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/m²). 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.

<table>
<thead>
<tr>
<th>Weight Status Category</th>
<th>Percentile Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>Less than the 5th percentile</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>5th percentile to less than the 85th percentile</td>
</tr>
<tr>
<td>Overweight</td>
<td>85th to less than the 95th percentile</td>
</tr>
<tr>
<td>Obese</td>
<td>Equal to or greater than the 95th percentile</td>
</tr>
</tbody>
</table>

The BMI cut points for adults are as follows:

<table>
<thead>
<tr>
<th>Weight Status Category</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight</td>
<td>BMI of 25.0 to 29.9</td>
</tr>
<tr>
<td>Obese</td>
<td>BMI of 30.0 or more</td>
</tr>
</tbody>
</table>

**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 every 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)
<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Zip Codes/ZCTAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allston/Brighton</td>
<td>02134, 02135, 02163, 02467</td>
</tr>
<tr>
<td>Back Bay (Back Bay, Downtown,</td>
<td>02108-02110, 02113-02114, 02116, 02199</td>
</tr>
<tr>
<td>Beacon Hill, West End)</td>
<td></td>
</tr>
<tr>
<td>Charlestown</td>
<td>02129</td>
</tr>
<tr>
<td>East Boston</td>
<td>02128</td>
</tr>
<tr>
<td>Fenway</td>
<td>02115, 02215</td>
</tr>
<tr>
<td>Hyde Park</td>
<td>02136</td>
</tr>
<tr>
<td>Jamaica Plain</td>
<td>02130</td>
</tr>
<tr>
<td>Mattapan</td>
<td>02126</td>
</tr>
<tr>
<td>North Dorchester</td>
<td>02121, 02125</td>
</tr>
<tr>
<td>North End</td>
<td>02113</td>
</tr>
<tr>
<td>Roslindale</td>
<td>02131</td>
</tr>
<tr>
<td>Roxbury</td>
<td>02119, 02120</td>
</tr>
<tr>
<td>South Boston</td>
<td>02127, 02210</td>
</tr>
<tr>
<td>South Dorchester</td>
<td>02122, 02124</td>
</tr>
<tr>
<td>South End</td>
<td>02111, 02118</td>
</tr>
<tr>
<td>West Roxbury</td>
<td>02132</td>
</tr>
</tbody>
</table>

**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/m² are considered obese. Obesity among children and youth is determined by a BMI
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 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.