of the Heart 537 (855.3)
3	Suicide 6 (4.8)	Diseases of the Heart 28 (13.7)	Other Injuries 57 (43.6)	Cerebrovascular Disease 161 (256.4)
4	*	Homicide 21 (10.3)	Chronic Liver 38 (29.1)	Alzheimer's Disease 113 (180.0)
5	*	Suicide 14 (6.8)	Diabetes 25 (19.1)	COPD 107 (170.4)

*Not calculated, n<5

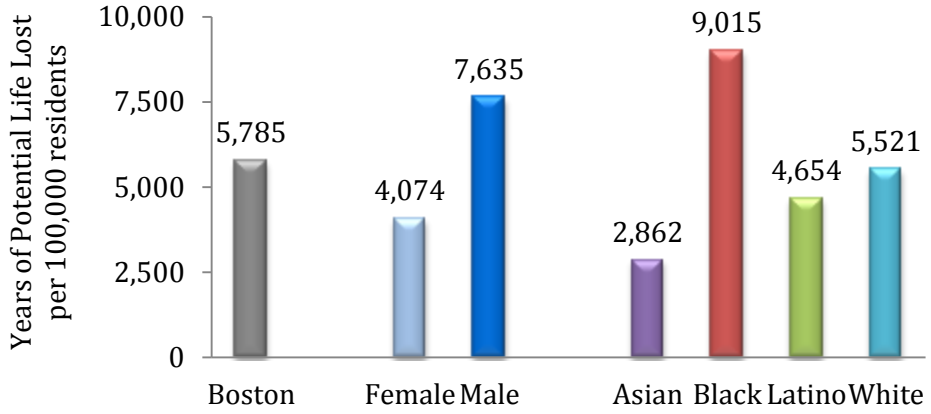
NOTE: Rates based on counts <20 should be interpreted with caution.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

In Boston from 2008-2012, the leading cause of death for those under 1 year of age was due to conditions originating in the perinatal period, with a rate of 1,814.2 per 100,000 residents under 1 year of age. For those 1-9 years of age, the top cause of death was cancer, with a rate of 13.4. For residents between the ages of 10-17 the leading cause of death was homicide (58.4) in this same period.

In 2012, the leading cause of death for residents 18-24 years of age was homicide (17.6). For those 25-44 years of age, the leading cause of death was other injuries (25.4). The leading cause of death for residents ages 45-64 and 65 years and over was cancer, with a rate of 208.8 and 1,079.9 respectively.

Figure 13.8 Years of Potential Life Lost by Gender and Race/Ethnicity*, 2008-2012



*Age-adjusted rates

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health

For 2008-2012, there were 5,785 years of potential life lost on average annually per 100,000 Boston residents. There were 4,074 years of potential life lost on average annually per 100,000 female residents and 7,635 years of potential life lost on average annually per 100,000 male residents. There were 2,862 years of potential life lost on average annually per 100,000 Asian residents, 9,015 years of potential life lost on average annually per 100,000 Black residents, 4,654 years of potential life lost on average annually per 100,000 Latino residents, and 5,521 years of potential life lost on average annually per 100,000 White residents.

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Technical Notes

This section provides the reader with definitions of terms commonly used throughout this report.

Adolescent Births: In this report, adolescent births are considered births to females ages 15-19.

Age-Adjusted Rate (AAR): Age-adjustment is a statistical process applied to rates of disease and death which allows populations or groups with different age structures to be compared. The occurrence of disease and death is often associated with age and the age distribution between populations may differ considerably. Thus, AARs are helpful when comparing rates over time and between groups or populations.

An AAR is derived by: 1) calculating age-specific rates (ASRs) across all age groups 2) multiplying the ASRs by age-specific weights that come from proportion of the 2000 U.S. standard population within each age group 3) summing the adjusted age-specific rates. In *Health of Boston 2014-2015* AARs are mainly used for the presentation of death, hospitalization, and emergency department visit data. With the exception of the substance abuse data, all AARs are based on a standard population distribution that covers all ages. Substance abuse AARs are based on a standard population distribution of persons ages 12 and older.

Age-Specific Rate (ASR): Age-specific rates (ASRs) are a type of crude rate limited to a particular age group within a population (e.g. 15-24 year old females). ASRs enable the comparison of event frequency between different age groups. The calculation for an ASR is the same as for a crude rate.

Age-Specific Birth Rate: The number of live births to women in an age group divided by the female population of that age group, expressed per 1,000 females in that age group.

Alcohol-Abuse Deaths: Death induced by alcohol use/abuse, such as liver disease due to alcohol consumption, and accidental alcohol overdose. In addition to excluding suicide determinations, this category excludes deaths indirectly due to alcohol use, such as deaths due to injuries occurring while intoxicated or deaths caused by another person who was intoxicated. The alcohol-related death code definition is from National Vital Statistics Reports, Vol. 58, No. 19, May 20, 2010 (page 120). ICD-10 codes E24.4, F10, G31.2, G62.1, G72.1, I42.6, K29.2, K70, K85.2, K86.0, R78.0, X45, and Y15 are used across multiple cause levels to identify alcohol-related deaths.

Alzheimer's disease: A degenerative brain disease that is progressive, irreversible and ultimately fatal. It affects memory, thinking, and language skills by slowly destroying them. Individuals with Alzheimer's disease eventually also have behavioral problems and an inability to perform normal daily activities. In this report, ICD-10 codes G30, G30.0, G30.1, G30.8, and G30.9 are used to identify deaths from Alzheimer's disease for analysis.

Asian: For the purposes of analysis in this report, Asians are all persons self-identified as Asian or Pacific Islander (e.g., Chinese, Japanese, Hawaiians, Cambodians, Vietnamese, Asian Indians, and Filipinos) who do not also identify themselves as Latino.

Asthma: Asthma is a chronic inflammatory condition defined by sudden periodic attacks of difficulty in breathing accompanied by wheezing caused by a spasm of the bronchial tubes. Hospitalizations and emergency department visits in this report were identified through the Acute Hospital Case Mix Databases from the Massachusetts Center for Health Information and Analysis. ICD-9-CM code 493 was used to identify asthma-related cases.

Binge Drinking: A pattern of alcohol consumption that brings the blood alcohol concentration (BAC) level to 0.08% or more. This pattern of drinking usually corresponds to 5 or more drinks on a single occasion for men or 4 or more drinks on a single occasion for women, generally within about 2 hours.

Birth Weight: The weight of an infant at the time of delivery. It may be recorded in either grams or pounds/ounces. If recorded in pounds/ounces, it is converted to grams for use in this report based on the following formula: 1 pound = 453.6 grams; 1,000 grams = 2 pounds and 3 ounces.

Black: For the purposes of analysis in this report, Black residents are all persons self-identified as Black (e.g., African Americans, Haitians, West Indians) who do not also identify themselves as Latino.

Blood-Lead Level: The amount of lead in micrograms per deciliter of blood, detected during finger stick or venous blood draw tests. Previously, the blood lead level of concern was defined as lead 10 or greater micrograms per deciliter of blood (>=10 µg/dL). In May 2012, the Centers for Disease Control and Prevention established a new reference level defined as lead 5 or greater micrograms per deciliter of blood (>=5 µg/dL). The new lower value means that more children will likely be identified as having lead exposure allowing parents, doctors, public health officials, and communities to take action earlier to reduce the child's future exposure to lead.

Body Mass Index (BMI): A measure of the appropriateness of weight in relation to height and allows for categorization of people into weight classes. BMI is calculated by dividing a person's weight in kilograms by his or her height in meters squared (kg/m^2). This calculation is used to screen and monitor populations in order to detect risks of health or nutritional disorders. BMI is used differently with children than with adults and is plotted according to age and sex-specific charts.

BMI-for-age weight status categories and the corresponding percentiles are shown in the following table.

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

The BMI cut points for adults are as follows:

Weight Status Category	BMI
Overweight	BMI of 25.0 to 29.9
Obese	BMI of 30.0 or more

Cancer: A group of diseases in which abnormal cells divide without control and can spread to other parts of the body. Cancer is a leading cause of death in the United States. According to the National Cancer Institute, there are more than 100 different types of cancer. In this report, ICD 10 codes C00-C97 are used to identify cancer deaths for analysis.

Census 2000, 2010: The count of the entire American population undertaken by the U.S. Census Bureau ever 10 years. In this report we use information from the censuses conducted by the U.S. Census Bureau in 2000 and 2010.

Chlamydia: A sexually transmitted disease caused by the bacterium *Chlamydia trachomatis*. It is the most common sexually transmitted disease in the United States.

Chronic Obstructive Pulmonary Disease (COPD): Diseases including bronchitis, asthma, emphysema, and allergies from inhaled organic dust particles, which decrease the ability of the lungs to oxygenate the blood. The major cause of COPD is smoking. ICD-10 codes J40-J47 are used to identify COPD deaths, and ICD-9-CM codes 490-496 are used to identify COPD hospitalizations for analysis.

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

Crude Rate: Crude rates are used to present data pertaining to an entire population, such as all of Boston, or to present data pertaining to a subpopulation, such as males or females. A crude rate is calculated by dividing the number of events for the entire population or subpopulation by the total population or subpopulation. In this report, rates of infectious disease, sexually transmitted infection, and birth are presented as crude rates.

Death Rate: The number of deaths per year per 100,000 people. In this report, death rates are presented as age-adjusted rates.

Demographics: Characteristics of human populations such as age, sex, and race/ethnicity.

Diabetes: Diabetes Mellitus is a group of diseases in which the body cannot effectively regulate blood glucose (sugar) due to deficiencies in producing or utilizing a hormone called insulin. ICD-9-CM code 250 is used to identify hospitalizations due to diabetes. Diabetes-related deaths are identified using ICD-10 codes E10-E14.

Diseases of the Heart: A group of conditions that involves the heart and/or blood vessels, such as ischemic heart diseases and coronary artery disease. ICD-10 codes I00–I09, I11, I13, I20-I22 I24-I31, I33-I38 I40, I42- I51 are used to identify deaths.

Drug-Abuse Deaths: Deaths, excluding suicide determinations, due to use of drugs other than alcohol and tobacco, including direct physiological causes as well as accidental deaths in which drug use/abuse is involved. This classification does not include deaths indirectly due to drug use, such as death due to injuries occurring while under the influence of drugs or deaths caused by another person under the influence of drugs. The ICD-10 codes used to identify deaths are D52.1, D59.0, D59.2, D61.1, D64.2, E06.4, E16.0, E23.1, E24.2, E27.3, E66.1, F11.0-F11.5, F11.7-F11.9, F12.0-F12.5, F12.7-F12.9, F13.0-F13.5, F13.7-F13.9, F14.0-F14.5, F14.7-F14.9, F15.0- F15.5, F15.7-F15.9, F16.0-F16.5, F16.7-F16.9, F17.0, F17.3-F17.5, F17.7-F17.9, F18.0-F18.5, F18.7-F18.9, F19.0-F19.5, F19.7-F19.9, G21.1, G24.0, G25.1, G25.4, G25.6, G44.4, G62.0, G72.0, I95.2, J70.2, J70.3, J70.5, K85.3, L10.5, L27.0, L27.1, M10.2, M32.0, M80.4, M81.4, M83.5, M87.1, R50.2, R78.1, R78.2, R78.3, R78.4, R78.5, X40-X44, and Y10-Y14 are used across multiple cause levels to identify drug-related deaths.

Emergency Department (ED) Visit: Visits to acute care hospital emergency departments for care. Emergency department visit data (e.g., nonfatal assault-related gunshot and stabbing wounds) result from an aggregation of patient data across three databases representing each of the three hospital settings from which a patient seen in the emergency department may be ultimately discharged (i.e., hospital inpatient, observational stay, and outpatient hospital emergency department). The aggregated total represents an unduplicated count of emergency department visits.

Gini Index of Income Inequality: The Gini is a measure of how much a given distribution varies from a proportionate distribution. A completely proportionate distribution of income means that every household in a given population has the same amount of income (i.e. 20% of households have 20% of the income, 30% of households have 30% of the income, etc.). This is also known as *perfect equality*. The opposite of perfect equality is *perfect inequality*. This would occur if every household in a given population has an income of zero except for one household which holds all of the income in that population. The Gini ranges from zero (perfect equality) to one (perfect inequality), and is calculated by measuring the difference between the distribution of actual values and a completely proportionate distribution.

Householder: The U.S. Census Bureau designates one person in each household as the householder. In most cases, this is the person or one of the people in whose name the home is owned, being bought, or rented, and who is listed on the American Community Survey questionnaire. If there is no such person in the household, any adult household member 15 years old and over could be designated as the householder.

Heart Disease: A group of conditions, including valve and conductive disorders such as hypertensive heart disease and congestive heart failure. ICD-9-CM codes 391-398, 402, 404, 410-416, and 420-429 are used in identifying heart disease hospitalizations.

Hepatitis B & C: Diseases caused by the hepatitis B or C virus that lead to inflammation of the liver.

Homeless: The federal government defines a *homeless individual* as an individual who lacks housing, including an individual whose primary residence during the night is a supervised public or private facility that provides temporary living accommodations and an individual who is a resident in transitional housing. This term does not include any individual imprisoned or otherwise detained under an Act of Congress or a state law.

Homicide: A death intentionally caused by a person other than the deceased. ICD-10 codes X85-Y09 and Y87.1 are used in identifying homicides for analysis. Death due to homicide as reported by the Boston Police Department (not included in this report) applies to any homicide that occurs in Boston without regard to the actual city of residence of the deceased. As a result, the homicide rates in this report will likely differ from those reported by the Boston Police Department.

Hospitalization: A patient's continuous stay of one night or more in the hospital for observation, care, diagnosis, or treatment before being discharged (released) from the inpatient setting by the hospital, or before death. Hospitalization data presented in this report represents only hospitalizations from acute, short-stay, non-federal hospitals.

Incidence: The number of new cases of a particular disease over a period of time (usually a year) and in relation to the population in which it occurs. Incidence rates are usually reported on the basis of every 100,000 people per year. New cases of an infectious disease such as hepatitis B and C are presented as incidence rates, which may be age-specific or crude.

Infant Death Rate: The number of deaths to children under one year of age per 1,000 live births.

Infectious/Communicable Disease: Infectious or communicable diseases are illnesses resulting from the presence of pathogenic microbial agents, such as viruses, bacteria, fungi, parasites, or prions. Diseases can be spread directly or indirectly from one person to another.

Injury: Injury deaths typically are grouped among five categories: homicides, suicides, motor vehicle-related injuries, (other) unintentional injuries, and "undetermined intent" injuries (for which it was not determined on the death certificate whether the injury was intentional). The latter three categories are grouped together in this report as "Other Injury Deaths" (see Other Injury Deaths). ICD-10 codes are used for identifying the type of injury that resulted in death.

Insufficient Sample Size: In this report *insufficient sample size* is used when certain data points are not presented. This occurs with survey data when there is not a large enough sample (number of survey respondents) to allow for the presentation of reliable point estimates. Data are also not presented if a sample size is too small, which may compromise the confidentiality of the respondents, or if the percentage of missing responses among all responses equals or exceeds 20% of the survey sample.

International Classification of Diseases, Ninth Revision, and Clinical Modification (ICD-9-CM) codes: Hospitalization data shown in this report are classified according to ICD-9-CM. This is the official system of assigning codes to diagnoses and procedures associated with hospital utilization in the United States. The ICD system standardizes medical terms and groups them for statistical purposes.

International Classification of Disease, Tenth Revision (ICD-10) codes: Death data presented in this report are classified according to the ICD-10, released by the World Health Organization in 2000 and adopted by the United States National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention. The ICD system standardizes medical terms and groups them for statistical purposes.

Labor Force Participation Rate: The labor force participation rate represents the proportion of the population that is in the labor force. For example, if there are 100 people in the population 16 years and over, and 64 of them are in the labor force, then the labor force participation rate for the population 16 years and over would be 64 percent.

Latino: Includes people of any race (Asian, Black, White, or Other) self-identified as Hispanic or Latino (such as Puerto Rican, Mexican, Cuban, Spanish, or Dominican).

Lead Screening: The measurement of blood-lead levels in children to identify those who have been exposed to high levels of environmental lead. In Boston, annual screening of children between 6 and 48 months of age is mandatory. In May 2012, the Centers for Disease Control (CDC) issued a recommendation to change the guidelines used for determining clinical lead poisoning from 10 or greater micrograms of lead per deciliter of blood (>=10 µg/dL) to 5 or greater micrograms of lead per deciliter of blood (>=5 µg/dL) for children 72 months old and under. This recommendation was based on an increasing body of scientific evidence demonstrating that these lower blood lead levels can also produce negative health consequences over one's lifetime. See Blood-Lead Level for more information.

Life expectancy: Calculated using 5-year abridged period life tables for a hypothetical cohort of 100,000 residents. An adjustment was made for age groups with zero deaths such that one death was subtracted from the next oldest age group with more than one death and added to the age group with zero deaths. The following adjustments, which are made by the United States National Center for Health Statistics (NCHS) for life expectancy calculations, were not made in this report:

- Age-specific death and population counts for Medicare beneficiaries age 66 and over are used to supplement vital statistics and census data.

- A statistical smoothing technique is used starting at about age 85 (the age varies depending on the specific racial or ethnic population) to estimate mortality for older persons.

Low Birth Weight (LBW): Birth weight of less than 2,500 grams or 5 pounds, 8 ounces.

Micrograms per Deciliter (µg/dL): A measurement unit for level of lead in a measured quantity of blood: a millionth of a gram in a tenth of a liter.

Modified Retail Food Environment Index (mRFEI): The percentage of food retailers in a census tract or within a one-half mile boundary of a census tract that are healthy food retailers. Healthy food retailers include supermarkets, larger grocery stores, supercenters, and produce stores. Less healthy food retailers include fast food restaurants, small grocery stores, and convenience stores.

n<5: A notation used to indicate that for this health indicator there were fewer than five occurrences (for example, births, deaths, new cases of a disease) and therefore a rate could not be presented. Also see the Note to Readers section of this report.

n<11: A notation used to indicate that for this health indicator there were fewer than eleven occurrences (for example, hospitalizations and ED visits) and therefore a rate could not be presented. Also see the Note to Readers section of this report.

Neighborhood: Neighborhoods can be identified in a number of ways. In *Health of Boston 2014* zip codes are used to identify neighborhood boundaries since this information is collected with health data. Please note that the zip code neighborhood definitions used in this report may differ from what are used by other organizations and agencies.

The zip codes used in this report for identifying neighborhoods are those currently used by the United States Postal Service (USPS). USPS zip codes are not based on geography, demographics, or population size; they are collection of mail delivery routes that are defined at the convenience of the U.S. Postal Service and may change from time to time.

Data from the U.S. Census Bureau comes in the form of Zip Code Tabulation Areas (ZCTAs), generalized areal representations of USPS zip code service areas. ZCTA is a trademark of the U.S. Census Bureau whereas ZIP Code is a trademark of the U.S. Postal Service.

Boston Neighborhoods Defined by Zip Codes/Zip Code Tabulation Areas (ZCTAs)

Neighborhood	Zip Codes/ZCTAs
Allston/Brighton	02134, 02135, 02163, 02467
Back Bay (Back Bay, Downtown, Beacon Hill, West End)	02108-02110, 02113-02114, 02116, 02199
Charlestown	02129
East Boston	02128
Fenway	02115, 02215
Hyde Park	02136
Jamaica Plain	02130
Mattapan	02126
North Dorchester	02121, 02125
North End	02113
Roslindale	02131
Roxbury	02119, 02120
South Boston	02127, 02210
South Dorchester	02122, 02124
South End	02111, 02118
West Roxbury	02132

Nephritis/Nephrosis: Inflammation of the kidneys (nephritis), or kidney disease with severe protein loss and fluid retention or degenerative changes in the kidneys without inflammation (nephrosis). ICD-10 codes N00-N07, N17-N19, and N25-N27 are used to identify deaths from nephritis/nephrosis for analysis.

Nonfatal Assault-Related Gunshot/Stabbing: Nonfatal assault-related Injuries due to gunshots and/or piercings and cuts by a sharp object such as a knife. Emergency department visits for such injuries were identified among three databases from the Massachusetts Center for Health Information and Analysis: Acute Case Mix Databases. ICD-9 codes E956 and E965 are used to identify nonfatal gunshot/stabbings.

Obesity: Obesity is a condition in which an accumulation of excess body fat has occurred to the extent that it may lead to adverse health events. Adults with a Body Mass Index (BMI) of equal to or greater than 30 kg/m^2 are considered obese. Obesity among children and youth is determined by a BMI

percentile standard ranking of 95% or higher.

Other Injury Death: Deaths from injuries caused by accidents or incidents of undetermined intent. These include motor vehicle accidents, other land transport accidents, unspecified transport accidents, falls, discharge of firearms, drowning and submersion, exposure to smoke, fire, or flames; poisoning or exposure to noxious substances, discharge of firearms, and other events considered accidents or of undetermined intent. This does not include homicide and suicide. ICD-10 codes V01, V05, V06, V09.1, V09.3-V09.9, V10, V11, V15-V18, V19.3, V19.8, V19.9, V80.0-V80.2, V80.6-V80.9, V81.2-V81.9, V87.9, v88.9, V89.0,-V89.3, V89.9, V90-V99, W00-W20, W32-W99, X00-X39, W75-W99, X40-X49, X50-X59, Y10 -Y34, Y85, Y86, Y87.2, Y89.9 are used to identify other injury death.

Physical Activity: Physical activity is anything that gets your body moving. According to the *2008 Physical Activity Guidelines for Americans*, adults and children need to do two types of physical activity to improve health–aerobic and muscle-strengthening.

Point Estimate: A single value calculated from survey sample data indicating the estimated percentage of a population with a given characteristic. A point estimate serves as the best approximation for an unknown population parameter and should be interpreted with information that considers the standard error associated with the estimate. See Note to the Readers section of this report.

Population: Two types of population statistics are used in this report. The first is the census of the population taken every ten years by the U.S. Census Bureau; it is a literal count of people living in the United States. The second is population estimates from a sample of the population made by the U.S. Census Bureau using the American Community Survey (ACS). Data from the 2000 and 2010 U.S. Census as well as American Community Survey are presented in the Demographic and Social Determinants of Health chapters in *Health of Boston 2014*.

The national decennial census provides the most accurate count of the U.S. population. It presents data to the level of small areas called census tracts, which may have only a few thousand residents, to larger areas such as zip codes. Census tracts or zip codes can be combined to permit Boston neighborhood-level analyses. Zip code-based populations derived through interpolation and extrapolation using data from the 2000 and 2010 U.S. Census are included in the calculation of rates for this report.

The U.S. Census Bureau uses the American Community Survey (ACS) to produce annual estimates that describe the population and housing characteristics of people in the United States. Estimates, by their

nature, are less precise than population census data. Because they are generated from a sample, estimates are associated with a margin of error that describes the level of accuracy. Margins of error need be considered when making any comparisons among estimate data. In *Health of Boston 2014-2015*, ACS estimates are used in the Demographic and Socioeconomic sections. Though margins of error are not presented with these estimates, differences cited reflect statistical significance at the 95% confidence level (as opposed to the 90% confidence level that ACS provides). Additionally, estimates with coefficients of variation equal to or greater than 30% have not been included. For more information on the treatment of ACS estimates within this report, please contact the Boston Public Health Commission Research and Evaluation Office.

Poverty: There are two predominant definitions of poverty. One is defined by the U.S. Census Bureau and referred to as *poverty thresholds* and the other is defined by the Department of Health and Human Services and referred to as *poverty guidelines*. The poverty definition used for data presented in poverty-related charts in *Health of Boston 2014* is the United States Census Bureau poverty thresholds. Poverty estimates are derived from the American Community Survey.

The U.S. Census Bureau's definition of poverty is a federal definition characterized by a series of poverty thresholds or dollar amounts which specify before-taxes, monetary income maximums an individual and/or family can earn in a given year and still be declared impoverished. This definition is based on same household of residence and takes into account family size and age structure. In 2012 for example, a family of four with two children and two adults had a poverty threshold of $23,283, while a single person under the age of 65 had a poverty threshold of $11,945. It does not include any income that may have been generated through federal financial assistance programs, capital gains, or from children under the age of 15; foster children are not included in the calculations. Poverty thresholds are not adjusted for regional differences in mean/median income levels. However, they are modified annually to account for inflation according to rates specified by the Consumer Price Index.

Poverty Level: A poverty level is the minimum level of income deemed necessary to achieve an adequate standard of living in a given country. Poverty level is what is used to describe poverty thresholds throughout this report.

Preterm Births: A preterm birth refers to the birth of a baby less than 37 weeks gestational age. Preterm births are the major cause of neonatal mortality in the United States.

Race/Ethnicity: All racial and ethnic designations except those from the death certificate, some hospital discharge data, and some emergency department data are self-reported.

Several cautions should be kept in mind when using data reported by race/ethnicity. Race and ethnicity are social constructions, not biological facts. There is often more genetic variation between members of the same race than between members of different races. In addition, the meanings of these designations are highly subject to historical, cultural, and political forces. Not only do these designations change over time, but there is also a very subjective element that influences who is considered a member of one group or another. The concept of race can be notably vague: the term "Black," for example, includes people describing themselves as African American, African, or Caribbean, groups with distinct histories and differing health risks.

Nevertheless, racial designations are useful in that they are nearly universally used by people in the United States to describe themselves, and they permit us to identify and address health inequities that exist across racial and ethnic groups.

Latinos can be of any race. In *Health of Boston 2014-2015* data for persons of Latin descent are presented alongside Non-Latino racial groups. Prior to 2008, Massachusetts' hospitalization and emergency department visits data by race/ethnicity were subject to variation in reporting practices by hospitals. As a result, stratification of hospitalization and emergency department visit data by race/ethnicity prior to 2008 was not possible in this report. Also, because of changes made by the U.S. Census Bureau in the collection and reporting of population data by race/ethnicity, comparing 1990 U.S. Census population data by race/ethnicity with 2000 or 2010 U.S. Census population data by race/ethnicity is discouraged.

In this report, Boston-specific data by race and ethnicity is presented for non-Latino Asians, non-Latino Blacks, non-Latino Whites, and Latino residents of any race. Few sources have data in large enough counts to allow presentation of data about smaller groups such as the many ethnicities included in the category "Asian."

Rates: A rate is a measure of a type of event, disease, or condition occurring among a population per unit(s) of time, for instance, the number of deaths due to diseases of the heart per 100,000 population for a given year or across multiple years. Three types of rates are presented in this report: crude rates, age-specific rates (ASRs), and age-adjusted rates (AARs).

In this report, most hospitalization, emergency department visit, and death rates are based on the primary diagnosis only. Nonfatal gunshot/stabbing ED visits and substance abuse rates are based on consideration of multiple levels of diagnosis.

The population denominators used for calculating rates are derived through interpolation or extrapolation using data from the 2000 and 2010 U.S Census. Linear interpolation/extrapolation involves the calculation of an average annual percent change for use in estimating population denominators. Linear interpolation is preferred to using a single year of U.S. Census data when calculating rates for intercensal years. The use of this method in *Health of Boston 2014-2015* is new; therefore, rates from this report cannot be compared to previous Health of Boston reports since those rates were calculated based on population denominators that came directly from the 2000 or 2010 U.S. Census.

Sample Size: The sample size refers to the number of people who responded to a survey (i.e., respondents). Also see definition for insufficient sample size.

Sexually Transmitted Infection (STI): An infection spread from person to person during sexual contact.

Socioeconomic Status (SES): An economic and sociological measure based on multiple factors, including but not limited to income, education, and occupation, that describes an individual's or family's economic and social position relative to others.

Standard Population: A specific population (e.g. Boston) or subpopulation (e.g. Boston females) whose age distribution is used in the calculation of standardized rates for purposes of comparison. The two standard populations used in this report (i.e., all ages, and ages 12 and older) come from the 2000 U.S. standard population.

Statistical Significance: An attribute of data based on statistical testing. A statistical test examines differences between rates or percentages to help determine if that observed difference reflects a true difference in the actual population experience. Statistical significance means that an observed difference is most likely true but not that is necessarily meaningful or important. For more information see #4 and #5 in Note to Readers.

Substance Abuse Deaths: Deaths in which alcohol and/or drugs played a causal role (Alcohol-Related Deaths and Drug-Related Deaths) excluding suicide determinations. Due to changes in case identification practices, counts and rates of substance abuse deaths cannot be compared to data presented in previous Health of Boston reports. Deaths in which the intent (accident, suicide, homicide) was unknown/undetermined are included among all substance abuse death data.

Substance Abuse Hospital Patient Encounters: Encounters are substance abuse related patient visits/discharges from any of the three acute care hospital settings: hospital inpatient, emergency department, observational stay. Substance abuse hospital patient encounters are identified by ICD9-CM codes relating to alcohol/drug dependence, alcohol/drug abuse, and unintentional overdose/poisoning of alcohol and other drugs of abuse. The relevant ICD9-CM codes could present on any level of diagnosis. As a result, a single encounter could present with multiple drug mentions and would be counted once in each of the relevant totals. Patient encounters do not represent unique persons. A unique person (i.e., Boston resident) may present to the hospital multiple times in a given time period (i.e., year). Drugs among our unintentional overdose/poisonings are a subset of all drugs and include alcohol, heroin, other opiates/opioids, cocaine, benzodiazepines, barbiturates, other sedatives, other tranquilizers, antidepressants, psychodysleptics (hallucinogens) and psychostimulants (see ICD9-CM codes below). Additionally, all overdose/poisoning patient encounters required having the first external causes of injury code (e-code) among E800-E869, E880-E929, E980-E989 (identifying accidental or undetermined intent) or present with no e-code in the case record. ICD9-CM Codes: Alcohol dependence or abuse (303, 3030, 3039, 3050), drug dependence or abuse(3040, 3041, 3042, 3043, 3044, 3045, 3046, 3047, 3048, 3049, 3052, 3053, 3054, 3055, 3056, 3057, 3058, 3059) and alcohol or drug overdose/poisoning: E8600, E8609, 9800, E8500, E8501, E8502, E8509, E8530, E8531, E8532, E8538, E8539, E8540, E8541, E8542, E8543, E8548, E851, E852, E8552, 9650, 9670, 9674, 9678, 9685, 9690, 9691, 9692, 9693, 9694, 9695, 9696, 9697, 9698, 9699, 9700, 9708, 9809. (Note: codes pertaining to unspecified/unknown drug poisoning were excluded from this analysis).

Suicide: The intentional and voluntary taking of one's own life. ICD-10 codes X60-X84 and Y87.0 are used in identifying cases of suicide. Of note, every year there are a number of injuries deaths with unknown/undetermined intent. In these cases, medical examiners did not have enough information to determine if the death was an accident, suicide, or homicide. As a result the rates of suicide are considered an undercount.

Unintentional Overdose/Poisoning: Hospital and mortality cases directly resulting from accidental drug and/or alcohol poisoning or in which the intent was undetermined/unknown. Known self-harm/suicide and homicide cases are excluded. Additionally, hospital cases resulting from adverse effects of drugs taken as prescribed are excluded.

White: All persons self-identified as White who do not also identify themselves as Latino.

Data Sources

Infectious Disease Data

Source: Communicable Disease Database, Communicable Disease Control Division, Infectious Disease Bureau, Boston Public Health Commission

Data from communicable disease surveillance systems are limited by the degree to which people with a condition seek health care that results in testing and reporting to the system. Many such diseases are asymptomatic or mild, or are treated presumptively without formal testing, and for some conditions, reporting may be less than complete. All of these factors may contribute to underestimates of the frequency of disease and/or distortions in the pattern of disease seen in the reported data.

Source: Division of Sexually Transmitted Disease (STD) Prevention, Bureau of Communicable Disease Control, Massachusetts Department of Public Health

New cases of chlamydia, syphilis and gonorrhea infection are reported to the Massachusetts Department of Public Health by diagnosing physicians and laboratories. Undiagnosed cases and variations in screening practices, and compliance with reporting requirements may influence the accuracy of reported sexually transmitted infections. Due to changes in case identification practices, counts and rates of sexually transmitted infections, such as chlamydia, presented in *Health of Boston 2014* cannot be compared to data in Health of Boston reports prior to 2011.

Source: HIV/AIDS Surveillance Program, Bureau of Communicable Disease Control, Massachusetts Department of Public Health

New cases of HIV/AIDS infection are reported to the Massachusetts Department of Public Health by diagnosing physicians and laboratories. Undiagnosed cases may influence the accuracy of reported cases and impede interpretation of HIV/AIDS case data.

Survey Data

Source: American Community Survey, Bureau of the Census, U.S. Department of Commerce

The American Community Survey (ACS) uses a sample of the population to provide information about demographics, housing, and socioeconomic characteristics of communities. People who live in

households, students, and those in institutions or other group quarters (e.g. jails, college dormitories, and nursing homes) are sampled. *Health of Boston 2014* presents estimates both for single and aggregated years.

The ACS results used in describing the Boston population are subject to the limitations common to all surveys. Samples produce estimates that can never be as precise as tabulations of the whole population. Other kinds of errors can further affect the precision of estimates, and nonrandom (or systematic) error has the potential to bias findings.

Source: Boston Behavioral Risk Factor Survey, Boston Behavioral Risk Factor Surveillance System (BBRFSS), Boston Public Health Commission

The Boston Behavioral Risk Factor Surveillance System (BBRFSS) is a system of telephone health surveys of adults living in non-institutional household settings ages 18 and over that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury.

The Boston Public Health Commission (BPHC) conducts an independent survey approximately every other year modeled after the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS) survey. Over time, the survey has been modified by BPHC to be more reflective of health risk behaviors specific to the Boston population. However, the Boston Behavioral Risk Factor Surveillance System survey has maintained many standard core questions included in the BRFSS used by the Massachusetts Department of Public Health. Results from the survey are used by BPHC to plan and implement health initiatives; to identify health problems within populations; to identify racial/ethnic inequities in access to and utilization of health care, in risk behaviors, and selected health conditions; to establish and monitor health objectives; to support health-related legislative activities; to evaluate disease prevention activities and programs; and to assist in receiving grants and other funding.

Source: Youth Risk Behavior Survey, Youth Risk Behavior Surveillance System (YRBSS), Centers for Disease Control and Prevention

The Youth Risk Behavior Surveillance System (YRBSS) is a system of national school-based surveys conducted by the Centers for Disease Control and Prevention (CDC) every other year among public high school students in grades 9-12. It is currently conducted in 47 states, 6 territories, 2 tribal governments, and 22 cities. The survey contains questions related to risk behaviors such as

unintentional injuries and violence, alcohol and drug use, tobacco use, sexual behavior, unhealthy eating behaviors, physical inactivity, and the prevalence of obesity and asthma.

The Boston Public Health Commission uses results from the YRBSS to identify the prevalence of health risk behaviors among Boston youth, identify racial/ethnic inequities, plan and implement health initiatives, support health-related legislative activities, and assist in obtaining grants and other funding.

Source: Boston Survey of Children's Health 2012, Boston Public Health Commission

The Boston Survey of Children's Health (BSCH) is a random-digit-dial phone survey of adult parents and caregivers of children ages 0-17 years. The survey questionnaire and methodology are modeled after the National Survey of Children's Health (NSCH) to allow the opportunity to compare data for Boston children with national and Massachusetts data.

Vital Records

Source: Boston Resident Live Births, Registry of Vital Records and Statistics, Bureau of Health Information Research Statistics and Evaluation, Massachusetts Department of Public Health

The recording of resident live births is nearly complete for Massachusetts resident births, including those that take place at home or out-of-state but to Massachusetts residents.

Race/ethnicity is self-reported by the mother. Infants are assigned their mother's race/ethnicity, and not a combination of both parents' race/ethnicity.

Source: Boston Resident Deaths, Registry of Vital Records and Statistics, Bureau of Health Information Research Statistics and Evaluation, Massachusetts Department of Public Health

Death data used by the Boston Public Health Commission pertains only to Boston residents.

Death records are completed with the assistance of an informant, typically a family member or funeral director, which may result in errors (for example, in race/ethnicity reporting) that would not occur in self-reported data.

Inconsistencies in the recording of immediate cause of death, intervening causes, and the underlying cause of death have been documented nationally. Such inconsistencies may result in under- or over-reporting of certain causes. Typically, death data are embargoed until after public release by the

Massachusetts Department of Public Health, which occurs approximately 14 months after the close of the data year.

Other Data

Source: Acute Hospital Case Mix Databases (Hospital Inpatient Discharge Database; Outpatient Hospital Observation Discharge Database; Outpatient Emergency Department Database), Massachusetts Center for Health Information and Analysis

Rates are based on the total number of discharges. Data represent the primary diagnosis only. Exceptions include nonfatal gunshot/stabbing ED visits and substance abuse rates. These indicators are based on consideration of multiple diagnoses levels. All rates are based on fiscal years running October through September.

Source: Bureau of Substance Abuse Services, Massachusetts Department of Public Health

The Bureau of Substance Abuse Services at the Massachusetts Department of Public Health provided publicly-supported substance abuse treatment admissions data for Boston resident treatment clients. These data are fiscal year based (July-June). Drug-specific rates of treatment clients presented within *Health of Boston 2014* reflect unique-person counts of clients identifying a specific drug as being either a primary, secondary or tertiary substance of abuse. This methodology of quantifying a given drug's exposure among the treatment client base is meant to better help identify the extent of drug-specific abuse among the client base for drugs not typically identified as a primary drug of abuse. Treatment admissions data reflect only individuals who have successfully accessed the treatment system and, therefore, do not describe the whole Boston resident drug abuse experience. For more analytic information please contact the Boston Public Health Commission Research and Evaluation Office.

Source: Census 2000 and 2010, Bureau of the Census, U.S. Department of Commerce

The U.S. census is conducted every ten years. Data from the 2000 and 2010 Censuses were used to interpolate and extrapolate denominators for the calculation of rates in this report. Since the population data used for these rates are estimates and not official counts, observed rate changes over time may to some extent reflect changes in the underlying population not accounted for when using estimates. Additionally, undercounts of certain subpopulations may occur when people (for example, undocumented immigrants) avoid being recorded in the census for fear of contact with the government or for other reasons. The use of interpolated/extrapolated population data was not used in previous

Health of Boston reports. Therefore, population-based rates in previous Health of Boston reports are not comparable.

The collection and coding of race/ethnicity data has changed significantly over time. Hispanic ethnicity was not asked until 1930, and then was limited to Mexican ancestry. It was collected in 1940 for all Hispanics/Latinos, but then not again until 1970 when it was only included in samples, and not in the count of the whole population. Beginning in 1980, Hispanic origin has been a regular part of the data collection. The capacity to distinguish race groups from Hispanic/Latino origin was not built into the census until 1980. See Race and Ethnicity section in Technical Notes for additional information.

Source: City of Boston Annual Homeless Census, Emergency Shelter Commission, Boston Public Health Commission

The City of Boston Homeless Census is conducted every December. It is a count of homeless persons living on the streets, in emergency shelters, in domestic violence programs, in residential mental health or substance abuse programs, transitional housing and in specialized programs serving homeless youth and homeless veterans.

Source: Foreclosures, Department of Neighborhood Development

The Boston Foreclosure Accountability Ordinance requires all owners of abandoned and/or foreclosing residential properties to register them with Boston's Inspectional Services Department (ISD). If the property is abandoned, the registration must state the name and address of the person or company responsible for its security and maintenance. The registration must be received within seven days of abandonment or initiation of the foreclosure process.

Source: Lead Screening, Boston Childhood Lead Poisoning Prevention Program, Environmental Health Office, Boston Public Health Commission

Massachusetts law requires annual mandatory screening of children between 6 and 48 months of age. The Boston Public Health Commission Lead Poisoning Prevention Program conducts annual screening of Boston children 72 months of age or under.

The elevated blood lead level data reported in this report are solely related to those children who are screened. In 2012, the guidelines used for diagnosing elevated blood lead levels in children were changed. See Technical Notes.

Source: Office of Data and Accountability, Boston Public Schools

Data comes from reports previously published by Boston Public Schools.

Source: Pediatric Nutrition Surveillance, Nutrition Division, Bureau of Family Health and Nutrition, Massachusetts Department of Public Health

Massachusetts has participated in the national Pediatric Nutrition Surveillance System since 1993. Agencies in Massachusetts collect information on infants and children up to age five who attend Women, Infant and Children (WIC) clinics for routine care, nutrition education, and supplemental foods.