Health of Boston 2012-2013

A Neighborhood Focus
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Boston Public Health Commission
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Introduction

Welcome to the *Health of Boston 2012-2013: A Neighborhood Focus*!

Since 1996, the Health of Boston reports have been commissioned annually to provide information about the health of city of Boston residents. As the title suggests, this year’s report provides a closer look at the health of Boston’s neighborhoods. In addition to demographic and socioeconomic data, the report presents approximately 30 health indicators by year and by racial/ethnic group for Boston overall and for each of the 15 Boston neighborhoods recognized in past HOB reports, plus the North End and Chinatown, as the data permits. These indicators were selected based on specific public health relevance and data availability. There are many other important health indicators not presented in this report that the Boston Public Health Commission will present in other reports and presentations. As always, we welcome requests for these data as well as more targeted requests for the indicator data presented in this report.

*Health of Boston 2012-2013: A Neighborhood Focus* looks quite different from past Health of Boston reports. A number of format changes were utilized to frame the data. In particular, data tables were incorporated throughout the health indicator sections in order to efficiently present extensive trend and racial/ethnic data for Boston overall and individual Boston neighborhoods.

As with previous Health of Boston reports, this report does not attempt to identify causality or make policy recommendations. Instead, it provides descriptive information intended to stimulate dialogue among individuals and within our communities.

**Report Overview**

The report begins with an executive summary and some notes to the readers, then proceeds with three sections (Health Equity, Demographic Profile, and Socioeconomic Profile) that offer a presentation of many social, economic, and environmental factors that are recognized to have profound influence on the health experience of individuals and populations, collectively referred to as Social Determinants of Health. Taken together, social determinants of health help provide a necessary foundation for understanding factors influencing the differences in health experience across various groups and smaller populations within the city as a whole. For many years, Health of Boston reports have revealed significant racial/ethnic health differences often referred to as racial/ethnic "health disparities" or "health inequities". In short, Asian and White Boston residents tend to have much better health experiences than their Black and Latino neighbors. Social determinants of health provide necessary context for understanding and addressing these differences. These three sections of the report provide the social determinant framework for the health data that follow.

The Boston Health Indicators section presents approximately 30 health indicators including data on select birth outcomes, health-related behaviors, disease incidence, hospitalizations, emergency department visits, and causes of death. These data are presented in trend tables that show rate changes over time and race/ethnicity tables that show rates by racial/ethnic group. Important differences are presented as bulleted highlights below the tables.

Next, the report presents the most comprehensive presentation of Boston neighborhood-level data to date. For each neighborhood, there are charts that describe demographic and socioeconomic characteristics, and health indicator tables in the same format as for Boston overall.

The report concludes with technical notes, a description of data sources and limitations, and a glossary.

We hope you enjoy the report and find the information presented here useful in our collective aim to live, learn, and nurture healthier individuals and communities.
EXECUTIVE SUMMARY

*Health of Boston 2012-2013: A Neighborhood Focus* provides extensive information about the health of city of Boston residents. In addition to demographic and socioeconomic data, the report presents health trends and racial/ethnic comparisons spanning approximately 30 health indicators for Boston overall and by Boston neighborhood. The report does not identify causality or make policy recommendations, but instead, provides descriptive information intended to encourage informed dialogue. What follows is a brief summary of some of the descriptive information presented within the report.

**Health Equity**

As you review the sections that follow, you will notice significant differences between the health of Boston's residents of color and the health of White residents. White residents, on average, enjoy better health than Black and Latino residents. These differences in health based on race are systemic, avoidable, unfair, and unjust; therefore, are referred to as health inequities. Health inequities are the result of multiple factors at the individual, community, and societal levels working together to create inequitable access, opportunities, and experiences based on race. Health inequities are found across multiple health conditions.

There are many factors at the individual and community levels that impact health – individual factors, such as biology and personal behaviors; relationships such as family and social networks; and social and physical environments of where one lives, works, and plays. While we often think first about biology, individual behavior, and health care access as the most important determinants of health, in actuality community-level factors, such as housing, education, environmental exposure, public safety, employment and income, are strong predictors of health. These features of one's social and physical environment are called the social determinants of health.

When examining how these factors contribute to health inequities, it is important to understand how experiences within the individual and community context differ by race. Health-promoting resources are distributed unevenly across the city and follow patterns of racial segregation and poverty concentration. This inequitable distribution of resources, coupled with residential segregation, results in people of color often living in neighborhoods where there is less access to conditions and opportunities that promote health, such as fresh fruits and vegetables, open green space, quality housing, and employment. Understanding the pathways and mechanisms through which social conditions affect health and contribute to health inequities is fundamental to understanding the health of populations.

**Boston: Demographic Profile**

In 2010, Boston had 617,594 residents. The overall population of Boston increased 5% between 2000 and 2010. During that time, the number of Latino residents and Asian residents increased by 27% and 25%, respectively. While English was the language most frequently reported being spoken at home, 35% of Boston residents ages 5 and over reported speaking a language other than English at home. Among the languages other than English spoken at home, Spanish (including Spanish Creole) was the most widely spoken language (15% of all homes), followed by French (including Patois, Cajun, and French Creole) (5%), Chinese (4%), Portuguese (including Portuguese Creole) (2%), and Vietnamese (2%).
Boston: Socioeconomic Profile

Socioeconomic status (SES) is a measure of an individual’s or family’s economic and social position relative to others based on income, education, and occupation. Low socioeconomic status is associated with limited access to regular health care, adequate housing, quality education, nutritious food, recreational opportunities, and other resources associated with a healthy lifestyle. The socioeconomic status of Boston residents varies dramatically by race/ethnicity, gender, and age. Key points from the socioeconomic status section in this report include the following in 2010:

- Sixty percent of female-headed households with children under age 5 had income below the poverty level compared with 18% for all family households in Boston
- The median annual household income for Latino households was $23,243 compared with $61,636 for White households
- The percentage of Boston residents with less than a high school diploma or GED was significantly higher among Latino adults (32%), Asian adults (24%) and Black adults (20%) compared with White adults (7%)
- Black male residents had an unemployment rate of 32% – almost four times the rate of 9% for White male residents
- More than 7,600 homeless individuals were counted in Boston in 2011; 33% of these individuals were children

Boston Health Indicators: Trends

Analysis of select Boston health indicators over time revealed progress or sustained improvement in a number of key public health priority areas:

- The adolescent birth rate for Boston female residents ages 15-17 decreased 9% from 2005 to 2010 and the overall percentage of preterm births among all Boston resident births decreased from 11% in 2005 to a preliminary 9% in 2010.
- The 5-year rolling average infant death rate for Black infants declined 11% from the period 2001-2005 to 2006-2010, based on preliminary data, compared to a decline of 8% for Boston overall. Between the periods of 2001-2005 and 2006-2010, the 5-year rolling averages for infant death rates for most of Boston neighborhoods also declined.
- Boston's stroke-related death rate decreased 15% from 2005 to 2010 based on preliminary death data for 2010.
- Boston’s heart disease hospitalization rate decreased 10% from 2005 to 2011 and the heart disease death rate decreased 16% from 2005 to 2010 based on preliminary death data for 2010.
- From 2001 to 2011, the percentage of Boston public high school students who reported smoking cigarettes decreased. Similarly, the percentage of Boston adult residents who reported smoking cigarettes decreased from 2001 to 2010.
- From 2001 to 2011, the percentage of Boston public high school students who reported persistent sadness (feeling sad, blue, or depressed every day for two weeks straight during the past year) decreased.
Analysis of other select Boston health indicators over time suggest continued need for improvement:

- Though similar to the US overall, based on preliminary data, Boston’s 5-year rolling average for its infant death rate remains higher than the IMR for Massachusetts overall for the period of 2006-2010.

- From 2001 to 2011, the percentage of public high school students getting regular physical activity during the past week and the percentage reporting excessive alcohol consumption (binge drinking) during the past month remained statistically similar.

- From 2007 to 2011, the percentage of public high school students who reported drinking one or more sodas per day and the percentage considered obese remained statistically similar.

- From 2001 to 2010, the percentage of Boston adult residents considered obese (whose body mass index or BMI is 30 or more) increased.

- The percentage of Boston adults who reported getting regular physical activity, having asthma, having diabetes, and having persistent sadness (being sad, blue or depressed 15 or more days during the past month) remained statistically similar from 2001 to 2010.

**Boston Health Indicators: Racial/Ethnic Group Comparisons**

Comparisons of racial/ethnic heath indicator data show Boston's Black and Latino residents continue to experience higher levels of chronic disease, mortality, and poorer health outcomes compared with White and Asian residents. Compared to Boston's White residents, Black and Latino residents had higher rates of:

- Births to adolescent females
- Low birth weight births
- Infant deaths
- Asthma emergency department visits among children less than 5 years old
- Heart disease hospitalizations
- Cerebrovascular disease (including stroke)-related hospitalizations
- Diabetes hospitalizations
- Nonfatal gunshot and stabbing injuries resulting in emergency department visits
- Homicide
- Adult obesity (based on self-reported height and weight)
- Adults who self-reported having persistent sadness (feeling sad, blue or depressed 15 or more of the past 30 days)
Neighborhood Profiles and Health Indicators

Where one lives contributes to shaping health behaviors and influencing one's health. In this year's Health of Boston, there is a much bigger emphasis on neighborhood-level data than in past years. Boston's neighborhoods vary in population characteristics and socioeconomic circumstances. As a result, for each neighborhood there are graphs, where data permits, that describe the population's gender and age distribution, household type, family poverty status, housing tenure (rental vs. owner-occupied), and educational attainment.

Neighborhood-level racial/ethnic distribution data exist in the Boston Demographic Profile section to allow for comparisons with Boston overall, other neighborhoods, and over time. In addition, there is a map for each neighborhood that identifies locations of known community assets. Finally, each neighborhood presents health indicator tables in the same format as for Boston overall: indicators over time and by racial/ethnic group.

Neighborhood Health Indicators: Trends

Similar to Boston overall, an analysis of neighborhood select health indicators over time reveals progress for several key public health priority areas:

- According to preliminary death data for 2010, from 2005 to 2010, Mattapan and Roxbury experienced the greatest decrease in their adolescent birth rates for females ages 15-17 among Boston neighborhoods. The decrease for Mattapan was 55% and for Roxbury 40%. Roslindale and North Dorchester experienced the greatest decrease in preterm births, 40% and 27% respectively, from 2005 to 2010.

- Based on preliminary death data for 2010, between 2005 and 2010, heart disease hospitalization rates and heart disease death rates decreased for the majority of Boston neighborhoods. Decreases in rates for heart disease hospitalization ranged from 4% to 31%. The greatest decreases occurred for residents of Charlestown (30%) and South Boston (31%). Rates for both Mattapan and North Dorchester increased 30% and 9%, respectively.

- Heart disease death rates also decreased for most of Boston neighborhoods. According to preliminary death data for 2010, between 2005 and 2010, decreases ranged, decreases for heart disease death rates ranged from less than 1% to 57%, with the North End and Jamaica Plain experiencing the greatest decreases of 57% and 36% respectively, followed by Mattapan and Back Bay with 34% each. North Dorchester was the only neighborhood whose heart disease death rate increased, although the increase was small (4%).

- Almost all of Boston neighborhoods experienced a decrease in asthma emergency department visits between 2005 and 2011 for children under the age of five. The greatest decreases occurred for South Boston (56%), Hyde Park (39%), and Roxbury (36%). Allston/Brighton, East Boston, and Fenway experienced increases of 23%, 27%, and 38% respectively.

The entire Health of Boston 2012-2013: A Neighborhood Focus will be available on the Boston Public Health Commission’s website at www.bphc.org.
# Health of Boston 2012–2013

## Population

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<th>18-64</th>
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## Maternal/Child Indicators

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<td>Low Birth Weight Births</td>
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<td>8.9%</td>
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<td>Preterm Births</td>
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## Mortality Rates

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*Age-adjusted rates

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. Birth and death data for 2010 are preliminary and should be interpreted with caution. Until data are final, some changes in data values may occur during data quality processes.

For data source information see end of the Executive Summary section.
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Notes:
- Includes other race/ethnicity.
- Rate by race/ethnicity is not presented due to high percentage of missing data.
- Gray gray represents rates based on counts of less than 20, and should be interpreted with caution. Black text represents rates based on counts of at least 20.
- Regular Physical Activity and percent overweight/obese for 2010 are preliminary and should be interpreted with caution. Until data are final, some changes in data values may occur during data quality processes. For data source information, see the Executive Summary section.
Map 1 Socioeconomic Status, 2006-2010

SES Index*
- Highest (8 - 9)
- Median (5 - 7)
- Lowest (3 - 4)
- Insufficient Sample Size

*This index was determined by assigning a value to each neighborhood based on whether a specific indicator represents a condition associated with higher (value=3) or lower (value=1) socioeconomic status (SES) when compared with Boston, or a condition associated with SES not different from Boston (value=2). These values are then added to create this index.

DATA SOURCE: US Census Bureau, 2006-2010 American Community Survey
DATA ANALYSIS: Boston Public Health Commission Research and Evaluation Office
MAP CREATED BY: Boston Public Health Commission Research and Evaluation Office
NOTE: The neighborhood definitions are based on census tracts.

Compared to Boston Overall
- Significantly lower than Boston overall
- Not significantly different from Boston overall
- Significantly higher than Boston overall
- Insufficient sample size

*The darker shades denote the higher median household income

The median household income in Boston ranges from $49,625 to $51,743 at 95% confidence level.
The percentage of population with less than high school diploma in Boston ranges from 15.1% to 18.3% at 95% confidence level.
The percentage of families with income below poverty level in Boston ranges from 15.1% to 16.7% at 95% confidence level.
Map 2 Birth Outcomes, Boston, 2005-2010 Average Annual Rates

*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 ANALYSIS: Boston Public Health Commission Research and Evaluation Office

MAPPING DATA: Boston Public Health Commission Research and Evaluation Office

NOTE: Birth and death data for 2010 are preliminary and should be interpreted with caution. Until data are final, some changes in data values may occur during data quality processes. The neighborhood definitions are based on Census tracts.

2006-2010 Boston infant mortality rate: 5.9
2005-2010 Boston preterm birth average: 9.9% of live births
2005-2010 Boston low birth weight average: 9.3% of live births
Map 3 Chronic Disease Hospitalization, Boston, 2005-2011 Average Annual Rates

Chronic Disease Hospitalization Rates

- Lowest Quartile
- 2nd Lowest Quartile
- 2nd Highest Quartile
- Highest Quartile

Chronic Disease Hospitalization Index*

- Low (0 - 1)
- Medium (2)
- High (3)

*This index are 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 chronic diseases shown.

DATA SOURCE: Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis
DATA ANALYSIS: Boston Public Health Commission Research and Evaluation Office
MAP CREATED BY: Boston Public Health Commission Research and Evaluation Office
NOTE: Data are presented as age-adjusted rates.
For specific ICD-9-codes, please see Glossary.
The neighborhood definitions are based on zip codes.

2005-2011 Boston heart disease hospitalization rate (per 1,000 residents): 11.2
2005-2011 Boston diabetes hospitalization rate (per 1,000 residents): 2.3
2005-2011 Boston cerebrovascular (Incl. stroke) hospitalization rate (per 1,000 residents): 2.5
Map 4 Chronic Disease Deaths, Boston, 2005-2010 Average Annual Rates

Chronic Disease Mortality Index*

- Low (0)
- Medium (1)
- High (2)

Cerebrovascular Disease (Incl. Stroke)

Diseases of the Heart

Chronic Disease Mortality Rates
- Lowest Quartile
- 2nd Lowest Quartile
- 2nd Highest Quartile
- Highest Quartile

2005-2010 Boston cerebrovascular disease (Incl. stroke) deaths rate (per 100,000 residents): 35.3
2005-2010 Boston diseases of the heart deaths rate (per 100,000 residents): 152.0

*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 two chronic diseases shown.

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission Research and Evaluation Office
MAP CREATED BY: Boston Public Health Commission Research and Evaluation Office
NOTE: Death data for 2010 are preliminary and should be interpreted with caution. Until data are final, some changes in data values may occur during data quality processes. Data are presented as age-adjusted rates.
For specific ICD-10 codes, please see Glossary.
The neighborhood definitions are based on census tracts.
Map 5 Substance Abuse Deaths and Suicide, Boston, 2005-2010 Average Annual Rates

Mortality Rates
- Lowest Quartile
- 2nd Lowest Quartile
- 2nd Highest Quartile
- Highest Quartile
- Too few occurrences to calculate a rate

Substance Abuse Deaths
2005-2010 Boston substance abuse mortality rate (per 100,000 residents): 33.9

Suicide
2005-2010 Boston suicide rate (per 100,000 residents): 5.7

DATA SOURCE: Boston Resident Deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission Research and Evaluation Office
MAP CREATED BY: Boston Public Health Commission Research and Evaluation Office
NOTE: Death data for 2010 are preliminary and should be interpreted with caution. Until data are final, some changes in data values may occur during data quality processes.
Data are presented as age-adjusted rates.
For specific ICD-10 codes, please see Glossary.
The neighborhood definitions are based on census tracts.
Executive Summary Notes, Data Sources, and Data Analysis

Boston Data Summary Table
DATA SOURCES:
Adolescent Birth Rate, Low Birth Weight Births, and Preterm Births: Boston resident live births, Massachusetts Department of Public Health
Elevated Blood Lead Levels: Boston Public Health Commission Office of Environmental Health
Infant Deaths: Boston Resident Live Births and Deaths, Massachusetts Department of Public Health
Homicide, Substance Abuse Deaths, Suicide, and Leading Causes of Death: Boston Resident Deaths, Massachusetts Department of Public Health
Asthma Emergency Department Visits: Hospital Emergency Department Visits identified among three databases: Inpatient Hospital Discharge Database, Outpatient Hospital Emergency Department Database, and Outpatient Hospital Observation Database, Massachusetts Center for Health Information and Analysis
Heart Disease Hospitalizations, Diabetes Hospitalizations, and Cerebrovascular Disease Hospitalizations (Incl. Stroke): Inpatient Hospital Discharge Database, Massachusetts Center for Health Information and Analysis
Nonfatal Gunshot/Stabbing Emergency Department Visits: Hospital Emergency Department Visits identified among three databases: Inpatient Hospital Discharge Database, Outpatient Hospital Emergency Department Database, and Outpatient Hospital Observation Database, Massachusetts Center for Health Information and Analysis
Chlamydia Incidence: Massachusetts Department of Public Health, STD Division
Hepatitis C Incidence: Communicable Disease Database, Boston Public Health Commission, Communicable Disease Control Division
DATA ANALYSIS: Boston Public Health Commission Research and Evaluation Office

Maps 1-5
ABBREVIATIONS KEY: A/B=Allston/Brighton, BB=Back Bay (includes Beacon Hill, Downtown, North End, and the West End), CH=Charlestown, EB=East Boston, FW=Fenway, HP=Hyde Park, JP=Jamaica Plain, MT=Mattapan, ND=North Dorchester, RS=Roslindale, RX=Roxbury, SB=South Boston, SD=South Dorchester, SE=South End (includes Chinatown), and WR=West Roxbury
NOTE TO READERS

What's the difference between census type data and survey data?

Census type data sources include the U.S. Census, birth data, death data, hospitalization data, and emergency department data. These data sets are created by collecting information from the entire Boston population rather than sampling a subset of the Boston population. The information collected from these data sets reflects the true frequency of events rather than estimates of the true frequency, since information from every single person was accounted for in the data set.

Survey type data sources include the American Community Survey, the Boston Behavioral Risk Factor Surveillance System, and the Youth Risk Behavioral Surveillance System. These data sets are created by collecting information from a randomly selected subset of the Boston population, or sample, which can then be adjusted statistically (or weighted) to make estimates about how the entire Boston population might have responded to the same survey questions if every single person had been interviewed. 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 "margin of error" or "confidence interval" in order to emphasize that the true frequency exists within a range of values with 95% certainty. For this report, the confidence intervals for the estimates presented are used to make determinations about whether estimates differ from one another significantly.

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

As introduced in the previous question, survey data drawn from a randomly selected subset, or sample, of the population generates point estimates, or percentages, of how likely the rate found in the sample population reflects the true rate of the entire population if every single person were accounted for. In order to determine whether two point estimates differ significantly from each other, the confidence intervals, or margin of error surrounding each estimate must be compared. 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. This determination is often referred to as "statistical significance." In this report, when the text refers to estimates as "higher" or "lower" than each other, it means that these estimates are statistically significantly different from each other with 95% certainty.

There are other statistical tests not used for this report that could reveal statistically significant differences in some cases where confidence intervals overlap slightly.

Rates drawn from census type data sources do not routinely undergo statistical testing, since the rates themselves are considered true values for the entire population rather than estimates of the true values based on a sample of the population. This means that the difference in values is interpreted as the true change from year to year or between different groups.

Making a determination about whether these differences are important, or meaningful, includes interpreting the social context in which these data were collected in any given year, changes in how data were categorized or reported, city-wide programs that may have affected event occurrence, etc.
In some instances, a test of significance is used to determine if the difference between two rates drawn from census type data is unlikely due to random chance. This is likely to occur when the difference is considered important and the number of events or cases is extremely small relative to the size of the population.

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

In the section notes, 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 (for example, births, deaths, new cases of a disease) and thus a rate could not be presented. The notation, \( n<7 \), is used when there are fewer than 7 occurrences of an event such as ED visits or hospitalizations. In some instances, combining several years of data increases the sample size enough for data to be reported.

**Why are some rates and percentages in health indicator tables presented in a gray color?**

This is an indication that those rates or percentages were based on counts of less than 20 and their results should be interpreted with caution.

**Why do we sometimes combine several years of data?**

In certain instances, when there are fewer than five 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.

**How do we define neighborhood boundaries in this report?**

Neighborhoods can be defined in a number of ways. In this report, zip codes and census tracts are used to identify neighborhood boundaries since this information is often collected with Boston health data. Most graphs and maps presenting neighborhood data use neighborhood definitions based on zip codes, but graphs, maps, and tables which include birth data, death data, American Community Survey data, and Census data rely on census tracts to define neighborhoods. In this report, the census tracts are those from the 2010 Census.

**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.
Health Equity

The Health of Boston 2012-2013: A Neighborhood Focus report provides a comprehensive view of the health of Boston residents. As you review the sections that follow, you will notice significant differences between the health of Boston’s residents of color and the health of White residents. White residents, on average, enjoy better health than Black and Latino residents. These differences in health based on race are systemic, avoidable, unfair and unjust; therefore, are referred to as health inequities. Health inequities are the result of multiple factors at the individual, community, and societal levels working together to create inequitable access, opportunities, and experiences based on race. The following framework represents these multiple factors and the relationships among them.

Health Inequities

Health inequities are found throughout the life cycle and across multiple health conditions such as birth and asthma ED visits for children, and mortality for specific types of disease overall. For example, according to preliminary death data for 2010, the stroke death rate for Black residents was about one and a half times and for Latino residents, one and a third times the rate for White residents.

Infant mortality is accepted internationally as a reliable indicator of the health status of a population [1]. Groups in which the infant mortality rate (IMR) is high invariably face high levels of other health problems. In Boston, for the period 2006-2010, the 5-year rolling average for infant deaths was 10.9 for Black infants and 6.1 for Latino infants per 1,000 live births, based on preliminary death and birth data for 2010. The rate for Black infants was 3 times higher than the rate of 3.4 for White infants. The rate for Latino infants was 1.8 times higher than the rate for White infants.

Individual & Community Context

There are many factors at the individual and community levels that impact health – individual factors, such as biology and personal behaviors; relationships such as family and social networks; and social and physical environments of where one lives, works, and plays. While we
often think first about biology, individual behavior, and health care access as the most important determinants of health, in actuality community level factors such as housing, education, environmental exposure, public safety, employment and income are actually stronger predictors of health than any of the individual factors. These features of one’s social and physical environment are called the social determinants of health [2].

Social determinants of health can be divided into three core areas: economic conditions, environmental and neighborhood conditions, and social conditions.

**Economic conditions** include employment, income, education, and wealth. Socioeconomic status has long been recognized as a key predictor of health [3]. When considering its relationship to health, socioeconomic position creates a social gradient in which health improves as socioeconomic status rises [4].

**Physical environment and neighborhood conditions** include food access, parks and open space, housing, air quality, liquor and tobacco advertisements, and transportation. These conditions work alone and in concert with each other to affect health. Individuals who live in areas with poor air quality experience higher rates of asthma. Lack of grocery stores that sell affordable fresh produce and the lack of safe and affordable places to engage in physical activity contribute to poor diets, obesity, and diabetes [5].

**Social conditions** include neighborhood safety, social networks, social capital, and civic engagement. Negative social conditions like exposure to racism and neighborhood violence lead to chronic stress. Stress is directly linked to chronic disease, particularly hypertension and heart disease [6]. Research has shown that supportive social networks can serve as a buffer to stress and depression, which in turn, protect against physical and mental illness [7].

When examining how these factors contribute to health inequities, it is important to understand how experiences within the individual and community context differ by race. Health-promoting resources are distributed unevenly across the city and follow patterns of racial segregation and poverty concentration. Resource-rich neighborhoods, which are also predominantly White and more affluent, provide ample opportunities for individuals to make healthy choices and have conditions that positively impact health. Resource-poor neighborhoods, which are also predominantly communities of color and less affluent, often offer fewer opportunities and conditions needed for good health. This inequitable distribution of resources, coupled with residential segregation, results in people of color often living in neighborhoods where there is less access to healthy conditions and opportunities, such as fresh fruits and vegetables, open green space, quality housing, and employment.

The social determinants of health affect individuals at each stage of life, and individuals have differential access and opportunities to healthy social conditions depending on their race. Understanding the pathways and mechanisms through which social conditions affect health and contribute to health inequities is fundamental to understanding the health of populations.

**Societal Context**

Society is organized and characterized by a number of factors that impact the health and well-being of communities in a number of ways. Most broadly, US society is defined by its economic and political systems – capitalism and representative democracy, respectively. In many ways, these systems dictate how power, wealth, and influence are distributed across communities. In addition to these large systems, there are smaller systems that define different societal sectors, including health care, education, media, finance, social services, and justice. Each of these systems, in turn, are characterized by specific institutions – e.g., hospitals, schools, newspapers, banks, community organizations, and courts. It is through these institutions that individuals and communities primarily interact with the larger systems. None of these systems or institutions operate in a
neutral way; they are all influenced by the dominant beliefs and values of the US, including individualism, personal responsibility, and freedom of choice. There are also a number of dominant discriminatory beliefs, such as racism, that influence the way systems operate.

While individuals may not be able to feel their impact directly, all of these societal factors affect the way people live. Systems and institutions shape the opportunities and resources available in communities through their policies and practices. For example, financial aid policies at academic institutions greatly impact the opportunities and resources available to students for higher education. However, policies and practice across institutions do not impact individuals and communities equally; people of color persistently have been shown to have less access to opportunities and resources that promote health and well-being, compared to White people. The influence of racism on our dominant beliefs and values, which inform the policies and practices of all institutions contribute to the unequal distributions of critical health promoting resources.

**Racism**

In the United States, racism plays a significant role in creating and perpetuating health inequities. Social inequities, such as poverty, segregation, and lack of educational and employment opportunities, 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. All forms of racism – structural, institutional, interpersonal, and internalized – contribute to persistent inequities, with people of color disproportionately affected by poor health outcomes, compared to their White counterparts [8]. Understanding the multiple pathways through which racism shapes factors at all levels within society and communities, including socioeconomic status, health behaviors, neighborhood environment, and individual experiences of stress, is essential in addressing racial inequities in health.

At the structural level, racial inequality is perpetuated through a system of allocating social privilege using public policies and institutional practices. At the institutional level, unfair organizational policies and practices affect access to goods, services, and opportunities, including healthcare. At the interpersonal level, prejudice, discrimination, and unconscious bias affect the way people of all races perceive and interact with each other, intentionally and unintentionally. Internalized racism manifests as internalized oppression for people of color and can cause stress, depression, and feelings of inadequacy. White people internalize beliefs of superiority, which affects the way they perceive and interact with each other and with people of color.

**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 may only be effective if they are built on the understanding that social, economic, and environmental inequity are root causes of health inequity, and that improving social, economic, and environmental conditions is essential to improving health outcomes. Strategies must address inequities in education, employment, income, housing, neighborhood safety, recreational opportunities, environmental hazards, and healthy food access, through policy, systems, and environmental change efforts [9]. In addition, these strategies must be rooted on the values of racial justice – equity, inclusion, transformation, sustainability, and integrity.

Addressing root causes of health inequities requires a long-term commitment to comprehensive multi-level and multisectoral strategies to change the social determinants of health and advance racial justice. Broad coalitions of public, private, nonprofit, and community stakeholders are required to change community structures. In order to do this work effectively, resident voices are essential; residents should define the assets and challenges of their communities, identify the possible solutions, and participate in the implementation of those solutions [10]. It is this model of building partnerships with community residents, community-based organizations, and large institutions that is essential to promoting system and policy level change to promote health in all Boston communities.
References


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