Dana-Farber Cancer Institute Community Needs Assessment (CHNA), 2020-2023
# TABLE OF CONTENTS

OVERALL EXECUTIVE SUMMARY ................................................................. i
BACKGROUND .................................................................................................. 1
METHODS ......................................................................................................... 3
  Social Determinants of Health Framework .................................................. 3
  Upstream Approaches to Health ................................................................. 3
  Health Equity Lens ..................................................................................... 3
Secondary Data ............................................................................................... 4
Focus Groups and Key Informant Interviews ............................................... 5
Community Survey ......................................................................................... 6
Data Limitations ............................................................................................. 6
POPULATION OVERVIEW .............................................................................. 8
  Population Count ......................................................................................... 8
  Age Distribution ......................................................................................... 9
  Racial and Ethnic Composition .................................................................. 10
  Educational Attainment .............................................................................. 12
SOCIAL AND ECONOMIC CONTEXT OF BOSTON RESIDENTS .................. 13
  Income and Financial Security .................................................................. 13
  Employment and Workforce ...................................................................... 16
  Housing ...................................................................................................... 17
  Transportation ............................................................................................ 20
  Social Environment and Discrimination .................................................... 21
  Violence and Trauma .................................................................................. 22
PERCEPTIONS OF CANCER AND OTHER HEALTH ISSUES .................... 24
  Community Perceptions of Health Issues .................................................. 24
  Perceptions of Cancer ............................................................................... 25
CANCER PREVENTION ................................................................................. 25
  Smoking .................................................................................................... 27
  Alcohol Misuse .......................................................................................... 30
  Obesity ..................................................................................................... 33
  Physical Activity and Healthy Eating .......................................................... 35
CANCER SCREENING .................................................................................... 41
  Breast Cancer Screening .......................................................................... 41
  Cervical Cancer Screening ........................................................................ 42
  Colorectal Cancer Screening .................................................................... 44
  HPV Vaccination ....................................................................................... 45
  Lung Cancer Screening ............................................................................. 45
  Perceptions of Cancer Screening ............................................................... 46
  Barriers to Accessing Screening Services ................................................. 46
  Cancer Screening Services ...................................................................... 48
HEALTH CARE UTILIZATION, CANCER INCIDENCE, AND MORTALITY ...... 49
  Use and Perceptions of the Health Care System ....................................... 49
  Barriers and Facilitators to Accessing Health Care Services .................... 51
OVERALL EXECUTIVE SUMMARY

This Executive Summary is intended to satisfy the Community Health Needs Assessment report requirement under Internal Revenue Code Section 501(r) and in accordance with the provisions of the Patient Protection and Affordable Care Act.

BACKGROUND

Dana-Farber Cancer Institute (DFCI) is one of the world’s leading cancer treatment and research centers. In addition to providing expert clinical care, DFCI is committed to educating the community and raising awareness about the importance of cancer prevention, outreach, screening, early detection, and clinical trials. To this end, DFCI’s Community Benefits Office provides education and outreach across Boston and beyond, offers support services and resources, and conducts evidence-based interventions through its collaborative work in local neighborhoods as well as through its national and international public and professional education initiatives. The mission of DFCI’s community benefits and outreach activities contributes to the larger goal of advancing diagnosis, care, treatment, cure, and prevention of cancer and related diseases.

In 2019 Dana Farber Cancer Institute (DFCI) and Boston Medical Center (BMC) collaborated to develop a Community Health Needs Assessment (CHNA). This CHNA also builds on information gathered for Boston’s first large-scale collaborative city-wide Community Health Needs Assessment in which target neighborhoods such as Dorchester, Roxbury, Jamaica Plain, Mission Hill, and Mattapan were investigated thoroughly. The purpose of the CHNA is to advance community efforts and priority areas by: assessing cancer burden in the community as well as access to and availability of cancer-related services; identifying key areas of significant community need and vulnerable populations; examining the impact and role of social determinants of health; and facilitating the development of multi-year implementation strategies to guide the hospitals’ community health initiatives and community investments. In addition to identifying broad health issues facing residents, the 2019 CHNA investigates the full continuum of cancer care; it explores different aspects of care from initial screening, to treatment, and culminates with considerations of survivorship.

The Boston CHNA-CHIP Collaborative is a new initiative that was created and launched by a number of stakeholders—community organizations, health centers, community development corporations, hospitals, and the Boston Public Health Commission. It aims to undertake the first large-scale collaborative city-wide Community Health Needs Assessment (Boston CHNA) and Community Health Improvement Planning (Boston CHIP) process.

The goals of the Boston CHNA are to:

- Systematically identify the health-related needs, strengths, and resources of communities to inform future planning,
- Understand the current health status of Boston overall and its sub-populations within their social context, and
- Meet regulatory requirements for a number of institutions, organizations, and agencies (e.g., IRS requirements for non-profit hospitals, PHAB for health departments).

To do so most effectively, DFCI, BMC and the Boston CHNA-CHIP Collaborative contracted with Health Resources in Action (HRiA), a Boston-based public health research firm, to facilitate the CHNA processes and produce this comprehensive report. DFCI and BMC were actively engaged in the city-wide
assessment, having representation on both the Steering and Operations Committees. This effort not only complies with the IRS and Massachusetts’ Department of Public Health and the Attorney General’s Office mandates for conducting community health needs assessments but aligns with DFCI’s approach of utilizing data to inform the development of its initiatives and strengthening of collaborative partnerships.

**METHODS**

**Health Equity Lens**

The Boston CHNA and this cancer-specific CHNA focus on the social determinants of health using a health equity lens. The influences of race, ethnicity, income, and geography on health patterns are often intertwined. In the United States, social, economic, and political processes ascribe social status based on race and ethnicity, which may influence opportunities for educational and occupational advancement and housing options, two factors that profoundly affect health. Institutional racism, economic inequality, discriminatory policies, and historical oppression of specific groups are many of the root factors that drive the health inequities we see in the U.S. today.

This report describes health patterns for Boston overall and areas of need for particular population groups. Understanding factors that contribute to health patterns for these populations can facilitate the identification of data-informed and evidence-based strategies to provide all residents with the opportunity to live a healthy life. While data is presented specifically by race/ethnicity and socioeconomic factors (e.g. education, income and employment status etc.), this report is not able to analyze findings for groups who experience multiple challenging conditions which presumably is associated with even worst health outcomes.

Using the health equity lens, the data is analyzed to detect disparities. Thus, Black, Latino and Asian groups are each compared to White residents. The table findings are highlighted in yellow to identify areas of concern, i.e. incidence or mortality rates that are statistically significantly higher compared to Whites or screening rates that are statistically significantly lower than Whites. The cancer incidence and mortality tables also include a red star to denote the group with the highest rate for a particular condition, even if the difference is not statistically significant.

The report also includes data for many variables presented at the neighborhood level with significant differences compared to Boston overall. These significant neighborhood differences are noted with yellow highlighting in the summary tables and noted with an asterisk in the bar charts. The neighborhood summary tables presented throughout the report include DFCI’s priority neighborhoods as well as neighborhoods with relatively high levels of concerning health conditions or cancer statistics. Information for all neighborhoods is available in the main text of the report.

**Secondary Data**

Secondary data for this report come from a variety of sources. The Massachusetts Department of Public Health provided much of the secondary data about cancer mortality, screening, and incidence. Additional data sources include the Boston Behavioral Risk Factor Surveillance Survey (BBRFSS), Youth
Risk Behavior Survey (YRBS), U.S. Census American Community Survey (ACS), vital records, and Acute Hospital Case Mix Database from the Center for Health Information and Analysis, among others. The Research and Evaluation Office at the Boston Public Health Commission conducted most of the data analysis for the secondary data in this report. Analyses are presented as frequencies (percentages) and rates throughout the report. Data from the ACS and surveillance systems, such as the BBRFSS, are presented with confidence intervals (or error bars in the figures), where possible.

Data is presented on all cancers overall, breast cancer, prostate cancer, colorectal cancer, liver cancer, and lung cancer. There is very limited data available for Head and Neck cancers and no data is presented on Cervical cancers as these types of cancer are relatively rare compared to other cancers in Massachusetts. The MA cancer registry does not disclose disease rates in instances of small numbers.

It is often difficult to know whether apparent differences reflect true underlying distinctions between groups or just normal fluctuations of rates and numbers. This cancer CHNA includes statistical testing to determine if differences are statistically significantly different. Differences that are deemed significant reflected instances where there is a high level of confidence that there is in fact a true difference. For instance, Black men have a mortality rate of 49.8/100,000 due to prostate cancer compared to 19.1 among White men. This difference is large enough to conclude that Black men have a statistically significantly higher rate of death from prostate cancer compared to White men, and there is a very high level of confidence that this difference is real. In this report, tests for significance are noted in the table or graph notes (where p<0.05, meaning there is only a five percent chance we would see these kinds of numbers if there was not a true difference), and the narrative uses the words “significant” or “significantly” to note statistically significant differences. While non-significant differences could be the beginning of a significant development or simply be limited by a small sample size, the significant differences deserve special attention as these are large enough discrepancies to reach the significance level.

Focus Groups and Key Informant Interviews
Focus groups with residents and key informant interviews were conducted to dive deeply into perceptions and experiences. Specifically, for the cancer-focused CHNA, eight focus groups were conducted between March-April 2019 in English, Spanish, and Chinese with cancer patients, survivors, and caregivers.

This report also includes data from thirteen focus groups conducted with community residents for the collaborative Boston CHNA. These focus groups were with specific underrepresented populations including low wage workers, LGTBQ youth at risk of being homeless, survivors of violence, public housing residents, and immigrant parents. Focus groups were conducted in English, Spanish, Haitian Creole, and Chinese. These discussions were not health topic-specific but delved more into the social and economic factors that impact their lives. Selected results from these focus groups are included in this report.

For this cancer-focused CHNA, seven key informant interviews were conducted with a variety of individuals from community-based organizations and hospitals including community advocates, cancer specialists, a primary care provider, and a patient navigator. Discussions explored participants’ perceptions of cancer and related services across the cancer continuum (prevention, screening, treatment, survivorship) and suggestions for future services and resources to address these issues.
This report includes data from 45 key informant interviews conducted for the collaborative Boston CHNA. These interviews were more general and explored interviewees’ experiences addressing community needs and opportunities for future alignment, coordination, and expansion of services, initiatives, and policies. Interviewees represented a variety of organizations and sectors including public health, health care, housing and homelessness, transportation, community development, faith, education, public safety, environmental justice, government, workforce development, social services, food insecurity, business organizational staff that work with specific population such as youth, seniors, disabled, LGBTQ, and immigrants.

In addition, this report also includes qualitative information collected by the Boston Public Health Commission (BPHC) between July 2018 and April 2019 as part of a study on prostate cancer. BPHC conducted six focus groups with African American and Caribbean American men ages 40-70 and influencers of these men (male or female). BPHC also conducted six key informant interviews with members of the community who have insights into men’s health care practices. The summary themes from this research were shared with HRiA and incorporated into this report.

Community Survey
A community survey was administered in February to March 2019 for the collaborative Boston CHNA. The survey focused on a range of issues related to the social determinants of health, community perceptions, and access to care. The survey was administered online and via hard copy in seven languages (English, Spanish, Portuguese, Haitian Creole, Chinese, Vietnamese, and Arabic). The survey utilized a convenience sample, but extensive outreach was conducted by Collaborative members to garner a sample that reflected Boston demographics. The survey was completed by 2,404 Boston residents. Significance testing to identify differences by sub-group were conducted on these data and are noted in the table or graph notes; the narrative uses the words “significant” or “significantly” to note where statistically significant differences exist.

Data Limitations
Several limitations related to these data should be acknowledged. A number of secondary data sources were drawn upon for this report. Although all the sources used for this purpose are considered highly credible, sources may use different methods and assumptions when conducting analyses (e.g., different questions to identify race/ethnicity; different boundaries for neighborhoods). There is also often a time lag from the time of data collection to data availability. Some data are not available by specific population groups or at a more granular geographic level due to small sub-sample sizes. For example, while incidence change data over time is presented by sex and by race/ethnicity, this data over time is not reported separately by age groups. Mortality change data over time is shown separately for those under age 65, but is not presented separately for additional age groups, nor by sex or race/ethnicity. In some cases, data from multiple years may have been aggregated to allow for data estimates at a more granular level or among specific groups. Further, it should be noted that some indicators are not comparable year to year.

For the Boston CHNA survey, while strong efforts were made to conduct broad outreach, a convenience sample was used for the community survey conducted for the Boston CHNA. A convenience sample is a type of non-probability sampling; thus, there is potential selection bias in who participated, and results cannot necessarily be generalized to the larger population.

Throughout this report, comparisons are made to findings from the previous 2016 CHNA conducted for DFCI. It is important to note that the methodologies related to focus groups differ across these two
reports. Eight focus groups with cancer patients, survivors, and caregivers in English, Spanish, and Chinese were conducted for this 2019 CHNA. In 2016, three focus groups were conducted, two with cancer survivors (one conducted in Spanish and one in English) and one with community members from specific neighborhoods. Thus, comparisons of themes from the 2016 report are made sparingly, and results should be interpreted with caution.

**Priority Neighborhoods:** Consistent with the previous CHNA, this effort focused on Dana-Farber’s priority neighborhoods for community benefits work – Roxbury, Mission Hill, Dorchester, Mattapan, and Jamaica Plain – which are some of Boston’s most diverse communities. Despite its statewide reach and services provided through our satellite operations in Weymouth, Allston/Brighton, and Milford, Dana-Farber’s prioritization of these five neighborhoods within its local service area reflects a commitment to reducing the health disparities in cancer care and improving the overall health and well-being of neighborhood residents.

![Figure 1: Map of the City of Boston highlighting Dana-Farber’s Priority Neighborhoods for Community Benefits work and Dana-Farber’s location in the Longwood Medical Area.](image)

**POPULATION OVERVIEW**
Overall, Boston is a young city, with about one third of residents under the age of 24, that continues to experience population growth. Boston is a diverse city with 23% of residents identifying as Black, nearly 20% identifying as Latino, and nearly 10% identifying as Asian. Among DFCI’s priority neighborhoods of Roxbury, Dorchester, and Mattapan, between 40-73% of residents identify as Black, a substantially greater proportion compared to Boston. In East Boston and Roxbury, 30%-57% of residents identify as Latino, while 22%-32% of downtown and Allston residents identify as Asian.

Overall, Boston is a highly educated city with nearly half of adults ages 25 years old or older holding a college degree or more. However, there are stark differences by race/ethnicity and by neighborhood. Nearly seven in ten White residents hold a college degree, while only two in ten Black and Latino residents do. By neighborhood, East Boston and Roxbury have a greater proportion of residents who do not have a high school diploma compared to Boston overall.
SOCIAL AND ECONOMIC CONTEXT

Income and Financial Security
Across all indicators of income and financial security, there are substantial differences across Boston neighborhoods and racial and ethnic groups, with very high and very low incomes. The median household income in Boston is $62,021 but ranges from a $27,721 in Roxbury to $150,678 in South Boston Waterfront. Median household income is highest for White residents and lowest for Latino residents; median value of total assets and net wealth for White residents far exceeds that for any other racial/ethnic group. Poverty and economic instability were key themes in focus groups and interviews, with participants sharing the challenges of meeting basic needs and the negative effects this has on personal health. Roxbury, Fenway, and Mission Hill had the highest proportion of households with incomes below $25,000, as well as the highest percentage of residents living below the federal poverty level in 2013-2017.

Employment and Workforce
Boston, like much of the rest of the nation, has experienced an economic upturn in recent years. In 2018, Boston’s unemployment rate was 3.0%, according to the Bureau of Labor Statistics; however, when examining unemployment data over the past several years (2013-2017), there are differences by neighborhood. Unemployment during this period was 7.3%, but over 10% in the neighborhoods of Roxbury, Longwood, Fenway, Mattapan, and Mission Hill.

Housing
The high and rising cost of housing in Boston was a main theme that emerged in focus group and interview discussions, as it did in 2016. The majority of housing units across Boston are renter-occupied (65%). More than half of those in renter-occupied units are housing cost-burdened, meaning they spend more than 30% of their income on housing. This percentage was significantly higher across several neighborhoods compared to the Boston overall average, including Fenway, East Boston, and Jamaica Plain. Additional pressures include gentrification, long wait lists for housing assistance, and for some, housing discrimination. There was general consensus across conversations that more affordable housing is needed in Boston.

Transportation
While many focus group participants perceived improvements in transportation recently, others expressed concern about cost, timeliness, and accessibility of public transportation, especially for the elderly, immigrants, and residents of neighborhoods with limited access to transportation. Additionally, transportation issues were largely noted in Mattapan as there is significantly less access to public transit options.

Social Environment and Discrimination
Focus group and interview participants identified examples of strong social networks in Boston. While community survey respondents reported strong community cohesion and civic engagement, they also mentioned a decline in community social ties, brought on by lack of time and generational differences as well as gentrification. CHNA community survey results and conversations in focus groups indicate that subtle and overt discrimination is an issue in Boston.

Violence and Trauma

“Most [residents] rely on public transportation and it is difficult when the signs are not in their language. They may not understand announcements about delays or emergencies, and it makes them feel insecure about how to navigate.”—Key informant interviewee
Many focus group participants expressed concerns about personal safety in their communities, with persons of color and children noted to be disproportionately affected. Approximately half of Boston CHNA survey respondents from Roxbury, Mattapan, and Dorchester described their neighborhood as unsafe or extremely unsafe, a prevalence that was more than double that observed across Boston. Intimate partner violence was also mentioned in focus groups and interviews, with women of color and non-English speaking immigrants identified as particularly vulnerable populations.

CANCER PREVENTION: PERCEPTIONS AND SURVEILLANCE DATA

Perceptions of Cancer and Other Health Issues
When asked about top health concerns in the city, focus group participants and interviewees participating in the Boston CHNA identified mental health and substance use, trauma, community violence, chronic diseases, healthy aging, and environmental health concerns. One in five people completing the Boston CHNA community survey identified cancer as one of their top five health concerns. Additionally, a high proportion of survey respondents identified factors that are linked to cancer—smoking, obesity, and environmental conditions—as top health concerns in the community.

For the cancer-specific assessment, cancer patients and survivors participating in focus groups had mixed perspectives about the extent to which people in their communities were aware of and understood cancer as a health issue, with some reporting high awareness and others indicating it is low. Fear of cancer and reluctance to speak about cancer was identified as one reason for low awareness. Rising rates of cancer particularly among young people and disparities in cancer incidence and mortality for racial and ethnic minorities were also highlighted by numerous interviewees and focus group members.

CANCER PREVENTION
Risk factors for cancer include smoking, alcohol misuse, obesity, unhealthy eating behaviors, and sedentary lifestyles. These behaviors are strongly influenced by one’s neighborhood environment and upstream factors such as employment status and educational opportunities. Quantitative data about these behaviors show some positive trends but also some areas for attention, especially when differences are examined across neighborhoods and socioeconomic variables.

Tables 1-2 on the following pages provide a brief overview of key social determinants across neighborhoods, as well as neighborhood differences in behavioral risk factors associated with cancer. Bright yellow highlighting indicates statistically significant neighborhood differences compared to Boston overall, while light yellow highlighting indicates large neighborhood differences for variables that were not tested for statistical differences.

“Denial is still so deep. Cancer still has a hold on communities of color, that it’s a shameful thing. You hide this diagnosis. Don’t show your face, don’t talk openly, don’t wear anything that identifies you as a survivor. So the shock and the shame stops people from talking about it, even in their family.”—Focus group participant
Table 1: Social Determinants of Health According to Neighborhood

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; High school diploma (2013-2017)</td>
<td>13.9%</td>
<td>24.3%</td>
<td>31.4%</td>
<td>17.6%</td>
<td>6.5%</td>
<td>15.6%</td>
<td>19.6%</td>
<td>7.9%</td>
<td>11.8%</td>
<td>9.2%</td>
<td>11.5%</td>
<td>6.8-8.7%</td>
</tr>
<tr>
<td>Living below FPL (2013-2017)</td>
<td>20.5%</td>
<td>33.9%</td>
<td>20.3%</td>
<td>20.7%</td>
<td>40.8%</td>
<td>40.4</td>
<td>23.9%</td>
<td>15.5%</td>
<td>11.3%</td>
<td>5.5%</td>
<td>19.6%</td>
<td>19.9-31.1%</td>
</tr>
<tr>
<td>&gt; 30% of income spent on renter-occupied housing (2013-2017)</td>
<td>53%</td>
<td>53%</td>
<td>59%</td>
<td>54.2%</td>
<td>59.1%</td>
<td>ND</td>
<td>36.4-47%</td>
<td>57.6%</td>
<td>50.3%</td>
<td>60%</td>
<td>51.4%</td>
<td>52.8%</td>
</tr>
<tr>
<td>Residents 16+ unemployed (2013-2017)</td>
<td>7.30%</td>
<td>12.9%</td>
<td>6.6%</td>
<td>11.2%</td>
<td>11.4%</td>
<td>10.2%</td>
<td>10.4%</td>
<td>4.7%</td>
<td>8%</td>
<td>5%</td>
<td>5.5%</td>
<td>4.9-6.9%</td>
</tr>
<tr>
<td>Consider neighborhood unsafe or extremely unsafe (2019)</td>
<td>25%</td>
<td>50%</td>
<td>27.3%</td>
<td>49%</td>
<td>ND</td>
<td>ND</td>
<td>45%</td>
<td>18.1%</td>
<td>14.8%</td>
<td>ND</td>
<td>21.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Limited grocery store access (2019)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yellow indicates a statistically significant difference when compared to the overall Boston percentages.
Light yellow indicates substantially higher percentages compared to Boston overall, although significance testing was not conducted.
ND: no data was collected on this population.

Importantly, the priority neighborhoods of Dorchester, Roxbury, and Mattapan appear to be disproportionately burdened by the social determinants of health and certain behavioral risk factors, such as smoking and less than daily fruit and vegetable consumption. Among Boston CHNA participants, nearly 50% of residents from Dorchester, Mattapan and Roxbury described their neighborhoods as unsafe or extremely unsafe; this reflects a doubling of the percent who reported this perception across Boston overall. Furthermore, the neighborhoods of Dorchester, East, Boston, Roxbury, Mattapan, Hyde Park and JP are all characterized by sizable geographic areas with limited access to grocery stores. It is important to consider the influence of these factors on healthy behaviors such as physical activity and healthy eating. In addition, only 58% of Fenway residents and 71% of East Boston residents report having a primary care provider compared to 80.1% in Boston overall, which may signify less access to medical care in these areas.
### Table 2: Difference in Health Behaviors According to Neighborhood, 2013-2017

<table>
<thead>
<tr>
<th>Health-Related Behaviors</th>
<th>Boston</th>
<th>Dorchester</th>
<th>E. Boston</th>
<th>Roxbury</th>
<th>Fenway</th>
<th>Hyde Park</th>
<th>Mattapan</th>
<th>S. Boston</th>
<th>S. End</th>
<th>Allston/Brighton</th>
<th>JP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Smoking</td>
<td>16.5%</td>
<td>21.9%</td>
<td>17.1%</td>
<td>20.6%</td>
<td>13.1%</td>
<td>15.8%</td>
<td>19.3%</td>
<td>20%</td>
<td>22.2%</td>
<td>17.0%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Have Regular PCP</td>
<td>80.1%</td>
<td>81.7-83.1%</td>
<td>71.4%</td>
<td>81%</td>
<td>58%</td>
<td>89.1%</td>
<td>84.1%</td>
<td>83.3%</td>
<td>75.7%</td>
<td>70.1%</td>
<td>84.3%</td>
</tr>
<tr>
<td>Adult &lt; 1 Daily Fruit 2</td>
<td>39.3%</td>
<td>44-45%</td>
<td>43.2%</td>
<td>41.5%</td>
<td>38.4%</td>
<td>40%</td>
<td>41.8%</td>
<td>44.3%</td>
<td>36.6%</td>
<td>43.7%</td>
<td>32.2%</td>
</tr>
<tr>
<td>Adult &lt; 1 Daily Vegetable</td>
<td>24.7%</td>
<td>29%</td>
<td>26.3%</td>
<td>35.1%</td>
<td>19.6%</td>
<td>21.3%</td>
<td>28.5%</td>
<td>31.1%</td>
<td>24.6%</td>
<td>21.9%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Overweight/Obesity</td>
<td>56.8%</td>
<td>63-65%</td>
<td>62.9%</td>
<td>57.9%</td>
<td>37%</td>
<td>64.8%</td>
<td>71.1%</td>
<td>57.3%</td>
<td>50.7%</td>
<td>49.7%</td>
<td>50.4%</td>
</tr>
</tbody>
</table>

Yellow indicates a statistically significant difference from the overall Boston percentages.

ND: No data collected on this population.


Table 3 below describes these health behaviors across racial and ethnic groups and socioeconomic factors.

### Table 3: Differences in Health Behaviors by Sub-Group, 2013-2017

<table>
<thead>
<tr>
<th>Health-Related Behaviors</th>
<th>All</th>
<th>White</th>
<th>Asian</th>
<th>Latino</th>
<th>Black</th>
<th>Men</th>
<th>&lt; High School Education</th>
<th>LGBTQ</th>
<th>&lt;$25,000</th>
<th>Not Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Cigarette Smoking</td>
<td>16.5%</td>
<td>16.5%</td>
<td>12.4%</td>
<td>13.9%</td>
<td>19.3%</td>
<td>20.2%</td>
<td>26.5%</td>
<td>22.4%</td>
<td>26.5%</td>
<td>30.8%</td>
</tr>
<tr>
<td>Adult Binge Drinking</td>
<td>24.6%</td>
<td>32.2%</td>
<td>10.7%</td>
<td>20.9%</td>
<td>16.2%</td>
<td>29.8%</td>
<td>14.3%</td>
<td>30.5%</td>
<td>18.5%</td>
<td>21.6%</td>
</tr>
<tr>
<td>Adult Obesity Overweight</td>
<td>56.8%</td>
<td>51.3%</td>
<td>34.4%</td>
<td>68.1%</td>
<td>68.4%</td>
<td>61.2%</td>
<td>69.9%</td>
<td>55.7%</td>
<td>61.9%</td>
<td>62.5%</td>
</tr>
<tr>
<td>Adults Consuming &lt;1 Fruit Daily</td>
<td>39.3%</td>
<td>34.7%</td>
<td>40.2%</td>
<td>45.7%</td>
<td>44.1%</td>
<td>42.0%</td>
<td>47.7%</td>
<td>40.1%</td>
<td>48.2%</td>
<td>41.9%</td>
</tr>
<tr>
<td>Adults Consuming &lt;1 Vegetable Daily</td>
<td>24.7%</td>
<td>20%</td>
<td>24.1%</td>
<td>29.1%</td>
<td>32.6%</td>
<td>28.1%</td>
<td>36.7%</td>
<td>25.4%</td>
<td>31.9%</td>
<td>27.3%</td>
</tr>
</tbody>
</table>

Yellow indicates a statistically significantly higher rate compared to comparison group. Asian, Latino and Black are compared to White; <High School Education is compared to some college or more, and income <$25,000 is compared to ≥$50,000.

Smoking
Boston has seen a statistically significant decrease in adult smoking in recent years, from 19% of adults in 2010 to 15% in 2017. However, nearly one in six Boston adults reported being a current smoker in 2017. This is a change from the trend reported in the 2016 CHNA, which noted that smoking rates had been steady at about 19% of the adult population. Nearly one in three unemployed adults smoke. LGBTQ respondents are more likely to be smokers than heterosexual/non-transgender respondents; and those with lower levels of education and lower levels of income are more likely to be smokers than their referent counterparts. Furthermore, Black residents are more likely to be current smokers than White residents (while Asian residents are less likely); Notably, the South End (which includes Chinatown), Dorchester, South Boston, and Roxbury all have significantly higher rates of smoking than Boston overall, with over 20% of their adult population reporting being a current smoker.

Alcohol Misuse
The percent of Boston adults reporting binge drinking (having 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women) has remained steady since 2010, with approximately one-quarter of Boston adult BRFSS respondents reporting this behavior. As in the 2016 CHNA, White adults are significantly more likely than adults from other racial/ethnic groups to report binge drinking. In addition, LGTBTQ adults, college-educated, higher income, and employed adults are significantly more likely to report binge drinking than their counterparts.

Obesity
Concerns related to obesity were frequently discussed among Boston CHNA focus group and interview participants. Numerous factors contribute to overweight and obesity according to participants, including lack of affordable healthy food and physical activity options, as well as low awareness about the importance of maintaining a healthy weight and how to do so. More than half of adults across Boston reported being classified as obese or overweight in 2013-2017. However, rates are even higher with certain population groups. Nearly seven in ten Black and Latino adults reported being obese or overweight, compared with five in ten White adults across Boston – a difference that was statistically significant. One third of Asian adults reported being obese or overweight, significantly lower than the prevalence for White adults. Older adults were significantly more likely than young adults to be classified as overweight or obese. The prevalence of obesity and overweight also follows a socioeconomic gradient, with a significantly higher percent of renters, residents with lower levels of educational attainment, and residents with lower income being obese or overweight compared to their counterparts. Variation in obesity rates are seen at the neighborhood level and is as high as 71% in Mattapan. In fact, the percent of adults in Mattapan, Hyde Park, Dorchester, West Roxbury, East Boston, and Roslindale who were overweight or obese was significantly higher than the prevalence of obesity in Boston overall.

Physical Activity and Healthy Eating
Limited access to affordable opportunities for physical activity was a common theme in discussions with residents conducted for the Boston CHNA. In 2013-2015, nearly 40% of Boston adults reported consuming less than one fruit per day and one quarter reported less than daily vegetable intake. A significantly higher proportion of adults who were Black, Latino, and male reported less than daily consumption of fruits and vegetables than their counterparts. As with patterns for obesity and overweight, adults with lower socioeconomic status and less than a high school diploma were more likely to report fruit and vegetable consumption on a less than daily basis. A higher percentage of adults in Dorchester reported low fruit and vegetable consumption while a lower percentage of adults in Jamaica Plain reported low fruit and vegetable consumption.
CANCER SCREENING

Screening Rates
The table below provides an overview of screening rates by various subgroups and highlights the groups with significantly lower screening rates compared to their counterparts.

Table 4: Cancer Screening Rates by Sub-Group, 2013-2017

<table>
<thead>
<tr>
<th>Screening Test</th>
<th>All</th>
<th>White</th>
<th>Asian</th>
<th>Latino</th>
<th>Black</th>
<th>&lt;$25,000</th>
<th>Not employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography</td>
<td>88.3%</td>
<td>87.3%</td>
<td>77.3%</td>
<td>93.0%</td>
<td>89.2%</td>
<td>88.5%</td>
<td>89.3%</td>
</tr>
<tr>
<td>Pap Smear</td>
<td>83.7%</td>
<td>88.5%</td>
<td>57.7%</td>
<td>83.3%</td>
<td>83.4%</td>
<td>77.3%</td>
<td>84.2%</td>
</tr>
<tr>
<td>Colonoscopy or sigmoidoscopy</td>
<td>64.5%</td>
<td>64.8%</td>
<td>49.7%</td>
<td>66.0%</td>
<td>68.5%</td>
<td>62.7%</td>
<td>54.8%</td>
</tr>
</tbody>
</table>

Yellow indicates statistically significantly lower rate compared to comparison group. Asian, Latino and Black are compared to White; income <$25,000 is compared to ≥$50,000


Breast Cancer Screening
Nearly nine in ten women 50 to 74 years of age across Boston reported receiving a mammogram in the past two years, a rate higher than the HP2020 target of 81.1%. Latina women (93%) were significantly more likely to report receiving a mammogram in the past two years compared to White women. There was no significant difference across Boston neighborhoods in the percent of women who reported receiving a mammogram in the past two years.

Cervical Cancer Screening
In 2013-2017, 84% of Boston women (21-64 years of age) reported receiving a pap smear test in the past two years, a rate lower than the HP2020 target of 93%. Relative to their counterparts, a significantly lower proportion of Black (83%), Latina (83%) and a much lower proportion of Asian (58%) women reported receiving a pap smear recently than White women (86%). Additionally, renters (74%-84%), immigrants (64%-83%), women with a high school education (76%), women with incomes <$50,000 (77%-85%) were significantly less likely than their counterparts of higher socioeconomic status to report receiving a pap smear in the past two years. Rates of cervical cancer screenings were significantly lower in the Fenway area than in Boston overall.

HPV Vaccination
While cervical and rectal cancers have routine screening tests, no routine screening tests exist for other HPV-associated cancers, including anal, oropharyngeal, penile, vaginal, and vulvar cancers. This lack of available screening tests makes the HPV vaccine critically important for the prevention of HPV-associated cancers. In 2017, rates of HPV vaccine completion in Massachusetts were 67% among females and 64% among males. Although Massachusetts has higher HPV vaccination rates than the US, it still falls short of the Healthy People 2020 goal of 80% vaccination among eligible youth.

Colorectal Cancer Screening
In 2013-2017, only two-thirds (65%) of Boston adults 50 to 75 years of age reported ever receiving a colonoscopy or sigmoidoscopy. This is lower than the HP2020 target of 70.5%. Compared to their counterparts, a significantly lower proportion of Asian adults (50%), immigrants living in the US for less
than 10 years (37%), residents with incomes <$25,000 (63%), and adults who were out of work (55%) reported receiving colon cancer screening. Data about colon cancer screenings across neighborhoods show that screening among adults 50 to 75 years of age was lowest in East Boston, a difference that was significantly lower than Boston overall in 2013-2017.

**Lung Cancer Screening**
Low-dose computed tomography (also called a low-dose CT scan, or LDCT) is the only recommended screening test for lung cancer. It has been shown to detect lung cancer at its earliest, most treatable stage, and is the only test that has been proven to reduce the risk of dying from lung cancer among those at high risk for the disease. New guidelines released by the U.S. Preventive Services Task Force in 2013 recommend yearly lung cancer screening with LDCT for individuals at high risk based on age and cumulative tobacco smoke exposure. This includes individuals between the ages of 55 and 80 who either currently smoke or have quit in the past 15 years and who have a smoking history of 30 or more “pack years.” A pack year is smoking an average of one pack of cigarettes per day for one year. Data regarding lung cancer screening in the US indicates that rates of recommended screening among those who meet the eligibility criteria are low. According to a study conducted by the Center for Disease Control and Prevention, only about 4.4% of adults who met the screening criteria reported receiving a low-dose CT scan. Although data regarding lung cancer screening rates is not included in this report, it is important to note that lung cancer screening, along with smoking cessation interventions, can substantially reduce the burden of lung cancer in both the nation and the greater Boston area.

**Perceptions of Cancer Screening**
The importance of screening was noted by most members of focus groups conducted for this CHNA. Many stated that their cancer was found during a routine screening. They also mentioned family history of cancer as a reason they stay current with their screenings. Rates for breast and cervical cancer screening were described as generally good, in part due to the fact that these have been prioritized nationally and numerous and accessible screening services were reported to exist. Interviewees and focus group members also reported that numerous programs and efforts exist to educate and connect residents to screening services, particularly those who are underserved. Hospital outreach efforts—including mobile vans—were mentioned. Interviewees and focus group members also talked about the critical role played by primary care providers.

**Barriers to Accessing Screening Services**
Focus group members and interviewees identified several barriers to getting screened including lack of awareness, discomfort and fear, inability to take time off work, and for a few, insurance and transportation issues. Health care professionals interviewed identified changing screening guidelines as barrier. These issues were also identified in the 2016 CHNA.

A prominent theme in conversations with interviewees was the importance of follow up after an abnormal screening result. Interviewees reported that for some patients, substantial care coordination and navigation is needed to ensure that patients are directed to and engage in further testing and care after an abnormal result. Challenges include knowing where to go for follow up, addressing other barriers (transportation, time off work, childcare), and navigating insurance.

"Doctors only have a certain amount of time and you can’t rely on them to talk to patients about everything. But there does need to be more navigators available to help patients understand and explain." – Focus group participant
Use and Perceptions of the Health Care System

Boston is a city with numerous health care resources including hospitals, community health centers, urgent care, primary care providers, and specialists. Approximately eight in ten respondents to the BRFSS reporting having at least one person as their personal doctor. Asian and Latino residents were significantly less likely than White residents to indicate having one person as their personal doctor or health care provider. While focus group, interview, and survey participants participating in the Boston CHNA were positive about the quality and proximity of health care in their community, they still cited several concerns over access. Unfriendly, uninterested, or rushed health care providers and office staff in health care settings were also issues that focus group participants mentioned.

Experiences with Cancer Treatment

Overall, focus group members spoke more positively than negatively about their treatment experiences. Among those reporting a positive experience, participants most often spoke about the quality of care: they praised the team-based nature of their care, excellent communication from physicians, as well as ongoing communication from providers’ offices to make and confirm appointments. The importance of trust and interpersonal rapport with physicians was mentioned by numerous respondents. The personal qualities of providers were frequently mentioned in the context of positive experiences including respect, a willingness to listen and explain, and timeliness.

Numerous respondents also praised social workers and patient navigators who helped them to manage the health care system and get connected to needed services. When asked about social and support services available during cancer care, most focus group members shared that they believed these were available, however, not all patients were aware of them. A few focus group members shared negative experiences with their cancer care. These comments related mainly to a lack of sensitivity about how they were told about their cancer. Lack of interpersonal rapport or perceived disrespect by providers were other themes associated with less positive cancer care experiences.

Challenges Accessing Cancer Treatment Services

Cancer patients, survivors and caregivers participating in focus groups, as well as interviewees, shared numerous challenges to accessing cancer treatment services. Cost, maintaining employment, transportation, and limited opportunities to participate in clinical trials were issues that rose to the top. Numerous cancer patients and survivors remarked that having cancer has depleted their resources. Cost challenges are compounded by the fact that cancer patients may be unable to work full time (or at all) during or even after treatment. Several respondents mentioned that transportation can be a challenge for cancer patients, a barrier also noted in 2016. However, increased use of transportation services (Uber Health and Lyft) by hospitals was seen as a step in a positive direction.

Numerous interviewees spoke about clinical trials, sharing their perception that these opportunities are limited, and patients of color are underrepresented. This was noted in the 2016 CHNA report as well. Language barriers and lack of cultural competency among providers as well as institutional racism were mentioned as challenges for patients of color and immigrants.

“I have no savings now. If my house hadn’t appreciated, I wouldn’t know what the future would hold. My house is my only asset. Everything else is gone.”—Focus group participant
The importance of having support during cancer treatment was mentioned by many respondents. A prevalent theme was that of navigating the cancer care system. This was also a prominent area of discussion in the 2016 CHNA as well. Participants expressed concern about patients “getting lost” in the system and as a result, not getting the care that they need. Care coordination—where a care team collaborates to facilitate the appropriate delivery of health care services—was seen as a critical aspect of successful cancer care and outcomes. Cancer patients and survivors had differing experiences with care coordination both within and outside the health care system, with some receiving substantial support and others reporting that they did not receive any. Many recommended expansion of navigation services and more promotion of these services to ensure that all cancer patients can access them.

Cancer Incidence
In 2015, the overall cancer incidence rate in Boston was 492.5 per 100,000 residents. Overall cancer incidence rates for Asian (390.5 per 100,000) and Latino (349.4 per 100,000) residents in Boston were significantly lower than for White residents (546.7 per 100,000). Women have lower overall cancer rates than men. Data on cancer incidence by age group and neighborhood was not available for this report.

Cancer Incidence Over Time
Overall cancer incidence rates have declined significantly in Boston between 2001 and 2015, as have incidence rates for colorectal, lung, and prostate cancers. Incidence rates for liver cancer, by contrast, have risen in Boston. The following table examines cancer incidence rates over time by race/ethnicity and gender.

<table>
<thead>
<tr>
<th>Table 5: Statistically Significant Changes in Cancer Incidence Over Time, by Sub-Group, 2001-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
</tr>
<tr>
<td>All Cancer</td>
</tr>
<tr>
<td>Breast</td>
</tr>
<tr>
<td>Colorectal</td>
</tr>
<tr>
<td>Liver</td>
</tr>
<tr>
<td>Lung</td>
</tr>
<tr>
<td>Prostate</td>
</tr>
<tr>
<td>Head and Neck</td>
</tr>
</tbody>
</table>

NOTES: GREEN arrow indicates statistically significant decrease over time; RED arrow indicates statistically significant increase over time; N/A indicates comparison is not applicable.
DATA SOURCE: Cancer registry, Massachusetts Department of Public Health

cancer and colorectal cancer incidence rates between 2001 and 2015; additionally, incidence rates of lung and prostate cancer among White men declined over this time period, while incidence of liver cancer among White women increased.

The table below provides an overview of the differences by race/ethnicity and gender for cancer incidence during the 2013 to 2015 time period, followed by an overview of key findings. Significant differences compared to White residents are marked with yellow highlighting.

### Table 6: Cancer Incidence for Boston Males by Race/Ethnicity, 2013-2015

<table>
<thead>
<tr>
<th>Incidence by Cancer Per 100,000 residents</th>
<th>All Men</th>
<th>Asian Men</th>
<th>Latino Men</th>
<th>Black Men</th>
<th>White Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers 2015</td>
<td>545.1</td>
<td>390.5</td>
<td>432.8</td>
<td>558.1</td>
<td>593.5</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>47.5</td>
<td>38.9</td>
<td>37.4</td>
<td>60.5</td>
<td>47.7</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>18.8</td>
<td>32.5</td>
<td>23.6</td>
<td>17.2</td>
<td>16.7</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>75.1</td>
<td>95.7</td>
<td>45.9</td>
<td>78.4</td>
<td>79.6</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>126.7</td>
<td>74.5</td>
<td>111.8</td>
<td>190</td>
<td>110.8</td>
</tr>
<tr>
<td>Head and Neck Cancers</td>
<td>24.7</td>
<td>26.5</td>
<td>25.3</td>
<td>29.0</td>
<td>34.2</td>
</tr>
</tbody>
</table>

*Yellow* statistically significantly higher than White comparison group

* indicate the highest incidence rate for each cancer type

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health

Data about different types of cancer reveal that Asian residents of Boston have higher rates of liver cancer than their White counterparts, with Asian men having higher rates than White men. However, Asian men have significantly lower rates of prostate and head and neck cancer than their White counterparts. Latino men have lower rates of cancer overall than their White counterparts as well as significantly lower rates of lung and head and neck cancers compared to White men. In general, Black residents of Boston have overall cancer rates similar to Whites. Black men, however, have significantly higher rates of colorectal and prostate cancer than White men.

### Table 7: Cancer Incidence for Boston Females by Race/Ethnicity, 2013-2015

<table>
<thead>
<tr>
<th>Incidence by Cancer Per 100,000 residents 2013-2015</th>
<th>All Women</th>
<th>Asian Women</th>
<th>Latina Women</th>
<th>Black Women</th>
<th>White Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>461.2</td>
<td>375.8</td>
<td>298.5</td>
<td>512.8</td>
<td>518.8</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>132.7</td>
<td>80.3</td>
<td>90.0</td>
<td>140.1</td>
<td>160.1</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>35.9</td>
<td>26.2</td>
<td>24.5</td>
<td>45.5</td>
<td>36.4</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>6.5</td>
<td>10.1</td>
<td>6.9</td>
<td>6.0</td>
<td>6.4</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>57.5</td>
<td>42.0</td>
<td>20.5</td>
<td>54.0</td>
<td>75.7</td>
</tr>
<tr>
<td>Head and Neck Cancers</td>
<td>8.2</td>
<td>N/A</td>
<td>4.7</td>
<td>9.4</td>
<td>12.3</td>
</tr>
</tbody>
</table>

* indicates highest mortality group for cancer type

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health

The above table demonstrates differences in cancer incidence for women of Boston by race/ethnicity. Asian women have significantly lower rates of breast and lung cancer incidence than White women,
however, like their Asian male counterparts, they have a non-significantly higher incidence of liver cancer when compared to their White counterparts. Latina women have significantly lower rates of cancer overall as well as significantly lower rates of breast, lung, colorectal and head and neck cancers compared to their White counterparts.

Black residents of Boston have overall cancer incidence rates very similar to Whites. Black women have significantly lower incidence rates of breast, lung, and head and neck cancers than White women, and have non-significantly higher rates of colorectal cancer incidence. This 2013-2015 data describing a lower rate of new breast cancer cases among Black women compared to White women contrasts with the 2011-2012 data reported in the previous CHNA. The prior data showed very similar numbers between the two groups (131.3/100,000 for Black women and 133.4/100,000 for White women). Future data will help to illuminate whether over time the breast cancer incidence rate will continue to be significantly lower among Black women compared to White women.

Cancer Mortality
Cancer and heart disease are the leading causes of death in Boston and have remained so for the last six years. Cancer has been the leading cause of premature death (death before age 65) from 2011-2016. The overall cancer mortality rate in Boston was 160 per 100,000 residents in 2015-2017. This is consistent with the HP2020 target of 161.4 deaths per 100,000 population.

The CHNA compares the overall Boston mortality rates (not separated by gender) with that of Massachusetts and the United States. Two types of cancer have mortality rates above both the state and national rates. The prostate cancer mortality rate in Boston is higher than the state and national rates (24.5 vs. 18.7 and 19.2 respectively per 100,000). Similarly, the Boston mortality rate for liver cancer is higher than the state and national rates (9.2 vs. 6.5 for both state and national rates per 100,000).

Between 2011 and 2017 the overall cancer mortality rate in Boston declined significantly as did colorectal and lung cancer mortality rates, as described in Table 8 on the following page. Despite some progress, the mortality rates of other cancers have not improved and remain unchanged over this six-year period. Additionally, premature mortality rates for breast, liver, prostate and lung cancer (for those under age 65) have not significantly changed. This reality underscores the importance of community outreach to raise awareness, promote preventative behaviors, and encourage early screening particularly given the unchanged treatment outcomes.
### Table 8: Statistically Significant Changes in Cancer Mortality Over Time for 2011-2017 in Boston, MA

<table>
<thead>
<tr>
<th></th>
<th>Mortality</th>
<th>Premature Mortality &lt;65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>

**NOTES:** GREEN arrow indicates statistically significant decrease over time; RED arrow indicates statistically significant increase over time; N/A indicates comparison is not applicable.

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health

The following tables provide an overview of significant differences in cancer mortality by gender and race/ethnicity, followed by explanations of the key findings associated with each population.

### Table 9: Cancer Mortality for Boston Males by Race/Ethnicity

<table>
<thead>
<tr>
<th></th>
<th>All Men</th>
<th>Asian Men</th>
<th>Latino Men</th>
<th>Black Men</th>
<th>White Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>160</td>
<td>157.6</td>
<td>149.4</td>
<td>234.4</td>
<td>197.0</td>
</tr>
<tr>
<td>All Cancers &lt;65 years</td>
<td>46.3</td>
<td>57.7</td>
<td>36.7</td>
<td>68.2</td>
<td>45.1</td>
</tr>
<tr>
<td>All Colorectal Cancer</td>
<td>12.1</td>
<td>11.3</td>
<td>8.3</td>
<td>23.0</td>
<td>16.7</td>
</tr>
<tr>
<td>Colorectal Cancer &lt;65 years</td>
<td>4.5</td>
<td>NA</td>
<td>NA</td>
<td>9.5</td>
<td>5</td>
</tr>
<tr>
<td>All Liver Cancer</td>
<td>9.2</td>
<td>12.6</td>
<td>15.7</td>
<td>17.7</td>
<td>12.8</td>
</tr>
<tr>
<td>Liver cancer &lt;65 years</td>
<td>3.8</td>
<td>10</td>
<td>5.3</td>
<td>11</td>
<td>4.1</td>
</tr>
<tr>
<td>All Lung cancer</td>
<td>36.5</td>
<td>58.9</td>
<td>32.2</td>
<td>41</td>
<td>47.6</td>
</tr>
<tr>
<td>Lung cancer &lt;65 years</td>
<td>10.0</td>
<td>12.8</td>
<td>7.0</td>
<td>15.2</td>
<td>12.8</td>
</tr>
<tr>
<td>All Prostate Cancer</td>
<td>24.5</td>
<td>NA</td>
<td>26.8</td>
<td>49.8</td>
<td>19.1</td>
</tr>
<tr>
<td>Prostate cancer &lt;65 years</td>
<td>2.0</td>
<td>NA</td>
<td>NA</td>
<td>3.7</td>
<td>1.6</td>
</tr>
</tbody>
</table>

★ highest mortality group for cancer type.

Yellow statistically significantly higher than White comparison group

**DATA SOURCE:** Massachusetts Department of Public Health, Boston resident deaths, 2015-2017 combined
Black men in Boston have the highest mortality rates for overall cancers, premature overall cancers, colorectal cancer, premature colorectal cancer, liver cancer, premature liver cancer, premature lung cancer, prostate cancer and premature prostate cancer as noted by the red star in almost every category for Black men. Compared to White men, the mortality rate for Black men is statistically significantly higher for all cancers, premature all cancers, premature colorectal cancer, premature liver cancer, prostate cancer and premature prostate cancer as noted with yellow highlighting.

Asian men experience significantly higher rates of premature mortality due to liver cancer relative to White men. Asian men also have the highest lung cancer mortality across the groups, which is the single highest mortality rate for any specific type of cancer. In contrast, Asian men have significantly lower rates of overall mortality due to cancer than White men.

Latino men in Boston experience significantly lower rates of overall cancer mortality due to lung cancer than White men in the city.

| Table 10: Cancer Mortality for Boston Females by Race/Ethnicity |
|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                  | All Women | Asian Women | Latina Women | Black Women | White Women |
| All Cancers      | 138.5     | 96.9        | 84.8          | 151.2        | 155.3         |
| All Cancers <65 years | 42.6       | 48.2        | 34.4          | 52.0         | 38.8          |
| All Breast Cancer| 19.9      | 9.9         | 8.2           | 26.2         | 21.3          |
| Breast Cancer <65 years | 8.1       | 11.1        | 4.4           | 10.9         | 7.1           |
| All Colorectal Cancer | 8.8      | 6.1         | 5.5           | 10.8         | 8.5           |
| Colorectal Cancer <65 years | 3.6 | N/A       | 5.7           | 4.2          | 2.6           |
| All Liver Cancer | 5.6       | 6.3         | 6.5           | 4.1          | 6.6           |
| Liver cancer <65 years | 1.4     | N/A         | N/A           | 1.8          | 0.9           |
| All Lung cancer  | 30.4      | 22.1        | 8.8           | 27.1         | 41.1          |
| Lung cancer <65 years | 7.8      | 8.1         | 2.5           | 9.0          | 9.3           |

★ highest mortality group for cancer type
Yellow statistically significantly higher than White comparison group
DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2017 combined

Black and White women have higher mortality rates from all cancers combined compared to Asian and Latina women. Although the difference does not reach a level of statistical significance, Black women have mortality rates above the other groups for breast cancer, colorectal cancer and for those under age 65, liver cancer. Moreover, Black women under age 65 have a mortality rate from all cancers that is significantly higher than their White counterparts.

The breast cancer mortality rate for Black women is higher than for White women for both breast cancer generally and for those under age 65. However, in contrast to prior data, these data from 2015-
2017 do not show a breast cancer mortality rate among Black women under 65 years of age that is significantly higher than White women. More data will be needed over more years to analyze and confirm whether this may reflect a trend away from the higher Black rate or whether these numbers may simply lack sufficient power from a large enough sample size to detect the difference at a significant level.

Although Asian and Latina women have mortality rates lower than White women for lung cancer, breast cancer and all cancers, Latina women under age 65 have significantly higher mortality rates from colorectal cancer compared to White women in this age group.

This report also analyzed patterns of cancer mortality according to Boston neighborhood. Table 11 below depicts differences in mortality rates by neighborhood, followed by an overview of key findings.

Table 11: Cancer Mortality Rates by Neighborhood

<table>
<thead>
<tr>
<th>Cancer Mortality (per 100,000), 2015-2017</th>
<th>Boston</th>
<th>Dorchester</th>
<th>Fenway</th>
<th>E. Boston</th>
<th>Hyde Park</th>
<th>S. Boston</th>
<th>Mattapan</th>
<th>Roxbury</th>
<th>S. End</th>
<th>JP</th>
<th>Allston/Brighton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer mortality</td>
<td>160.4</td>
<td>177.4</td>
<td>159.2</td>
<td>190.9</td>
<td>205.7</td>
<td>207.6</td>
<td>152.5</td>
<td>170.9</td>
<td>144.2</td>
<td>141.8</td>
<td>144.5</td>
</tr>
<tr>
<td>Premature cancer mortality</td>
<td>10</td>
<td>15</td>
<td>14.6</td>
<td>7.9</td>
<td>9.6</td>
<td>10.6</td>
<td>9.3</td>
<td>10</td>
<td>10.6</td>
<td>6</td>
<td>9.4</td>
</tr>
<tr>
<td>Breast cancer mortality</td>
<td>19.9</td>
<td>9.6-19.5</td>
<td>35.9</td>
<td>24.6</td>
<td>36.3</td>
<td>25.9</td>
<td>32.1</td>
<td>23.4</td>
<td>10.3</td>
<td>24.9</td>
<td>13.6</td>
</tr>
<tr>
<td>Premature breast cancer mortality</td>
<td>8.1</td>
<td>4.2-6.2</td>
<td>18.8</td>
<td>NA</td>
<td>11.2</td>
<td>8.1</td>
<td>12.3</td>
<td>9</td>
<td>6.1</td>
<td>11.3</td>
<td>8.3</td>
</tr>
<tr>
<td>Liver cancer mortality</td>
<td>9.2</td>
<td>11.3-11.8</td>
<td>6.5</td>
<td>17.1</td>
<td>7.9</td>
<td>7.5</td>
<td>5.8</td>
<td>7.5</td>
<td>11.7</td>
<td>6.5</td>
<td>7.5</td>
</tr>
<tr>
<td>Lung cancer mortality</td>
<td>36.5</td>
<td>46.8</td>
<td>24.1</td>
<td>57.8</td>
<td>48.8</td>
<td>57.9</td>
<td>28.4</td>
<td>35.8</td>
<td>45.8</td>
<td>28.4</td>
<td>30.6</td>
</tr>
<tr>
<td>Premature lung cancer mortality</td>
<td>10</td>
<td>15</td>
<td>14.6</td>
<td>7.9</td>
<td>9.6</td>
<td>10.6</td>
<td>9.3</td>
<td>10</td>
<td>10.6</td>
<td>6</td>
<td>9.4</td>
</tr>
<tr>
<td>Prostate cancer mortality</td>
<td>24.5</td>
<td>45.2</td>
<td>28.5</td>
<td>NA</td>
<td>41.4</td>
<td>30.8</td>
<td>29.5</td>
<td>24.3</td>
<td>23.2</td>
<td>28.2</td>
<td>13.5</td>
</tr>
<tr>
<td>Colorectal cancer mortality</td>
<td>12.1</td>
<td>13.1-14.7</td>
<td>7.6</td>
<td>7.7</td>
<td>14.4</td>
<td>12.7</td>
<td>14.4</td>
<td>9.5</td>
<td>9.4</td>
<td>11.6</td>
<td>13.5</td>
</tr>
</tbody>
</table>

Yellow: significantly higher than the overall Boston rate
ND: no data was collected on this population
DATA SOURCE: Massachusetts Department of Public Health, Boston resident deaths, 2015-2017 combined

As was observed with patterns related to behavioral risk factors, cancer mortality rates are also concentrated in neighborhoods challenged by the social determinants of health. Of note, residents of Dorchester experience significantly higher rates of premature (less than age 65) cancer mortality, lung cancer mortality, and premature lung and prostate cancer mortality. Residents of East Boston die of liver cancer at a rate nearly double that of what is observed across Boston and have significantly higher rates of lung cancer mortality and all cancer mortality. Residents of Fenway and Hyde Park die of breast cancer at a rate nearly double that of what is observed across Boston. In addition, Fenway residents have significantly higher premature breast cancer mortality, premature lung cancer mortality, and premature all cancer mortality rates compared to the rest of Boston.
CANCER SURVIVORSHIP

Perceptions of Cancer Survivorship
When asked about survivor services and experiences, interviewees and focus group members agreed that some follow up support with a medical care team is available following treatment, however they perceived that the support “falls off” shortly after. Patients described the need for more access to post-treatment supports for issues like managing the long-term effects of treatment (such as lymphedema) as well as how to stay on top of medications. Survivors mentioned that the prevailing concern for those who have successfully undergone cancer treatment is the fear that it will return. Focus group participants and interviewees reported that there is a lack of planning for survivorship as part of the cancer treatment process. As a result, patients, many of whom have received substantial support during their cancer journeys, suddenly feel isolated and alone. As in 2016, a common theme among cancer survivors was the importance of rejoining the workforce and concerns about their cancer history being viewed as a liability by colleagues and current and prospective employers.

Support groups were reported to be available and very helpful to survivors, and to patients in cancer treatment. Focus group members who have participated in support groups after cancer reported that these have been a source for information about services and advice about nutrition, exercise, and monitoring. Support groups also help to fill the need for emotional support after treatment. However, some reported, not all patients receive information about these groups. Survivors also mentioned the need for supports relative to how to live healthy lifestyles after cancer.

“I don’t know, but I feel very disconnected.... it’s like I’m out here by myself, there’s no sense of connection. Well, the immediate afterwards was okay, but after that, there’s nothing. It can come back at any time and I’m like, ‘how do I know?’” —Focus group participant

OTHER HEALTH ISSUES

Mental Health
Mental health issues were described as a priority concern across almost all focus group and interviews. Stress, anxiety, and depression were the most frequently-cited challenges among Boston residents. Surveillance and survey data indicate that anxiety and depression are somewhat common across Boston residents. While statistics indicate that the proportion of people receiving treatment for depression has grown, barriers such as stigma, cultural and language differences, and lack of sufficient providers constrain access to services for many. Residents from Jamaica Plain and Roxbury were significantly more likely to receive treatment for depression than the rest of Boston; those from Back Bay, Charlestown, and Hyde Park were significantly less likely to do so.

Substance Use
Substance use was considered a priority health issue in many focus group and interview discussions. Participants mentioned a variety of substances including marijuana, prescription drug use, and opioids as most concerning.

Other Chronic Conditions
Quantitative data point to a high prevalence of chronic disease among the residents of Boston. In 2013-2017, one-quarter of Boston adults reported being diagnosed with hypertension and about 10% reported having diabetes. Rates of these chronic diseases are significantly higher among Black and
Latino residents when compared to White residents. A significantly higher proportion of residents in DFCI’s priority neighborhoods of Mattapan, Roxbury, and Dorchester reported a hypertension diagnosis compared to the rest of Boston. Diabetes was also more prevalent in Dorchester, Mattapan, and Roxbury, as each had a significantly higher percentage of adults reporting a diabetes diagnosis compared to the overall Boston rate. The heart disease mortality rate was also significantly higher in East Boston, Hyde Park, Roxbury, and South Boston than the rest of Boston.

The table below depicts the various proportions of Boston residents affected by chronic health conditions across select neighborhoods. Significantly higher rates are highlighted.

<table>
<thead>
<tr>
<th>Chronic Health Conditions by Neighborhood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Overweight/obesity (2013-2017)</td>
</tr>
<tr>
<td>Diabetes prevalence (2013-2017)</td>
</tr>
<tr>
<td>Self-reported hypertension (2013-2017)</td>
</tr>
<tr>
<td>Heart disease mortality per 100,000 (2016-2017)</td>
</tr>
</tbody>
</table>

Yellow: significantly higher than the overall Boston rate
ND: no data was collected on this population


Environmental Health
Outdoor noise and air pollution from vehicles, and dangerous traffic were identified as top environmental health concerns in the Boston CHNA community survey. Quantitative data show secondhand smoke exposure was significantly higher among Boston residents of color and lower socioeconomic status.

KEY THEMES AND CONCLUSIONS

- **Cancer is the leading cause of death in Boston and Massachusetts; rates of cancer mortality differ across different subgroups and by sex.** Black men experience the highest rates of mortality from all cancers and all premature cancers among those under age 65. These rates are significantly higher than White men. Black male residents also experience the highest rates of mortality due to colorectal, liver, and prostate cancer and lung cancer among those under age 65. Black women under age 65 have the highest mortality rates from all cancers which is statistically significantly higher than their White counterparts. Across all groups and cancers included in this CHNA, Asian men have the single highest mortality rate for lung cancer (58.9/100,000) followed by Black men for prostate cancer (49.8/100,000). Asian and Latino residents experience lower overall cancer mortality rates compared to White residents. Cancer mortality rates overall have declined.
significantly in Boston from 2011 to 2017, as have colorectal and lung cancer mortality rates. In contrast, mortality rates have not changed significantly for breast, liver and prostate cancer and lung cancer for younger patients under 65.

- **Cancer screening rates for some cancers are better than others, and some residents face substantial barriers to getting screened.** Quantitative data indicate that screening rates for breast and cervical cancer are relatively high in Boston, while colon cancer screening rates are substantially lower. Black, Latina, and Asian women are significantly less likely to receive pap smears than their White counterparts with Asian women being far less likely to have a pap smear. While a variety of cancer screening opportunities exist in Boston, barriers to accessing these remain and include lack of awareness, discomfort and fear, inability to take time from work, confusion about screening guidelines and for a few, insurance and transportation issues.

- **Breast and Prostate cancers continue to be the most frequent type of cancer diagnosed in Boston** and the mortality rates have not improved for these diseases. The highest incidence of breast cancer is among White women (160/100,000) followed by Black women (140/100,000). The highest incidence of prostate cancer is seen among Black men (190/100,000) followed by Latino (112/100,000) and White men (111/100,000). The largest incidence disparity occurs among Black men for prostate and colorectal cancer and for Asian men for liver cancer. Liver cancer has a much lower incidence but is on the rise. Lung cancer is the deadliest form of cancer for almost all groups.

- **Some cancer incidence rates have declined over time, although disparities still exist.** Overall cancer incidence rates have declined in Boston between 2001 and 2015, as have incidence rates for colorectal, lung, and prostate cancers. Incidence rates for liver cancer, by contrast, have risen in Boston. Differences exist across race/ethnicity and sex, as follows:
  - **Overall cancer incidence:** Rates have increased for Asian and Black women over this time period and decreased among Black men and Whites of both genders. Rates are lower among Asian and Latino residents compared to White residents.
  - **Breast Cancer:** Rates have increased among Asian women but remained the same for women in other racial and ethnic groups.
  - **Colorectal Cancer:** Rates have declined among Asian men, Black women, and Whites of both genders, but remain highest among Black men.
  - **Lung Cancer:** Rates have increased among Latino men and declined among Black and White men.
  - **Prostate Cancer:** Rates have significantly declined among men of all racial/ethnic groups but remain highest among Black men.
  - **Liver Cancer:** Rates have risen over time, with White women experiencing significant increases in these rates. Asian residents experience higher rates of liver cancer than White residents, with Asian men having significantly higher rates than White men. The Boston Liver cancer rate is higher than the Massachusetts and US rates.

- **In synthesizing the data described in this CHNA, certain populations, including Black men and women, Asian men and women, and immigrants appear to have disproportionately higher levels of disease burden and risk, warranting increased attention.** Furthermore, the data confirms the need to prioritize efforts in Dorchester, Roxbury, and Mattapan while also pointing to emerging areas of need in neighborhoods such as East Boston and Fenway that warrant additional consideration.
• **Boston has many health care and social service assets, but challenges to treatment exist for those in need of cancer care.** A high proportion of Boston residents are insured and report having one person as their personal doctor or health care provider, although barriers to accessing healthcare exist. These include underinsurance; cost; language and immigration status; navigation and care coordination challenges; transportation; and lack of culturally-sensitive approaches to care. Primary challenges to access for those with cancer include cost, maintaining employment, transportation, limited opportunities to participate in clinical trials, language access, and for communities of color, racism within the health care system.

• **Patient navigation continues to be an area where more attention is needed.** While numerous focus group members reported that they benefitted greatly from having a care coordinator, social worker, or patient navigator during their cancer care, not all patients appear to have access to these services. There is a need for assistance with navigating the health system and health insurance, connection to social and other services, as well as advocacy for some. Respondents also suggested that such support be provided across the cancer continuum—from the point of an abnormal finding to survivorship. In particular, there was a strong desire for navigation services to support survivors well beyond the treatment period.

• **Clinical Trials continue to be an area where more attention is needed.** As noted in the previous CHNA, more outreach is needed to patients, especially people of color, to raise awareness for this opportunity and to ensure that clinical trial participants will reflect the actual diversity of the city of Boston. It is incumbent on medical providers to encourage participation in clinical trials and to ensure that there is adequate space for underrepresented patients to participate. There is also a desire for providers to generally strengthen their patient communication and to better engage with patients regarding treatment options.

• **Planning for cancer survivorship and expanding survivorship services were seen as important areas where more attention is needed.** Patients value the support that is provided during cancer treatment but saw a need for this during survivorship as well. This was noted as a substantial need in the 2016 CHNA as well. Planning for survivorship includes attending to issues like long-term effects of treatment, medication needs, managing day-to-day activities like employment and healthy living, and emotional support.

• **Nearly one in five respondents participating in the Boston CHNA felt that cancer was a top concern.** Additionally, several of the top concerns (e.g. smoking, obesity) are risk factors for cancer. Among the general population, top community concerns were mental health and substance use, trauma, community violence, obesity, and social and economic concerns such as housing and employment.

• **Quantitative data on smoking, alcohol use, obesity, and access to healthy foods and opportunities for physical activity indicate that some Boston residents are at increased risk for cancer.** While smoking rates have declined over time, one in six Boston adults still smoke, with significantly higher rates of smoking among Black residents, males, and those with lower levels of education and income. For example, nearly 1 in 3 unemployed residents smoke. Obesity was an area of substantial concern for Boston CHNA focus group members and interviewees, and data show that over half of Boston adults are overweight or obese. Black and Latino adults, as well as those who are older and who have lower levels of education and income are significantly more likely to be obese or
overweight. Certain neighborhoods also appear to have much higher rates of obesity; seven out of ten Mattapan residents, for instance, are obese or overweight. Limited access to opportunities for physical activity, food deserts, as well as lack of time to prepare healthy food were all reported to be contributors to obesity, especially among lower income residents.

SUGGESTIONS FOR CANCER-RELATED INITIATIVES, PROGRAMS, AND SERVICES

Overall

- **Expanded patient navigation/care coordination services.** Among all suggestions provided by interviewees and focus group participants, enhanced support to help patients navigate cancer services and related care was mentioned most frequently. This was a key suggestion in 2016 as well. They described a need for assistance navigating the health system and health insurance, connection to social and other services, as well as advocacy for some. Similarly, interviewees noted the importance of navigation support, including support at the beginning of the cancer continuum—when a patient has an abnormal screening result. Ensuring that patients are informed of these services and that they are offered to equally to all patients was also emphasized. The need for transportation support was also noted.

- **Enhanced language capacity/cultural competency.** While interpretation services in most aspects of cancer care was reported to be good, a few focus group members and interviewees suggested that greater language capacity is needed with front-line staff to help with scheduling and with different sub-specialty groups. They also mentioned an ongoing need for more cultural competency capacity across the cancer care system, including training in anti-racism/anti-discrimination. Some stated that greater racial/ethnic diversity in the cancer care workforce is a critical step in ensuring cancer care meets the needs of all patients.

- **Policy change.** A few respondents suggested policy changes including reimbursement for patient navigation as mentioned above. Additional policy suggestions included working with public benefits (such as SSI and SSDI) to minimize the catastrophic financial toll that cancer can have on individuals and families and advocating for changes in insurance coverage for alternative treatments and patient navigator services.

- **Greater collaboration across institutions.** A couple of focus group members and interviewees reported that collaboration among hospitals serving cancer patients could be improved, in particular relative to clinical trials and patient navigation services and ensuring that cancer patients and survivors at all hospitals are aware of the services available to them. More collaboration between hospitals and community-based organizations was also mentioned.

Prevention

- **Obesity Prevention.** Obesity is a risk factor for cancer and other chronic diseases. Given that more than half of Boston residents are obese or overweight, there is a need to provide education about healthy eating and nutrition. Community Benefits may be able to build on the past success of promoting healthy eating and cooking in a low-income housing community. Over five years of data, nearly two-thirds of Community Benefits priority neighborhood program participants indicated on a feedback survey that they wish to learn more about nutrition. Similarly, CHNA focus group participants expressed concern about obesity and not knowing how to prevent it. Particular geographic areas with higher obesity rates, such as Mattapan, would benefit from such education.
• Tobacco Use. Tobacco use is the most important risk factor for lung cancer and is linked to approximately 90% of lung cancer deaths in the United States, according to the Centers for Disease Control and Prevention. The data show high smoking rates among certain groups. For example, more than 1 in 4 Boston residents who are unemployed, low-income and do not have a high school degree smoke. DFCI’s Treatment Program in Roxbury has had success in helping people reduce their tobacco use or quit completely. Expanding this program to other health centers in areas with high smoking rates, such as Dorchester or South Boston, or other community settings such as low-income housing developments, could help prevent lung and other cancers.

• Low-dose lung screening. Education about lung screening and expanded lung screening opportunities could help detect lung cancer at an earlier stage when most treatable, particularly for groups most at risk. Asian men have the highest lung cancer incidence rate and also the highest mortality rate across all cancers and all groups reported in the CHNA. Additionally, Latino men have had a large increase in lung cancer incidence.

Screening

• More outreach about cancer prevention and screening services. While screening rates for some cancers and among some groups is high, focus group members and interviewees saw a need to continue to maintain these rates, while also expanding efforts to ensure that underserved populations are reached. Suggestions about the type of information that needs to be disseminated include clear information about current cancer screening guidelines, the treatability of cancer, the importance of engaging in healthy behaviors to prevent cancer, and why it is important to follow up on abnormal results. Suggestions to enhance outreach included identifying and engaging community champions, utilizing multi-media approaches, and prioritizing young audiences and men.

• Better patient follow-up after abnormal findings. Respondents who discussed screening services overwhelmingly mentioned a need for better protocols relative to follow up after abnormal results.

• Greater engagement of PCPs. Interviewees stressed the importance of ensuring that PCPs are up-to-date about most current guidelines and have the resource they need to educate patients about why screenings are important, what is involved, and any risk or benefits.

Cancer Treatment

• Greater access to clinical trials. Noting the underrepresentation of people of color in clinical trials, several interviewees mentioned a need to conduct better outreach to these groups and to reduce barriers to their participation. This was also a key suggestion in 2016. Patient navigators or care coordinators can also be a critical resource relative to trials, helping patients to identify opportunities and dealing with barriers such as insurance. Direct messaging to patients about clinical trials was also suggested.

• More support groups and education. Cancer patients and survivors requested more cancer support groups in different languages, across different cancers and serving different populations. A few participants wanted financial planning guidance in the context of cancer and strategies to negotiate with employers. Caregivers participating in focus groups also saw a need for more education.

• Better communication by physicians and provider offices. Although most focus group members reported that received high quality cancer care, some saw a need for improvement relative to communication. A few reported that they wished that they had received more information about treatment options or had more of an opportunity to discuss these with their physicians.
Cancer Survivorship

- **Survivorship Services.** As in the 2016 CHNA, there was a request for more support services for survivors and families. People appreciated hospital survivor support groups but expressed a need for more support groups in other languages, as well as support groups facilitated by people of color and cancer survivors, possibly in collaboration with faith-based organizations. More information and support regarding living with cancer, rejoining the workforce, maintaining a healthy lifestyle, and supporting families was also requested.

- **Survivorship planning.** Respondents shared that more attention needs to be paid to helping cancer patients plan for survivorship including ongoing medical care, transition back to work and family life, emotional support, diet and exercise, and other needed social supports.

- **Engagement of primary care providers.** As with cancer screening and treatment, engagement of PCPs is critical in survivorship to ensure follow up care and monitoring. A couple of interviewees noted that more should be done to ensure that all patients have a medical home after treatment. Ensuring that primary care providers have sufficient expertise to provide this care is also important.

- **Exercise and nutrition support.** Specific support around healthy lifestyles after treatment was suggested by several respondents. Specific suggestions included nutrition consultation as a routine part of post-cancer care and more low-cost or free exercise programs for cancer survivors.

Conclusion and Acknowledgements

Cancer remains the leading cause of death in Boston. While the CHNA findings reflect that collective efforts to advance cancer screening and prevention are making a difference, the overall burden of cancer across all types is weighty and more effort is needed to reduce the cancer burden and address disparities. Dana-Farber recognizes that our efforts must go beyond cancer care and treatment, and as such, we will continue our unwavering commitment to reducing the cancer burden and promoting survivorship. We remain committed to educating the community and raising awareness about the importance of cancer prevention, outreach, screening, early detection, clinical trials and survivorship. In addition, we will continue to conduct a broad scope of community-based research and evidence-based interventions through collaborative work in local neighborhoods and throughout the region.

This comprehensive Cancer CHNA Report would not have been possible without the support and engagement of DFCI and BMC patients, family members, and caregivers, who generously contributed their time and feedback to this process. We’d also like to acknowledge our community partners, including Union Capital Boston (UCB), BMC, Whittier Street Health Center, BPHC’s Pink and Black Education and Support Network, the Prostate Health Education Network (PHEN), Asian Women for Health (AWFH), Enhance Asian Community on Health (EACH), and Dana-Farber’s Determination of Need Advisory Committee members, among others, for their collaboration and support. In addition, we want to thank the over 100 organizations that participated in the first Collaborative Boston CHNA/CHIP. Please see [http://www.bostonchna.org/](http://www.bostonchna.org/) for a full list of organizations engaged in this process.
BACKGROUND

Purpose and Scope of the 2019 Cancer-Focused Community Health Needs Assessment
The purpose of a Community Health Needs Assessment (CHNA) is to identify health-related needs, strengths, and resources of a community through systematic, comprehensive data collection and analysis. The assessment provides data that can be used by stakeholders to plan and develop initiatives and invest resources.

In 2019, a wide variety of Boston stakeholders—community organizations, community development corporations, health centers, hospitals, and the Boston Public Health Commission—formed the Boston CHNA-CHIP Collaborative to engage in Boston’s first large-scale collaborative city-wide Community Health Needs Assessment (CHNA) and Community Health Improvement Plan (CHIP).

While community health assessment and planning work have been long-standing endeavors within individual organizations, the Boston CHNA-CHIP Collaborative aligns and coordinates resources between multi-sector stakeholders across Boston. Boston Medical Center and Dana-Farber Cancer Institute are actively engaged in the city-wide assessment, having representation on both the Steering Committee and work groups. The 2019 Boston Collaborative CHNA provides a comprehensive look at a range of health outcomes and conditions in Boston, as well as the social determinants that affect health. That full report is available at www.BostonCHNA.org.

That city-wide effort provides data on a number of different health issues but does not dive deeply on specific issues across the cancer continuum. In 2019, Dana-Farber Cancer Institute (DFCI) and Boston Medical Center (BMC) aimed to provide a deeper analysis of the issues across the cancer continuum. They contracted with Health Resources in Action (HRiA), a Boston-based public health organization, to develop this cancer-specific report.

This report presents findings from the cancer-focused CHNA as well integrates the key results of the larger citywide CHNA to provide a deeper dive in residents’, cancer patients’, and survivors’ experiences, concerns, supports, and challenges related to cancer prevention, screening, treatment, and survivorship within the larger framework of the social determinants of health.

Definition of Community Served
The 2019 Boston CHNA focused on the geographic area of the City of Boston (Figure 1) with a neighborhood focus. Data are presented for Boston overall and by different sub-populations where appropriate and available. This includes by neighborhood but also by race/ethnicity, gender, LGBTQ status, income, and other defining characteristics.
Figure 1: Map of Boston Neighborhoods

The map above delineates the neighborhood boundaries used in this report. Neighborhoods can be identified in several ways. In this report, consistent with the *Health of Boston 2016-2017*, zip codes are used to identify neighborhood boundaries since this information is collected with health data and it allows us to standardize data to rates using population estimates which can change over time.

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 collections 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.

With this approach, some neighborhoods are combined to provide a larger area for analysis. Please note that the zip code neighborhood definitions used in this report may differ from what are used by other organizations and agencies. To this point, there are a few tables in this report with demographic data by neighborhood that lists more neighborhoods than the ones in the map above. These data were pulled using the Boston Planning and Development Agency delineations of neighborhoods which are based on census tracts and not ZCTAs. Therefore, it should be noted that the neighborhood boundaries for the data in these tables are slightly different than the rest of the report.
METHODS

Social Determinants of Health Framework

Upstream Approaches to Health
Having a healthy population is about more than delivering quality health care to residents. Where a person lives, learns, works, and plays all have an enormous impact on health. Health is not only affected by people’s genes and lifestyle behaviors, but by more upstream factors such as employment status, quality of housing stock, and economic policies. Figure 2 provides a visual representation of these relationships, demonstrating how individual lifestyle factors, which are closest to health outcomes, are influenced by more upstream factors such as employment status and educational opportunities.

Figure 2: Social Determinants of Health Framework

Health Equity Lens
The influences of race, ethnicity, income, and geography on health patterns are often intertwined. In the United States, social, economic, and political status based on race and ethnicity can influence opportunities for educational and occupational advancement and housing options, two factors that profoundly affect health. Institutional racism, economic inequality, discriminatory policies, and historical oppression of specific groups are a few of the factors that drive health inequities in the U.S.

This report describes health patterns for Boston overall and areas of need for particular population groups. Understanding factors that contribute to health patterns for these populations can facilitate the identification of data-informed and evidence-based strategies to provide all residents with the opportunity to live a healthy life. While data is presented specifically by race/ethnicity and socioeconomic factors (e.g. education, income and employment status etc.), this report is not able to analyze findings for groups who experience multiple challenging conditions which presumably is associated with even worst health outcomes.

Using the health equity lens, the data is analyzed to detect disparities. Thus, Black, Latino and Asian groups are each compared to White residents. The table findings are highlighted in bright yellow to identify areas of concern, i.e. incidence or mortality rates that are statistically significantly higher compared to Whites or
screening rates that are statistically significantly lower than Whites. The cancer incidence and mortality tables also include a red star to denote the group with the highest rate for a particular condition, even if the difference is not statistically significant.

The report also includes data for many variables presented at the neighborhood level with significant differences compared to Boston overall. These statistically significant neighborhood differences are noted with bright yellow highlighting in the summary tables and with an asterisk in the bar charts. In addition, light yellow highlighting indicates large neighborhood differences compared to overall Boston rates for variables that were not tested for statistical differences. The neighborhood summary tables presented throughout the report include DFCI’s priority neighborhoods as well as neighborhoods with relatively high levels of concerning health conditions or cancer statistics. Although the summary tables do not include all the Boston neighborhoods, information for all Boston neighborhoods is available in bar charts throughout the report.

Secondary Data
Data is presented on all cancers overall, breast cancer, prostate cancer, colorectal cancer, liver cancer, and lung cancer. There is very limited data available for Head and Neck cancers and no data is presented on Cervical cancers as these types of cancer are relatively rare compared to other cancers in Massachusetts. The Massachusetts Cancer Registry does not disclose disease rates in instances of small numbers.

Secondary data for this report come from a variety of sources. The Massachusetts Department of Public Health provided much of the secondary data about cancer mortality, screening, and incidence. Additional data sources include the Boston Behavioral Risk Factor Surveillance Survey (BBRFSS), Youth Risk Behavior Survey (YRBS), U.S. Census American Community Survey (ACS), vital records, and Acute Hospital Case Mix Database from the Center for Health Information and Analysis, among others.

The Research and Evaluation Office at the Boston Public Health Commission conducted the data analysis for nearly all the secondary data on health indicators in this report (e.g., lifestyle behaviors, screening behaviors, cancer incidence, cancer mortality). Analyses are presented as frequencies (percentages) and rates throughout the report. Data from the ACS and surveillance systems, such as the BBRFSS, are presented with confidence intervals (or error bars in the figures), where possible.

It is often difficult to know whether apparent differences reflect true underlying distinctions between groups or just normal fluctuations of rates and numbers. This cancer CHNA includes statistical testing to determine if differences are statistically significantly different. Differences that are deemed significant reflected instances where there is a high level of confidence that there is in fact a true difference. For instance, Black men have a mortality rate of 49.8/100,000 due to prostate cancer compared to 19.1 among White men. This difference is large enough to conclude that Black men have a statistically significantly higher rate of death from prostate cancer compared to White men, and there is a very high level of confidence that this difference is real. In this report, tests for significance are noted in the table or graph notes (where p<0.05, meaning there is less than a five percent chance we would see these kinds of numbers if there was not a true difference), and the narrative uses the words “significant” or “significantly” to note statistically significant differences. While non-significant differences could be the beginning of a significant development or simply be limited by a small sample size, the significant differences deserve special attention as these are large enough discrepancies to reach the significance level.

Significance testing of time trends of cancer incidence and mortality data were conducted using Poisson regression. Poisson regression is used for count data and takes into account all of the data points in the time period. Therefore, when percent change for incidence and mortality is discussed in the narrative, it
represents the calculation of the overall change across the time period and not simply the percent change between the baseline and end points.

Focus Groups and Key Informant Interviews
Focus groups with residents and key informant interviews were conducted to dive deeply into perceptions and experiences. Specifically, for the cancer-focused CHNA, eight focus groups were conducted between March-April 2019 in English, Spanish, and Chinese. Sixty-three individuals representing cancer patients, survivors, and caregivers were engaged in discussions. Focus groups lasted between 60-90 minutes and included 5-17 participants in each group. Trained facilitators used a semi-structured moderator’s guide to ensure consistency across conversations.

In addition to the eight focus groups conducted specifically related to perceptions, experiences, and care-seeking around cancer, this report also includes data from thirteen focus groups conducted with community residents for the collaborative Boston CHNA. These focus groups were with specific populations not typically represented in assessment processes including low wage workers, LGTBQ youth at risk of being homeless, survivors of violence, public housing resident, and immigrant parents. Focus groups were conducted in English, Spanish, Haitian Creole, and Chinese. A total of 104 community residents participated in focus groups. Focus groups were 90-minute semi-structured conversations with approximately 8-12 participants per group and aimed to delve deeply into community’s needs, strengths, and opportunities for the future. These discussions were not health topic-specific but delved more into the social and economic factors that impact their lives. Selected results from these focus groups are included in this report.

For this cancer-focused CHNA, seven key informant interviews were conducted with a variety of individuals from community-based organizations and hospitals including community advocates, cancer specialists, a primary care provider, and a patient navigator. Discussions explored participants’ perceptions of cancer and related services across the cancer continuum (prevention, screening, treatment, survivorship) and suggestions for future services and resources to address these issues. A semi-structured interview protocol was used across all discussions to ensure consistency in the topics covered.

Along with the seven cancer-specific interviews, this report includes data from 45 key informant interviews conducted for the collaborative Boston CHNA. These interviews were more general and explored interviewees’ experiences addressing community needs and opportunities for future alignment, coordination, and expansion of services, initiatives, and policies. Interviewees represented a variety of organizations and sectors including public health, health care, housing and homelessness, transportation, community development, faith, education, public safety, environmental justice, government, workforce development, social services, food insecurity, business organizational staff that work with specific population such as youth, seniors, disabled, LGTBQ, and immigrants.

In addition to these focus groups, this report includes qualitative information collected by the Boston Public Health Commission (BPHC) as part of a study on prostate cancer. BPHC conducted six focus groups (44 people in total) with African American and Caribbean American men ages 40-70 (those who were screened or not screened) and influencers of these men (male or female). Focus groups were held between July 2018 and April 2019 and included between 4-10 participants. Facilitators used a semi-structured discussion guide to ensure consistency across conversations. BPHC also conducted six key informant interviews with members of the community who have insights into men’s health care practices. The summary themes from this research were shared with HRiA and incorporated into this report.

In total, data from 27 focus groups (193 individuals) and 52 key informant interviews are included in this report.
Community Survey
A community survey was developed and administered for the collaborative Boston CHNA. The survey focused on a range of issues related to the social determinants of health, community perceptions, and access to care. The survey was developed collaboratively with work group members and pilot-tested in late January 2019. The final instrument was launched in February 2019 and fielded through early March 2019. The survey was administered on-line and via hard copy in seven languages (English, Spanish, Portuguese, Haitian Creole, Chinese, Vietnamese, and Arabic). The survey utilized a convenience sample, but extensive outreach was conducted by Collaborative members to garner a sample that reflected Boston demographics. The survey was completed by 2,404 respondents who were Boston residents. Significance testing to identify differences by sub-group were conducted on these data and are noted in the table or graph notes; the narrative uses the words “significant” or “significantly” to note where there are statistically significant differences exist.

Data Limitations
Several limitations related to these data that should be acknowledged. A number of secondary data sources were drawn upon for this report. Although all the sources used for this purpose are considered highly credible, sources may use different methods and assumptions when conducting analyses (e.g., different questions to identify race/ethnicity; different boundaries for neighborhoods). There is also often a time lag from the time of data collection to data availability. Some data are not available by specific population groups or at a more granular geographic level due to small sub-sample sizes. In some cases, data from multiple years may have been aggregated to allow for data estimates at a more granular level or among specific groups.

Further, it should be noted that some indicators are not comparable year to year. In particular, cancer screening guidelines have changed related to time periods or ages recommended for screening. While there may not be consensus among some screening guidelines, analyses by government agencies who follow different guidelines has changed and thus rates year to year may not be directly comparable.

Additionally, while focus groups and interviews provide valuable insights and important in-depth context, due to their small sample size and non-random sampling methods, results are not necessarily generalizable. Additionally, it is important to note that data were collected at one point in time, so findings, while directional and descriptive, should not be interpreted as definitive.

For the Boston CHNA survey, while strong efforts were made to conduct broad outreach, a convenience sample was used for the community survey conducted for the Boston CHNA. A convenience sample is a type of non-probability sampling; thus, there is potential selection bias in who participated or was asked to participate in the survey. Due to this, results cannot necessarily be generalized to the larger population.

Throughout this report, comparisons are made to findings from the previous 2016 CHNA conducted for DFCI. It is important to note that the methodologies related to focus groups differ across these two reports. Eight focus groups with cancer patients, survivors, and caregivers in English, Spanish, and Chinese were conducted for this 2019 CHNA. In 2016, three focus groups were conducted, two with cancer survivors (one conducted in Spanish and one in English) and one with community members from specific neighborhoods. Thus, comparisons of themes from the 2016 report are made sparingly, and results should be interpreted with caution.
**Priority Neighborhoods:**
Consistent with the previous CHNA, this effort focused on Dana-Farber’s priority neighborhoods for Community Benefits work – Roxbury, Mission Hill, Dorchester, Mattapan, and Jamaica Plain – which are some of Boston’s most diverse communities. The DFCI Community Benefits office has identified these neighborhoods as priority focus areas given that they are within DFCI’s service area and include many of the city’s most underserved populations. Dana-Farber’s prioritization of these five neighborhoods within its local service area reflects a commitment to reducing the health disparities in cancer care and improving the overall health and well-being of neighborhood residents.

**DFCI Satellite Locations and Health Equity**
In addition to the Main Campus located in the Longwood area of Boston, DFCI also provides adult cancer care services at its hospital satellite facilities in Brighton, Milford and Weymouth. The neighborhood of Allston/Brighton was included as part of this assessment due to a long history of partnering with the Charles River Community Health Center, which serves low-income and underserved populations living in the Allston/Brighton area. To meet its Community Benefit mission, DFCI has continued to provide mobile mammography services to residents of Allston/Brighton through its partnership with Charles River Community Health Center. This collaboration has set a strong foundation for our work in this community.

While there are cancer related needs in Milford and Weymouth, the health equity analysis used for this assessment confirms the considerable health disparities that exist in DFCI’s priority neighborhoods. We will continue to collaborate with community partners in Milford and Weymouth to share best practices to strengthen our collective outreach efforts. The most recent CHNA reports for Milford and Weymouth can be found at https://www.milfordregional.org/about-us/community-benefits/ and https://www.southshorehealth.org/about-us/community-benefits.

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**Figures 2-3:** Maps of the City of Boston and Greater Boston, highlighting Dana-Farber’s Priority Neighborhoods for Community Benefits work and Dana-Farber’s locations in the Longwood Medical Area, Allston/Brighton, Weymouth and Milford.
Focus Area Prioritization Process
Identifying key areas of focus for Dana-Farber’s Community Benefits work has been conducted through an iterative, multi-phased process as part of the Collaborative Boston CHNA, the Cancer CHNA Report, and the creation of the Implementation Plan, which will be completed in November 2019. Building upon Dana Farber’s existing portfolio of Community Benefits activities, the health equity analysis undertaken for this assessment seeks to demonstrate measurable outcomes in reducing cancer incidence and mortality through programmatic enhancements.

The prioritization of focus areas includes several considerations:
- Alignment with Dana-Farber’s mission and current work
- The magnitude and severity of the issue
- Potential impact and the ability to demonstrate measurable outcomes
- Opportunity to leverage current partnerships to intensify efforts

To achieve racial/ethnic health equity across the cancer continuum, Dana-Farber’s Community Benefits activities will continue to focus on the following areas:

1. Addressing the cancer burden
2. Reducing access barriers
3. Promoting survivorship, particularly in communities of color.

These areas reflect a commitment to meeting the health needs of medically underserved populations in DFCI’s priority neighborhoods and leveraging the hospital’s unique role in the continuum of care as a comprehensive cancer center. In addition, they provide the umbrella under which DFCI’s community outreach activities are organized and have guided the approach to the 2019 DFCI community needs assessment. Additional priorities will emerge through our Implementation Plan, which will be completed in November 2019.

Stakeholder Engagement
In June and in September 2019, a total of four separate groups were engaged to discuss DFCI’s Cancer CHNA findings. In these sessions, HRiA presented key qualitative and quantitative findings to DFCI’s Determination of Need (DoN) Advisory Committee, Board of Trustees’ Community Programs Committee and Community Benefits Office staff. The Internal Community Benefits Committee presentation was conducted by the Community Benefits Office staff. During these sessions, HRiA provided an overview of the data findings followed by a discussion with the audience to identify questions, gaps, areas for further exploration, and potential implications. Those discussions helped refine the development of the CHNA report and will help guide the upcoming implementation plan.

POPULATION OVERVIEW

Population Count
The most current figures from the 2013-2017 American Community Survey show that Boston has 669,158 residents, a population that has grown 8% in the last several years (Table 1). Boston’s population is projected to continue to grow at that rate—to 723,500 people by 2030. In the last several years, the population has increased in all neighborhoods, with double digit increases in Roxbury, South Boston, Hyde Park, East Boston, and Charlestown.
## Table 1: Total Population, by Boston and Neighborhood, 2008-2012 and 2013-2017

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>2008-2012</th>
<th>2013-2017</th>
<th>% population change 2012 to 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>619,662</td>
<td>669,158</td>
<td>8.0%</td>
</tr>
<tr>
<td>Allston/Brighton</td>
<td>61,159</td>
<td>63,270</td>
<td>3.5%</td>
</tr>
<tr>
<td>Back Bay</td>
<td>51,735</td>
<td>55,635</td>
<td>7.5%</td>
</tr>
<tr>
<td>Charlestown</td>
<td>17,052</td>
<td>18,901</td>
<td>10.8%</td>
</tr>
<tr>
<td>Dorchester (02121, 02125)</td>
<td>58,797</td>
<td>63,733</td>
<td>8.4%</td>
</tr>
<tr>
<td>Dorchester (02122, 02124)</td>
<td>75,304</td>
<td>79,717</td>
<td>5.9%</td>
</tr>
<tr>
<td>East Boston</td>
<td>41,680</td>
<td>46,655</td>
<td>11.9%</td>
</tr>
<tr>
<td>Fenway</td>
<td>52,897</td>
<td>54,267</td>
<td>2.6%</td>
</tr>
<tr>
<td>Hyde Park</td>
<td>29,219</td>
<td>33,084</td>
<td>13.2%</td>
</tr>
<tr>
<td>Jamaica Plain</td>
<td>36,866</td>
<td>39,435</td>
<td>7.0%</td>
</tr>
<tr>
<td>Mattapan</td>
<td>27,335</td>
<td>29,141</td>
<td>6.6%</td>
</tr>
<tr>
<td>Roslindale</td>
<td>30,370</td>
<td>32,819</td>
<td>8.1%</td>
</tr>
<tr>
<td>Roxbury</td>
<td>37,454</td>
<td>43,871</td>
<td>17.1%</td>
</tr>
<tr>
<td>South Boston</td>
<td>34,452</td>
<td>39,866</td>
<td>15.7%</td>
</tr>
<tr>
<td>South End</td>
<td>34,395</td>
<td>34,777</td>
<td>1.1%</td>
</tr>
<tr>
<td>West Roxbury</td>
<td>27,163</td>
<td>28,505</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

NOTE: Neighborhoods as defined by Boston Public Health Commission; Back Bay includes Back Bay, Beacon Hill, Downtown, North End, and West End; South End includes South End and Chinatown; Boston population count includes some areas that are not covered by neighborhood definitions per ZCTAs; Data for Mission Hill were analyzed by Boston Planning and Development Agency

### Age Distribution

Overall, Boston is a young city, with about one third of residents under the age of 24. Boston’s population represents a range of age groups, but the distribution of these ages varies across neighborhoods. Overall, 20.9% of Boston’s residents are 19 years old or younger, 34.5% are 20-34 years old, and 11.0% are 65 years or older (Figure 4). Dorchester, Fenway, Longwood, and Roxbury (defined using BPDA boundaries) have the largest proportions of children 19 years old or younger. West Roxbury is the neighborhood with largest proportion of older residents, with 17.9% 65 years or older.
**Racial and Ethnic Composition**

Boston is a diverse city with 23% of residents identifying as Black, 19% identifying as Latino, and nearly 10% identifying as Asian (Table 2). Diversity among younger residents is greater than among older residents, and diversity at the neighborhood level varies substantially. While more than one in five Boston residents (22.7%) identify as Black, in neighborhoods such as Roxbury, Hyde Park, and Dorchester the percentage is 40-50%, while Black residents comprise 73% of the population of Mattapan. Nearly 20% of the Boston population identifies as Latino, yet 57.4% of East Boston’s population and 30% of Roxbury’s population is Latino. Asian residents are nearly 10% of Boston’s population, while 32% of downtown and 22% of Allston residents are Asian.

**Figure 4: Age Distribution, by Boston and Neighborhood, 2013-2017**

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>0-19 years</th>
<th>20-34 years</th>
<th>35-54 years</th>
<th>55-64 years</th>
<th>65+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>20.9%</td>
<td>34.6%</td>
<td>23.6%</td>
<td>10.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Allston</td>
<td>16.7%</td>
<td>67.6%</td>
<td>8.8%</td>
<td>3.4%</td>
<td></td>
</tr>
<tr>
<td>Back Bay</td>
<td>13.4%</td>
<td>41.3%</td>
<td>19.2%</td>
<td>11.7%</td>
<td>14.5%</td>
</tr>
<tr>
<td>Beacon Hill</td>
<td>10.8%</td>
<td>48.8%</td>
<td>18.7%</td>
<td>9.4%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Brighton</td>
<td>12.6%</td>
<td>52.9%</td>
<td>16.1%</td>
<td>6.2%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Charlestown</td>
<td>19.2%</td>
<td>30.4%</td>
<td>28.1%</td>
<td>12.0%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Dorchester</td>
<td>25.1%</td>
<td>28.0%</td>
<td>26.0%</td>
<td>10.4%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Downtown</td>
<td>20.4%</td>
<td>33.5%</td>
<td>20.2%</td>
<td>11.5%</td>
<td>14.4%</td>
</tr>
<tr>
<td>East Boston</td>
<td>22.5%</td>
<td>29.3%</td>
<td>30.1%</td>
<td>9.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Fenway</td>
<td>29.0%</td>
<td>52.4%</td>
<td>10.1%</td>
<td>6.4%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Hyde Park</td>
<td>23.8%</td>
<td>20.8%</td>
<td>26.8%</td>
<td>14.7%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Jamaica Plain</td>
<td>18.5%</td>
<td>33.0%</td>
<td>26.9%</td>
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<td>11.0%</td>
</tr>
<tr>
<td>Longwood</td>
<td>50.4%</td>
<td>46.5%</td>
<td>1.6%</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>Mattapan</td>
<td>24.8%</td>
<td>21.5%</td>
<td>29.2%</td>
<td>12.0%</td>
<td>12.5%</td>
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<tr>
<td>Mission Hill</td>
<td>19.0%</td>
<td>48.1%</td>
<td>15.2%</td>
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<td>11.2%</td>
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<td>North End</td>
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<td>11.4%</td>
</tr>
<tr>
<td>Roslindale</td>
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<td>30.6%</td>
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<td>12.7%</td>
</tr>
<tr>
<td>Roxbury</td>
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<td>24.3%</td>
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<td>10.4%</td>
</tr>
<tr>
<td>South Boston</td>
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<tr>
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<tr>
<td>West End</td>
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<tr>
<td>West Roxbury</td>
<td>22.6%</td>
<td>17.2%</td>
<td>28.2%</td>
<td>14.1%</td>
<td>17.9%</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** U.S. Census, American Community Survey 5-Year Estimates, 2013-2017

**NOTE:** Neighborhoods as defined by Boston Planning and Development Agency based on a combination of census tracts, zip codes and zoning districts; Downtown includes Chinatown, Leather District and Downtown; South End includes South End and Bay Village
Table 2: Racial and Ethnic Distribution, by Boston and Neighborhood, 2013-2017

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>9.4%</td>
<td>22.7%</td>
<td>19.4%</td>
<td>44.9%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Allston</td>
<td>21.7%</td>
<td>6.2%</td>
<td>13.8%</td>
<td>54.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Back Bay</td>
<td>9.9%</td>
<td>4.2%</td>
<td>8.1%</td>
<td>75.5%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Beacon Hill</td>
<td>6.2%</td>
<td>1.3%</td>
<td>6.9%</td>
<td>83.4%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Brighton</td>
<td>15.9%</td>
<td>4.4%</td>
<td>10.8%</td>
<td>65.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Charlestown</td>
<td>7.2%</td>
<td>5.8%</td>
<td>11.8%</td>
<td>73.2%</td>
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</tr>
<tr>
<td>Dorchester</td>
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<td>45.4%</td>
<td>18.1%</td>
<td>21.5%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Downtown</td>
<td>31.6%</td>
<td>3.4%</td>
<td>6.1%</td>
<td>56.4%</td>
<td>2.5%</td>
</tr>
<tr>
<td>East Boston</td>
<td>3.8%</td>
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<td>57.4%</td>
<td>32.6%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Fenway</td>
<td>20.3%</td>
<td>4.5%</td>
<td>11.6%</td>
<td>60.1%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Hyde Park</td>
<td>1.8%</td>
<td>45.5%</td>
<td>24.9%</td>
<td>24.5%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Jamaica Plain</td>
<td>6.2%</td>
<td>11.2%</td>
<td>23.7%</td>
<td>55.1%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Longwood</td>
<td>11.2%</td>
<td>5.9%</td>
<td>9.8%</td>
<td>70.2%</td>
<td>2.9%</td>
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<tr>
<td>Mattapan</td>
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<td>73.0%</td>
<td>15.3%</td>
<td>6.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Mission Hill</td>
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<td>20.0%</td>
<td>43.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>North End</td>
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<td>88.4%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Roslindale</td>
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<td>20.5%</td>
<td>23.1%</td>
<td>51.3%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Roxbury</td>
<td>3.7%</td>
<td>51.5%</td>
<td>30.0%</td>
<td>10.5%</td>
<td>4.3%</td>
</tr>
<tr>
<td>South Boston</td>
<td>4.2%</td>
<td>6.3%</td>
<td>10.9%</td>
<td>77.0%</td>
<td>1.6%</td>
</tr>
<tr>
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<td>3.0%</td>
<td>81.4%</td>
<td>2.1%</td>
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<tr>
<td>South End</td>
<td>16.6%</td>
<td>10.6%</td>
<td>13.5%</td>
<td>55.9%</td>
<td>3.4%</td>
</tr>
<tr>
<td>West End</td>
<td>15.0%</td>
<td>7.0%</td>
<td>12.7%</td>
<td>62.6%</td>
<td>2.7%</td>
</tr>
<tr>
<td>West Roxbury</td>
<td>7.6%</td>
<td>10.4%</td>
<td>10.2%</td>
<td>69.4%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

1. DATA SOURCE: U.S. Census, American Community Survey 5-Year Estimates, as analyzed by BPDA Research Division, as reported by Boston Planning and Development Agency, BPDA Research Division, Boston in Context: Neighborhoods 2019, 2013-2017
2. NOTES: Neighborhoods as defined by Boston Planning and Development Agency based on a combination of census tracts, zip codes and zoning districts; Downtown includes Chinatown, Leather District and Downtown; South End includes South End and Bay Village; Latino includes residents who identify as Latino regardless of race and racial categories include residents who do not identify as Latino; Other includes American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some other race, and Two or more races

While Boston’s overall population increased by 8% from 2008 to 2017, the number of Latino residents grew by 20.1%. The number of Asian residents increased by 12.8%, and those of another race (a combined category of American Indian/Alaskan Native, Native Hawaiian and Other Pacific Islander, some other race, or two or more races) increased 13.6% in the past several years. Growth in the number of Black residents and White residents between 2008 and 2017 was comparatively lower: the number of Black residents increased by 6.1% over this time period, while the number of White residents increased by 3.1%.

Boston’s immigrant community is strong. While over 28% of Boston residents were born outside the United States, that figure is significantly higher in East Boston, Dorchester, and Mattapan. Those born outside the United States were most likely to come from the Caribbean (29.1% of foreign-born residents) and Asia (26.0% of foreign-born residents). Nearly 38% of residents speak a language other than English at home and those figures are significantly higher for East Boston, Dorchester (zip codes 02121, 02125), Roxbury, Hyde Park, and the South End (which includes Chinatown) compared to Boston overall.
French/Haitian Creole/Cajun, other Indo-European languages (e.g., Portuguese, Italian), and Chinese are the most commonly spoken languages in Boston other than English.

**Educational Attainment**

Overall Boston is a highly educated city with nearly half of adults (48.2%) ages 25 years old or older holding a college degree or more (Figure 5). However, there are stark differences by race/ethnicity and by neighborhood. Nearly seven in ten white residents hold a college degree, while only two in ten Black and Latino residents do. Nearly six in ten Asian residents hold a college degree. Over one quarter of Latino adult residents do not have a high school diploma, compared to only 4% of white adult residents. By neighborhood, East Boston and Roxbury have a greater proportion of residents who do not have a high school diploma compared to Boston overall (Figure 6).

**Figure 5: Educational Attainment for Population 25 Years and Over, by Boston and Race/Ethnicity, 2017**

<table>
<thead>
<tr>
<th></th>
<th>Less than HS diploma</th>
<th>HS graduate</th>
<th>Some college/ Associate's degree</th>
<th>Bachelor's degree or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>12.0%</td>
<td>56.8%</td>
<td>20.2%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Asian</td>
<td>18.3%</td>
<td>30.6%</td>
<td>33.9%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Black</td>
<td>21.4%</td>
<td>13.7%</td>
<td>32.1%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Latino</td>
<td>12.4%</td>
<td>18.3%</td>
<td>26.1%</td>
<td>4.7%</td>
</tr>
<tr>
<td>White</td>
<td>56.8%</td>
<td>48.2%</td>
<td>20.2%</td>
<td>20.5%</td>
</tr>
</tbody>
</table>

DATA SOURCE: U.S. Census, American Community Survey 1-Year Estimates, 2017
SOCIAL AND ECONOMIC CONTEXT OF BOSTON RESIDENTS

Income and Financial Security
Income is a powerful social determinant of health that influences where people live and their ability to access resources which affects health and well-being. As described earlier, those with cancer face substantial economic challenges, both relative to the cost of treatment and related services but also, for some, challenges with maintaining employment and income.

As also highlighted in the 2016 CHNA, financial insecurity was a major theme across many focus groups conducted for the Boston CHNA. Participants talked about the challenges of making ends meet. As one participant noted, “Even if rent goes up $50 or $100 a month, it’s a lot when your income is not growing.” Participants talked about challenges with being stuck in low-wage jobs, with little room for advancement, and how that made it difficult to maintain a good quality of life. Across most groups, participants spoke of having to live paycheck to paycheck and being unable to save any additional income for emergencies. Residents also described struggles to maintaining financial stability, mentioning limited resources to help families attain upward mobility. One key informant explained, “Families who are lower middle income are trying to get out of the grey area but are stuck because they don’t qualify for services.” — Key informant interviewee

According to key informants and non-English focus group participants, residents who were undocumented and new immigrants were especially vulnerable to financial instability between no documentation, limited power, and the desire to support their families in their country of birth. Multiple focus group participants...
also described what is known as ‘the cliff effect’—a minor increase in income can cause a swift and total loss of benefits that are often more than the financial raise. Focus group residents who identified as low-income echoed this sentiment, with some describing experiences of losing health insurance or other benefits as a result of picking up even a few extra hours of work a week. One Mattapan resident shared, “I got 4 extra hours at my job and MassHealth cut me off and I couldn’t afford my pills for weeks after that.”

Across all indicators of income and financial security, there are substantial differences across Boston neighborhoods and racial and ethnic groups. The median household income in Boston is $62,021 but ranges from a $27,721 in Roxbury to $150,678 in South Boston Waterfront. In 2013-2017, one-quarter of Boston households had incomes <$25,000 (27%), one in seven households earned between $25,000 and <$50,000 (16%), and nearly one in ten earned between $50,000 and <$75K (14%) or $75K to <$100,000 (10%) (Figure 7). One third of Boston households earned $100,000 or more (33%). Roxbury (47%), Fenway (42%), and Mission Hill (40%) had the highest proportion of households with incomes below $25,000. Approximately half of households across the North End (48%), Back Bay (51%), and South Boston Waterfront (65%) had incomes of $100,000 or more (Figure 7).

![Figure 7: Household Income Distribution, by Boston and Neighborhood, 2013-2017](chart)

DATA SOURCE: U.S. Census, American Community Survey 5-Year Estimates, as analyzed by BPDA Research Division, as reported by Boston Planning and Development Agency, BPDA Research Division, Boston in Context: Neighborhoods 2019, 2013-2017

NOTES: Neighborhoods as defined by Boston Planning and Development Agency based on a combination of census tracts, zip codes and zoning districts; Downtown includes Chinatown, Leather District and Downtown; South End includes South End and Bay Village

There were significant racial/ethnic differences in median household income relative to the average for Boston. White households ($98,317) reported incomes that were 47% higher than the city average...
Asian ($47,048), Black ($39,344), and Latino ($36,998) households earned significantly less than the average across Boston. Notably, while White households reported incomes that were approximately $30,000 above the city average, Latino and Black households brought home incomes that were $30,000 below the median income across Boston.

One in five Boston residents (20.5%) lives below the federal poverty line, although this situation varies by neighborhoods (Figure 8). The percent of residents living below the federal poverty level was highest in Fenway (40.8%), Mission Hill (40.4%), and Roxbury (33.9%) in 2013-2017. South Boston Waterfront (5.5%) had the lowest proportion of residents living below the federal poverty level in 2013-2017. The percentage of the population living in poverty differs significantly by race/ethnicity. Using just 2017 data, Asian residents, at nearly 31%, and Latino residents, at nearly 28%, are significantly more likely to be in poverty than Boston residents overall. White residents are significantly less likely, at nearly 11%.

**Figure 8: Percent Population Living Below Poverty Level, by Boston and Neighborhood, 2013-2017**

DATA SOURCE: U.S. Census, American Community Survey 5-Year Estimates, as analyzed by BPDA Research Division, as reported by Boston Planning and Development Agency, BPDA Research Division, Boston in Context: Neighborhoods 2019, 2013-2017

NOTES: Neighborhoods as defined by Boston Planning and Development Agency based on a combination of census tracts, zip codes and zoning districts; Downtown includes Chinatown, Leather District and Downtown; South End includes South End and Bay Village
Employment and Workforce

Employment can confer income, benefits, and economic stability – factors that promote health. Overall, Boston residents have been experiencing low levels of unemployment in the last several years.

However, in focus group and interview discussions conducted for the Boston CHNA, there were differing views about employment and economic prospects in the city of Boston. Several key informant interviewees talked about the economic vitality in the city, citing a strong local economy and thriving small businesses. However, many residents across several focus groups discussed the challenges for workers, especially those with lower educational levels or skills, in securing well-paying jobs, remarking on the stark divides in class between Boston residents. One interviewee shared, “We have become the two cities of Boston. The extreme and stark difference is right in your face; where you have urban affluence right up against urban poverty… the Ritz condo development right next to St. Francis House…” Several focus group participants from Dorchester, East Boston, Mattapan, Chinatown, and Allston/Brighton described working multiple low-wage jobs and the stressors that come from a lack of job security. One Dorchester resident shared, “I have three jobs and still make less than $45,000 a year, barely getting by.” Immigrant communities, single-parent households, residents with a criminal record, and parents of children with special needs were described as especially vulnerable to unstable employment situations.

Quantitative data indicate differences in the proportion of residents who are not employed. In 2018, Boston’s unemployment rate was 3.0%, according to the Bureau of Labor Statistics; however, when examining unemployment data over the past several years (2013-2017), which can be analyzed by neighborhood and other subgroups, there are differences by neighborhood. Unemployment during this period was 7.3%, but over 10% in the neighborhoods of Roxbury, Longwood, Fenway, Mattapan, and Mission Hill (Figure 9).

Figure 9: Percent Population 16 Years and Over Unemployed, by Boston and Neighborhood, 2013-2017

DATA SOURCE: U.S. Census, American Community Survey 5-Year Estimates, as analyzed by BPDA Research Division, as reported by Boston Planning and Development Agency, BPDA Research Division, Boston in Context: Neighborhoods 2019, 2013-2017
NOTES: Neighborhoods as defined by Boston Planning and Development Agency based on a combination of census tracts, zip codes and zoning districts; Downtown includes Chinatown, Leather District and Downtown; South End includes South End and Bay Village

“I’ve struggled to get a job. I have more than a decade of experience, but the minimum requirements are always a bachelor’s degree, so that disqualifies you for ten jobs right off the bat.”—Focus group participant
According to 2015 Census data, Boston has almost 13,000 payroll jobs per square mile, a job density similar to San Francisco, New York City, and Washington, DC. Boston’s largest employers reflect the dominance of the health care and education industries, which account for 14 of the top 20 largest employers in the city. According to the American Community Survey, nearly one-third of Boston residents 16 years or older are employed in education, health care, or social assistance industries. The next most common industry for Boston residents is professional, scientific, and management; administrative, and waste management services (industry categories are pre-defined by the U.S. Census).

**Housing**

The high and rising cost of housing in Boston was a main theme that emerged in focus group and interview discussions conducted for the Boston CHNA. This theme emerged as a key issue in prior DFCI CHNAs as well. Focus group and interview participants reported that housing costs comprise a large and ever-increasing portion of household budgets, leaving few resources for other needs such as health care, medicine, or nutritious food. Lack of affordable housing was a prominent theme that arose across all key informant interviews and focus groups. Participants across geographies consistently shared that the rising cost of living in Boston was a major day-to-day concern and reported a need for more affordable housing for low and moderate-income levels. However, data indicate that the proportion of affordable housing to market rate is decreasing, rather than increasing. Even with the growth in development, the proportion of affordable housing units in total production in Boston has been falling since 2003. In the period 1996 to 2003, more than 39 percent of all permits were for affordable units. In the following period, 2004–2010, the proportion was down to less than 26 percent, and from 2011-2016, the proportion has fallen to about 18 percent.

According to Boston CHNA key informants and most focus group participants who identified as low-income, housing costs comprise a large part of spending for their households, leaving few resources for other needs such as health care, medicine, or nutritious food. One interviewee shared, “Many folks who are rent burdened are paying [up to] 50% of their income in rent; most of their resources going to this very essential need. The choices that people have to make—whether it’s not being able to ever take a vacation, not being able to purchase clothing or pay your bills... causes immense stress and mental health issues for care takers and children.” Further, some assessment participants reported instances of residents staying in emotionally or physically un-healthy environments because they could not afford other circumstances.

The majority of housing units across Boston are renter-occupied (65%), and renters spend an average of $1,445 per month on housing. More than half of those in renter-occupied units are housing cost-burdened (52%), meaning they spend more than 30% of their income on housing. A significantly higher proportion of residents in rental units in Roslindale (62%), South Boston (60%), Fenway (59%), East Boston (59%), and Jamaica Plain (58%) spent at least 30% of their income on housing costs, compared to the Boston overall average (Figure 10).
As shown in Figure 11, on average one-third (35%) of owner-occupied units in Boston spent at least 30% of their income on monthly housing costs, much smaller than the burden of housing costs for renters across the city in 2013-2017. Compared to Boston overall, a significantly higher proportion of residents of owner-occupied units in East Boston (47%), South Boston (47%), Roslindale (45%), Hyde Park (43%), and Fenway (41%) spent at least 30% of their income on housing. A significantly lower proportion of residents in owner-occupied units in Charlestown (24%), Dorchester (02122, 02124; 27%) and West Roxbury (27%) spent 30% or more of their income on housing.
Figure 11: Percent Housing Units Where 30% or More of Income Spent on Monthly Housing Costs, by Owner with Mortgage, by Boston and Neighborhood, 2013-2017

Data about housing cost burden across different racial/ethnic groups reveals that a higher proportion of residents of color than White residents are housing cost-burdened. In 2017, 48% of Black residents who own their homes and 59% of Black resident households who rent their homes spent 30% or more of their income on housing, compared to the Boston average, a significant difference. In contrast, 25% of White resident households who own their homes and 41% of White resident households who rent their homes spent at least 30% of their income on housing, significantly less than the Boston average.

Housing costs vary across Boston neighborhoods. South Boston, Back Bay, and Allston/Brighton had the highest monthly rental prices, while Dorchester ($812) and Roxbury ($917 and $1,074) had the lowest. For Boston overall, residents spent an average of $1,445 per month on housing if they rent and $2,293 per month if they owned their housing unit with a mortgage. Housing costs have risen substantially in Boston in the past several years. From 2011 to 2016, the median price for single-family homes in Boston increased by 48%, from $359,000 (2011) to $530,000 (2016). Home prices increased in each neighborhood over this period for which data were available. The largest increase in home prices was seen in East Boston (152%) and Roxbury (107%).

The housing cost burden has cascading effects on residents’ home and social environment. Overcrowding, housing instability, and homelessness are only a few of the themes that emerged in discussions with focus group and interview participants. For example, focus group participants who identified as low-wage workers discussed that in order to make ends meet, it was often a necessity to live in multigenerational households, with roommates, or with multiple families. One focus group participant shared, “I am trying to get ahead so I work two jobs overnight, but because I can’t afford rent on my own, I
have a lot of roommates. You live with too much stress because you’re working too hard, and then you have to come back home to a lot of people who might be noisy or unclean.” Housing quality and poor housing conditions were themes discussed in several conversations for this data gathering effort. Participants across most groups voiced concerns about the old housing stock in the city of Boston, specifically mentioning lead, mold, rodents, and insects as issues in their neighborhoods.

Transportation
Similar to those participating in focus groups for this CHNA, residents in focus groups conducted for the Boston CHNA shared mixed perceptions about transportation. Some participants reported being generally satisfied with transportation access in their neighborhoods, while others voiced concerns about cost, timeliness, and accessibility for the elderly. For example, focus group participants from Allston/Brighton and Jamaica Plain reported being satisfied with transportation in their neighborhoods, citing close proximity to buses and trains. Focus group participants in Mattapan noted improvements to key Mattapan bus routes in recent years. Transportation issues were also identified as a concern in the 2016 CHNA, with Mattapan residents facing substantial challenges.

Across most focus groups conducted for the Boston CHNA, parking and traffic were mentioned as a day-to-day concern for many community residents. Focus group participants in Dorchester indicated that these problems are compounded during the winter months because of the snow, especially on dead-end streets. According to key informants, rapid development happening across the city is compounding parking issues. As one participant explained, “The idea that the city would provide more housing without parking is a real challenge, especially as you start thinking of initiatives like dedicated bus lanes.” Further, ride shares such as Uber and Lyft were described as exacerbating congestion issues.

Across Boston, use of a personal vehicle (39%) was the most common form of transportation to work, followed by public transportation (34%), walking (15%), and carpooling (6%) in 2013-2017.10 Compared to Boston overall, East Boston (58%), Jamaica Plain (43%), Roxbury (40%), Dorchester (37-38%), South Boston (36%), and Allston/Brighton (35%) had a significantly higher proportion of residents who used public transportation to go to work. West Roxbury (17%), Back Bay (23%), Hyde Park (23%), Charlestown (27%), Roslindale (28%), Fenway (28%), and the South End (28%) had a significantly lower percentage of residents who used public transportation to get to work.

In 2015, 1,056 patients of 14 community health centers across Boston were asked about their means of transit to the health center on the day of their health center visit (Figure 12). The bus was the most common form of transportation for patients who identified as Black (54%), Latino (44%), Multi-Racial (44%), or who did not report a racial/ethnic identity (43%), followed by driving (27%-38%). Among respondents who identified as Asian, half (51%) reported driving to the health center and one-quarter (26%) used the bus to get to the health center. Among respondents who identified as White, driving (40%) was the most common form of transit to the health center, followed by taking the bus (34%) and walking (31%).

“Most [residents] rely on public transportation and it is difficult when the signs are not in their language. They may not understand announcements about delays or emergencies, and it makes them feel insecure about how to navigate.”—Key informant interviewee
Social Environment and Discrimination

Community cohesion refers to community dynamics, such as a shared sense of membership, influence, social integration, and connections among residents. In focus group discussions conducted for the Boston CHNA, participants who belonged to similar affinity groups expressed a strong sense of cohesion among their communities, particularly those with similar racial, cultural, linguistic, and religious backgrounds. Residents in East Boston, for example, referenced feeling “en casa” with their fellow Latino neighbors; translated to “make yourself at home” — the phrase means to extend hospitality and respect to one’s neighbor.

However, while some groups described strong community linkages, others did not, noting that people don’t interact as they have in the past or don’t get involved as they once did. Respondents who live in public housing residents and lower-income groups, for example, described limited connections or interactions with their neighbors. For example, residents from Dorchester shared, “No one knows each other anymore or talks to each other like they used to years ago. You can live right across the street from somebody and not even know their first name.” A few focus group and interviewees attributed these disconnects to lack of time and generational differences. Additionally, some mentioned that the migration of young professionals into some communities is changing the “feel” of these areas.

When asked about perceptions of community cohesion or connectedness, approximately three-quarters of Boston CHNA survey respondents perceived that they and their neighbors want the same thing for their neighborhood (77%). While gentrification was a theme that emerged in focus groups, seven in ten Boston CHNA survey respondents indicated that they plan to live in their neighborhood for a long time (73%). Approximately two-thirds (68%) of respondents noted that their neighbors help each other out and more than half (56%) of respondents reported recognizing most people who lived in their neighborhood. Notably, despite reported ties to their neighborhood and neighbors, only approximately one-third (35%) of respondents perceived that they had influence over what their neighborhood is like.

“Communities have changed so radically over time; the community fabric in terms of [young people] caring for an elder has changed. Just like it takes a village to raise child, it takes a village to raise an elder.” — Key informant interviewee
Boston CHNA survey respondents were asked about their experiences of discrimination in day-to-day life. Nearly half of respondents reported being treated with less courtesy than other people (49%), people acting as if they are better than the respondent (48%) and being treated with less respect (47%) a few times per year or more. Approximately half of respondents attributed their experience of discrimination to their gender (51%) or race (48%). These experiences of discrimination are important as they can restrict access to health promoting resources (such as health care), serve as stressful life events, and/or shape future interactions with institutions or spaces where they experienced discrimination.

Interviews and focus group discussions with residents help to illuminate experiences of discrimination similar to those reported in the Boston CHNA survey. Focus group participants who identified as immigrants most commonly described instances of discrimination in public spaces like the supermarket or on public transportation; this was especially true for those who identified as Latino and Asian. These groups perceived an increase in prejudice or discriminatory behavior in the last few years and attributed these tensions to the current political climate. Being discriminated against because of one’s ability to speak English or because of one’s accent was also a common theme among non-English focus group participants. One resident expressed, “Even when you try to speak English- they try to humiliate your accent.”

**Violence and Trauma**

Violence and trauma were frequent concerns reported by focus group and interview participants participating in the Boston CHNA. Community violence was the most frequently discussed type of violence in focus groups, namely in the neighborhoods of Dorchester, Mattapan, Roxbury, Chinatown, and East Boston. English and non-English speaking residents alike reported concerns about personal safety in their communities. Across all language groups, many focus group participants reported concerns about personal safety in their communities. Key informants and focus group participants specifically mentioned that children and communities of color are disproportionately impacted by violence. Further, community residents and interviewees alike stressed that community violence needs to be addressed from a lens of collective trauma. One Dorchester resident shared, “Our community is suffering from PTSD. We need to heal these wounds…kids have to walk by places where people they loved have been killed.”

When Boston CHNA survey respondents were asked how safe from crime they considered their neighborhood to be, one-quarter of respondents described their neighborhood as unsafe or extremely unsafe. Approximately half of respondents from Roxbury (50%), Mattapan (49%), and Dorchester (45%) described their neighborhood as unsafe or extremely unsafe, a prevalence that was more than double that across Boston (25%) (Figure 13).
Boston CHNA survey respondents who identified as Black (40%) or Latino (37%), respondents with some college or a certificate program (39%), and parents of children younger than 18 years of age (32%) were more likely to characterize their neighborhoods as unsafe or extremely unsafe.

The prevalence of interpersonal violence—a pattern or behavioral used to establish power and control over another person through fear and intimidation, often including the threat or use of violence—was discussed by a few key informants and by some focus group participants from Chinatown, East Boston, and Mattapan. One key informant explained, “There are plenty of families who are dealing with abusive relationships...there is evidence of abuse, domestic violence, drug addiction.” Women of color and non-English speaking immigrants were identified as especially vulnerable to interpersonal and domestic violence due to cultural or linguistic barriers.

Institutional racism—or the systematic distribution of resources, power, and opportunity in our society to the benefit of people who are White and the exclusion of people of color—was described as a priority by several key informants and focus group participants participating in the Boston CHNA. As one interviewee summarized, “We see things in communities of color like over policing, greater system involvement, more suspensions, the school to prison pipeline...racism shows up in all of these insidious ways.” Similarly, one focus group participant in Dorchester shared, “If the rules are made by White people for White people, it doesn’t matter who is elected to represent us; nothing will change for us [Black residents].” Key informants identified a need for more structural commitments to anti-racism work including investments in staff training.
PERCEPTIONS OF CANCER AND OTHER HEALTH ISSUES

Community Perceptions of Health Issues
When asked about top health concerns in the city, focus group participants and interviewees participating in the collaborative Boston CHNA identified housing affordability, mental health and substance use, trauma, community violence, chronic diseases, healthy aging, and environmental health concerns as especially concerning. Similar concerns were noted by Boston CHNA community survey participants. About half of survey respondents identified housing quality or affordability (51%) and alcohol and drug abuse (49%) as top community health concerns. They also identified mental health (42%) and community violence (31%) as concerns (Figure 14). One in five people in the community survey identified cancer as one of their top five health concerns. Additionally, a high proportion of survey respondents identified factors that are linked to cancer—smoking, obesity, and environmental conditions—as top health concerns in the community.

Figure 14: Percent Boston CHNA Survey Respondents Reporting Top Most Important Concerns In Their Community or Neighborhood That Affect Their Community's Health (N=2,053), 2019

DATA SOURCE: Boston CHNA Community Survey, 2019
Perceptions of Cancer
Similar to findings in the 2016 CHNA, among those participating in the collaborative Boston CHNA, health issues other than cancer were seen as more pressing for the community. The exception to this was in focus groups in East Boston and Chinatown. In Chinatown, for example, focus group participants perceived that high rates of tobacco use among residents impacted cancer rates in their neighborhood. East Boston participants spoke of cancer in the context of environmental concerns; specifically, residents worried about an electrical plant that was being built by the harbor and its potential impact on health, including cancer. The impact of environmental surroundings on cancer risk was also noted by focus group participants in 2016.

Cancer patients and survivors participating in focus groups for this specific data gathering effort had mixed perspectives about the extent to which people in their communities were aware of and understood cancer as a health issue. Respondents generally agreed that among cancers, awareness of breast cancer is most prevalent, attributed in large part to extensive messaging and public education. In contrast, awareness of prostate, cervical, and lung cancer was reported to be substantially lower, especially in communities of color. For some, respondents reported, cancer sparks fear, and thus, is not discussed. As one focus group member stated, “Cancer—it’s a scary word.” Others stated that shame and a desire not to burden friends or family are also reasons cancer is not discussed in their communities. As one member of the caregiver focus group explained, “Some people don’t want to talk about cancer; they keep it bottled up and don’t want to be a burden to others.” However, other focus group members reported that cancer is openly talked about in their communities because with better survival rates, cancer no longer seemed like the dire diagnosis it was previously.

As in 2016, a few focus group participants perceived that cancer is more widespread now than in the past, noting that more people seem to have cancer and that cancer is increasingly afflicting younger people. As one member of a Spanish-speaking focus group described, “Cancer now is a ‘gripe’, an epidemic. Before you didn’t see it as much.” Disparities in cancer incidence and mortality were also highlighted by numerous interviewees and focus group members. A few interviewees noted that breast cancer rates appear to be rising in young African American and Asian women, even among those with no family history.

CANCER PREVENTION

Risk factors for cancer include smoking, alcohol misuse, obesity, unhealthy eating behaviors, and sedentary lifestyles. These behaviors are strongly influenced by one’s neighborhood environment and upstream factors such as employment status and educational opportunities. Quantitative data about these behaviors show some positive trends but also some areas for attention, especially when differences are examined across neighborhoods and socioeconomic variables.

Tables 3-4 below provide a brief overview of key social determinants across neighborhoods, as well as neighborhood differences in behavioral risk factors associated with cancer. Bright yellow highlighting indicates statistically significant neighborhood differences compared to Boston overall, while light yellow highlighting indicates large neighborhood differences for variables that were not tested for statistical differences.
### Table 3: Social Determinants of Health According to Neighborhood

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<td>Living below FPL (2013-2017)</td>
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<td>Residents 16+ unemployed (2013-2017)</td>
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<td>10.2%</td>
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<td>5%</td>
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</tr>
<tr>
<td>Consider neighborhood unsafe or extremely unsafe (2019)</td>
<td>25%</td>
<td>50%</td>
<td>27.3%</td>
<td>49%</td>
<td>ND</td>
<td>ND</td>
<td>45%</td>
<td>18.1%</td>
<td>14.8%</td>
<td>ND</td>
<td>21.8%</td>
</tr>
<tr>
<td>Limited grocery store access (2019)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Yellow indicates a statistically significant difference when compared to the overall Boston percentages.
Light yellow indicates substantially higher percentages compared to Boston overall, although significance testing was not conducted.
ND: no data was collected on this population.


### Table 4: Difference in Health Behaviors According to Neighborhood, 2013-2017

<table>
<thead>
<tr>
<th>Health-Related Behaviors</th>
<th>Boston</th>
<th>Dorchester</th>
<th>East Boston</th>
<th>Roxbury</th>
<th>Fenway</th>
<th>Hyde Park</th>
<th>Mattapan</th>
<th>S. Boston</th>
<th>S. End</th>
<th>Allston/Brighton</th>
<th>JP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Smoking</td>
<td>16.5%</td>
<td>21.9%</td>
<td>17.1%</td>
<td>20.6%</td>
<td>13.1%</td>
<td>15.8%</td>
<td>19.3%</td>
<td>20%</td>
<td>22.2%</td>
<td>17.0%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Have Regular PCP</td>
<td>80.1%</td>
<td>81.7-83.1%</td>
<td>71.4%</td>
<td>81%</td>
<td>58%</td>
<td>89.1%</td>
<td>84.1%</td>
<td>83.3%</td>
<td>75.7%</td>
<td>70.1%</td>
<td>84.3%</td>
</tr>
<tr>
<td>Adult &lt; 1 Daily Fruit</td>
<td>39.3%</td>
<td>44-45%</td>
<td>43.2%</td>
<td>41.5%</td>
<td>38.4%</td>
<td>40%</td>
<td>41.8%</td>
<td>44.3%</td>
<td>36.6%</td>
<td>43.7%</td>
<td>32.2%</td>
</tr>
<tr>
<td>Adult &lt; 1 Daily Vegetable</td>
<td>24.7%</td>
<td>29%</td>
<td>26.3%</td>
<td>35.1%</td>
<td>19.6%</td>
<td>21.3%</td>
<td>28.5%</td>
<td>31.1%</td>
<td>24.6%</td>
<td>21.9%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Overweight/Obesity</td>
<td>56.8%</td>
<td>63-65%</td>
<td>62.9%</td>
<td>57.9%</td>
<td>37%</td>
<td>64.8%</td>
<td>71.1%</td>
<td>57.3%</td>
<td>50.7%</td>
<td>49.7%</td>
<td>50.4%</td>
</tr>
</tbody>
</table>

Yellow indicates a statistically significant difference from the overall Boston percentages.
ND: No data collected on this population.


Importantly, the priority neighborhoods of Dorchester, Roxbury, and Mattapan appear to be disproportionately burdened by the social determinants of health and certain behavioral risk factors, such as smoking and less than daily fruit and vegetable consumption. Among Boston CHNA participants, nearly 50% of residents from Dorchester, Mattapan and Roxbury described their neighborhoods as unsafe or extremely unsafe; this reflects a doubling of the percent who reported this perception across Boston overall. Furthermore, the neighborhoods of Dorchester, East, Boston, Roxbury, Mattapan, Hyde Park and JP...
are all characterized by sizable geographic areas with limited access to grocery stores. It is important to consider the influence of these factors on healthy behaviors such as physical activity and healthy eating. In addition, only 58% of Fenway residents and 71% of East Boston residents report having a primary care provider compared to 80.1% in Boston overall, which may signify less access to medical care in these areas.

Table 5 below describes these health-related behaviors across racial and ethnic groups and socioeconomic factors.

**Table 5: Differences in Health Behaviors by Sub-Group, 2013-2017**

<table>
<thead>
<tr>
<th>Health-Related Behaviors</th>
<th>All</th>
<th>White</th>
<th>Asian</th>
<th>Latino</th>
<th>Black</th>
<th>Men</th>
<th>&lt; High School</th>
<th>LGBTQ</th>
<th>&lt;$25,000</th>
<th>Not Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Cigarette Smoking</td>
<td>16.5%</td>
<td>16.5%</td>
<td>12.4%</td>
<td>13.9%</td>
<td>19.3%</td>
<td>20.2%</td>
<td>26.5%</td>
<td>22.4%</td>
<td>26.5%</td>
<td>30.8%</td>
</tr>
<tr>
<td>Adult Binge Drinking</td>
<td>24.6%</td>
<td>32.2%</td>
<td>10.7%</td>
<td>20.9%</td>
<td>16.2%</td>
<td>29.8%</td>
<td>14.3%</td>
<td>30.5%</td>
<td>18.5%</td>
<td>21.6%</td>
</tr>
<tr>
<td>Adult Obesity Overweight</td>
<td>56.8%</td>
<td>51.3%</td>
<td>34.4%</td>
<td>68.1%</td>
<td>68.4%</td>
<td>61.2%</td>
<td>69.9%</td>
<td>55.7%</td>
<td>61.9%</td>
<td>62.5%</td>
</tr>
<tr>
<td>Adults consuming &lt;1 Fruit Daily</td>
<td>39.3%</td>
<td>34.7%</td>
<td>40.2%</td>
<td>45.7%</td>
<td>44.1%</td>
<td>42.0%</td>
<td>47.7%</td>
<td>40.1%</td>
<td>48.2%</td>
<td>41.9%</td>
</tr>
<tr>
<td>Adults consuming &lt;1 Vegetable Daily</td>
<td>24.7%</td>
<td>20%</td>
<td>24.1%</td>
<td>29.1%</td>
<td>32.6%</td>
<td>28.1%</td>
<td>36.7%</td>
<td>25.4%</td>
<td>31.9%</td>
<td>27.3%</td>
</tr>
</tbody>
</table>

Yellow indicates a statistically significantly higher rate compared to comparison group. Asian, Latino and Black are compared to White; <High School Education is compared to some college or more, and income <$25,000 is compared to ≥$50,000


The following sections of the report explore each of these health-related behaviors in more depth, highlighting differences by neighborhood and subgroup.

**Smoking**

The connection between smoking and lung cancer is well known. According to the Centers for Disease Control and Prevention (CDC), cigarette smoking is linked to between 80-90% of all lung cancer deaths; people who smoke cigarettes are 15 to 30 times more likely to get lung cancer or die from lung cancer than people who do not smoke.11

Boston has seen a statistically significant decrease in smoking among adults in recent years, from 19.1% of adults in 2010 to 15.0% in 2017. This is a change from the trend reported in the 2016 CHNA, which noted that smoking rates had been steady at about 19% of the adult population. At the state level, 13.7% of Massachusetts adults report being a current smoker.

While the Boston city-wide rate is 15.0%, there are significant differences by neighborhood. South End (which includes Chinatown), Dorchester (zip codes 02122, 02124), South Boston, and Roxbury all have significantly higher rates of smoking than the rest of Boston, with over 20% of their adult population reporting being a current smoker (Figure 15). Tobacco use was described as a frequent concern among focus group participants in Chinatown. This was reiterated in the Boston CHNA community survey where smoking was identified as the top health concern among Chinatown residents who completed the survey.
Figure 15: Percent Adults Reporting Current Smoking, by Boston and Neighborhood, 2013, 2015, and 2017 Combined

![Bar Chart]

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTE: Asterisk (*) denotes where neighborhood estimate was significantly different compared to the rest of Boston (p < 0.05); Error bars show 95% confidence interval

Quantitative data from the Boston CHNA indicate that Black residents are more likely to be current smokers than White residents (while Asian residents are less likely); non-homeowners in any housing situation categorized in the survey are more likely to be smokers than homeowners; LGBTQ respondents are more likely to be smokers than heterosexual/non-transgender respondents; and those with lower levels of education, lower levels of income, and without full-time employment are more likely to be smokers than their referent counterparts (Figure 16).
Figure 16: Percent Adults Reporting Current Smoking, by Boston and Selected Indicators, 2013, 2015, and 2017 Combined

Similar to the trend for adults, youth cigarette smoking rates in Boston have also significantly declined over the years, from 10% of Boston high school students reporting being a current smoker in 2011 to only 3.1% of high school students in 2017. Smoking rates among Boston high school students were significantly lower among Black students and females, especially among Black and Latina females when looking at rates within gender (Figure 17). A growing concern among participants in Boston CHNA focus groups and interviews was e-cigarettes or vaping, which was described as an increasingly popular among young people and adults. However, data from the Youth Risk Behavior Risk Survey indicate that the use of e-cigarettes among high school students has significantly decreased, from 14.5% reporting use in 2015 down to 5.1% of high school students reporting any e-cigarette use in the past 30 days in 2017.
Figure 17: Percent Boston Public High School Youth Reporting Current Cigarette Smoking, by Boston and Selected Indicators, 2013, 2015, and 2017 Combined

DATA SOURCE: Centers for Disease Control and Prevention and Boston Public Schools, Youth Risk Behavior Survey, 2013, 2015, and 2017 combined
DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTE: Current smoking is defined as smoking cigarette in the past 30 days; Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05); Error bars show 95% confidence interval

Alcohol Misuse

According to the National Cancer Institute, there is strong evidence that drinking alcohol can cause several types of cancers, accounting for an estimated 3.5% of cancer-related deaths in the United States in 2009.\(^14\) Data suggest that alcohol use is linked to head and neck cancer, esophageal cancer, liver cancer, breast cancer and colorectal cancer.

The percent of Boston adults reporting binge drinking (having 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women) has remained steady since 2010, with approximately one-quarter of Boston adult BRFSS respondents reporting this behavior, similar to the finding shared in the 2016 CHNA report. The Massachusetts statewide rate for binge drinking is 18.8%. In Boston, White adults are significantly more likely than adults from other racial/ethnic groups to report binge drinking. In addition, LGBTQ adults are significantly more likely than heterosexual/non-transgender adults, males are significantly more likely than females, and adults earning $50,000 or more are significantly more likely than those earning $25K-$50K or those earning <$25K to report binge drinking (Figure 18).
Figure 18: Percent Adults Reporting Binge Drinking, by Boston and Selected Indicators, 2013, 2015, and 2017 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Binge drinking is defined as having 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women; Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05); Error bars show 95% confidence interval

There has been a significant decrease since 2011 in the percent of Boston high school students who report binge drinking, from 16.6% in 2011 to 10.5% in 2017. However, there are significant differences by student characteristics. White students are more likely than those of racial/ethnic groups, female students are more likely than male students, and LGBTQ students are more likely than heterosexual/non-transgender students to report current binge drinking behaviors.

The rate of alcohol treatment admissions for Boston overall was 71.9 treatment admissions per 10,000 residents 12 years and over (Figure 19). Compared to White residents, Black residents had a higher treatment admission rate for alcohol, whereas Asian and Latino residents had lower treatment admission rates for alcohol. The rate for females was far lower than that for males. Over time, the rate of treatment admissions has declined.
Figure 19: Unique Alcohol Abuse Treatment Admission Rate, by Boston and Selected Indicators, Age Adjusted Rate per 10,000 Residents, 2015-2017 Combined

<table>
<thead>
<tr>
<th></th>
<th>Boston</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td></td>
<td>6.7*</td>
<td>91.7*</td>
<td>64.2*</td>
<td>78.1</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>33.8*</td>
<td>112.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Substance Abuse Services, 2015-2017
DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data include admissions where alcohol was the primary, secondary, or tertiary drug; Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Alcohol mortality data over time indicate that alcohol mortality rates for Black residents have significantly declined from 20.3 deaths per 100,000 residents in 2013 to 17.8 deaths per 100,000 residents in 2016 (Figure 20).

Figure 20: Alcohol Mortality Rate, by Boston and Race/Ethnicity, Age-Adjusted Rate per 100,000 Residents 12 Years and Over, 2013-2016

DATA SOURCE: Massachusetts Department of Public Health, Boston resident deaths, 2013-2016
DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Sample sizes for Latino for all years and Black for 2014 and 2015 are ≤ 20 and rates should be interpreted with caution; Data not shown for Asian due to insufficient sample size; Dashed line indicates reference group for statistical testing done for 2016 data; Asterisk (*) denotes where estimate was significantly different compared to reference group for 2016 data (p <0.05); Change over time was statistically significant for Black (decrease over time)
Obesity
Overweight and obesity are associated with increased risk of 13 types of cancer, according to the CDC; as obesity rates in the United States have increased, so have the rates of cancers associated with these conditions.\(^{16}\)

As in 2016, concerns related to obesity were frequently discussed among Boston CHNA focus group and interview participants, who saw the issue as integrally connected to chronic disease such as heart disease and diabetes. According to participants, numerous factors contribute to overweight and obesity including lack of affordable healthy food and physical activity options, as well as low awareness about the importance of maintaining a healthy weight and how to do so. Childhood obesity was also a common theme discussed by focus group members and interviewees, who linked challenges related to healthy eating with socioeconomic status.

As shown in Figure 21, more than half (57%) of adults across Boston reported being classified as obese or overweight in 2013-2017. However, rates are different by various population groups. Nearly seven in ten Black and Latino adults reported being obese or overweight, compared with five in ten White adults across Boston – a difference that was statistically significant. One-third of Asian adults reported being obese or overweight, significantly lower than the prevalence for White adults. Older adults were significantly more likely than young adults to be classified as overweight or obese. For example, 40% of adults 18-34 years of age were overweight or obese in 2013-2017, while approximately two-thirds of adults 50-65 years of age and 65 years of age or older were overweight or obese. The prevalence of obesity and overweight also follows a socioeconomic gradient, with a significantly higher percent of renters, residents with lower levels of educational attainment, and residents with lower income being obese or overweight compared to their counterparts.

“When your kid is hungry, it’s much cheaper to buy a soda and a bag of chips than buy some fruit. There’s a huge difference in paying almost $10 for berries versus $3 for a soda and large bag of chips that’ll fill you.”—Key informant interviewee
At the neighborhood level, the percent of adults in Mattapan (71%), Hyde Park (65%), Dorchester (63-65%), West Roxbury (64%), East Boston (63%), Roslindale (63%) who were obese or overweight was significantly higher than the prevalence of obesity in the rest of Boston (Figure 22). In contrast, compared to the rest of Boston, a significantly lower proportion of adults in Fenway (37%), Back Bay (42%), Charlestown (48%), Allston/Brighton (50%), and Jamaica Plain (50%) were obese or overweight.
One-third of Boston high school students (33%) reported being obese or overweight in 2013-2017. Rates have stayed steady over time. Similar to patterns for adults, a significantly higher proportion of Hispanic (37%) and Black (36%) high school students reported being obese or overweight than White high school students (23%). Racial/ethnic differences in the prevalence of obesity or overweight were similar for males and females.\textsuperscript{17}

**Physical Activity and Healthy Eating**

Poor diet and limited physical activity have been linked to a variety of chronic diseases including diabetes, heart disease and stroke. Poor diet has also been linked to cancer. As noted in a recent article in *JNCI Cancer Spectrum*, over 80,000 new U.S. cancer cases in 2015, predominantly colorectal cancer, were estimated to be associated with poor diet, with middle-aged men and racial/ethnic minorities experiencing the greatest diet-associated cancer burden.\textsuperscript{18}

Limited access to affordable opportunities for physical activity was a common theme in discussions with residents conducted for the Boston CHNA. Community resources such as the YMCA and Boys and Girls Club were identified as inaccessible to many due to cost. One resident from Dorchester explained, “The only gym by me is the YMCA, but that is now $30 a month. Who has an extra $30 a month? They say they do it by your income but there's no way I can afford that.” Seniors also expressed challenges affording these resources. One shared, “I tried to keep up with my monthly fee at the Y, but I just can’t afford it anymore.”

A low percent of youth across Boston reported regular exercise. Three in ten (30%) Boston high school students reported engaging in regular physical activity in 2013-2017. Among female high school students, approximately one in five Asian (17%), Latina (21%), and Black (22%) students engaged in regular physical activity, significantly lower than the percent reported among White female students (37%).\textsuperscript{19} One-quarter
of Asian male high school students (28%) reported engaging in regular physical activity, significantly lower than the prevalence of 44% reported by White male high school students.

In 2013-2015, four in ten (39%) Boston adults reported consuming less than one fruit per day (Figure 23). A significantly higher proportion of adults who were Black (44%), Latino (46%), male (42%), renters (42%-48%), and younger (18-34 years of age; 47%) reported not consuming fruit on a daily basis compared to their counterparts. As with patterns for obesity and overweight, adults with lower socioeconomic status were more likely to report fruit consumption on a less than daily basis: renters (43%-48%), residents in other housing arrangements (42%) residents with less than a college education (48-49%), and adults with incomes <$50,000 (37%-48%) were significantly more likely than their counterparts (31%-42%) to not consume fruit daily.

Figure 23: Percent Adults Reporting Fruit Consumption of Less Than Once per Day, by Boston and Selected Indicators, 2013 and 2015 Combined

Reported fruit consumption also varied by neighborhood. Forty-four percent of adults across Dorchester (44%-45%) reported consuming fruit less than once per day, significantly higher than the proportion in the rest of Boston (Figure 24). The percent of adults in Charlestown (27%), Back Bay (31%), West Roxbury (32%), and the DFCI priority neighborhood of Jamaica Plain (32%) reporting less than daily fruit intake was significantly lower than the rest of Boston.
Figure 24: Percent Adults Reporting Fruit Consumption of Less Than Once per Day, by Boston and Neighborhood, 2013 and 2015 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTE: Asterisk (*) denotes where neighborhood estimate was significantly different compared to the rest of Boston (p < 0.05); Error bars show 95% confidence interval

Low vegetable consumption is also an issue in Boston. As shown in Figure 25, one-quarter (25%) of adults across Boston reported less than daily vegetable intake in 2013-2015, combined. Adults who identified as Black (33%), Latino (29%), male (28%), younger (18-34 years, 31%); renters (25%-34%), having less than a college education (35-37%), having incomes <$50,000 (27%-32%), and immigrants living in the US for less than 10 years (29%) were significantly more likely than their counterparts to report consuming vegetables less than daily.
Similar to fruit consumption, approximately three in ten adults in Roxbury (35%) and Dorchester (02121, 02125; 29%) reported consuming vegetables on a less than daily basis, a prevalence that was significantly higher than that for adults across Boston (Figure 26). Adults in Jamaica Plain (15%) and Back Bay (18%) were significantly less likely to report less than daily vegetable consumption compared to the rest of Boston.
Figure 26: Percent Adults Reporting Vegetable Consumption of Less Than Once per Day, by Boston and Neighborhood, 2013 and 2015 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTE: Asterisk (*) denotes where neighborhood estimate was significantly different compared to the rest of Boston (p < 0.05); Error bars show 95% confidence interval

More than four in ten (45%) Boston public high school students reported consuming fruit on a less than daily basis in 2013-2017 and half (50%) reported consuming vegetables on a less than daily basis in the same time period. Among female high school students, a significantly higher proportion of Latina (5%), Black (50%), and Asian (45%) students reported less than daily fruit consumption than White female students (35%). Among male high school students, Latino male students (46%) were significantly more likely than White male students (38%) to consume fruit on a less than a daily basis. When looking at patterns by race/ethnicity and gender, a significantly high proportion of Latina/o (59% and 54%) and Black (57% and 52%) female and male students, respectively, ate vegetables less than daily compared with 31% of White female students and 40% of White male students.

Key informants and focus group participants participating in the Boston CHNA shared several factors that contribute to poor diet, especially for lower income residents. Some mentioned limited healthy food options in lower-income neighborhoods across the city—particularly in Dorchester, Mattapan, and Roxbury. As shown in Figure 27, more than half of East Boston includes regions where there is not a grocery store within half a mile, as indicated by light blue shading. The neighborhoods of Jamaica Plain, West Roxbury, and Hyde Park, and portions of Roxbury, Mattapan, and Dorchester are also characterized by sizable geographic areas with limited access to grocery stores. Much of these areas where there is no grocery store also do not include convenience stores, drug stores, or specialty markets. In Dorchester, grocery store access is concentrated in the northern region, with convenience stores and drug stores covering the remaining area where grocery store access is within half a mile of residents.
In focus groups, participants mentioned the higher cost of fresh produce and lack of time for healthy food preparation as barriers to healthy eating. One Dorchester resident shared, “Buying cheap food is not good for your kids but I can’t afford Whole Foods.” Some residents in focus groups described a prevalence of convenient stores and fast food restaurants in low-income communities, which many linked to the rise of
obesity and diabetes. One parent from Dorchester shared, “In our neighborhood we have a lot of corner stores full of a bunch of junk foods.” Further, focus group participants from these communities perceived that their neighborhoods had lower quality food compared to more affluent areas of the city. In addition, transportation was cited a barrier to accessing healthy food by a few focus group participants and interviewees. One shared, “Some places are only accessible by car; folks come to the food pantry and only get things based on what they can carry sometimes. Grocery stores accessible by T [stations] are some of the more expensive; so, cost of nutritious and high-quality food is a challenge.”

**CANCER SCREENING**

Cancer screening tests help to identify cancer before signs or symptoms of the disease appear. This section presents quantitative data about cancer screening rates and qualitative findings from interviewees, cancer patients, survivors, and caregivers about screening services. Table 6 provides screening rate numbers for specific groups and highlights the groups with significantly lower rates, while Table 7 provides an overview of subgroup differences in screening behaviors that are significantly higher, lower, or similar to the reference group. The subsequent section provides greater detail on the quantitative data and qualitative themes.

**Table 6: Cancer Screening Rates by Sub-Group, 2013-2017**

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>White</th>
<th>Asian</th>
<th>Latino</th>
<th>Black</th>
<th>&lt;$25,000</th>
<th>Not employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography</td>
<td>88.3%</td>
<td>87.3%</td>
<td>77.3%</td>
<td>93.0%</td>
<td>89.2%</td>
<td>88.5%</td>
<td>89.3%</td>
</tr>
<tr>
<td>Pap Smear</td>
<td>83.7%</td>
<td>88.5%</td>
<td>57.7%</td>
<td>83.3%</td>
<td>83.4%</td>
<td>77.3%</td>
<td>84.2%</td>
</tr>
<tr>
<td>Colonoscopy or sigmoidoscopy</td>
<td>64.5%</td>
<td>64.8%</td>
<td>49.7%</td>
<td>66.0%</td>
<td>68.5%</td>
<td>62.7%</td>
<td>54.8%</td>
</tr>
</tbody>
</table>

*Yellow* indicates statistically significantly lower rate compared to comparison group. Asian, Latino and Black are compared to White; income <$25,000 is compared to ≥$50,000  

**Table 7: Statistically Significant Comparisons in Cancer Screenings by Group, 2013-2017**

<table>
<thead>
<tr>
<th>Comparison group</th>
<th>White</th>
<th>White</th>
<th>White</th>
<th>Men</th>
<th>Home owners</th>
<th>College education</th>
<th>Non-LGBTQ</th>
<th>≥$50,000</th>
<th>Employed</th>
<th>Not employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammograms</td>
<td>H</td>
<td>S</td>
<td>S</td>
<td>N/A</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Pap Smear</td>
<td>L</td>
<td>L</td>
<td>N/A</td>
<td>S</td>
<td>L</td>
<td>(3)</td>
<td>S</td>
<td>L</td>
<td>(4)</td>
<td>L</td>
</tr>
<tr>
<td>Colonoscopy or sigmoidoscopy</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>(5)</td>
<td>L</td>
<td></td>
</tr>
</tbody>
</table>

*NOTES: H* indicates the estimate/rate is significantly higher than reference group; *L* indicates the estimate/rate is significantly lower than reference group; *S* indicates the estimate/rate is statistically similar to reference group (i.e., no statistically significant difference)

(3) L for high school graduates; S for less than high school education  
(4) L for <$25,000; S for $25,000-$49,000  
(5) L for less than high school education; S for high school graduate

**Breast Cancer Screening**

Nearly nine in ten women 50 to 74 years of age across Boston (88%) reported receiving a mammogram in the past two years. This proportion exceeds the current HP2020 target of 81.1% of women ages 50-74 receiving a mammogram and exceeds the 2016 mammography rates for both Massachusetts (80.6%) and
the US (72.4%). Latina women (93%) and immigrants living in the US for fewer than 10 years (97%) were significantly more likely to report receiving a mammogram in the past two years compared to their counterparts (Figure 28). Screening patterns shared in the 2016 CHNA were similar, with rates highest among Latino and Black women and lowest among Asian women (data for women over 40). There was no significant difference across Boston neighborhoods in the percent of women who reported receiving a mammogram in the past two years.

**Figure 28: Percent Female Adults (Aged 50-74 Years) Reporting Having Had a Mammogram in Past Two Years, by Boston and Selected Indicators, 2013, 2015, and 2017 Combined**

**Cervical Cancer Screening**

In 2013–2017, 84% of Boston women (21-64 years of age) reported receiving a pap smear test in the past two years (Figure 29). This rate is lower than the HP2020 target of 93%. Relative to their counterparts, a significantly lower proportion of women who identified as Black (83%) and Latina (83%) and a much lower proportion of Asian (58%) women reported receiving a pap smear recently compared to White women (86%). Additionally, renters (74%-84%), those in other housing arrangements (76%), immigrants living in the US for less than ten years (64%), and immigrants residing in the US for more than 10 years (83%) reported receiving a pap smear in the past two years. Additionally, women with a high school education (76%),
women with incomes <$25,000 (77%) or $25,000-$49,999 (85%), or another employment status (75%) were significantly less likely than their counterparts of higher socioeconomic status to report receiving a pap smear in the past two years. Rates of cervical cancer screenings were significantly lower in the Fenway area (65%) than in Boston overall (%).

Figure 29: Percent Female Adults (Aged 21-64 Years) Reporting Having Had a Pap Test in Past Two Years, by Boston and Selected Indicators, 2013, 2015, and 2017 Combined

The proportion of women residents receiving pap tests in Fenway (65%) was significantly lower than the rest of Boston (84%) in 2013-2017 (Figure 30). By comparison, the prevalence of pap tests among residents of Charlestown (91%), Jamaica Plain (89%), and Roslindale (89%) was significantly higher than the rest of Boston.
Figure 30: Percent Female Adults (Aged 21-64 Years) Reporting Having Had a Pap Test in Past Two Years, by Boston and Neighborhood, 2013, 2015, and 2017 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTE: Asterisk (*) denotes where neighborhood estimate was significantly different compared to the rest of Boston (p < 0.05); Error bars show 95% confidence interval

Colorectal Cancer Screening
In 2013-2017, only two-thirds (65%) of Boston adults 50 to 75 years of age reported ever receiving a colonoscopy or sigmoidoscopy, a rate similar to that reported in 2016 (Figure 31). This is lower than the HP2020 target of 70.5% of adults ages 50 to 75 screened and lower than the 2016 colorectal screening rates in Massachusetts (75.3%) and the US (67.3%).

Compared to their counterparts, a significantly lower proportion of Asian adults (50%), immigrants living in the US for less than 10 years (37%), residents with incomes <$25,000 (63%), and adults who were out of work (55%) reported receiving colon cancer screening. There were no other statistically significant sub-group differences.
Data on colon cancer screening by neighborhood were similar with one significant data point. The prevalence of colon cancer screening among adults 50 to 75 years of age was lowest in East Boston (56%), a difference that was significantly lower than the rest of Boston in 2013-2017.

**HPV**

While cervical and rectal cancers have routine screening tests, no routine screening tests exist for other HPV-associated cancers, including anal, oropharyngeal, penile, vaginal, and vulvar cancers. This lack of available screening tests makes the HPV vaccine critically important for the prevention of HPV-associated cancers. In 2017, rates of HPV vaccine completion in Massachusetts were 67% among females and 64% among males. Although Massachusetts has higher HPV vaccination rates than the US, it still falls short of the Healthy People 2020 goal of 80% vaccination among eligible youth.

**Lung Cancer Screening**

Low-dose computed tomography (also called a low-dose CT scan, or LDCT) is the only recommended screening test for lung cancer. It has been shown to detect lung cancer at its earliest, most treatable stage, and is the only test that has been proven to reduce the risk of dying from lung cancer among those at high risk for the disease. New guidelines released by the U.S. Preventive Services Task Force in 2013 recommend yearly lung cancer screening with LDCT for individuals at high risk based on age and cumulative tobacco smoke exposure. This includes individuals between the ages of 55 and 80 who either currently smoke or have quit in the past 15 years and who have a smoking history of 30 or more “pack years.” A pack year is smoking an average of one pack of cigarettes per day for one year.
Data regarding lung cancer screening in the US indicates that rates of recommended screening among those who meet the eligibility criteria are low. According to a study conducted by the Center for Disease Control and Prevention, only about 4.4% of adults who met the screening criteria reported receiving a low-dose CT scan. Although data regarding lung cancer screening rates is not included in this report, it is important to note that lung cancer screening, along with smoking cessation interventions, can substantially reduce the burden of lung cancer in both the nation and the greater Boston area.

Perceptions of Cancer Screening
The importance of screening was noted by most members of focus groups conducted for this CHNA. Many patients and survivors stated that their cancer was found during a routine screening. They also mentioned family history of cancer as a reason they stay current with their screenings. As one focus group participant shared, “I’ve been getting mammograms since I was 14 years old, me and my sister, because my mom died of breast cancer when she was 20 years old.” For some respondents, their primary care provider was the trusted source that encouraged them to get screening. For example, as one focus group participant indicated, “My family doctor tells me when to do screening. I think it’s necessary to have a good family doctor.” According to focus group participants, primary care providers and community health centers also play a key role in reminding patients of screening timelines and ensuring access to screening. As in 2016, easy accessibility to screening through mobile services was seen as important among those discussing screening in 2019. As one focus group member explained, “The mammogram van came to my church, and I go there; that’s the easy way to go, it’s accessible. I’ll go in to satisfy my doctor.”

Interviewees’ perspectives on screening rates mirror the quantitative data. Rates for breast and cervical cancer were described as generally good, in part due to the fact that these have been prioritized nationally and numerous and accessible screening services were reported to exist. As one interviewee stated, “We are doing well with screening but, at the same time, we cannot let our guard down.” However, interviewees shared, screening rates for lung and prostate cancer are low. As one interviewee stated, “What we have found is that underserved patients are utilizing lung cancer screening at very low rates. Lung cancer screening rates are at 2 or 3% for the eligible population.”

Barriers to Accessing Screening Services
Focus group members and interviewees identified several barriers to getting screened including lack of awareness, discomfort and fear, inability to take time off work, confusion about screening guidelines, and for a few, insurance and transportation issues. Barriers are similar to those shared in 2016, although insurance coverage was seen as less of an issue affecting access to screening in 2019.

Lack of Awareness
Lack of awareness about cancer—its prevention as well as its treatability—was identified by focus group participants and interviewees as a barrier to accessing screening. Lack of awareness about the possibility of and need for prostate cancer screening, for example, was identified as a major barrier in the BPHC study of prostate cancer. One reason for this has to do with language. As one person explained, “There is literally not a word for the prostate gland [in Haitian Creole]. We have created the word from English and French transliteration. When there is no language for something, then it doesn’t exist.”

Another barrier identified by focus group members and interviewees is a mindset that one only sees a doctor when sick. As one interviewee explained, “We find that Asian Americans, when they get to the hospital, cancer is late stage. We don’t have a concept of prevention, we only go to the doctor when something goes wrong.” Some respondents also mentioned that lack of awareness of the pap smear test and HPV vaccine among young women, particularly those who are uninsured, is a factor contributing to lower screening rates among this population.
**Discomfort and Fear**
Discomfort and fear of the screening process and results are also barriers to screening according to participants. The discomfort associated with mammograms and prostate screenings was specifically mentioned. As one focus group member shared, “The [prostate] test itself, it’s not the most comfortable test to get done.” As in 2016, some gender differences related to attitudes and perceptions of cancer screenings were noted. Specifically, men were reported to be more likely to feel uncomfortable talking about genitalia or health issues like prostate cancer, leading them to avoid routine checkups or cancer screenings. Some focus group participants also reported that another aspect that affects screening is the fear of a cancer diagnosis. As an interviewee explained, “There is also a notion that if you want to find something, you will find something. People are afraid that something will be found so they do not get tested.”

**Lack of Time**
Time was also mentioned as a barrier to getting screened. This is especially an issue for colonoscopies, interviewees and focus group members reported, due to the time required for both the preparation and the procedure. For lower-income or hourly workers, taking time off from work for any kind of screening can mean a loss of income, contributing to lower screening rates among these residents.

**Lack of Transportation**
Lack of transportation was identified as a barrier to screening by a few respondents. They noted that mobile screening services, such as mammogram vans, have been very successful in reaching some residents who face transportation barriers to screenings.

**Changing Screening Guidelines**
While the barriers described above relate to the challenges individuals face in getting screened, health care professionals interviewed identified changing screening guidelines as a systemic barrier for them. This was a prominent theme in the 2016 CHNA as well. In recent years, guidelines on screenings such as pap smears and prostate screenings have changed as have guidelines relative to mammograms and breast density. Participants perceived that these changes have led to confusion, and in some cases, have contributed to reductions in screening rates.

According to a few interviewees, this has been especially challenging with changing guidelines for prostate cancer screenings and pap smears. One interviewee noted that it did not seem like the change in prostate cancer screenings over the last several years has been widely communicated to the providers. A primary care provider mentioned that the revised recommendation that pap smears be provided to women every three years rather than every year has been confusing to many. This interviewee reported that patients are unclear what the current screening guideline is, with a number questioning why screening frequency would be reduced. Again, lack of widespread and clear communication about why this recommendation has been changed was reported to be one reason for the confusion.
Cancer Screening Services

While a variety of barriers to cancer screening exist, interviewees and focus group members also reported that numerous programs and efforts exist to educate and connect residents to screening services, particularly those who are underserved. Hospital outreach efforts—including mobile vans—were mentioned. Interviewees and focus group members also talked about the critical role played by primary care providers. Numerous focus group members, for example, mentioned that their primary care providers reminded them about screenings, conducted some screenings, and/or connected them to screening services. Additionally, programs such as those provided by the Women’s Health Network (WHN) funded by the Massachusetts Department of Public Health, community health workers in hospitals and community health centers, and the efforts of community-based groups such as Asian Women for Health were all seen as important in educating residents about screenings and connecting them to services.

A prominent theme in conversations with interviewees was the importance of follow-up after an abnormal screening result. This is also often, respondents reported, where more vulnerable patients fall off, for both individual and systemic reasons. As one provider stated, “It’s not enough to have a screening program, you have to be able to get people through in a timely manner and make sure that they get follow up in a timely manner. And the more vulnerable to the patient population, the more they are going to need navigation.” A few interviewees shared that patients may not be aware of the importance of following-up on screening results. As this person stated, “We do a bad job with educating about screening, especially relative to the importance of follow-up. The message is that it is not worth screening if there is no follow-up.” Additional barriers, some reported, are systemic. For example, health care systems may lack effective protocols for follow-up, or primary care providers—often gatekeepers for this information—may be too overwhelmed to effectively follow up with difficult to reach populations. Focus group participants also shared perspectives on this. While most reported receiving good communication about results from screenings and what to do next, a few expressed frustrations with delayed sharing of information and a lack of follow-up from providers after abnormal results.

Screening Follow-up and Primary Care Physicians

Interviewees reported that for some patients, substantial care coordination and navigation is needed to ensure that patients are directed to and engage in further testing and care after an abnormal result. Challenges include knowing where to go for follow-up, addressing other barriers (transportation, time off work, childcare), and navigating insurance. For patients who are unable to do this on their own, responsibility often falls to the primary care provider who, respondents shared, may not have the time or knowledge to do this well. Self-advocacy is also important, according to focus group participants. As one focus group member cautioned, “In my mom’s case, when a growth was first detected through a CT scan, the doctors told us we didn’t need to be concerned. But we insisted on more frequent follow-up and more holistic examination. The doctors agreed to getting a biopsy and it turned out to be cancerous. Therefore, I think being vigilant even during the early detection phase is important.”

As described above, primary care physicians (PCPs) are critical partners in helping patients navigate cancer screening and follow-up. They are often the medical professionals who educate and answer questions about screenings. Numerous focus group participants, for example, mentioned that they rely on their PCPs to tell them when screening tests are due. PCPs also perform some screenings. For PCPs to successfully play these roles, they must be able to explain the tests—both the need for them and any risks—in a way that patients can understand, free from jargon. They must also be aware of current guidelines. As one
interviewee stated, “The problem is that if you go to your doctor and he or she is not savvy about the current recommendations, then you walk out not getting screened. I have seen cases where the patient has come asking for the screening and still does not get it. A lot of this falls on the primary care provider to know about what’s going on.”

Providers must also have the trust of patients. As shared in conversations about prostate cancer screening, poor provider-patient communication as well as historic discrimination vis-à-vis patients of color, has led to distrust of the health care system. This creates challenges to engage some patients in health care, especially relative to prevention.

HEALTH CARE UTILIZATION, CANCER INCIDENCE, AND MORTALITY

Use and Perceptions of the Health Care System
Boston is a city with numerous health care resources including hospitals, community health centers, urgent care, primary care providers, and specialists. Most Boston CHNA survey respondents indicated that they were satisfied with the health care in their community, with 71.2% indicating that they strongly or somewhat agreed that they are satisfied with the health care system in their community, 86.7% agreeing that they are satisfied with their health care providers, and 87.3% agreeing that they could access health care services easily.

The bi-annual Boston Behavioral Risk Factor Surveillance Survey asks residents about whether they have at least one person they view as their personal doctor or health care provider. Results have remained steady over the past several years, with approximately eight in ten respondents reporting having at least one person as their personal doctor (Figure 32). However, Asian (67.0%) and Latino (70.9%) residents are significantly less likely than White (83.6%) residents to indicate having one person as their personal doctor or health care provider. Older residents are significantly more likely than younger to have one person as their personal doctor or health care provider. Further, residents from Allston/Brighton, East Boston, and Fenway are significantly less likely to have one person as their personal doctor (Figure 33).
Figure 32: Percent Adults Reporting Having a Personal Doctor or Health Care Provider, by Boston and Selected Indicators, 2013, 2015, and 2017 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05); Error bars show 95% confidence interval
Very few Boston residents are uninsured. According to American Community Survey 2013-2017 estimates, 3.9% of the overall population (civilian, noninstitutionalized) in Boston were uninsured, while only 1.4% of the population under 19 years old were uninsured. Among the Boston civilian population, 29.6% have Medicaid (MassHealth) coverage.

Barriers and Facilitators to Accessing Health Care Services

While focus group, interview, and survey participants participating in the Boston CHNA were positive about the quality and proximity of health care in their community, they still cited several concerns over access. A prominent theme across focus groups and interviews was the challenge of navigating the complex health system. Focus group members spoke about the struggle understanding their health care benefits, reporting that they “felt lost in the system.” Seniors were described as especially vulnerable to challenges navigating the health system. Several focus group participants emphasized that many simply do not know what resources are available to them or how to access them. Multiple key informants and focus group participants identified peer navigators and community health workers as valuable resources. One focus group participant shared, “Doctors only have a certain amount of time, and you can’t rely on them to talk to patients about everything. But there does need to be more navigators available to help patients understand and explain.” Key informants echoed the value of these services; however, reimbursement models and funding constraints appear to make it difficult for organizations to fund these positions, as some key informants noted.

Transportation was also mentioned by assessment participants as a challenge to accessing health care. Some focus group participants noted that public transportation is limited for accessing services locally as well as for accessing specialty care. One parent shared, “My son has to see a specialist, but I don’t drive, and it can take up to 3 hours to get to the specialty care [he goes to outside the city].”
For immigrant communities, participants described immigration status (e.g., undocumented vs. documented status) as a significant barrier to accessing health care. Key informants spoke of fear in undocumented or mixed status families which prevented residents from seeking care. One key informant explained, “Immigrant populations face challenges [accessing care]. It is a hostile environment; even though we are a sanctuary city they do not feel safe.” The need for increased linguistic capacity in the health care and social service landscape was also a common theme in conversations, particularly with those participating in non-English focus groups and key informants who worked in health and social services. The importance of culturally-sensitive approaches to care were also discussed in multiple focus groups and interviews.

Unfriendly, uninterested, or rushed health care providers and office staff in health care settings were also issues that focus group participants mentioned. Some focus group participants described feeling “unseen” by their health care providers, citing feeling rushed or seeing providers who seemed disengaged. One East Boston resident shared, “I went to the doctor, and no one looked me in the eyes; they sent me home with so many medicines, but no one asked me how I was…it’s like they don’t see the whole person.”

Cost was not identified as a major barrier to care for the majority of participants; however, a few focus group participants discussed cost barriers in relation to affording medication for chronic diseases, and the challenge of meeting expenses on a fixed income. One focus group participant summarized, “When you’re stressed about the fact that not enough money is coming in, you have bills to pay, and then a medical issue that needs to be addressed, but you can’t afford the treatment...you make hard decisions.”—Focus group participant

When Boston CHNA survey respondents were asked about the factors that made it harder for them to get the health care services they needed in the past two years, issues related to convenience [long wait for an appointment (44.0%), lack of evening/weekend services (38.2%)], cost of care (33.8%), lack of transportation (19.0%), and office not accepting new patients (18.3%) were cited as the top five most challenging issues; however none of these were cited by a majority of respondents.

While much of the discussions in the Boston CHNA focus groups and interviews emphasized the challenges in accessing health care, having insurance and proximity to health care services were cited as factors that supported people’s access to care. When Boston CHNA survey respondents were asked what factors made it easier for them to get the health care services they needed in the past two years, having a regular source of care (63.4%), having insurance cover what they needed (49.8%), providers taking their insurance (47.9%), having positive interactions with doctors, providers, or office staff (40.0%), and feeling comfortable asking questions (37.4%) were the top five factors cited.
Cancer Treatment Services

Experiences with Cancer Treatment
Focus group members who were currently receiving cancer treatment, cancer survivors, and caregivers shared their experiences with cancer treatment. Overall, focus group members spoke more positively than negatively about their treatment experiences. Among those reporting a positive experience, participants most often spoke about the quality of care: they praised the team-based nature of their care, excellent communication from physicians, as well as ongoing communication from providers’ offices to make and confirm appointments.

The importance of trust and interpersonal rapport with physicians was mentioned by numerous participants, such as one who explained, “You really do have to develop a good rapport...trust, between the oncologist and patient. If you don’t have that, you’re going to have all these cracks, and a lot of stuff is going to slip through them.” The personal qualities of providers were frequently mentioned in the context of positive experiences including respect, a willingness to listen and explain, and timeliness. As one patient shared, “The surgeon drew me a picture and I knew what I had, and I knew what it was called. Two lines, layman terms, everything on the table.” Numerous respondents also praised social workers and patient navigators who helped them to manage the health care system and get connected to needed services. When asked about social and support services available during cancer care, most focus group members shared that they believed these were available, however, not all patients were aware of them.

A few focus group members shared negative experiences with their cancer care. These comments related mainly to a lack of sensitivity about how they were told about their cancer. As one person shared, “the doctor who did the biopsy calls me at my work number and tells me I have cancer.. that was so shocking and traumatic. I put the phone down, went into the ladies room and cried.” Other negative experiences with cancer care identified by focus group members and interviewees included lack of communication about changed appointments and long wait times for appointments. As one caregiver shared, “I have a friend right now with cancer and I’ve gone to a few appointments. They’re waiting two hours to be seen. They’re scared to death as it is, and then you go there and wait. The person got frustrated a few times and left. If you’re (the patient) late to your appointment, then you have to reschedule.”

Lack of interpersonal rapport or perceived disrespect by providers were other themes associated with less positive cancer care experiences. As one caregiver shared, “I think there is a lack of communication physicians with the patient. In my mom’s case, she had the biopsy and then the surgery, but in between we didn’t really get a chance to discuss with the doctors about her options, which was not a good way to build trust between providers and patients.” A couple of focus group members reported that they did not feel they were provided sufficient information about alternatives to chemotherapy. As one focus group member stated, “listen to me—if I don’t have to go through chemo, then don’t put me through it unless it’s the last resort.”

“I felt like when I got diagnosed it was such a blur. From December to April they scheduled me...They were wonderful, they were talking to each other, and when I went in for my actual surgery I had the best doctor in the world, I wanted her to take care of everything for me after that. I felt like I was so cared for.” --Focus group participant
Challenges Accessing Cancer Treatment Services

Cancer patients, survivors and caregivers participating in focus groups, as well as interviewees, shared numerous challenges to accessing cancer treatment services. Cost, maintaining employment, transportation, and limited opportunities to participate in clinical trials were issues that rose to the top.

Cost

The expense of cancer treatment and related services was a prominent theme in focus group conversations and interviews. Numerous cancer patients and survivors remarked that having cancer has depleted their resources. Cost challenges are compounded by the fact that cancer patients may be unable to work full time (or at all) during or even after treatment. As one patient described, “It’s a money issue. Now my money is going to my medical treatment. I don’t mean a little bit of money. We thought we were financially secure, and then now we’re going to the pantry.” A couple of interviewees stated that “financial toxicity”—when people do not have resources to continue to maintain their standard of living or are in danger of medical bankruptcy due to medical treatment—is a concern for cancer patients and negatively affects cancer outcomes.

The financial burden of cancer treatment was reported to be closely related to whether patients are insured and the type of insurance they have. Individuals who have insurance through MassHealth or who have high-quality private insurance were generally seen as having fewer challenges with cancer-related treatment costs than those who have lower-cost private insurance. High-deductible plans were particularly problematic. Although most focus group participants were pleased with coverage through public insurance, one expressed concern about Medicare including lack of coverage for some services, including transportation to appointments. Additionally, interview and focus group participants commented that the uninsured and underinsured are less likely to get screened which means their cancer is more advanced and more costly to treat when they are diagnosed. Insurance likewise, participants reported, can limit treatment options such as the opportunity to get a second opinion, some genetic tests, and participation in clinical trials. Finally, cancer medication is costly. While insurance covers most cancer-related medication, one interviewee noted that insurance does not always cover the newest treatments and medications. As this interviewee explained, “There is this rapid development of all these kinds of treatments, but some of those are not covered. So you can come into a place and say ‘I heard this is great,’ but then your plan does not cover it.”

The cost burden of cancer is not limited to the expense of treatment and medication. Focus group members shared examples of other costs including transportation to the multitude of appointments for cancer care, child care or home support services, and the need for healthy food. Finally, participants noted, the cost of cancer also extends to family members of cancer patients who themselves must take time from work and families to care for those with cancer.

Maintaining Employment

Closely related to economic issues described above is the fact that patients face challenges to being able to work and continue to earn an income while undergoing cancer treatment. Numerous focus group members shared the challenges they faced maintaining employment during treatment. They described the physical depletion that comes with chemotherapy and that makes it difficult to work.

Accommodation, or lack thereof, of employers was also a theme in conversations. Many respondents reported that they were able to continue to work during cancer treatment, often on a reduced schedule.
One focus group member stated, “My supervisor was very accommodating to me. My coworker and I, we worked it out. I would have Wednesdays off, and I went to work Thursdays but when I had to go for my treatment I would text him and let him know and I would have that Wednesday off.” Not all focus group who were working reported positive experiences with employers, however. A few shared that they lost their jobs when they had cancer, such as one who explained, “I got really depressed and my ex-manager told me he was not working with anyone ‘sick’ and said I had to leave the job. A lot of things went wrong, I had a lot of obstacles on the way.”

The need to continue to work to be able to pay bills during cancer was mentioned by several people. While a few focus group participants reported that they had disability insurance through their employers to ensure some level of income, most did not. The need to continue to work, some reported, can lead some patients to skip treatments or forego needed rest. This is particularly challenging for lower income employees many of whom who do not have benefits such as sick time or short-term disability. The need to continue to pay for housing was identified as a challenge by a couple of interviewees. One interviewee shared that people who live in subsidized housing have their rent reduced when their income decreases; however, those in other forms of housing do not. As this person described, “People who are at the above 200% of the poverty level but below 300% might be skipping treatments or deciding against more aggressive treatment because the side effects may interfere with the ability to keep working. If your income goes down and your rent isn’t going to go down while you are nauseous for a number of months, you cannot make that choice.”

**Transportation**

Several respondents mentioned that transportation can be a challenge for cancer patients, a barrier also noted in 2016. While Boston has good public transportation (especially when compared to the suburbs), using this can be challenging for cancer patients who are often depleted after treatment. While there are other transportation options and programs, these can be challenging, some reported, because they have limited hours, require advanced scheduling, and can be unreliable. As one patient described, “If they go to the wrong address and you call them and tell them they say ‘well we can’t come, we got this address... find your own way there.’” A provider echoed this, stating, “There are a number of transportation systems in place that we have found to be inefficient and ineffective. They are consistently late which means that patients are not getting to appointments on time which means they’re missing appointments.” Additional challenges mentioned by focus group participants who have personal vehicles included finding parking close to providers’ offices and the cost of parking. One focus group participant specifically mentioned that she was upset that Medicare does not pay for transportation to and from appointments.

However, participants also reported that hospitals and health care providers are taking steps to address transportation barriers through use of driver services such as Lyft and Uber Health. Those who have used these services have been very happy with them. As one focus group member shared, “[The hospital] allows me to take Uber, so before I leave in the morning I call Uber, and they are usually outside in 2-3 minutes.” Focus group members reported that paperwork must be completed for these services and that can be a barrier for those who do not have documentation or who do not speak English.

**Limited Opportunities to Participate in Clinical Trials**

Numerous interviewees spoke about clinical trials, sharing their perception that these opportunities are limited, and that patients of color are underrepresented. This was noted in the 2016 CHNA report as well and was recommended as a possible strategy to address disparities in cancer outcomes. It is important to note, however, that several focus group members in the 2019 data gathering process reported that they have participated in trials. Interviewees shared that the ability to participate in clinical trials is particularly limited for patients of hospitals without a research infrastructure. As one key informant interviewee noted,
“I think every patient should have the same opportunity as someone from the suburbs has for clinical trials. I think that is one area where our Boston underserved population has been underserved.”

Additional barriers identified by focus group participants included insurance restrictions relative to clinical trial participation, lack of awareness of clinical trial opportunities, or perceptions that clinical trials are too risky. Interviewees also noted that among patients of color, negative history associated with medical experiments is a significant barrier. As one interviewee explained, “We have the Tuskegee disaster where Black men were used as guinea pigs to get information that was helping other populations; the patient base is not trustful of clinical trials.” Patient focus group members corroborated some of the fears and thoughts about clinical trials. As one person stated, “I went running from the doctor because he was trying to get me to try a new treatment that hadn’t been tested on others. He said, ‘you are young and strong, and you can tolerate it.’ The theme of cancer terrified me.” However, another participant in the same group stated, “The doctor explained the study to me: ‘Do you want to try the study? With this you’re helping to advance science.’ I said, ‘let’s go ahead with the study.’”

**Language Barriers and Discrimination**

Focus group members and interviewees shared specific challenges to cancer care faced by communities of color and immigrants. Several respondents specifically mentioned challenges faced by those who do not speak English well and/or who are undocumented. As one interviewee stated, “Without immigration status, you can’t have public insurance.” Language barriers were also mentioned. As in 2016, respondents reported that interpretation—either in person or on the phone—is available for patients receiving cancer care. However, challenges with this were noted. It can take time to schedule interpreters, especially those who are fluent in less common languages. Challenges with possible misinterpretation were also noted. As one provider pointed out, “There is a difference between accessing interpretation and receiving care in your language.” There are few bilingual cancer care providers according to respondents.

Echoing themes identified in the Boston CHNA, a few focus group members participating in this CHNA also mentioned racism in the health care system as a challenge. Citing their own experiences or those of others they know, participants expressed skepticism that the health care system treats everyone equally. As one interviewee shared, “I think in terms of cancer services certainly one area that we have not discussed that can be very, very important and makes a difference between success or not is acknowledging how pervasive the experience of racism has been. Specifically, for people of African descent... there are a lot of valid reasons for black people in America to be distrustful of and to have a stressful experience more so than someone who is Caucasian or someone who has an advanced degree or works in the medical field.” One focus group member mentioned discrimination based on HIV status as an issue.
**Cancer Care Coordination**

A prevalent theme in focus group discussions and interviews was that of navigating the cancer care system. This was also a prominent area of discussion in 2016. Participants expressed concern about patients “getting lost” in the system and as a result, not getting the care that they need. Care coordination—where a care team collaborates to facilitate the appropriate delivery of health care services—was seen as a critical aspect of successful cancer care and outcomes.

Cancer patients and survivors had differing perspectives relative to how coordinated their care was. Some patient and survivor focus group participants reported that it was very coordinated, mentioning “teams” devoted to their care and ongoing communication among them. Several respondents praised the collaborative approach taken by their oncologists, surgeons, and nurses. As one patient stated, “The oncologist, never late. She’s the lead on the team. If I email her in the morning, before close of business, she answers my email.” Patients viewed their care teams as a source of support.

Another patient stated, “My principal relationship was with my chemo nurse and she had to give 10 people chemo at one time. Those nurses are working very hard and they’re the ones who are making sure and they know more about us.”

Focus group participants also mentioned that they relied on navigators, social workers, and care coordinators who helped to schedule and follow up on appointments, connect them to community services such as utility or housing assistance, and helped them to access alternative therapies. As one person shared, “I had a care coordinator, she was a social worker. She was with me for five years. She was just awesome. Anytime I needed something and couldn’t get to the oncologist or my PCP she would handle these things for me.” Another patient echoed a similar thought stating, “My social worker was a huge asset and would reach out me and tell me about the resources that were available that I didn’t know about. Ask questions because there are resources available to you…but you have to ask.” However, not all focus group members reported that they received this kind of care coordination. Some participating in focus groups expressed frustration that such support was not offered to them, although they could have benefitted from it. It was unclear from focus group discussions specifically why some patients had this support and some did not; one explanation shared by a focus group participant was that it was related to the type of insurance a patient has.

Patients and survivors also described the importance of self-advocacy relative to treatment and related services. They also mentioned the benefits of having a family member or friend along for appointments as “another set of ears” about treatment and follow up. One person stated, “When I was told, I wasn’t prepared, and I came by myself. After that, everything that I went to, I brought someone along. Having someone with you is really important.” One patient mentioned tape recording all early conversations with providers as a strategy to ensure that no important information was missed.

**Sources of Support During Cancer Treatment**

Focus group members reported that they turned to various sources for support as they underwent cancer treatment. Many relied on their friends and family, although they acknowledged that they were careful not to burden others. As in 2016, focus group members also identified faith as a considerable source of support.
support. As one focus group member put it, “I was very disappointed [that I had cancer] at first, but I trusted in God and I made it through. I had good care and everything.”

Focus group participants shared that cancer support groups have been tremendously helpful, both during and after cancer treatment. They mentioned formal groups, such as those sponsored by hospitals, and reported being connected informally by community-based groups to cancer survivors who share their language and culture. In describing what was gained from participation in a support group, one individual said, “I feel like when I come, everyone here has been through something. I feel like these people know what I’m talking about. I need this [support] group. You can’t pay my bills, but you’re supporting me.” A member of the Spanish speaking focus group member shared a similar thought, saying, “When I first got to this group I was bad mentally and I find it that this class is a big big help for me. I got to this group bad mentally and now I love it.”

When asked about programs and services that support those in cancer treatment, participants largely mentioned hospitals and hospital-based programs. Several community-based organizations were also mentioned such as the Medical Legal Partnership of Boston that assists patients with a range of health care and other advocacy needs, Asian Women for Health which provides outreach, education, and some advocacy for Asian women, and the Breast Cancer Equity Coalition which is working on issues related to health equity at the systems level. Also mentioned was the Pink and Black Education and Support Network launched in 2017 to address the unique needs of Black women who suffer disproportionately from burden of breast cancer.

**Cancer Incidence**
The following section describes cancer incidence rates in Boston, currently and over time, overall and by different racial and ethnic groups. Data are presented for 2013-2015 and over time, in aggregate for Boston and by race/ethnicity and gender. To increase readability, only end data points for time series charts are provided. Data points for each time period in the time series are provided in the Appendix. When percent change over time is presented for time trends, the percent change noted is from Poisson regression models that take into account all of the data points in the time period, rather than simply the percent change between the baseline and end points.

In 2015, the overall cancer incidence rate in Boston was 492.5 per 100,000 residents, a rate higher than Massachusetts (466.1 per 100,000) (2011-2015) and the United States (439.2 per 100,000) (2011-2015). Overall cancer incidence rates for Asian (390.5 per 100,000) and Latino (349.4 per 100,000) residents in Boston were significantly lower than for White residents (546.7 per 100,000) (Figure 34). Both Latino and Asian males and females had significantly lower overall cancer incidence rates than their White counterparts (Figure 35 and Figure 36). Black and White residents have similar incidence rates for overall cancer (527.9 and 546.7 respectively per 100,000) (Figure 34). Women have lower overall cancer incidence rates than men. Data on cancer incidence by age group and neighborhood was not available for this report.
Figure 34: All Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Figure 35: All Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Figure 36: All Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2015

![Bar chart showing incidence rates by race/ethnicity for female residents in 2015.](chart.png)

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Tables 8 and 9 below and on the following page provide a summary snapshot of the 2013-2015 incidence rates of different types of cancer for men and women separately by race/ethnicity. These tables highlight in yellow the groups with incidence rates that are statistically significantly higher than White residents, and red stars denote the groups with the highest incidence rates, even if not statistically significantly different.

Subsequently, Table 10 summarizes the statistically significant incidence rate differences for specific cancer types among Asian, Latino and Black residents compared to White residents, including instances when these groups have significantly lower rates compared to Whites.

### Table 8: Cancer Incidence for Boston Males by Race/Ethnicity, 2013-2015

<table>
<thead>
<tr>
<th>Incidence by Cancer Per 100,000 Residents 2013-2015</th>
<th>All Men</th>
<th>Asian Men</th>
<th>Latino Men</th>
<th>Black Men</th>
<th>White Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers 2015</td>
<td>545.1</td>
<td>390.5</td>
<td>432.8</td>
<td>558.1</td>
<td>593.5</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>47.5</td>
<td>38.9</td>
<td>37.4</td>
<td>60.5</td>
<td>47.7</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>18.8</td>
<td>32.5</td>
<td></td>
<td>23.6</td>
<td>17.2</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>75.1</td>
<td>95.7</td>
<td></td>
<td>45.9</td>
<td>78.4</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>126.7</td>
<td>74.5</td>
<td>111.8</td>
<td>190</td>
<td>110.8</td>
</tr>
<tr>
<td>Head and Neck Cancers</td>
<td>24.7</td>
<td>26.5</td>
<td>25.3</td>
<td>29.0</td>
<td>34.2</td>
</tr>
</tbody>
</table>

Yellow statistically significantly higher than White comparison group

★ indicate the highest incidence rate for each cancer type

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health

Data about different types of cancer reveal that Asian residents of Boston have higher rates of liver cancer than their White counterparts, with Asian men having significantly higher rates than White men. However, Asian men have significantly lower rates of prostate and head and neck cancer than their White counterparts. Latino men have significantly lower rates of lung and head and neck cancers compared to White men. Black men have significantly higher rates of colorectal and prostate cancer than White men.

60
### Table 9: Cancer Incidence for Boston Females by Race/Ethnicity, 2013-2015

<table>
<thead>
<tr>
<th>Incidence by Cancer</th>
<th>All Women</th>
<th>Asian Women</th>
<th>Latina Women</th>
<th>Black Women</th>
<th>White Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>461.2</td>
<td>375.8</td>
<td>298.5</td>
<td>512.8</td>
<td>518.8</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>132.7</td>
<td>80.3</td>
<td>90.0</td>
<td>140.1</td>
<td>160.1</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>35.9</td>
<td>26.2</td>
<td>24.5</td>
<td>45.5</td>
<td>36.4</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>6.5</td>
<td>10.1</td>
<td>6.9</td>
<td>6.0</td>
<td>6.4</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>57.5</td>
<td>42.0</td>
<td>20.5</td>
<td>54.0</td>
<td>75.7</td>
</tr>
<tr>
<td>Head and Neck Cancers</td>
<td>8.2</td>
<td>N/A</td>
<td>4.7</td>
<td>9.4</td>
<td>12.3</td>
</tr>
</tbody>
</table>

* indicates highest mortality group for cancer type

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health

The above table demonstrates differences in cancer incidence for women of Boston by race/ethnicity. Asian women have significantly lower rates of breast and lung cancer incidence than White women, however, like their Asian male counterparts, they have a non-significantly higher incidence of liver cancer when compared to their White counterparts. Latina women have significantly lower rates of breast, lung, colorectal and head and neck cancers compared to their White counterparts.

Black women have significantly lower incidence rates of breast, lung, and head and neck cancers than White women, and have non-significantly higher rates of colorectal cancer incidence. This 2013-2015 data describing a lower rate of new breast cancer cases among Black women compared to White women contrasts with the 2011-2012 data reported in the previous CHNA. The prior data showed very similar numbers between the two groups (131.3/100,000 for Black women and 133.4/100,000 for White women). Future data will help to illuminate whether over time the breast cancer incidence rate will continue to be significantly lower among Black women compared to White women.

### Table 10: Statistically Significant Comparisons of Cancer Incidence Rates, by Sub-Group, 2015

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>L</td>
</tr>
<tr>
<td>Breast</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>L</td>
<td>N/A</td>
<td>L</td>
<td>N/A</td>
<td>L</td>
<td>N/A</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>S</td>
<td>L</td>
<td>H</td>
<td>S</td>
<td>S</td>
<td>L</td>
<td>H</td>
<td>S</td>
<td>L</td>
</tr>
<tr>
<td>Liver</td>
<td>H</td>
<td>S</td>
<td>H</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>L</td>
</tr>
<tr>
<td>Lung</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>L</td>
</tr>
<tr>
<td>Prostate</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>L</td>
<td>N/A</td>
<td>S</td>
<td>N/A</td>
<td>H</td>
<td>N/A</td>
</tr>
<tr>
<td>Head and Neck Cancers</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>L</td>
<td>*</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>S</td>
</tr>
</tbody>
</table>

NOTES: H indicates the estimate/rate is significantly higher than reference group; L indicates the estimate/rate is significantly lower than reference group; S indicates the estimate/rate is statistically similar to reference group (i.e., no statistically significant difference); N/A: comparison is not applicable. *Sample too small.

### Cancer Incidence Over Time

Overall cancer incidence rates have declined significantly in Boston between 2001 and 2015, as have incidence rates for colorectal, lung, and prostate cancers. Incidence rates for liver cancer, by contrast, have risen in Boston. The following table summarizes cancer incidence rates over time by race/ethnicity and
gender and more detail is provided about cancer incidence over time by specific type of cancer and by group in the graphs following the summary table.

Table 11: Statistically Significant Changes in Cancer Incidence Over Time, by Sub-Group, 2001-2015

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Asian Men</th>
<th>Asian Women</th>
<th>Latino Men</th>
<th>Latina Women</th>
<th>Black Men</th>
<th>Black Women</th>
<th>White Men</th>
<th>White Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancer</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>Down</td>
<td>Up</td>
<td>Down</td>
<td>Down</td>
</tr>
<tr>
<td>Breast</td>
<td>N/A</td>
<td>Up</td>
<td>N/A</td>
<td>No change</td>
<td>N/A</td>
<td>No change</td>
<td>N/A</td>
<td>No change</td>
</tr>
<tr>
<td>Colorectal</td>
<td>Down</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>Down</td>
<td>Down</td>
<td>Down</td>
</tr>
<tr>
<td>Liver</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>Up</td>
</tr>
<tr>
<td>Lung</td>
<td>No change</td>
<td>No change</td>
<td>Up</td>
<td>No change</td>
<td>No change</td>
<td>Down</td>
<td>Down</td>
<td>No change</td>
</tr>
<tr>
<td>Prostate</td>
<td>Down</td>
<td>N/A</td>
<td>Down</td>
<td>N/A</td>
<td>N/A</td>
<td>Down</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Head and Neck</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>

NOTES: GREEN arrow indicates statistically significant decrease over time; RED arrow indicates statistically significant increase over time; N/A indicates comparison is not applicable.
DATA SOURCE: Cancer registry, Massachusetts Department of Public Health


During this fourteen-year period, overall cancer rates decreased over time by 12% for all Boston residents, a statistically significant change (Figure 37). This trend was also noted in BPHC’s 2018 special report on cancer in Boston. This is driven by a 14% decrease among White residents, also a statistically significant change.
Figure 37: All Cancer Incidence Rates Over Time by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time) and White (decrease over time)

Figure 38: All Cancer Incidence Rates Over Time by Race/Ethnicity and Sex, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston males (decrease over time), Black males (decrease over time) and White males (decrease over time)
Figure 39: All Cancer Over Time by Race/Ethnicity and Sex, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015,

Breast Cancer
In 2013-2015, the breast cancer incidence rate in Boston was 132.7 per 100,000 females (Figure 40). This is lower than the Massachusetts rate of 137.6 per 100,000 and higher than the US rate of 124.7 per 100,000 (2011-2015). Asian (80.3 per 100,000) Black (140.1 per 100,000) and Latina (90.0 per 100,000) female residents had significantly lower rates of breast cancer than White female residents (160.1 per 100,000).

Figure 40: Breast Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston females (decrease over time), Black females (increase over time), Asian females (increase over time) and White females (decrease over time)
There was a significant increase in breast cancer rates among Asian women between 2001 and 2015, from 67.7 per 100,000 females to 80.3 per 100,000 females (Figure 41). The overall increase over time was 48%. Rates for other groups did not change significantly over this time period.

**Figure 41: Female Breast Cancer Over Time by Race/Ethnicity, Over Time, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015**

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Asian females (increase over time)

**Colorectal Cancer**

Data from the Massachusetts Cancer Registry show that the overall colorectal cancer rate was 40.9 per 100,000 in 2013-2015 (Figure 42). This is higher than the rate for Massachusetts (37 per 100,000) and the US (39.3 per 100,000). Rates were significantly higher for Black residents (51.6 per 100,000) and significantly lower for Latino residents (28.9 per 100,000) than White residents (41.3 per 100,000). Black male residents (60.5 per 100,000) had significantly higher colorectal cancer rates than White male residents (47.7 per 100,000) (Figure 43) and Latino females had significantly lower rates than White females (24.5 versus 36.4 per 100,000 females) (Figure 44).
Figure 42: Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2013-2015

![Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2013-2015](image)

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Figure 43: Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2013-2015

![Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2013-2015](image)

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Figure 44: Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

From 2001-2003 to 2013-2015, there was a 37% decrease in colorectal cancer rates in Boston (Figure 45). Over this time period, there was a 43% decrease in colorectal cancer rates for White residents, 21% decrease for Black residents and a 32% decrease for Asian residents, all statistically significant declines. Both White females and White males experienced statistically significant declines in incidence of colorectal cancer over this time period (Figure 46 and Figure 47). The decrease for Asians residents was likely driven by a 39% decrease in colorectal cancer among Asian males; the decrease for Black residents was driven by a 25% decrease for Black females.

Figure 45: Colorectal Cancer Incidence Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time), Asian (decrease over time), Black (decrease over time), and White (decrease over time)
Figure 46: Colorectal Cancer Incidence Rate Over Time by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Asian males (decrease over time) and White males (decrease over time)

Figure 47: Colorectal Cancer Incidence Rate Over Time by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Black females (decrease over time) and White females (decrease over time)
Liver Cancer
In 2013-2015, the overall rate of liver cancer incidence for Boston residents was 12.0 per 100,000 (Figure 48). This is higher than both the rates for Massachusetts (7.9 per 10,000) and the US (8.1 per 100,000) (2011-2015). 30 Asian residents (20.5 per 100,000) had significantly higher rates of liver cancer than White residents (11.3 per 100,000). This is attributable to Asian men (32.5 per 100,000) having significantly higher rates than White men (16.7 per 100,000) (Figure 49). The BPHC cancer report suggested that high rates of chronic hepatitis B virus (which is endemic in parts of Asia) among Boston’s Asian population may account for this, as this infection is a prominent risk factor for liver cancer. There were no statistically significant differences in liver cancer incidence across female subgroups (Figure 50).

Figure 48: Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Figure 49: Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Figure 50: Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

From 2001-2003 to 2013-2015, liver cancer rates increased in Boston by 22%, a statistically significant level of change (Figure 51). Rates of liver cancer increased across both males and females. The incidence of liver cancer among males in Boston increased by 65% over time from 2001-2003 to 2013-2015 (Figure 52). White female rates of liver cancer increased by 107%, a statistically significant change (Figure 53). Though this rate has doubled since 2001-2003, the 2013-2015 White female resident rate (6.4 cases per 100,000 residents) is similar to Black (6.0 per 100,000), Asian (10.1 per 100,000), and Latina (6.9 per 100,000) female resident rates. Female overall rates (6.5 per 100,000) are lower than male rates (18.8 per 100,000). (Discussed in a later section, it should be noted that while liver cancer incidence has increased over time, liver cancer mortality has not.)
Figure 51: Liver Cancer Incidence Rate Over Time by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (increase over time)

Figure 52: Liver Cancer Incidence Rate Over Time by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston males (increase over time)
Figure 53: Liver Cancer Incidence Rate Over Time by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for White females (increase over time)

Lung Cancer
In 2013-2015, the lung cancer incidence rate in Boston was 64.7 per 100,000 residents (Figure 54). This is similar to the rate for Massachusetts (63.8 per 100,000) and higher than the U.S. rate (60.5 per 10,000) (2011-2015). White residents had the highest rates of lung cancer among all racial/ethnic groups; this was also noted in the 2016 DFCI CHNA. The rate was significantly lower for Black (62.8 per 100,000) and Latino (30.9 per 100,000) residents than for White residents (77.2 per 100,000). Both Latino males and Latino females had significantly lower rates of lung cancer than their White counterparts (Figure 55 and Figure 56).

Figure 54: Lung Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
From 2001-2003 to 2013-2015, there was a 17% decrease in incidence of lung cancer in Boston (Figure 57). This is consistent with trends in lung cancer incidence noted in BPHC’s 2018 special report on cancer in Boston. Rates of lung cancer among Black and White residents declined over this time period (by 15% and 16%, respectively), while Latino residents experienced an 18% increase. The increase among Latinos is driven by a 61% increase for Latino males (Figure 58). Even with this increase, the 2013-2015 rate for White residents is double the rate for Latino residents. The overall rate of lung cancer for Boston females declined by 12% overall from 2001-2003 to 2013-2015, a statistically significant decrease (Figure 59).
Figure 57: Lung Cancer Incidence Rate Over Time by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time), Black (decrease over time), Latino (increase over time), and White (decrease over time)

Figure 58: Lung Cancer Incidence Rate Over Time by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time), Black (decrease over time), Latino (increase over time), and White (decrease over time)
Figure 59: Lung Cancer Incidence Rate Over Time by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time)

Prostate Cancer
In 2013-2015, the overall incidence of prostate cancer in Boston was 126.7 per 100,000 male residents (Figure60). This is higher than the prostate cancer incidence rates for Massachusetts (106.4 per 100,000) and the US (109.2 per 100,000). Prostate cancer incidence rates were significantly higher for Black males (190.0 per 100,000) and significantly lower for Asian males (74.5 per 100,000) compared to White males (110.8 per 100,000). This is a similar pattern to that reported in the 2016 CHNA.

Figure 60: Prostate Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Between 2001-2003 and 2013-2015, prostate cancer incidence rates decreased significantly for Boston male residents overall and for each subgroup (Figure 61). The rate declined 30% in Boston overall; White males experienced the largest overall decline (40%) and Latino males the lowest (20%); rates for Asian and Black males in Boston declined by 34% and 32%, respectively.

**Figure 61: Prostate Cancer Incidence Rate Over Time by Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015**

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time), Asian (decrease over time), Black (decrease over time), Latino (decrease over time), and White (decrease over time)

**Head and Neck Cancer**

In 2013-2015, the overall incidence rate for head and neck cancer in Boston was 18.3 per 100,000 (Figure 62). Asian (14.7 per 100,000) and Latino (13.2 per 100,000) residents had lower incidence rates of head and neck cancer than White residents (22.5 per 100,000). In 2013-2015, Asian, Black, and Latino males all had significantly lower rates of head and neck cancer than White males (Figure 63); Black and Latino females had significantly lower rates than White females (Figure 64). Rates of head and neck cancer have not significantly changed between 2001 and 2015 overall in Boston or within any population subgroup (charts in Appendix).
Figure 62: Head and Neck Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p < 0.05)

Figure 63: Head and Neck Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p < 0.05)
Figure 64: Head and Neck Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2013-2015

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTE: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Cancer Mortality

Leading Causes of Death and Premature Death
Cancer and heart disease are the leading causes of death in Boston and have remained so for the last six years (Table 12). In 2016, the overall cancer mortality rate in Boston was 163.6 per 100,000 residents, a higher rate than deaths due to heart disease (126.0 per 100,000). Cancer has been the leading cause of premature death (death before age 65) from 2011-2016. The premature death rate due to cancer was 45.8 per 100,000 residents in 2016, compared to 46 per 100,000 residents for accidents and 25.6 per 100,000 residents for heart disease.

Table 12: Leading Causes of Mortality in Boston, Age-Adjusted Rate per 100,000 Residents, 2011-2016

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cancer</td>
<td>171.7</td>
<td>187.3</td>
<td>175.9</td>
<td>153.3</td>
<td>163.4</td>
<td>163.6</td>
</tr>
<tr>
<td>2</td>
<td>Heart Disease</td>
<td>130.4</td>
<td>132.3</td>
<td>133.7</td>
<td>125.7</td>
<td>136.8</td>
<td>126.0</td>
</tr>
<tr>
<td>3</td>
<td>Accidents</td>
<td>28.9</td>
<td>Cerebrovascular Diseases 34.4</td>
<td>Accidents 32.1</td>
<td>Accidents 34.8</td>
<td>Accidents 44.8</td>
<td>Accidents 54.6</td>
</tr>
<tr>
<td>4</td>
<td>Chronic Lower Respiratory Diseases</td>
<td>28.8</td>
<td>Accidents 29.4</td>
<td>Chronic Lower Respiratory Diseases 30.4</td>
<td>Cerebrovascular Diseases 29.8</td>
<td>Cerebrovascular Diseases 29.3</td>
<td>Cerebrovascular Diseases 26.7</td>
</tr>
<tr>
<td>5</td>
<td>Cerebrovascular Diseases</td>
<td>26.1</td>
<td>Chronic Lower Respiratory Diseases 23.5</td>
<td>Cerebrovascular Diseases 26.6</td>
<td>Chronic Lower Respiratory Diseases 25.6</td>
<td>Chronic Lower Respiratory Diseases 27.9</td>
<td>Chronic Lower Respiratory Diseases 25.3</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Death Files, 2011-2016
DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
Cancer Mortality Rates
The following section describes cancer mortality and premature (under age 65) mortality rates in Boston, currently and over time. Data are presented for 2015-2017 and over time, in aggregate for Boston.

Between 2011 and 2017 the overall cancer mortality rate in Boston declined significantly as did colorectal and lung cancer mortality rates, as described in Table 13 below. Despite some progress, the mortality rates of other cancers have not improved and remain unchanged over this six-year period. Additionally, premature mortality rates for breast, liver, prostate and lung cancer (for those under age 65) have not significantly changed. This reality underscores the importance of community outreach to raise awareness, promote preventative behaviors, and encourage early screening particularly given the unchanged treatment outcomes.

Table 13: Statistically Significant Changes in Cancer Mortality Over Time for 2011-2017 in Boston, MA

<table>
<thead>
<tr>
<th></th>
<th>Mortality</th>
<th>Premature Mortality &lt;65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>↓</td>
<td>No change</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>

NOTES: GREEN arrow indicates statistically significant decrease over time; RED arrow indicates statistically significant increase over time; N/A indicates comparison is not applicable.
DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health

Quantitative data about cancer mortality provided by the Massachusetts Department of Public Health show that the overall cancer mortality rate in Boston was 160 per 100,000 residents in 2015-2017. This is consistent with the HP2020 target of 161.4 deaths per 100,000 population. It is slightly lower than overall cancer incidence rates in the US (163.5 per 100,000; 2011-2015) and slightly higher than the overall cancer incidence rate in Massachusetts (156.3 per 100,000).35

Rates of cancer mortality differ, however, across different subgroups. Of all racial/ethnic groups, Black residents experienced the highest rates of cancer mortality, 181.9 deaths per 100,000 residents. Overall cancer mortality rates were significantly lower among Asian (123.3 per 1000,000) and Latino (109.0 per 100,000) residents, compared to White (171.9 per 100,000) residents. Females (138.5 per 100,000) in Boston overall had significantly lower cancer mortality rates than males (192.5 per 100,000) in 2015-2017.

The tables below (Table 14 and Table 15) present mortality rates by gender and race/ethnicity and highlight disparities compared to White residents. The tables are followed by descriptions of key findings associated with each population.
<table>
<thead>
<tr>
<th>Mortality Per 100,000 2015-2017</th>
<th>All Men</th>
<th>Asian Men</th>
<th>Latino Men</th>
<th>Black Men</th>
<th>White Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>160</td>
<td>157.6</td>
<td>149.4</td>
<td>234.4</td>
<td>197.0</td>
</tr>
<tr>
<td>All Cancers &lt;65 years</td>
<td>46.3</td>
<td>57.7</td>
<td>36.7</td>
<td>68.2</td>
<td>45.1</td>
</tr>
<tr>
<td>All Colorectal Cancer</td>
<td>12.1</td>
<td>11.3</td>
<td>8.3</td>
<td>23.0</td>
<td>16.7</td>
</tr>
<tr>
<td>Colorectal Cancer &lt;65 years</td>
<td>4.5</td>
<td>NA</td>
<td>NA</td>
<td>9.5</td>
<td>5</td>
</tr>
<tr>
<td>All Liver Cancer</td>
<td>9.2</td>
<td>12.6</td>
<td>15.7</td>
<td>17.7</td>
<td>12.8</td>
</tr>
<tr>
<td>Liver cancer &lt;65 years</td>
<td>3.8</td>
<td>10</td>
<td>5.3</td>
<td>11</td>
<td>4.1</td>
</tr>
<tr>
<td>All Lung Cancer</td>
<td>36.5</td>
<td>58.9*</td>
<td>32.2</td>
<td>41</td>
<td>47.6</td>
</tr>
<tr>
<td>Lung cancer &lt;65 years</td>
<td>10.0</td>
<td>12.8</td>
<td>7.0</td>
<td>15.2</td>
<td>12.8</td>
</tr>
<tr>
<td>All Prostate Cancer</td>
<td>24.5</td>
<td>NA</td>
<td>26.8</td>
<td>49.8</td>
<td>19.1</td>
</tr>
<tr>
<td>Prostate cancer &lt;65 years</td>
<td>2.0</td>
<td>NA</td>
<td>NA</td>
<td>3.7</td>
<td>1.6</td>
</tr>
</tbody>
</table>

* highest mortality group for cancer type.
**Yellow** statistically significantly higher than White comparison group

DATA SOURCE: Massachusetts Department of Public Health, Boston resident deaths, 2015-2017 combined

Black men in Boston have the highest mortality rates for overall cancers, premature (under age 65) overall cancers, colorectal cancer, premature colorectal cancer, liver cancer, premature liver cancer, premature lung cancer, prostate cancer and premature prostate cancer as noted by the red star in almost every category for Black men. Compared to White men, the mortality rate for Black men is statistically significantly higher for all cancers, premature all cancers, premature colorectal cancer, premature liver cancer, prostate cancer and premature prostate cancer as noted with yellow highlighting.

Asian men experience significantly higher rates of premature mortality due to liver cancer. Asian men also have the highest lung cancer mortality across the groups, which is the single highest mortality rate for any specific type of cancer.
Table 15: Cancer Mortality for Boston Females by Race/Ethnicity

<table>
<thead>
<tr>
<th>Mortality Per 100,000 Women</th>
<th>All Women</th>
<th>Asian Women</th>
<th>Latina Women</th>
<th>Black Women</th>
<th>White Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>138.5</td>
<td>96.9</td>
<td>84.8</td>
<td>151.2</td>
<td>155.3</td>
</tr>
<tr>
<td>All Cancers &lt;65 years</td>
<td>42.6</td>
<td>48.2</td>
<td>34.4</td>
<td>52.0</td>
<td>38.8</td>
</tr>
<tr>
<td>All Breast Cancer</td>
<td>19.9</td>
<td>9.9</td>
<td>8.2</td>
<td>26.2</td>
<td>21.3</td>
</tr>
<tr>
<td>Breast Cancer &lt;65 years</td>
<td>8.1</td>
<td>11.1</td>
<td>4.4</td>
<td>10.9</td>
<td>7.1</td>
</tr>
<tr>
<td>All Colorectal Cancer</td>
<td>8.8</td>
<td>6.1</td>
<td>5.5</td>
<td>10.8</td>
<td>8.5</td>
</tr>
<tr>
<td>Colorectal Cancer &lt;65 years</td>
<td>3.6</td>
<td>N/A</td>
<td>5.7</td>
<td>4.2</td>
<td>2.6</td>
</tr>
<tr>
<td>All Liver Cancer</td>
<td>5.6</td>
<td>6.3</td>
<td>6.5</td>
<td>4.1</td>
<td>6.6</td>
</tr>
<tr>
<td>Liver cancer &lt;65 years</td>
<td>1.4</td>
<td>N/A</td>
<td>N/A</td>
<td>1.8</td>
<td>0.9</td>
</tr>
<tr>
<td>All Lung cancer</td>
<td>30.4</td>
<td>22.1</td>
<td>8.8</td>
<td>27.1</td>
<td>41.1</td>
</tr>
<tr>
<td>Lung cancer &lt;65 years</td>
<td>7.8</td>
<td>8.1</td>
<td>2.5</td>
<td>9.0</td>
<td>9.3</td>
</tr>
</tbody>
</table>

☆ highest mortality group for cancer type  
Yellow statistically significantly higher than White comparison group  
DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2017 combined

Although the difference does not reach a level of statistical significance, Black women have mortality rates above the other groups for breast cancer, colorectal cancer and for those under age 65, liver cancer. Moreover, Black women under age 65 have a mortality rate from all cancers that is significantly higher than their White counterparts.

The breast cancer mortality rate for Black women is higher than for White women for both breast cancer generally and for those under age 65. However, in contrast to prior data, these data from 2015-2017 do not show a breast cancer mortality rate among Black women under 65 years of age that is significantly higher than White women. More data will be needed over more years to analyze and confirm whether this may reflect a trend away from the higher Black rate or whether these numbers may simply lack sufficient power from a large enough sample size to detect the difference at a significant level.

Latina women under age 65 have significantly higher mortality rates from colorectal cancer compared to White women in this age group.

While the tables above focus on mortality rates that are higher than Whites, Table 16 on the following page compares Asian, Latino and Black mortality rates to White mortality rates and indicates any direction of significant difference including significantly lower mortality rates.
Table 16: Statistically Significant Comparisons of Cancer Mortality and Premature Mortality, by Sub-Group, 2015-2017 Combined

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asian</td>
<td>Latino</td>
<td>Black</td>
<td>Asian</td>
<td>Latino</td>
<td>Latina</td>
<td>Black</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>All Cancers—Mortality</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>H</td>
<td>S</td>
<td>L</td>
</tr>
<tr>
<td>All Cancers—Premature Mortality</td>
<td>S</td>
<td>S</td>
<td>H</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>H</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>Breast Cancer—Mortality</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>L</td>
<td>N/A</td>
<td>L</td>
<td>N/A</td>
<td>S</td>
</tr>
<tr>
<td>Breast Cancer—Premature Mortality</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>S</td>
<td>N/A</td>
<td>S</td>
<td>N/A</td>
<td>S</td>
</tr>
<tr>
<td>Colorectal Cancer—Mortality</td>
<td>S</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Colorectal Cancer—Premature Mortality</td>
<td>S</td>
<td>S</td>
<td>H</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>H</td>
<td>H</td>
<td>S</td>
</tr>
<tr>
<td>Liver Cancer—Mortality</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Liver Cancer—Premature Mortality</td>
<td>H</td>
<td>S</td>
<td>H</td>
<td>H</td>
<td>*</td>
<td>S</td>
<td>*</td>
<td>H</td>
<td>S</td>
</tr>
<tr>
<td>Lung Cancer—Mortality</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>L</td>
</tr>
<tr>
<td>Lung Cancer—Premature Mortality</td>
<td>S</td>
<td>L</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Prostate Cancer—Mortality</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>*</td>
<td>N/A</td>
<td>S</td>
<td>N/A</td>
<td>H</td>
<td>N/A</td>
</tr>
<tr>
<td>Prostate Cancer—Premature Mortality</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>*</td>
<td>N/A</td>
<td>*</td>
<td>N/A</td>
<td>H</td>
<td>N/A</td>
</tr>
</tbody>
</table>

NOTES: H indicates the estimate/rate is significantly higher than reference group; L indicates the estimate/rate is significantly lower than reference group; S indicates the estimate/rate is statistically similar to reference group (i.e., no statistically significant difference); N/A: comparison is not applicable. *Sample too small.

Asian and Latina women have mortality rates significantly lower than White women for lung cancer, breast cancer and all cancers. Asian men have significantly lower mortality from all cancer compared to White men. And Latino men have significantly lower mortality from all cancers, colorectal cancer and lung cancer compared to White men.

This report also analyzed patterns of cancer mortality according to Boston neighborhoods. The table on the following page summarizes differences in mortality rates by select neighborhoods, followed by an overview of key findings. Bar charts below show mortality data by cancer type for all Boston neighborhoods that had available data.
### Table 17: Cancer Mortality Rates by Neighborhood

<table>
<thead>
<tr>
<th>Cancer Mortality (per 100,000), 2015-2017</th>
<th>Boston</th>
<th>Dorchester</th>
<th>Fenway</th>
<th>E. Boston</th>
<th>Hyde Park</th>
<th>S. Boston</th>
<th>Mattapan</th>
<th>Roxbury</th>
<th>S. End</th>
<th>JP</th>
<th>Allston/Brighton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer mortality</td>
<td>160</td>
<td>177.4</td>
<td>159.2</td>
<td>190.9</td>
<td>205.7</td>
<td>207.6</td>
<td>152.5</td>
<td>170.9</td>
<td>144.2</td>
<td>141.8</td>
<td>144.5</td>
</tr>
<tr>
<td>Premature cancer mortality</td>
<td>10</td>
<td>15</td>
<td>14.6</td>
<td>7.9</td>
<td>9.6</td>
<td>10.6</td>
<td>9.3</td>
<td>10.6</td>
<td>6</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Breast cancer mortality</td>
<td>19.9</td>
<td>9.6-19.5</td>
<td>35.9</td>
<td>24.6</td>
<td>36.3</td>
<td>25.9</td>
<td>32.1</td>
<td>23.4</td>
<td>10.3</td>
<td>24.9</td>
<td>13.6</td>
</tr>
<tr>
<td>Premature breast cancer mortality</td>
<td>8.1</td>
<td>4.2-6.2</td>
<td>18.8</td>
<td>NA</td>
<td>11.2</td>
<td>8.1</td>
<td>12.3</td>
<td>9</td>
<td>6.1</td>
<td>11.3</td>
<td>8.3</td>
</tr>
<tr>
<td>Liver cancer mortality</td>
<td>9.2</td>
<td>11.3-11.8</td>
<td>6.5</td>
<td>17.1</td>
<td>7.9</td>
<td>7.5</td>
<td>5.8</td>
<td>7.5</td>
<td>11.7</td>
<td>6.5</td>
<td>7.5</td>
</tr>
<tr>
<td>Lung cancer mortality</td>
<td>36.5</td>
<td>46.8</td>
<td>24.1</td>
<td>57.8</td>
<td>48.8</td>
<td>57.9</td>
<td>28.4</td>
<td>35.8</td>
<td>45.8</td>
<td>28.4</td>
<td>30.6</td>
</tr>
<tr>
<td>Premature lung cancer mortality</td>
<td>10</td>
<td>15</td>
<td>14.6</td>
<td>7.9</td>
<td>9.6</td>
<td>10.6</td>
<td>9.3</td>
<td>10.6</td>
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<tr>
<td>Prostate cancer mortality</td>
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<td>41.4</td>
<td>30.8</td>
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<td>28.2</td>
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<td>Colorectal cancer mortality</td>
<td>12.1</td>
<td>13.1-14.7</td>
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<td>12.7</td>
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<td>9.5</td>
<td>9.4</td>
<td>11.6</td>
<td>13.5</td>
</tr>
</tbody>
</table>

Yellow: significantly higher than the overall Boston rate  
ND: no data was collected on this population  
DATA SOURCE: Massachusetts Department of Public Health, Boston resident deaths, 2015-2017 combined

As was observed with patterns related to behavioral risk factors, cancer mortality rates are also concentrated in neighborhoods challenged by the social determinants of health. Of note, residents of Dorchester experience significantly higher rates of premature (less than age 65) cancer mortality, lung cancer mortality, and premature lung and prostate cancer mortality. Residents of East Boston die of liver cancer at a rate nearly double that of what is observed across Boston and have significantly higher rates of lung cancer mortality and all cancer mortality. Residents of Fenway and Hyde Park die of breast cancer at a rate nearly double that of what is observed across Boston. In addition, Fenway residents have significantly higher premature breast cancer mortality, premature lung cancer mortality, and premature all cancer mortality rates compared to the rest of Boston.

Data on the following page show mortality rates by demographic details for all cancers and by cancer type.
Figure 65: Cancer Mortality Rate, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2015-2017 Combined

<table>
<thead>
<tr>
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<th>Asian</th>
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<th>Latino</th>
<th>White</th>
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<tbody>
<tr>
<td>Female</td>
<td>160.0</td>
<td>123.2*</td>
<td>181.9</td>
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<td>171.9</td>
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<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>192.5</td>
</tr>
</tbody>
</table>

Under 45 years

|                | 7.5*   |
45-64 years     | 168.6* |
65+ years       | 962.5  |

NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05); For age stratifications, rates are age-specific rates per 100,000 residents

In Boston the rate of all cancer prematurity was 46.3 per 100,000 residents in 2015-2017; rates of premature cancer mortality were significantly higher for Black residents (59.2 per 100,000) than White (41.8 per 100,000) and significantly lower for Boston females (42.6 per 100,000) compared to males (50.6 per100,000) (Figure 67). Both Black females (52.0 per 100,000) and males (68.2 per 100,000) had cancer rates significantly higher than their white counterparts (38.8 and 45.1 per 100,000, respectively) (Figure 68).
Cancer mortality rates also differ across Boston neighborhoods, in some cases significantly (Figure 69). In 2015-2017, East Boston (190.9 per 100,000) and South (207.6 per 100,000) Boston and Hyde Park (205.7 per 100,000) had the highest mortality rates compared to the rest of Boston, while Allston-Brighton (144.5 per 100,000) and Back Bay (135.1 per 100,000) had significantly lower rates. Dorchester (02121 and 02125) (15.0 per 100,000) and Fenway (14.6 per 100,000) had significantly higher rates of premature cancer mortality than the rest of Boston, while Back Bay (6.1 per 100,000) was lower (Figure 70).
Continuing the downward trend described in the 2016 CHNA, overall cancer mortality rates have declined significantly in Boston from 2011 to 2017, from 171.7 to 153.2 deaths per 100,000 residents (Figure 71).
Premature cancer mortality rates have also significantly declined over this time period, from 55.3 per 100,000 residents to 44.4 per 100,000 residents (Figure 72).

**Figure 71: Cancer Mortality Rate, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2011-2017**

![Graph showing cancer mortality rate by year from 2011 to 2017]

DATA SOURCE: Massachusetts Department of Public Health, Boston resident deaths, 2011-2017
DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Change over time was statistically significant (decrease over time)

**Figure 72: Boston Cancer Premature Mortality Over Time, Age-Adjusted Rates per 100,000 Residents, 2011-2017**

![Graph showing breast cancer mortality rate by year from 2011 to 2017]

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Change over time was statistically significant (decrease over time)

**Breast Cancer**

The overall breast cancer mortality in Boston was 19.9 deaths per 100,000 female residents in 2015-2017 (Figure 73). This is slightly better than the HP2020 target of 20.7 deaths per 100,000 females. The rate of breast cancer mortality in Boston is higher than for Massachusetts overall (18 per 100,000) and lower than the US (20.6 per 100,000) (2012-2016). Rates were significantly lower for Asian (9.9 per 100,000) and Latino (8.2 per 100,000) women than White women (21.3 per 100,000). Data about premature breast cancer mortality reveal higher rates for Asian and Black women than Latino or White women, although
these differences are not statistically significant (Figure 74). It is not known whether this is a clinically meaningful difference or not, although it is possible that there is not enough statistical power to detect a significant difference between Black and White female breast cancer mortality.

**Figure 73: Boston Female Breast Cancer, Mortality, Age-Adjusted Rates per 100,000 Female Residents, 2015-2017 Combined**

![Bar chart showing age-adjusted mortality rates per 100,000 female residents for Boston, Asian, Black, Latino, and White females, with under 45 years showing 1.8%, 45-64 years showing 28.1%, and 65+ years showing 106.3%.

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

**Figure 74: Boston Female Breast Cancer, Premature Mortality by Selected Indicators, Combined, Age-Adjusted Rates per 100,000 Female Residents, 2013-2017**

![Bar chart showing premature mortality rates per 100,000 female residents for Boston, Asian, Black, Latino, and White females, with under 45 years showing 8.1%, 45-64 years showing 11.1%, and 65+ years showing 7.1%.

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category

Breast cancer mortality rates vary across Boston neighborhoods, with Fenway (35.9 per 100,000) and Hyde Park (36.3 per 100,000) experiencing significantly higher rates in 2015-2017 and Dorchester zip codes 02121 and 02125 (9.6 per 100,000) experiencing lower than the rest of Boston (Figure 75). Fenway (18.8 per 100,000) also experiences premature mortality rates due to breast cancer that are significantly higher than the rest of Boston (Figure 76).
Figure 75: Boston Female Breast Cancer Mortality by Neighborhood, Age-Adjusted Rates per 100,000 Female Residents, 2015-2017 Combined

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Asterisk (*) denotes neighborhood estimate was significantly different compared to the Boston estimate (p < 0.05)

Figure 76: Boston Female Breast Cancer, Premature Mortality by Neighborhood, Age-Adjusted Rates per 100,000 Female Residents, 2013-2017 Combined

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Asterisk (*) denotes neighborhood estimate was significantly different compared to the Boston estimate (p < 0.05)
Figure 77 shows breast cancer mortality over time. Although a significant decline in breast cancer mortality was reported in the 2016 CHNA, (from 22.8 per 100,000 in 2001 to 17.8 per 100,000 in 2012) there were no statistically significant differences in mortality rates over the 2011 to 2017 time period. Likewise, there was no statistically significant change in premature mortality rates due to breast cancer over this time period (Figure 78).

Figure 77: Boston Female Breast Cancer Mortality Over Time, Age-Adjusted Rates per 100,000 Female Residents, 2011-2017

![Graph showing breast cancer mortality over time for female residents in Boston, 2011-2017.](image)

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office

Figure 78: Boston Female Breast Cancer Premature Mortality Over Time, Age-Adjusted Rates per 100,000 Residents, 2011-2017

![Graph showing breast cancer premature mortality over time for female residents in Boston, 2011-2017.](image)

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Change over time was not statistically significant

Colorectal Cancer
The overall colorectal cancer mortality rate in Boston in 2015-2017 was 12.1 per 100,000 residents (Figure 79). This is lower than the HP2020 target of 14.5 deaths per 100,000. It is similar to the rate of colorectal deaths in Massachusetts (12.3 per 100,000) and lower than the rate for the US 914.2 per 100,000) (2012-2016). Rates are significantly lower for females (8.8 per 100,000) than males (16.5 per
100,000) and Latino residents (6.4 per 100,000) than White residents (12.2 per 100,000). Data by sex and race/ethnicity reveal that in 2015-2017, Latino males (8.3 per 100,000) had significantly lower rates of colorectal cancer mortality than White males (16.7 per 100,000) (Figure 80).

**Figure 79: Boston Colorectal Cancer Mortality, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined**

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
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<td>Boston</td>
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<td>8.7</td>
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<tr>
<td>Black</td>
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</tr>
<tr>
<td>Latino</td>
<td>6.4*</td>
</tr>
<tr>
<td>White</td>
<td>12.2</td>
</tr>
<tr>
<td>Under 45 years</td>
<td>0.5*</td>
</tr>
<tr>
<td>45-64 years</td>
<td>14.6*</td>
</tr>
<tr>
<td>65+ years</td>
<td>70.9</td>
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<tr>
<td>Female</td>
<td>8.8*</td>
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<tr>
<td>Male</td>
<td>16.5</td>
</tr>
</tbody>
</table>

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

**Figure 80: Boston Colorectal Cancer Mortality by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined**

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Premature mortality rates for colorectal cancer were significantly higher among Black (6.5 per 100,000) residents compared to White (3.9 per 100,000) and lower among females (3.6 per 100,000) than males (5.4 per 100,000) (Figure 81). High premature colorectal cancer mortality rates among Black residents were driven by high rates among Black males (9.5 per 100,000) (Figure 82). Among females, Latino women (5.7 per 100,000) had higher rates of colorectal cancer compared to White women (2.6 per 100,000). BPHC’s special report on cancer likewise noted the disparity in colorectal mortality rates between Black and White males in Boston. The report identified lower rates of diagnostic follow-up among Black patients as one possible explanation for this.

Figure 81: Boston Colorectal Cancer Premature Mortality by Selected Indicators, Age-Adjusted Rates per 100,000 Residents, 2013-2017 Combined

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Figure 82: Boston Colorectal Cancer Premature Mortality by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2013-2017 Combined

- Black
- Latino
- White

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Of all Boston neighborhoods, Charlestown (22.5 per 100,000) experienced significantly higher colorectal cancer mortality rates than the rest of Boston (12.1 per 100,000) (Figure 83). No statistically notable differences relative to premature colorectal cancer mortality are evident across neighborhoods (Figure 84).

Figure 83: Boston Colorectal Cancer Mortality by Neighborhood, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Continuing a downward trend from 2001 reported in the 2016 CHNA, colorectal mortality rates have seen a 34% decrease between 2011 and 2017, a statistically significant decline (Figure 85). There was also a significant decrease in premature mortality colorectal cancer rates over this time period as well (Figure 86).

**Figure 84: Boston Colorectal Cancer Premature Mortality by Neighborhood, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined**

**Figure 85: Boston Colorectal Cancer Mortality Over Time, Age-Adjusted Rates per 100,000 Residents, 2011-2017**
Liver Cancer

In 2015-2017, the liver cancer mortality rate in Boston was 9.2 per 100,000 residents (Figure 87). No HP2020 target has been set for liver cancer. The Boston rate is higher than the Massachusetts and US rates (both 6.5 per 100,000) (2012-2016). \(^{38}\) The rate was relatively similar across racial/ethnic groups. Liver cancer mortality rates among Boston males (14 per 100,000) was over twice as high as for Boston females (5.6 per 100,000). No statistically significant differences are evident across males and females of different racial/ethnic groups (Figure 88).

**Figure 86: Boston Colorectal Cancer Premature Mortality Over Time, Age-Adjusted Rates per 100,000 Residents, 2011-2017**

![Graph showing colorectal cancer premature mortality over time](image)

**Figure 87: Boston Liver Cancer Mortality, Age-Adjusted Rates per 100,000 Residents, 2015-2017**

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<td>Latino</td>
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<tr>
<td>White</td>
<td>9.4</td>
</tr>
<tr>
<td>Under 45 years</td>
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</tr>
<tr>
<td>Male</td>
<td>14</td>
</tr>
</tbody>
</table>

**NOTES:** Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Premature mortality due to liver cancer in Boston was 3.8 per 100,000 residents (Figure 89). Asian (5.6 per 100,000) and Black (5.8 per 100,000) residents experienced significantly higher rates of premature mortality than Whites (2.5 per 100,000), and females (1.4 per 100,000) experienced significantly lower rates than males (6.4 per 100,000). Both Asian (10.0 per 100,000) and Black (11.0 per 100,000) men experienced higher rates of premature mortality due to colorectal cancer than White men (4.1 per 100,000) (Figure 90).

Figure 89: Boston Liver Cancer Premature Mortality by Selected Indicators, Age-Adjusted Rates per 100,000 Residents, 2013-2017 Combined

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office

NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Liver cancer mortality rates are significantly higher in East Boston (17.1 per 100,000) than the rest of Boston (9.2 per 100,000) (Figure 91). Data about premature mortality due to liver cancer by neighborhood is unavailable due to small sample size.

Liver cancer mortality rates stayed the same between 2011 and 2017 (Figure 92). Rates declined slightly for premature mortality due to liver cancer, although this change is not statistically significant (Figure 93).
Figure 92: Boston Liver Cancer Mortality Over Time Age-Adjusted Rates per 100,000 Residents, 2011-2017

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Change over time was not statistically significant

Figure 93: Boston Liver Cancer Premature Mortality Over Time, Age-Adjusted Rates per 100,000 Residents, 2011-2017

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Change over time was not statistically significant

Lung Cancer

The overall lung cancer mortality rate in Boston was 36.5 per 100,000 residents. This is lower than the HP2020 target of 45.5 deaths per 100,000. This rate is also lower than the lung cancer mortality rates for Massachusetts (40.6 per 100,000) and the US (41.9 per 100,000).^{39}

Blacks (32.4 per 100,000) and Latinos (18.4 per 100,000) experienced significantly lower rates than Whites (43.7 per 100,000) and females (30.4 per 100,000) experiencing significantly lower rates than males (45.2 per 100,000) (Figure 94). Data about lung cancer mortality by sex and race/ethnicity shows substantial variation, with substantially lower rates of mortality among Latinos when compared to Whites. Latino (8.8 per 100,000) women experience far lower rates of lung cancer mortality than White (41.1 per 100,000) women (Figure 95). Asian (22.1 per 100,000), and Black (43.7 per 100,000) women also experience significantly lower rates of lung cancer compared to White women. Latino men (32.2 per 100,000) experience significantly lower rates than White males (47.6 per 100,000).
Figure 94: Boston Lung Cancer Mortality, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined

Boston 36.5
Asian 38.1
Black 32.4*
Latino 18.4*
White 43.7

Under 45 years 0.7*
45-64 years 39.6*
65+ years 221.6

Female 30.4*
Male 45.2

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Figure 95: Boston Lung Cancer Mortality by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined

The premature lung cancer mortality rate was 10 per 100,000 residents in 2013-2017 (Figure 96). Mortality rates among Latino (4.5 per 100,000) residents was lower than among White (11 per 100,000) residents;
females (7.8 per 100,000) also experienced lower rates of premature death due to lung cancer than males (12.4 per 100,000). Both Latino males and females have significantly lower rates of premature death due to lung cancer than their white counterparts (Figure 97).

**Figure 96: Boston Lung Cancer Premature Mortality by Selected Indicators, Age-Adjusted Rates per 100,000 Residents, 2013-2017 Combined**

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate per 100,000</th>
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<tr>
<td>Black</td>
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<td>Latino</td>
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<td>White</td>
<td>11</td>
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<tr>
<td>Female</td>
<td>7.8*</td>
</tr>
<tr>
<td>Male</td>
<td>12.4</td>
</tr>
</tbody>
</table>

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

**Figure 97: Boston Premature Lung Cancer Mortality by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined**

<table>
<thead>
<tr>
<th></th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
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<td>8.1</td>
<td>9.0</td>
<td>2.5*</td>
<td>9.3</td>
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<tr>
<td>Male</td>
<td>12.8</td>
<td>15.2</td>
<td>7.0*</td>
<td>12.8</td>
</tr>
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</table>

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

Lung cancer mortality rates are significantly higher in Charlestown (58.7 per 100,000) and East (57.87 per 100,000) and South Boston (57.9 per 100,000), and Dorchester zip codes 02121 and 02125 (46.8 per
than the rest of Boston (36.5 per 100,000) and significantly lower in Fenway (24.1 per 100,000) (Figure 98). Premature deaths due to lung cancer are significantly lower in Back Bay (6.1 per 100,000) and significantly higher in Dorchester zip codes 02121 and 02125 (15 per 100,000) and Fenway (14.6 per 100,000) compared to the rest of Boston (10 per 100,000) (Figure 99).

**Figure 98: Boston Lung Cancer Mortality by Neighborhood, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined**

![Bar chart showing lung cancer mortality rates by neighborhood.](chart1.png)

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health  
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office  
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)

**Figure 99: Boston Premature Lung Cancer Mortality by Neighborhood, Age-Adjusted Rates per 100,000 Residents, 2015-2017 Combined**

![Bar chart showing premature lung cancer mortality rates by neighborhood.](chart2.png)

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health  
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office  
NOTES: Bars with pattern indicate reference group for its specific category; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05)
Lung cancer mortality rates in Boston have declined by 21% from 2011 to 2017, a statistically significant level of change (Figure 100). The premature mortality rate changed slightly over this time period, from 9.9 per 100,000 in 2011 to 8.6 per 100,000 in 2017 (Figure 101). This change was not statistically significant.

**Figure 100: Boston Lung Cancer Mortality Over Time, Age-Adjusted Rates per 100,000 Residents, 2011-2017**

![Lung Cancer Mortality Graph](image)

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Change over time was statistically significant (decrease over time)

**Figure 101: Boston Lung Cancer Premature Mortality Over Time, Age-Adjusted Rates per 100,000 Residents, 2011-2017**

![Premature Mortality Graph](image)

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Boston Public Health Commission (BPHC) Research and Evaluation Office
NOTES: Change over time was not statistically significant

**Prostate Cancer**

The cancer mortality rate for prostate cancer in Boston was 24.5 per 100,000 residents in 2015-2017. This is higher than the HP2020 rate of 21.8 prostate cancer deaths per 100,000. This is also higher than death rates for Massachusetts (18.7 per 100,000) and the US (919.2 per 100,000) (2012-2016).40

Prostate cancer rates were significantly higher for Black males (49.8 per 100,000) compared to White (19.1 per 100,000) (Figure 102). This substantial difference was also noted in the 2016 CHNA at which time the prostate cancer mortality rate for Black men was nearly three times the rate for White men (58.9 per
100,000 compared to 20.1 per 100,000 in 2012. Premature death rates due to prostate cancer were also significantly higher for Black males (3.7 per 100,000) compared to White males (1.6 per 100,000) (Figure 103).

Figure 102: Boston Prostate Cancer Mortality, Age-Adjusted Rates per 100,000 Male Residents, 2015-2017 Combined

Looking across Boston neighborhoods, prostate cancer mortality rates are significantly higher in Dorchester 02121 and 02125 zip codes (45.2 per 100,000) and Hyde Park (41.4 per 100,000) and significantly lower in Allston/Brighton (13.5 per 100,000) and Back Bay (11.2 per 100,000) when compared to the rest of Boston.
Data about premature mortality are not available at the neighborhood level due to small sample size.

**Figure 104: Boston Prostate Cancer Mortality by Neighborhood, Age-Adjusted Rates per 100,000 Male Residents, 2015-2017 Combined**

Prostate cancer mortality rates and premature mortality rates have not changed significantly in Boston between 2011 and 2017 (Figure 105 and Figure 106).

**Figure 105: Boston Prostate Cancer Mortality Over Time, Age-Adjusted Rates per 100,000 Male Residents, 2011-2017**
CANCER SURVIVORSHIP

Perceptions of Cancer Survivorship
Cancer survivors participating in focus groups for this CHNA were optimistic about their futures, as in 2016. When asked about survivor services and experiences, interviewees and focus group members agreed that some follow up support with a medical care team is available following treatment, however they perceived that the support “falls off” shortly after. Patients described the need for more access to post-treatment supports for issues like managing the long-term effects of treatment (such as lymphedema) as well as how to stay on top of medications. Survivors mentioned that the prevailing concern for those who have successfully undergone cancer treatment is the fear that it will return. As one focus group member shared, “Your brain doesn’t shut off—every little thing you start thinking is cancer.”

Numerous survivors participating in focus groups reported sharing this concern, as well as anxiety about knowing what symptoms to “look out for.” As one focus group participant described, “So I feel like, what do I do now? How long do I wait? Do I wait until it shows back up again? Is there anything that can be prevented? Anything I should be on top of?” Having a resource to provide guidance about post-treatment issues was seen as critical. As one person mentioned, “Have someone come in and explain to me, is there a possibility it will come back? How will it come back? What do I look for? What signs do I need to look for?”

Focus group members also reported a need for on-going support to adjust to life after cancer, or as one participant described, how to “live with a new normal.” This includes dealing with side effects from medication, issues like memory loss and physical therapy, maintaining health through nutrition and exercise, and on-going monitoring. The need for emotional support was particularly noted. Several interviewees mentioned that depression is common after cancer treatment as patients move back into their former lives and relationships. This can be difficult to navigate and focus group members reported that there are few mental health supports available. As one cancer survivor shared, “Looking for a therapist is very challenging. Resources aren’t out there, you don’t even know where to go.” As described earlier,
focus group members reported that they believed that more resources were available for survivors of breast cancer than other cancers.

As in 2016, a common theme among cancer survivors was the importance of rejoining the workforce. Returning to work was reported to be challenging for some. Some stated that they were looking or had found new jobs, while others shared that they were cutting back on work hours. Some remained in their current positions. Several focus group participants expressed a reluctance to disclose that they had cancer, fearing it would affect their job opportunities or their relationships with co-workers. A couple expressed concern that having had cancer would be viewed as a disability by employers, and thereby negatively affect job or promotion prospects.

Use and Access to Cancer Survivorship Services
Both focus group participants and interviewees reported that there is a lack of planning for survivorship as part of the cancer treatment process. As a result, patients, many of whom have received substantial support during their cancer journeys, suddenly feel isolated and alone. As one interviewee observed, “There is no systematic standard of care relative to survivorship.” Another noted, “You feel shame, denial, you don’t want to tell people what you went through. After treatment, what do I do now? The doctor doesn’t tell you go to get into a nutrition program, start exercising. I was like, on my own, trying to figure it out.” As the on-going point of contact for most patients, primary care providers play an important role in supporting cancer survivors; ensuring that patients maintain this contact with PCPs is critical, interviewees reported.

Support groups were reported to be available and very helpful to survivors and patients in cancer treatment. Focus group members who have participated in support groups after cancer reported that these have been a source for information about services and advice about nutrition, exercise, and monitoring. Support groups also help to fill the need for emotional support after treatment. A survivor described the benefits of support groups as follows: “I do think it’s helpful for patients to hear from survivors, so they can build up more confidence and a sense of control over the situation.” A few respondents also noted that it can be challenging for non-English speakers to access some of these supports services. However, some reported, not all patients receive information about these groups.

Survivors also reported that they have ongoing questions about how to live healthy lifestyles after cancer. While they know the importance of a nutritious diet and regular exercise, they were unsure about where to get these supports. An exercise class for cancer survivors at the local YMCA was mentioned in one focus group, but this was reported to have ended. Likewise, respondents identified a need for mental health services. A need for more programs to help cancer survivors maintain a healthy lifestyle was expressed.

OTHER HEALTH ISSUES
The challenges of cancer treatment and survivorship can be exacerbated by other health conditions. This section draws on quantitative and qualitative data from the Boston CHNA to provide a brief overview of some of these, including mental health, substance use, chronic disease, and environmental conditions. More in-depth analysis is available in the Boston CHNA report which can be found at http://www.bostonchna.org/.

Mental Health
Mental health issues were a primary community health concern identified in the Boston CHNA and were discussed across almost all focus group and interviews. Stress, anxiety, and depression were the most frequently-cited challenges among Boston residents. In conversations, these mental health issues were often discussed in relation to social determinant factors like poverty, employment, and safety. Immigrants
and communities of color were described as especially vulnerable to mental health concerns due to limited English language skills, cultural norms, and stigma related to seeking mental health services.

Surveillance and survey data indicate that anxiety and depression are somewhat common across Boston residents. According to the Behavioral Risk Factor Surveillance System (BRFSS), 12.3% of Boston residents reported persistent sadness (feeling sad, blue, or depressed for more than 15 days within the past 30 days) and 21.3% reported persistent anxiety (feeling worried, tense, or anxious for more than 15 days within the past 30 days).41 Black and Latino residents were significantly more likely to report persistent sadness than White residents. Females were significantly more likely than males to report persistent sadness and persistent anxiety.

There was a significant increase over the past few years in the percent of residents who indicated they were receiving treatment for depression: 13.9% of respondents in 2010 reported receiving treatment for depression while 18.5% reported receiving treatment in 2017. Among those who reported receiving treatment for depression in 2017, rates were significantly lower among Asian and Black residents compared to white residents and significantly higher for females compared to males. Residents from Jamaica Plain and Roxbury were significantly more likely to receive treatment for depression than the rest of Boston; those from Back Bay, Charlestown, and Hyde Park were significantly less likely to do so (Figure 107).

Figure 107: Percent Adults Reporting Receiving Treatment for Depression in the Past Year, by Boston and Neighborhood, 2013, 2015, and 2017 Combined

These statistics mirror some of the themes discussed in the focus groups related to mental health services conducted for the Boston CHNA where stigma, access barriers, and cultural competency concerns were challenges to getting the mental health care services needed. Stigma around mental health was commonly
discussed in key informant interviews and in many English and non-English focus groups as a challenge to seeking services. For example, one key informant explained, “Mental health is kind of a taboo discussion; the community’s willingness to embrace mental health services is an issue.” Cost of mental health services was also reported to be a barrier, for both lower-income residents and for middle-income residents with private insurance who do not qualify for financial supports.

Cultural and language differences were described as barriers to mental health utilization for immigrant communities. One interviewee summarized, “There’s a lack of mental health providers in general, and then when you add the cultural competency/language barriers among those providers it’s even harder.” Other key informants explained that non-English speakers had to wait longer to receive services because interpreters must be found. Focus group members from communities of color and immigrant residents also expressed frustration with the lack of mental health providers who reflect their lived experiences.

Key informants participating in the Boston CHNA pointed to systemic challenges to addressing community mental health issues. Participants described an insufficient number of providers in the community to meet the demand, noting long wait lists and limited resources for non-English speakers. Several also cited larger workforce challenges that compounded these issues, including the struggle to attract and retain a diverse behavioral health workforce; these challenges were attributed to low wages, licensing demands, and costs of higher education/student debt.

Substance Use
Substance use was also considered a priority health issue in many focus group and interview discussions. Smoking and alcohol misuse are discussed earlier in this report; this section focuses on other substances such as opioids. The majority of focus group participants and key informants in the Boston CHNA who discussed substance use as a concern identified opioids as a persistent issue in Boston. While a few key informants indicated that major headway around substance use and the opioid epidemic has been made in recent years, more is needed to address the severity of the issue. Quantitative data confirm the perceptions of focus group members and interviewees. There has been a significant increase in unintentional opioid overdose deaths in Boston overall, with 16.6 deaths per 100,000 residents in 2013 to 35.4 deaths per 100,000 residents in 2016. Several informants indicated that heroin and Fentanyl use was on the rise, and that these substances were cheap and easily available. A few focus group members involved in this cancer-specific CHNA also expressed concern about opioids; respondents reported seeing people using drugs on the street, the prevalence of needles, and perceived an increase of crime in the community.

Several focus group and interview participants in the Boston CHNA perceived that the rates of marijuana use were increasing, including the variety of ways that residents are consuming the substance. As one interviewee shared, “Marijuana used to be simple, something kids would do behind the school; but today there are so many forms of marijuana like brownies and gummy bears, and youth are organizing parties or gatherings to try these things.” Those working with young people or in community-based settings described seeing an increase in marijuana use among students and parents in recent years, which they attributed to more social acceptance. Quantitative data show that 18.5% of Boston adults reported using marijuana in the past 30 days.

Barriers to substance use treatment was discussed by some participating in the Boston CHNA. These participants discussed the need for more affordable inpatient and outpatient treatment options, especially for non-English speakers. Long-term support services like sober houses were identified as limited and expensive, with one key informant sharing, “I can get someone into detox, but what we don’t have enough
us is a place for them to get to the next step of sobriety." Focus group participants in recovery also reported that cost was a barrier to treatment. There was a perception that insurance companies only covered certain substances. Further, the need for culturally-competent treatment options was also discussed as a challenge by key informants.

Figure 108 shows that in 2017, there were 129.1 unique substance abuse treatment admissions per 10,000 Boston residents 12 years old and over, which is significantly lower than the rate of admissions in 2011 (142.4 admissions per 10,000 Boston residents 12 years old and over). The reason for this decrease is unclear. It does not seem likely that there is less of a need for treatment. It is possible that there are significant barriers to treatment for those in need.

**Figure 108: Unique Substance Abuse Treatment Admission Rate, by Boston and Over Time, Age-Adjusted Rate per 10,000 Residents Aged 12+ Years, 2011-2017**

![Graph showing the trend in unique substance abuse treatment admissions per 10,000 residents from 2011 to 2017.](image)

**DATA SOURCE:** Massachusetts Department of Public Health, Substance Abuse Services, 2011-2017  
**DATA ANALYSIS:** Boston Public Health Commission, Research and Evaluation Office  
**NOTES:** Data represent treatment admissions for unique individuals; Change over time was statistically significant (decrease over time)

**Other Chronic Conditions – Heart Disease, Stroke, Diabetes**

Heart disease and stroke were only mentioned by a few key informants participating in the Boston CHNA, and neither topic emerged as a priority theme in focus groups. However, quantitative data point to a prevalence of chronic disease among the residents of Boston. In 2013-2017, one-quarter (25%) of Boston adults reported being diagnosed with hypertension. A significantly higher proportion of adults who identified as Black (38%) and Latino (26%) reported being diagnosed with hypertension or high blood pressure, compared to their White counterparts. Additionally, while the prevalence of reported diabetes across Boston was 9% in 2013-2017, this proportion was significantly higher among adults who identified as Black (15%) and Latino (12%) compared to White adults.

Table 18 on the following page highlights significantly higher rates of chronic health conditions across select Boston neighborhoods. The bar charts that follow show data for chronic diseases for all neighborhoods in this report that had available data.
As shown above, a significantly higher proportion of residents in DFCI’s priority neighborhoods of Mattapan, Roxbury, and Dorchester reported a hypertension diagnosis compared to the rest of Boston. Diabetes was also more prevalent in Dorchester, Mattapan, and Roxbury, as each had a significantly higher percentage of adults reporting a diabetes diagnosis compared to the overall Boston rate. The heart disease mortality rate was also significantly higher in East Boston, Hyde Park, Roxbury, and South Boston compared to the rest of Boston. Specific rates by neighborhood and subgroup are described in further detail in the bar charts that follow.

![Figure 109: Percent Adults Reporting Hypertension, by Boston and Neighborhood, 2013, 2015, 2017 Combined](image)


DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office

NOTE: Asterisk (*) denotes where neighborhood estimate was significantly different compared to the rest of Boston (p < 0.05); Error bars show 95% confidence interval
A significantly higher proportion of residents in Mattapan (38%), Roxbury (30%), Dorchester (02121, 02125; 30%); and Dorchester (02122, 02124; 30%) reported a hypertension diagnosis compared to the rest of Boston (Figure 109). By comparison, the neighborhoods of Fenway (13%), Allston/Brighton (17%), Charlestown (19%), Jamaica Plain (20%), and Back Bay (21%) had a significantly lower percent of residents reporting a hypertension diagnosis than the rest of Boston.

From young adulthood to 50 to 64 years of age, the heart disease mortality rate was highest for Black adults. More specifically, among adults 18 to 34 years of age and 35 to 49 years of age, the heart disease mortality rate for Black adults was statistically higher than the mortality rate for White adults. For adults 65 years of age and older, the heart disease mortality rate for Asian, Black, and Latino adults was significantly lower than that for White residents. As with other chronic conditions, in 2016-2017 the heart disease mortality rate was highest in East Boston (174 deaths per 10,000 residents), where it was 36% higher than the rest of Boston (Figure 110). The heart disease mortality rate was also significantly higher in East Boston, Hyde Park, Roxbury, and South Boston than the rest of Boston. The heart disease mortality rate was significantly lower in the neighborhoods of Back Bay, Fenway, and the South End.

Figure 110: Heart Disease Mortality Rate in Boston, by Neighborhood, Age-Specific Rate per 100,000 Residents, 2016-2017 Combined

DATA SOURCE: Boston Public Health Commission, Boston resident deaths, 2016-2017 Combined
DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTE: Asterisk (*) denotes where neighborhood estimate was significantly different compared to the rest of Boston (p < 0.05)

In 2017 3% of adults across Boston reported being diagnosed with a stroke in the past. The prevalence of stroke among Black adults (5%) was more than twice the prevalence among White adults (2%), a difference that was statistically significant.46

In 2016-2017, the stroke-related mortality rate for Black (41 deaths per 10,000 residents) and Asian (31 deaths per 10,000 residents) residents was significantly higher than that for White residents (23 deaths per 10,000 residents).47 The stroke-related mortality rate for residents of Dorchester (02122, 02124) and Dorchester (02121, 02125) was significantly higher than the mortality rate for the rest of Boston. The mortality rate was lowest in Back Bay, which was significantly below the average across Boston. Diabetes was frequently mentioned as a community concern in the Boston CHNA, and one that has an impact on both adults and children. Many focus group and interview participants discussed diabetes in
connection with obesity. While the prevalence of reported diabetes across Boston was 9% in 2013-2017, there were significant differences in the distribution of diabetes across the population. A significantly higher proportion of adults who identified as Black (15%) and Latino (12%) reported a diabetes diagnosis compared to White adults.48

In 2013-2017, compared to the rest of Boston, a significantly higher percent of adults in Mattapan (18%), Roxbury (14%), and Dorchester (02122, 02124; 13%) reported a diabetes diagnosis (Figure 111). By comparison, a significantly lower percent of adults in Allston/Brighton (4%), Fenway (4%), Back Bay (5%), Charlestown (5%), Jamaica Plain (5%), and South Boston (6%) reported a diabetes diagnosis during this period.

Figure 111: Percent Adults Reporting Diabetes Diagnosis, by Boston and Neighborhood, 2013, 2015, and 2017

![Figure 111: Percent Adults Reporting Diabetes Diagnosis, by Boston and Neighborhood, 2013, 2015, and 2017](image)

Data Analysis: Boston Public Health Commission, Research and Evaluation Office
Note: Asterisk (*) denotes where neighborhood estimate was significantly different compared to the rest of Boston (p < 0.05); Error bars show 95% confidence interval

Environmental Health Issues
Boston CHNA survey respondents noted several different environmental health concerns and whether they experienced any of these concerns at home, work, or school. A few participants in the Cancer CHNA also mentioned that they believed environmental factors play a role and possibly explain some of the recent increases in cancer rates in the community. Among all the issues listed, Boston CHNA survey respondents identified outdoor noise pollution from vehicles (36.7%), outdoor air pollution from vehicles (35.8%), and dangerous traffic (33.1%) as the top three environmental health concerns near their homes. Overall, these top three concerns were similar across neighborhoods, except for East Boston, which cited airport noise as a top concern.

Concerns related to air pollution were identified specifically in Boston CHNA focus groups in Chinatown and East Boston. Residents perceived that lower-income neighborhoods were more vulnerable to pollutants and litter due to proximity to highways, airports, and train stations. As one key informant noted, “You see those kids playing basketball every day at the Wang Center (YMCA in Chinatown). It’s right by the highway. Think, they are just breathing in all those highway fumes every day.” East Boston residents reported significant concerns of the addition of an electrical plant in the neighborhood, which they feared would
increase cancer rates and respiratory issues. One resident shared, “The electricity plant is coming and it’s going to make us all sick, my kids will grow up breathing poison.” Another participant agreed and added, “Why do they always build the bad in this neighborhood [East Boston]?”

As noted in the 2016-2016 Health of Boston report, data from the five Massachusetts Department of Environmental Protection (MassDEP) sites located in Boston that monitor particulate matter indicated that there were no years between 2005-2015 when the particulate concentrations exceeded the annual standard set forth by the U.S. Environmental Protection Agency (EPA). Another component of air pollution is secondhand smoke, which has been shown to be linked to cancer. BBRFSS data show that more than one in ten Boston adults reported exposure to secondhand smoke. Respondents who identified as Asian, Black, or Latino were all significantly more likely than White respondents to report exposure to secondhand smoke.

The impact of climate change was mentioned by multiple key informants who shared concerns such as heat related illness and warming oceans. Key informants described how climate-related triggers like heat waves can agitate mental health stressors. Key informant interviewees noted several concerns related to the effects of climate change, with mental health triggers and flooding being some of the most significant issues. Climate Ready Boston projections estimate that 7% of Boston’s land area could be exposed to frequent stormwater flooding by 2050.

COMMUNITY ASSETS

Perceptions of Community Strengths and Assets
Understanding the resources and services available in a community—as well as their distribution—helps to elucidate the assets that can be drawn upon to address community health, as well as any gaps that might exist. Boston has numerous strengths according to focus group participants, interviewees, and CHNA community survey respondents.

Proximity to health care services and educational institutions was described as assets among focus group and interview participants involved in the Boston CHNA. One focus group participant in Mattapan noted, “There’s so much that the city of Boston has to offer; it has some of the best colleges and universities, best teaching hospitals and traveling [health care].” Similarly, residents in Chinatown described the close proximity to services as a strength in their neighborhood. One key informant shared, “One of Chinatown’s greatest strengths is that you have access to almost everything you need. You can go to restaurants, you can buy groceries, you can access services, you can get health care. As long as you know what you are looking for, you likely are able to find it in Chinatown.”

Diversity and multiculturalism were seen as strengths across the city. Focus group and interview participants described their communities as “tight-knit”. Participants described an engaged community that is willing to help those who are struggling. One key informant shared, “Regardless of the changing face of the community, there is still a real sense of community here. People looking out for each other...and the amount of services and variety of services is just incredible. We hope to keep that richness within the community.”—Focus group participant

Diversity and multiculturalism were seen as strengths across the city. Focus group and interview participants described their communities as “tight-knit”. Participants described an engaged community that is willing to help those who are struggling. One key informant shared, “Regardless of the changing face of the community, there is still a real sense of community here. People looking out for each other...and the amount of services and variety of services is just incredible. We hope to keep that richness within the community.” Focus group and interview participants described the strong work ethic and “will to survive” as a strength in immigrant communities. Neighborhoods like Chinatown were noted as a strong cultural hub.
Survey data reinforce many of these themes from qualitative discussions. When Boston CHNA survey respondents were asked to mark the biggest strengths in their community, a majority of respondents noted “my community is close to medical services” (69.0%), “my community has people of many races and cultures” (67.5%), “people speak my language” (54.8%), and “my community has good access to resources” (54.6%) (Figure 112).

**Figure 112: Percent Boston CHNA Survey Respondents Reporting Strengths of Their Community or Neighborhood (N=2,022), 2019**

- My community is close to medical services: 69.0%
- My community has people of many races and cultures: 67.5%
- People speak my language: 54.8%
- My community has good access to resources: 54.6%
- People care about improving their community: 48.4%
- People are proud of their community: 45.0%
- People accept others who are different than themselves: 44.8%
- People feel like they belong in this community: 38.8%
- People like to work together in this community: 34.5%
- People can deal with challenges in this community: 28.1%
- There are innovation and new ideas in my community: 27.9%

DATA SOURCE: Boston CHNA Community Survey, 2019
NOTES: Percentage calculations do not include respondents who selected “none of the above”

**Services and Organizational Resources**

Survey, focus group, and interview participants involved in the Boston CHNA all noted proximity and abundance to health care services were major strengths of their community. Health care is the largest industry in Boston: there are 22 hospitals and 33 health center access sites in Boston, including 16 federally qualified health center organizations (with 28 sites as some have more than one location) and 5 hospital-licensed health center organizations. Participants in focus groups conducted for this CHNA likewise praised the city’s health care resources, with most providing high praise for the cancer services they have received.

Many focus group and interview participants participating in the Boston CHNA, particularly those working for a variety of organizations across the city, described the city of Boston as having a strong network of social services with strong partnerships and collaborations. One key informant described, “Generally Boston is deeply collaborative; even though there isn’t a plan, there is a willingness and appetite to collaborate and...”
pull together in ways that affect the common good." However, there is still a need to reduce duplicative services and strengthen collaborations. One key informant summarized, “Community connectedness matters. The more we are talking to each other, the more success we’re going to have.” Another interviewee echoed this sentiment and added, “It can feel like an inundation of services that makes people feel disengaged. Instead we should combine services or be better partners.” An important next step, suggested key informants, is to fix infrastructure challenges around data sharing. This includes strengthening data repositories to interact across systems and tracking health and environmental data.

KEY THEMES AND CONCLUSIONS

This CHNA examines quantitative and qualitative data about cancer in Boston including cancer burden, perceptions of cancer, and services, issues, and needs related to cancer prevention, screening, treatment, and survivorship. Overarching themes that emerged from this synthesis include:

• **Cancer is the leading cause of death in Boston and Massachusetts; rates of cancer mortality differ across different subgroups and by sex.** Black men experience the highest rates of mortality from all cancers and all premature cancers among those under age 65. These rates are significantly higher than White men. Black male residents also experience the highest rates of mortality due to colorectal, liver, and prostate cancer and lung cancer among those under age 65. Black women under age 65 have the highest mortality rates from all cancers which is statistically significantly higher than their White counterparts. Across all groups and cancers included in this CHNA, Asian men have the single highest mortality rate for lung cancer (58.9/100,000) followed by Black men for prostate cancer (49.8/100,000). Asian and Latino residents experience lower overall cancer mortality rates compared to White residents. Cancer mortality rates overall have declined significantly in Boston from 2011 to 2017, as have colorectal and lung cancer mortality rates. In contrast, mortality rates have not changed significantly for breast, liver and prostate cancer and lung cancer for younger patients under 65.

• **Cancer screening rates for some cancers are better than others, and some residents face substantial barriers to getting screened.** Quantitative data indicate that screening rates for breast and cervical cancer are relatively high in Boston, while colon cancer screening rates are substantially lower. Black, Latina, and Asian women are significantly less likely to receive pap smears than their White counterparts with Asian women being far less likely to have a pap smear. While a variety of cancer screening opportunities exist in Boston, barriers to accessing these remain and include lack of awareness, discomfort and fear, inability to take time from work, confusion about screening guidelines and for a few, insurance and transportation issues.

• **Breast and Prostate cancers continue to be the most frequent type of cancer diagnosed in Boston** and the mortality rates have not improved for these diseases. The highest incidence of breast cancer is among White women (160/100,000) followed by Black women (140/100,000). The highest incidence of prostate cancer is seen among Black men (190/100,000) followed by Latino (112/100,000) and White men (111/100,000). The largest incidence disparity occurs among Black men for prostate and colorectal cancer and for Asian men for liver cancer. Liver cancer has a much lower incidence but is on the rise. Lung cancer is the deadliest form of cancer for almost all groups.

• **Some cancer incidence rates have declined over time, although disparities still exist.** Overall cancer incidence rates have declined in Boston between 2001 and 2015, as have incidence rates for colorectal, lung, and prostate cancers. Incidence rates for liver cancer, by contrast, have risen in Boston. Differences exist across race/ethnicity and sex, as follows:
Overall cancer incidence: Rates have increased for Asian and Black women over this time period and decreased among Black men and Whites of both genders. Rates are lower among Asian and Latino residents compared to White residents.

Breast Cancer: Rates have increased among Asian women but remained the same for women in other racial and ethnic groups.

Colorectal Cancer: Rates have declined among Asian men, Black women, and Whites of both genders, but remain highest among Black men.

Lung Cancer: Rates have increased among Latino men and declined among Black and White men.

Prostate Cancer: Rates have significantly declined among men of all racial/ethnic groups but remain highest among Black men.

Liver Cancer: Rates have risen over time, with White women experiencing significant increases in these rates. Asian residents experience higher rates of liver cancer than White residents, with Asian men having significantly higher rates than White men. The Boston Liver cancer rate is higher than the Massachusetts and US rates.

In synthesizing the data described in this CHNA, certain populations, including Black men and women, Asian men and women, and immigrants appear to have disproportionately higher levels of disease burden and risk, warranting increased attention. Furthermore, the data confirms the need to prioritize efforts in Dorchester, Roxbury, and Mattapan while also pointing to emerging areas of need in neighborhoods such as East Boston and Fenway that warrant additional consideration.

Boston has many health care and social service assets, but challenges to treatment exist for those in need of cancer care. A high proportion of Boston residents are insured and report having one person as their personal doctor or health care provider, although barriers to accessing healthcare exist. These include underinsurance; cost; language and immigration status; navigation and care coordination challenges; transportation; and lack of culturally-sensitive approaches to care. Primary challenges to access for those with cancer include cost, maintaining employment, transportation, limited opportunities to participate in clinical trials, language access, and for communities of color, racism within the health care system.

Patient navigation continues to be an area where more attention is needed. While numerous focus group members reported that they benefitted greatly from having a care coordinator, social worker, or patient navigator during their cancer care, not all patients appear to have access to these services. There is a need for assistance with navigating the health system and health insurance, connection to social and other services, as well as advocacy for some. Respondents also suggested that such support be provided across the cancer continuum—from the point of an abnormal finding to survivorship. In particular, there was a strong desire for navigation services to support survivors well beyond the treatment period.

Clinical Trials continue to be an area where more attention is needed. As noted in the previous CHNA, more outreach is needed to patients, especially people of color, to raise awareness for this opportunity and to ensure that clinical trial participants will reflect the actual diversity of the city of Boston. It is incumbent on medical providers to encourage participation in clinical trials and to ensure that there is adequate space for underrepresented patients to participate. There is also a desire for providers to generally strengthen their patient communication and to better engage with patients regarding treatment options.
Planning for cancer survivorship and expanding survivorship services were seen as important areas where more attention is needed. Patients value the support that is provided during cancer treatment but saw a need for this during survivorship as well. This was noted as a substantial need in the 2016 CHNA as well. Planning for survivorship includes attending to issues like long-term effects of treatment, medication needs, managing day-to-day activities like employment and healthy living, and emotional support.

Nearly one in five respondents participating in the Boston CHNA felt that cancer was a top concern. Additionally, several of the top concerns (e.g. smoking, obesity) are risk factors for cancer. Among the general population, top community concerns were mental health and substance use, trauma, community violence, obesity, and social and economic concerns such as housing and employment.

Quantitative data on smoking, alcohol use, obesity, and access to healthy foods and opportunities for physical activity indicate that some Boston residents are at increased risk for cancer. While smoking rates have declined over time, one in six Boston adults still smoke, with significantly higher rates of smoking among Black residents, males, and those with lower levels of education and income. For example, nearly 1 in 3 unemployed residents smoke. Obesity was an area of substantial concern for Boston CHNA focus group members and interviewees, and data show that over half of Boston adults are overweight or obese. Black and Latino adults, as well as those who are older and who have lower levels of education and income are significantly more likely to be obese or overweight. Certain neighborhoods also appear to have much higher rates of obesity; seven out of ten Mattapan residents, for instance, are obese or overweight. Limited access to opportunities for physical activity, food deserts, as well as lack of time to prepare healthy food were all reported to be contributors to obesity, especially among lower income residents.

**SUGGESTIONS FOR CANCER-RELATED INITIATIVES, PROGRAMS, AND SERVICES**

**Overall**

- **Expanded patient navigation/care coordination services.** Among all suggestions provided by interviewees and focus group participants, enhanced support to help patients navigate cancer services and related care was mentioned most frequently. This was a key suggestion in 2016 as well. They described a need for assistance navigating the health system and health insurance, connection to social and other services, as well as advocacy for some. Similarly, interviewees noted the importance of navigation support, including support at the beginning of the cancer continuum—when a patient has an abnormal screening result. Ensuring that patients are informed of these services and that they are offered to equally to all patients was also emphasized. The need for transportation support was also noted.

- **Enhanced language capacity/cultural competency.** While interpretation services in most aspects of cancer care was reported to be good, a few focus group members and interviewees suggested that greater language capacity is needed with front-line staff to help with scheduling and with different subspecialty groups. They also mentioned an ongoing need for more cultural competency capacity across the cancer care system, including training in anti-racism/anti-discrimination. Some stated that greater racial/ethnic diversity in the cancer care workforce is a critical step in ensuring cancer care meets the needs of all patients.

- **Policy change.** A few respondents suggested policy changes including reimbursement for patient navigation as mentioned above. Additional policy suggestions included working with public benefits (such as SSI and SSDI) to minimize the catastrophic financial toll that cancer can have on individuals and families and advocating for changes in insurance coverage for alternative treatments and patient navigator services.

- **Greater collaboration across institutions.** A couple of focus group members and interviewees reported that collaboration among hospitals serving cancer patients could be improved, in particular relative to
clinical trials and patient navigation services and ensuring that cancer patients and survivors at all hospitals are aware of the services available to them. More collaboration between hospitals and community-based organizations was also mentioned.

Prevention
- **Obesity Prevention.** Obesity is a risk factor for cancer and other chronic diseases. Given that more than half of Boston residents are obese or overweight, there is a need to provide education about healthy eating and nutrition. Community Benefits may be able to build on the past success of promoting healthy eating and cooking in a low-income housing community. Over five years of data, nearly two-thirds of Community Benefits priority neighborhood program participants indicated on a feedback survey that they wish to learn more about nutrition. Similarly, CHNA focus group participants expressed concern about obesity and not knowing how to prevent it.
  - Particular geographic areas with higher obesity rates, such as Mattapan, would benefit from such education.
- **Tobacco Use.** Tobacco use is the most important risk factor for lung cancer and is linked to approximately 90% of lung cancer deaths in the United States, according to the Centers for Disease Control and Prevention. The data show high smoking rates among certain groups. For example, more than 1 in 4 Boston residents who are unemployed, low-income and do not have a high school degree smoke. DFCI’s Treatment Program in Roxbury has had success in helping people reduce their tobacco use or quit completely. Expanding this program to other health centers in areas with high smoking rates, such as Dorchester or South Boston, or other community settings such as low-income housing developments, could help prevent lung and other cancers.
- **Low-dose lung screening.** Education about lung screening and expanded lung screening opportunities could help detect lung cancer at an earlier stage when most treatable, particularly for groups most at risk. Asian men have the highest lung cancer incidence rate and also the highest mortality rate across all cancers and all groups reported in the CHNA. Additionally, Latino men have had a large increase in lung cancer incidence.

Screening
- **More outreach about cancer prevention and screening services.** While screening rates for some cancers and among some groups is high, focus group members and interviewees saw a need to continue to maintain these rates, while also expanding efforts to ensure that underserved populations are reached. Suggestions about the type of information that needs to be disseminated include clear information about current cancer screening guidelines, the treatability of cancer, the importance of engaging in healthy behaviors to prevent cancer, and why it is important to follow up on abnormal results. Suggestions to enhance outreach included identifying and engaging community champions, utilizing multi-media approaches, and prioritizing young audiences and men.
- **Better patient follow-up after abnormal findings.** Respondents who discussed screening services overwhelmingly mentioned a need for better protocols relative to follow up after abnormal results.
- **Greater engagement of PCPs.** Interviewees stressed the importance of ensuring that PCPs are up-to-date about most current guidelines and have the resource they need to educate patients about why screenings are important, what is involved, and any risk or benefits.

Cancer Treatment
- **Greater access to clinical trials.** Noting the underrepresentation of people of color in clinical trials, several interviewees mentioned a need to conduct better outreach to these groups and to reduce barriers to their participation. This was also a key suggestion in 2016. Patient navigators or care coordinators can also be a critical resource relative to trials, helping patients to identify opportunities
and dealing with barriers such as insurance. Direct messaging to patients about clinical trials was also suggested.

- **More support groups and education.** Cancer patients and survivors requested more cancer support groups in different languages, across different cancers and serving different populations. A few participants wanted financial planning guidance in the context of cancer and strategies to negotiate with employers. Caregivers participating in focus groups also saw a need for more education.

- **Better communication by physicians and provider offices.** Although most focus group members reported that received high quality cancer care, some saw a need for improvement relative to communication. A few reported that they wished that they had received more information about treatment options or had more of an opportunity to discuss these with their physicians.

### Cancer Survivorship

- **Survivorship Services.** As in the 2016 CHNA, there was a request for more support services for survivors and families. People appreciated hospital survivor support groups but expressed a need for more support groups in other languages, as well as support groups facilitated by people of color and cancer survivors, possibly in collaboration with faith-based organizations. More information and support regarding living with cancer, rejoining the workforce, maintaining a healthy lifestyle, and supporting families was also requested.

- **Survivorship planning.** Respondents shared that more attention needs to be paid to helping cancer patients plan for survivorship including ongoing medical care, transition back to work and family life, emotional support, diet and exercise, and other needed social supports.

- **Engagement of primary care providers.** As with cancer screening and treatment, engagement of PCPs is critical in survivorship to ensure follow up care and monitoring. A couple of interviewees noted that more should be done to ensure that all patients have a medical home after treatment. Ensuring that primary care providers have sufficient expertise to provide this care is also important.

- **Exercise and nutrition support.** Specific support around healthy lifestyles after treatment was suggested by several respondents. Specific suggestions included nutrition consultation as a routine part of post-cancer care and more low-cost or free exercise programs for cancer survivors.

### Conclusion and Acknowledgements

Cancer remains the leading cause of death in Boston. While the CHNA findings reflect that collective efforts to advance cancer screening and prevention are making a difference, the overall burden of cancer across all types is weighty and more effort is needed to reduce the cancer burden and address disparities. Dana-Farber recognizes that our efforts must go beyond cancer care and treatment, and as such, we will continue our unwavering commitment to reducing the cancer burden and promoting survivorship. We remain committed to educating the community and raising awareness about the importance of cancer prevention, outreach, screening, early detection, clinical trials and survivorship. In addition, we will continue to conduct a broad scope of community-based research and evidence-based interventions through collaborative work in local neighborhoods and throughout the region.

This comprehensive Cancer CHNA Report would not have been possible without the support and engagement of DFCI and BMC patients, family members, and caregivers, who generously contributed their time and feedback to this process. We’d also like to acknowledge our community partners, including Union Capital Boston (UCB), BMC, Whittier Street Health Center, BPHC’s Pink and Black Education and Support Network, the Prostate Health Education Network (PHEN), Asian Women for Health (AWFH), Enhance Asian Community on Health (EACH), and Dana-Farber’s Determination of Need Advisory Committee members, among others, for their collaboration and support. In addition, we want to thank the over 100 organizations
that participated in the first Collaborative Boston CHNA/CHIP. Please see http://www.bostonchna.org/ for a full list of organizations engaged in this process.

Approved by DFCI Trustees: 9/11/2019
APPENDIX

Table 19: All Cancer Incidence Rate Over Time by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
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<th>Latino</th>
<th>White</th>
</tr>
</thead>
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<td>574.6</td>
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<td>618.1</td>
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<td>520.0</td>
<td>324.2</td>
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<td>399.3</td>
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DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time) and White (decrease over time)
Table 20: All Cancer Incidence Rate Over Time by Race/Ethnicity and Sex, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
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<th>White</th>
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DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston males (decrease over time), Black males (decrease over time) and White males (decrease over time)

Table 21: All Cancer Incidence Rate Over Time by Race/Ethnicity and Sex, 2001-2015, Age-Adjusted Rates per 100,000 Female Residents

<table>
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<tr>
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<th>White</th>
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<td>427.8</td>
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<td>375.8</td>
<td>512.8</td>
<td>298.5</td>
<td>518.8</td>
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DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston females (decrease over time), Black females (increase over time), Asian females (increase over time) and White females (decrease over time)
Table 22: Female Breast Cancer Incidence Rate Over Time by Race/Ethnicity, -Adjusted Rates per 100,000 Female Residents, 2001-2015

<table>
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<th>Year</th>
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<th>White</th>
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DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Asian females (increase over time)

Table 23: Colorectal Cancer Incidence Rate Over Time by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
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<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2010-2012</td>
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DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Boston (decrease over time), Asian (decrease over time), Black (decrease over time), and White (decrease over time)

Table 24: Colorectal Cancer Over Time by Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

<table>
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<th>Year</th>
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<th>Latino</th>
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</thead>
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<td>64.3</td>
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<tr>
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<td>60.5</td>
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DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: Change over time was statistically significant for Asian males (decrease over time) and White males (decrease over time)
### Table 25: Colorectal Cancer Over Time by Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
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<th>White</th>
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**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** Change over time was statistically significant for Black females (decrease over time) and White females (decrease over time)

### Table 26: Liver Cancer Incidence Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
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**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** Change over time was statistically significant for Boston (increase over time)

### Table 27: Liver Cancer Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

<table>
<thead>
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<th>White</th>
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<tr>
<td>2007-2009</td>
<td>21.5</td>
<td>48.0</td>
<td>25.0</td>
<td>24.1</td>
<td>17.3</td>
</tr>
<tr>
<td>2010-2012</td>
<td>22.8</td>
<td>43.8</td>
<td>29.3</td>
<td>30.7</td>
<td>15.2</td>
</tr>
<tr>
<td>2013-2015</td>
<td>18.8</td>
<td>32.5</td>
<td>17.2</td>
<td>23.6</td>
<td>16.7</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** Change over time was statistically significant for Boston males (increase over time)

### Table 28: Liver Cancer Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015
## Table 29: Lung Cancer Incidence Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2003</td>
<td>4.3</td>
<td>***</td>
<td>5.2</td>
<td>8.6</td>
<td>3.9</td>
</tr>
<tr>
<td>2004-2006</td>
<td>3.7</td>
<td>13.0</td>
<td>3.3</td>
<td>7.3</td>
<td>2.2</td>
</tr>
<tr>
<td>2007-2009</td>
<td>6.2</td>
<td>14.9</td>
<td>6.8</td>
<td>9.4</td>
<td>4.7</td>
</tr>
<tr>
<td>2010-2012</td>
<td>6.0</td>
<td>9.2</td>
<td>5.2</td>
<td>10.5</td>
<td>5.4</td>
</tr>
<tr>
<td>2013-2015</td>
<td>6.5</td>
<td>10.1</td>
<td>6.0</td>
<td>6.9</td>
<td>6.4</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** Change over time was statistically significant for White females (increase over time)

## Table 30: Lung Cancer Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2003</td>
<td>77.9</td>
<td>53.6</td>
<td>73.8</td>
<td>19.9</td>
<td>91.4</td>
</tr>
<tr>
<td>2004-2006</td>
<td>75.2</td>
<td>49.4</td>
<td>74.4</td>
<td>21.9</td>
<td>89.3</td>
</tr>
<tr>
<td>2007-2009</td>
<td>67.7</td>
<td>46.1</td>
<td>65.2</td>
<td>39.7</td>
<td>80.0</td>
</tr>
<tr>
<td>2010-2012</td>
<td>67.9</td>
<td>52.7</td>
<td>68.1</td>
<td>33.9</td>
<td>80.3</td>
</tr>
<tr>
<td>2013-2015</td>
<td>64.7</td>
<td>65.7</td>
<td>62.8</td>
<td>30.9</td>
<td>77.2</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** Change over time was statistically significant for Boston (decrease over time), Black (decrease over time), Latino (increase over time), and White (decrease over time)

## Table 31: Lung Cancer Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Female Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2003</td>
<td>96.2</td>
<td>73.3</td>
<td>99.2</td>
<td>26.0</td>
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<tr>
<td>2004-2006</td>
<td>94.1</td>
<td>77.1</td>
<td>111.7</td>
<td>33.0</td>
<td>101.8</td>
</tr>
<tr>
<td>2007-2009</td>
<td>85.8</td>
<td>63.4</td>
<td>98.4</td>
<td>61.4</td>
<td>92.8</td>
</tr>
<tr>
<td>2010-2012</td>
<td>79.3</td>
<td>78.0</td>
<td>93.8</td>
<td>48.1</td>
<td>83.4</td>
</tr>
<tr>
<td>2013-2015</td>
<td>75.1</td>
<td>95.7</td>
<td>78.4</td>
<td>45.9</td>
<td>79.6</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** Change over time was statistically significant for Boston (decrease over time), Black (decrease over time), Latino (increase over time), and White (decrease over time)
### Table 32: Prostate Cancer Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Male Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2003</td>
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<td>101.8</td>
<td>315.3</td>
<td>156.1</td>
<td>170.4</td>
</tr>
<tr>
<td>2004-2006</td>
<td>171.9</td>
<td>89.8</td>
<td>274.8</td>
<td>173.7</td>
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<tr>
<td>2007-2009</td>
<td>174.0</td>
<td>91.6</td>
<td>243.3</td>
<td>203.0</td>
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<tr>
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<td>159.7</td>
<td>59.2</td>
<td>277.2</td>
<td>185.7</td>
<td>121.5</td>
</tr>
<tr>
<td>2013-2015</td>
<td>126.7</td>
<td>74.5</td>
<td>190.0</td>
<td>111.8</td>
<td>110.8</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** Change over time was statistically significant for Boston (decrease over time), Asian (decrease over time), Black (decrease over time), Latino (decrease over time), and White (decrease over time)

### Table 33: Head and Neck Cancer Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2001-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
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<th>Black</th>
<th>Latino</th>
<th>White</th>
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</thead>
<tbody>
<tr>
<td>2001-2003</td>
<td>18.2</td>
<td>15.3</td>
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<td>14.1</td>
<td>8.6</td>
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<td>18.3</td>
<td>14.6</td>
<td>15.9</td>
<td>15.5</td>
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<tr>
<td>2010-2012</td>
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<td>15.8</td>
<td>20.0</td>
<td>20.4</td>
</tr>
<tr>
<td>2013-2015</td>
<td>18.3</td>
<td>14.7</td>
<td>17.6</td>
<td>13.2</td>
<td>22.5</td>
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</tbody>
</table>

**DATA SOURCE:** Cancer Registry, Massachusetts Department of Public Health  
**DATA ANALYSIS:** Research and Evaluation Office, Boston Public Health Commission  
**NOTES:** No statistically significant changes over time
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
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<td>31.7</td>
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<tr>
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<td>24.7</td>
<td>26.5</td>
<td>29.0</td>
<td>25.3</td>
<td>34.2</td>
</tr>
</tbody>
</table>

DATA SOURCE: Cancer Registry, Massachusetts Department of Public Health
DATA ANALYSIS: Research and Evaluation Office, Boston Public Health Commission
NOTES: No statistically significant changes over time

REFERENCES


24 US Census Bureau. (2017). *American Community Survey 5-Year Estimates, 2013-2017*. NOTE: Civilian noninstitutionalized population is defined as all U.S. civilians not residing in institutional group quarters facilities such as correctional institutions, juvenile facilities, skilled nursing facilities, and other long-term care living arrangements


