September 2022

Dana-Farber Cancer Institute
2022 Cancer-Focused Community Health Needs Assessment (CHNA) Report

Submitted to:
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OVERALL EXECUTIVE SUMMARY

This CHNA Report and 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 (Dana-Farber) is one of the world’s leading cancer treatment and research centers. In addition to providing expert clinical care, Dana-Farber 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, Dana-Farber’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 Dana-Farber’s community benefits and outreach activities contributes to the larger goal of advancing diagnosis, care, treatment, cure, and prevention of cancer and related diseases.

Purpose and Scope of the 2022 Cancer Community Health Needs Assessment

In addition to fulfilling the requirement by the IRS Section H/Form 990 mandate, the 2022 Dana-Farber Community Health Needs Assessment (CHNA) aimed to gain a deep understanding of health issues facing Boston residents including cancer risks and cancer experiences. This report presents findings from cancer-focused data collection and analysis and also integrates key results from a larger Boston CHNA to provide a deeper dive from the perspective of residents, cancer patients, and survivors regarding their experiences, concerns, supports, and challenges related to cancer prevention, screening, treatment, and survivorship within the larger framework of the social determinants of health. The ongoing COVID-19 pandemic, which has resulted in significant changes and inequities in health, the economy, and the workforce, has been an important and evolving backdrop to this CHNA. Dana-Farber contracted with Health Resources in Action (HRiA), a Boston-based public health organization, to develop this cancer-specific report.
METHODS

Health Equity Lens

The 2022 Dana-Farber CHNA focuses on the social determinants of health using a health equity lens. There is often a deep connection between how race, ethnicity, income, geography, and other factors shape health patterns. This CHNA focuses on the social determinants of health and also recognizes the need and imperative to focus on root causes in order to truly address inequities. As depicted in the Health Tree figure, these root causes include but are not limited to structural and institutional barriers, distribution of resources, poverty, and racism. Guided by this framework, 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.

2022 CHNA: A Snapshot in Time

This 2022 Dana-Farber CHNA was conducted during an unprecedented time, including the COVID-19 pandemic, which exacerbated many social and economic inequalities that have been present for generations. The pandemic contributed to a staggering number of COVID-19 cases, deaths, and ongoing health challenges which disproportionately affected marginalized populations. During this same period, there has been a growing national movement calling for racial equity to address racial injustices in the U.S. The growth of this movement has been sparked by the killings of several Black Americans including George Floyd and Ahmaud Arbery. In 2020, the City of Boston declared racism as a public health crisis, underscoring the City’s commitment to dismantle structural racism and recognize historical injustice.

This context shaped the assessment approach and content, in that the 2022 Dana-Farber CHNA also explores how the pandemic and racial injustices have affected community health needs. Dana-Farber is committed to meeting the health needs of medically underserved populations and recognizes that many of the populations that Dana-Farber focused on in this 2022 Dana-Farber CHNA have been disproportionately impacted by the COVID-19 pandemic. Given the unprecedented nature of the COVID-19 pandemic, it is critical now, more than ever, to understand community needs, experiences, and opportunities for the future.
Secondary Data
Secondary data for this report come from a variety of sources. Data sources include the Boston Behavioral Risk Factor Surveillance Survey (BBRFSS), the U.S. Census, the Massachusetts Cancer Registry, and vital records. As part of the BBRFSS, a separate COVID-19 Health Equity Survey was conducted in December 2020/January 2021 by the Boston Public Health Commission to better understand experiences among residents who have been most impacted by the pandemic. Data from this COVID-19 Health Equity Survey are also included in this report.

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.


Dana-Farber Key Informant Survey
Dana-Farber designed a qualitative key informant survey. This survey was fielded with cancer survivors and representatives from organizations that serve individuals across the cancer continuum. The survey aimed to understand their experiences with cancer prevention, cancer care, and survivorship; recommendations for cancer and chronic disease prevention services and resources; the influence of the COVID-19 pandemic on access to cancer screening and health care; potential facilitators to increase cancer screening; and recommendations for addressing gaps in services and resources for cancer survivors. Of 27 people contacted, a total of 13 cancer survivors and community stakeholders representing community-based, public health, and health care organizations completed this qualitative survey.

Focus Groups and Interviews
DFCI worked with a variety of partners to gather primary qualitative data through focus groups and interview discussions. DFCI made a concerted effort to engage with populations and communities that have been historically marginalized. Altogether, 8 focus groups with 69 participants (caregivers, patients/survivors) and 4 interview discussions were conducted specifically for this CHNA. Key themes from two additional data sources were also analyzed and are incorporated into this CHNA. First, the Boston Breast Cancer Equity Coalition (BBCEC) shared key themes from 9 interviews conducted with small, local non-profit organizations who support BIPOC communities. Second, the Boston Public Health Commission also shared key findings from a focus group conducted with their 10-member Racial Health Equity Advisory Committee (RHEAC) to garner input to inform the creation of a lung cancer communication campaign.

Boston CHNA
This report also integrates findings from data collected as part of the 2022 Boston CHNA-CHIP Collaborative’s process. The Collaborative’s Community Engagement Work Group facilitated 29 virtual and in-person focus group discussions with a total of 309 residents who have been disproportionately burdened
by social, economic, and health challenges including: youth and adolescents, older adults, persons with disabilities, low-resourced individuals and families, LGBTQIA+ populations, racially/ethnically diverse populations (e.g., African American, Latino, Haitian, Cape Verdean, Vietnamese, Chinese), limited-English speakers, immigrant and asylee communities, families affected by incarceration and/or violence, and veterans. Some focus groups were conducted in languages other than English, including Spanish, Chinese, and Vietnamese. Collaborative members also conducted key informant interviews with 62 individuals. These interviewees included leaders and staff from public health, health care, behavioral health, the faith community, immigrant services, housing organizations, economic development, community development, racial justice organizations, social service organizations, education, community coalitions, the business community, childcare centers, elected government offices, and others.

Limitations
While the data sources used in this CHNA are robust and highly credible, there are some considerations that are important to keep in mind. Qualitative discussions use small sample sizes and non-random sampling methods, the latter of which is an important approach to incorporating the perspectives of communities who have been underrepresented and underserved in the past and many of whom experience structural disadvantages related to the social determinants of health. Moreover, due to the ongoing COVID-19 pandemic, the majority of interviews and focus group discussions were conducted remotely, which may have affected participation – both in terms of who is able to participate remotely and the information elicited in remote discussions.

Secondary data may have a time lag and apply different ways of measuring variables such as neighborhoods. Additionally, BBRFSS data from 2015-2019 are the most recent data available regarding the experiences, health behaviors, and self-reported health and health care patterns among Boston residents. Given the need to aggregate data across years to look at patterns across neighborhoods and population groups, data from the 2015-2019 period overlap with data reported in the 2019 Dana-Farber CHNA. Finally, COVID-19 data included in this report provide a snapshot of one moment in time in the ongoing pandemic and are not necessarily representative of the entire pandemic.

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 depicted in Figure 2 below – which are some of Boston’s most diverse communities. The Dana-Farber Community Benefits office has identified these neighborhoods as priority focus areas given that they are within Dana-Farber’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.
Dana-Farber has a statewide reach and also provides services at the following satellite locations:

- Milford
- Allston/Brighton
- South Shore
- Foxborough
- Merrimack Valley
BOSTON POPULATION OVERVIEW

Boston’s population is incredibly diverse in terms of race and ethnicity, country of birth, and languages spoken, which residents discussed as a community strength. According to Census estimates, approximately 3 in 5 (60.0%) Boston residents identify as people of color. Mattapan, Hyde Park, Dorchester, and Roxbury are home to the largest proportion of Boston residents who identify as Black. East Boston, Roxbury, Hyde Park, and Dorchester’s 02121 and 02125 zip codes have the largest percent of residents who identify as Latino. Fenway and Allston/Brighton are home to the largest proportion of Asian residents. Participants noted many languages spoken among residents, including Cantonese, Mandarin, Russian, Spanish, Haitian Creole, Cape Verdean Creole, and indigenous languages. Boston’s population represents a range of age groups, and the distribution of these ages varies across neighborhoods. Overall, according to 2020 Census estimates, 20% of Boston’s residents are 19 years old or younger, 35% are 20-34 years old, 13% are 35-44 years old, 21% are 45-64 years old and 12% are 65 years or older.

SOCIAL AND ECONOMIC CONTEXT

Income and Poverty
Income loss during the pandemic has disproportionately affected Boston residents of color and low-income residents. Residents who identified as Black or Latino were most affected by income loss, with almost two-thirds (62.3%) of Latino respondents indicating that they had experienced income loss during the pandemic and nearly half of Black residents (49.9%) reporting income loss, compared to 33.1% of White adults. Relative to their counterparts, adults with incomes less than $25,000 (63.8%), and adults with incomes $25,000-$50,000 (52.8%) reported income loss during the pandemic. Some 2022 Dana-Farber CHNA participants also described poverty and economic insecurity as a barrier to cancer screenings and health care appointments, citing barriers such as limited, inconsistent, or no health care coverage; lack of access to preventive health care; and difficulties taking time off work for low-wage workers. Several cancer survivors and caregivers mentioned the high financial costs and strain of a cancer diagnosis and treatment.

Food Insecurity
Participants discussed how the cost of food is rising, contributing to growing levels of food insecurity as residents struggle to afford food, especially healthy food. Several participants underscored that many low-income residents have not been able to eat healthy foods during the COVID-19 pandemic due to financial constraints and some residents face barriers to safely accessing food due to concern about virus transmission. Some caregivers shared that it is difficult to get food, let alone healthy food, when undergoing cancer treatment and noted that it is difficult to get assistance with access to healthy food when undergoing cancer treatment. Pre-pandemic, about 17.8% of Boston residents were identified as food insecure – in that the food they purchased ran out before they had money to buy more. More than one quarter of residents in Mattapan (30.3%), Dorchester (25.1% to 27.8%) and East Boston (26.1%) reported food insecurity. Approximately 40% of Latino (40.4%) and Black (39.3%) adults reported using food assistance services during the COVID-19 pandemic, a markedly higher rate than 7.9% of White adults.

Employment
Similar to the rest of the country, the greater Boston metropolitan area’s unemployment rate fluctuated dramatically during the pandemic. The Boston metro area’s unemployment rate was 16.0% during the early stages of the pandemic in April 2020 and has dropped to 3.7% nearly two years later in February 2022. Additionally, as of December 2021, an estimated 56,900 workers in Massachusetts have left the labor force; this pattern is not reflected in current unemployment rates. Participants noted that the COVID-19 pandemic contributed to job and income loss, with some cancer survivors experiencing job loss or needing
to leave their job due to health concerns about working in-person. Also, participants cited work as a barrier to cancer screening and treatment, particularly for residents with low-paying jobs.

**Education**

The 2019 CHNA reported that college education differs dramatically by race/ethnicity and neighborhood. Nearly 70% of Boston White residents graduated college compared to only 20% of Black and Latino residents. East Boston and Roxbury have a greater proportion of residents without a high school diploma compared to Boston overall. Further, participants mentioned that many children struggle in school, especially during the pandemic. About 14.5% of Boston adults with children reported that they had unmet educational needs for children or teens during the COVID-19 pandemic.

**Housing**

Housing concerns in Boston have been pervasive for years since Boston is one of the most expensive cities in the U.S for renters. Participants reported being even more concerned about being able to afford where they currently live during the COVID-19 pandemic. More than 4 in 10 Boston adults (41.5%) reported that they have had trouble paying their rent or mortgage during the COVID-19 pandemic. Many residents, especially people of color, struggled with rents or mortgages. Compared to White respondents (24.8%), Latino (71.2%), Asian (52.1%), and Black (49.9%) adults were twice as likely or more to have trouble paying rent or mortgage. Other housing concerns included housing instability, mold and other environmental and safety issues that are unaddressed by landlords, and fear of losing housing due to medical costs and job loss or reduced work during cancer treatment.

**Transportation**

Participants explained that often cancer patients live far from hospitals where they are receiving treatment, which makes for a long and exhausting commute, either by personal vehicle, a ride from a loved one, cab, or public transportation. In 2015-2019, 11.9% of Boston adults reported having transportation difficulties in the past year. Reports of transportation difficulties were highest in Dorchester’s 02121 and 02125 zip codes (20.4%), Mattapan (17.2%), and South Boston (16.2%).

**BEHAVIORAL HEALTH**

**Trauma, Discrimination, and Racism**

Several participants discussed the impact of childhood trauma – such as racism, violence, poverty, home environments, addiction, neglect, and the loss of loved ones – on health and economic opportunity. Some participants mentioned experiences of racism in health care settings, citing poor treatment from doctors and hospital staff. About 6.4% of Boston adults indicated that they have been threatened at least a few times a month due to discrimination. This is significantly greater among Black and Latino residents (9.5% and 8.2%, respectively) compared to White residents (4.4%).

**Community Violence and Interactions with Police**

Experiences with violence and with racism in non-health care settings emerged as a concern. Some participants discussed anti-Asian hate crimes and physical and verbal attacks as increasing and contributing to fear among Asian American residents seeking health care. About 14.4% of Boston adults perceived their neighborhoods as unsafe, with the highest percentage of residents from Dorchester (24.5% to 34.3), Mattapan (29.5%), and Roxbury (29.3%) indicating concerns about neighborhood safety.
Cancer and Mental Health
Several participants discussed the impact of the COVID-19 pandemic on mental health, citing high levels of stress and anxiety and fear about leaving home, feeling depressed, and isolation for cancer patients and survivors who felt like they could not leave home due to the ongoing pandemic and their immunocompromised health status. Some cancer patients and survivors discussed mental health issues related to their cancer diagnosis and treatment, describing the difficulty of processing and coping with a cancer diagnosis and treatment. During the COVID-19 pandemic, 16.8% of Boston adults reported experiencing persistent sadness – defined as feeling down, depressed, or hopeless more than half of the days in the previous 2 weeks.

Behavioral and Mental Health Care Access and Barriers to Care
About 7.1% of Boston adults reported delaying mental health care during the COVID-19 pandemic because of cost. Several barriers to mental health care emerged, including: a limited number of mental health providers, long wait lists, the need for referrals, financial barriers, limited mental health options for low-income communities, lack of culturally appropriate and linguistically congruent care, and mental health stigma.

HEALTH PROMOTION AND CANCER PREVENTION

Cancer Prevention Services Access and Delivery
Several participants discussed the lack of cancer prevention resources and barriers to accessing those resources in their communities, which are exacerbated for low-income residents and residents of color. Some key informants noted that the pandemic shifted the operational focus of their organizations from health promotion activities such as raising awareness about breast health to supporting COVID-19 testing and vaccination. Others noted that preventive services and programs may be a new concept for some immigrant communities.

Smoking
Although smoking has declined (18.4% in 2013 to 12.2% in 2019), some groups smoke at rates substantially above the Boston rate overall. The single highest smoking rate was among those out of work (30.5%). Compared to their counterparts, reports of smoking were highest among Black adults (17.8%), men (18.4%), renters (15.8% to 29.9%), US-born adults (16.3%), and those not formally employed (17.0%). Notably, the percent of low-income respondents (15.7% to 23.4%) who reported smoking was nearly double that reported for higher income respondents (9.5%). During the 2015-2019 period, 18.6% of LGBTQ adults reported smoking.

Alcohol Misuse
About 27.8% of Boston adults reported increased drinking habits during the COVID-19 pandemic. Prior to the COVID-19 pandemic, nearly one-quarter (24.1%) of Boston residents reported binge drinking (this proportion is similar to the rate reported in the 2019 Dana-Farber CHNA). In 2015-2019, compared to their counterparts, reports of binge drinking were highest among White adults (32.0%), men (28.9%), renters who do not receive rental assistance (30.1%), higher income residents (32.0%), US-born adults (27.7%), and those with some college education or higher (30.1%). More than one-quarter (29.1%) of LGBTQ adults reported binge drinking. Self-reported binge drinking was highest in South Boston, Allston/Brighton, and Back Bay. Alcohol mortality appears to have spiked among Black residents as it more than doubled from 2019-2020.
**Obesity**
Obesity continues to be a health concern; more than half (57.9%) of Boston adults reported being overweight or obese. Compared to their counterparts, the highest percentages of overweight and obesity are seen among Black (70.0%) and Latino (69.4%) adults, men (61.5%), renters who do not receive rental assistance (69.0%), low-income residents (60.4% to 62.5%), immigrants who have lived in the US for more than 10 years (66.1%), and adults with lower educational attainment (58.8% to 66.4%). Similar to patterns across Boston, about half (54.3%) of LGBTQ adults met the criteria for being overweight or obese. The neighborhoods of Mattapan, Hyde Park, Dorchester (all zip codes), East Boston, South Boston, and West Roxbury had the highest percent of residents who reported being overweight or obese.

**Physical Activity and Healthy Eating**
Some participants described exercise as important for promoting physical and mental health, particularly when living with cancer. The percent of Boston adults who met the CDC guidelines for physical activity declined from 24.1% in 2013 to 19.0% in 2019. Compared to their counterparts, a lower proportion of Asian adults (14.7%), Latino adults (13.9%), renters (15.8% to 16.1%), low-income residents (13.8% to 15.2%), immigrants (13.0% to 14.8%), and adults with less than a high school education (12.6%) met the CDC guidelines for physical activity. Among LGBTQ adults, 22.5% reported levels of physical activity consistent with the CDC guidelines. Some participants mentioned limited healthy food options in lower-income neighborhoods across the city—particularly in Dorchester, Mattapan, and Roxbury.

**CANCER SCREENING**

<table>
<thead>
<tr>
<th>Cancer Screening</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>
<th>High School or Less</th>
<th>Renter</th>
<th>10 yrs or less in U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography</td>
<td>87.1%</td>
<td>85.7%</td>
<td>74.0%</td>
<td>91.7%</td>
<td>88.2%</td>
<td>88.2%</td>
<td>87.2%</td>
<td>86.6%</td>
<td>85.6%</td>
<td>***</td>
</tr>
<tr>
<td>Colonoscopy or sigmoidoscopy</td>
<td>78.4%</td>
<td>81.2%</td>
<td>62.7%</td>
<td>77.4%</td>
<td>77.9%</td>
<td>74.3%</td>
<td>47.6%</td>
<td>73.5%</td>
<td>70.6%</td>
<td>51.3%</td>
</tr>
<tr>
<td>Pap Smear (2013, 2015, 2017 combined)</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>
<td>76%</td>
<td>74%-84%</td>
<td>63.5%</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

NOTE: Pap smear data is from the 2019 CHNA and was not available for the 2022 CHNA.


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Breast Cancer Screening
Before the COVID-19 pandemic, 87.1% of Boston female adults aged 50-74 years reported having a mammogram in the past two years. This proportion exceeds the Healthy People 2030 (HP2030) target of 80.5% and is slightly lower than the mammography rate reported in the 2019 Dana-Farber CHNA (88.3%). Fortunately, disparities in mammogram rates were not seen among these groups; there was not a statistically significant difference in mammogram patterns across social and economic groups. Of note, data from 2015-2019 are the most recent data available pertaining to cancer screening patterns. However, these data were collected before the COVID-19 pandemic, when cancer screening rates declined.

Colorectal Cancer Screening
Prior to the onset of the COVID-19 pandemic, just over three-quarters (78.4%) of Boston adults 50-75 years of age reported ever receiving colon cancer screening. This is slightly higher than the HP2030 target of 74.4% and is also higher than the colorectal cancer screening rate reported in the 2019 Dana-Farber CHNA (64.5%). Compared to their counterparts, the percent of adults reporting colon cancer screening was lowest among Asian adults (62.7%), men (73.8%), renters who do not receive housing assistance (70.6%), low-income adults (74.3% to 76.6%), and adults with less than a high school education (73.5%). Notably, just over half of recent immigrants (51.3%) reported ever receiving a colonoscopy, compared with 80.7% of US-born respondents. Again, it should be noted that these data were collected before the COVID-19 pandemic, when cancer screening rates declined.

The 2019 Massachusetts Department of Public Health Assessment of Colorectal Cancer Screening Attitudes and Practices among Asian Communities in Massachusetts identified several barriers and facilitators to colorectal cancer screening for Asian communities. Barriers included: limited experiences with and knowledge about preventive care; challenges of navigating the health care system; the time and financial burden of preventive care; low awareness of colorectal cancer; limited language and translation support; challenges translating the concept of and technicalities related to colorectal cancer in many native languages; transportation barriers; fear about screening procedures and potential results; and prioritization of non-Western medical approaches for some subgroups. Ongoing interactions with the healthcare system and positive relationships with providers were key facilitators to colorectal cancer screening.

Other Screenings
Cervical Cancer Screening
The most recent available data on cervical cancer screening rates in Boston was collected in 2017 and is reported in the 2019 Dana-Farber CHNA. As described in that report, in 2013-2017, 84% of Boston women (21-64 years of age) reported receiving a pap smear test in the past two years. This rate is nearly the same as the HP2030 target of 84.3%. 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. Also, 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.
**Lung Cancer Screening**

As reported in the 2019 Dana-Farber CHNA, 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. The U.S. Preventive Services Task Force updated their guidelines in March of 2021. These guidelines recommend yearly lung cancer screening with LDCT for individuals who have a history of heavy smoking, and smoke now or have quit within the past 15 years and are between 50 and 80 years old. In 2020, rates of lung cancer screening in Massachusetts were 19.7%. While data on lung cancer screening rates in Boston is not currently available, it is anticipated that future BBRFSS data collection will include this.

**Prostate Cancer Screening**

In 2017 the U.S. Preventive Services Task Force (USPSTF) updated its guidance for prostate cancer screening and recommended individual decision making with a physician about the test for men between the ages of 55 and 69 years. Following the USPSTF change, the prostate cancer screening rate appeared to increase by 12.1% among 55 to 69 year-old men. According to the National Cancer Institute Cancer Trends Progress Report, in 2018 39.0% of all men in the U.S. were screened for prostate cancer within the past year. However, the prostate cancer screening rate among Black and Latino men (37.0% and 33.2%, respectively) appears lower than among White men (40.4%). Research suggests that screening Black men for prostate cancer at a younger age may substantially decrease the likelihood of diagnosis of metastatic prostate cancer and reduce the probability of dying from it.

**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 2020, rates of HPV vaccine completion among adolescents ages 13-17 in Massachusetts were 75% among females and 72% among males. Although Massachusetts has higher HPV vaccination rates than the US and Massachusetts’s rate has increased since 2017, it still falls short of the Healthy People 2030 goal of 80% vaccination among eligible youth.

**Barriers to Accessing Screening Services**

Participants cited several barriers to cancer screenings (and potential cancer diagnoses), including: disruption in in-person wellness programs that promote screening due to the COVID-19 pandemic, delays in screening due to fear of contracting COVID-19 at the screening facility and when taking public transportation to get to cancer screening appointment, long wait times for screening appointments since the onset of the COVID-19 pandemic, COVID-19 policies that restrict patients from being accompanied by loved ones, concerns about changes to the recommended frequency of cancer screenings, and fear of a cancer diagnosis.

Studies indicate that sexual and gender minoritized communities are less likely to have a regular primary care provider and to get cancer screening. When compared to heterosexual counterparts, gay men are more likely to report a cancer diagnosis and some gynecological cancers are higher among lesbians and bisexual women. Transgender people experience unique health care barriers. For example, the prevalence of reported discrimination in health care settings as experienced by transgender people is higher than that reported by LGBQ populations.
HEALTH CARE UTILIZATION, CANCER INCIDENCE, AND MORTALITY

Use and Perceptions of the Health Care System
Several participants noted that limited access to primary care providers is a barrier to health care utilization. About 81.0% of Boston adults report having a personal doctor or health care provider and 19.0% of Boston adults surveyed do not. Compared to their counterparts, a lower percentage of men (74.8%), Asian residents (63.9%), Latino residents (72.1%), renters who do not receive rental assistance (74.6%), residents with other living arrangements (74.9%), low-income residents (76.8% to 79.3%), and residents with a lower educational attainment (78.0% to 79.3%) reported having a personal doctor. Notably, fewer than half of immigrants who have lived in the US for less than 10 years (48.7%) had a primary care provider, which is nearly half the prevalence seen for US-born adults (86.4%). About 84.3% of LGBTQ adults reported having a personal doctor. The neighborhoods of Fenway (59.3%), East Boston (72.5%), and Allston/Brighton (73.4%) had the lowest percent of residents who report having a personal doctor or health care provider.

Accessing Health Care Services for Cancer Prevention and Treatment: Barriers and Facilitators
Access to health care services is vitally important for cancer prevention and treatment. Participants identified various factors that can facilitate or hinder access to health care, including: health care access delays due to the COVID-19 pandemic; access to preventive health care; language barriers; health insurance affordability, changes, and charges; navigation of the health care system; long waits and limited time with doctors; COVID-19 policies that limit social support for cancer screenings, doctor’s visits, and cancer treatment; limited and inconsistent health information from providers; and caregiving responsibilities.

Perceptions of Cancer Treatment and Support Services
Several barriers and facilitators to cancer treatment emerged from participant discussions and a review of other assessments. Health care institutions and interpersonal interactions with providers can create barriers to cancer treatment for sexual and gender minoritized people. These barriers include, for example: gendering care across the cancer continuum and provider assumptions about patients’ sexual behavior, histories, family formation, marital status, and the association between hormone replacement and cancer outcomes. Some participants described concerns that providers were not transparent about cancer outcomes and treatment options, the need for providers who deliver culturally responsive care, and barriers to understanding diagnosis and treatment options. Others described strong and regular communication with providers and support staff. Some participants mentioned stressors related to cancer diagnoses and treatment. While some participants worked with social workers and patient navigators and found them to be important sources of support, several participants were not aware of this resource. Some participants also noted a need for more support for caregivers such as providing information early on in the cancer journey about treatment and end of life care. Some participants perceived that the COVID-19 pandemic contributed to poorer quality care. While some participants found telemedicine convenient for brief follow-up appointments and seeing a provider in a timely manner, several participants emphasized the importance of in-person doctor’s appointments and highlighted digital literacy as a telemedicine barrier for low-income communities and older adults.

Cancer Incidence
In 2018, the overall cancer incidence rate in Boston was 415.7 per 100,000 residents. Overall cancer incidence rates for Asian (287.1 per 100,000) and Latino (333.5 per 100,000) residents in Boston were significantly lower than for White residents (434.9 per 100,000). Both Latino and Asian males and females had significantly lower overall cancer incidence rates than their White counterparts. Black residents overall
and Black males had significantly higher incidence rates for overall cancer compared to their White counterparts. Women had lower overall cancer incidence rates than men.

The tables below present incidence rates by gender and race/ethnicity and highlight disparities compared to White residents.

### Table 2: Cancer Incidence per 100,000 for Boston Males by Race/Ethnicity, 2016-2018

<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><strong>All Cancers (2018)</strong></td>
<td>461.2</td>
<td>279.8*</td>
<td>394.5*</td>
<td>577.6*</td>
<td>477.6</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>32.8</td>
<td>31.6</td>
<td>27.8</td>
<td>42.7*</td>
<td>30.7</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>18.0</td>
<td>28.3*</td>
<td>15.3</td>
<td>23.0*</td>
<td>15.3</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>63.2</td>
<td>62.1</td>
<td>49.2*</td>
<td>66.6</td>
<td>68.6</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>127.7</td>
<td>48.7*</td>
<td>117.7</td>
<td>232.8*</td>
<td>110.3</td>
</tr>
</tbody>
</table>

**Asterisk (*) denotes estimate was significantly different compared to White reference group within specific category (p <0.05)**

**Yellow denotes statistically significantly higher than White comparison group**

**DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018**

### Table 3: Cancer Incidence per 100,000 for Boston Females by Race/Ethnicity, 2016-2018

<table>
<thead>
<tr>
<th></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><strong>All Cancers (2018)</strong></td>
<td>387.3</td>
<td>296.2*</td>
<td>305.5*</td>
<td>468.5</td>
<td>412.3</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>123.7</td>
<td>88.0*</td>
<td>96.5*</td>
<td>138.3</td>
<td>145.6</td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td>25.4</td>
<td>20.9</td>
<td>21.8</td>
<td>35.9*</td>
<td>24.8</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>6.7</td>
<td>10.1*</td>
<td>9.6*</td>
<td>9.7*</td>
<td>4.4</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>50.2</td>
<td>38.1*</td>
<td>24.5*</td>
<td>45.5</td>
<td>64.9</td>
</tr>
</tbody>
</table>

**Asterisk (*) denotes estimate was significantly different compared to White reference group within specific category (p <0.05)**

**Yellow denotes statistically significantly higher than White comparison group**

**DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018**

### Cancer Incidence Over Time

Overall cancer incidence rates have declined significantly in Boston between 2010 (496.7 per 100,000) and 2018 (415.7 per 100,000), as have incidence rates for colorectal, lung, and prostate cancers. Incidence rates for liver and breast cancer, by contrast, in Boston have remained relatively stable. The following table summarizes cancer incidence rates over time by race/ethnicity and sex.
Table 4. Statistically Significant Changes in Cancer Incidence Over Time, by Sub-Group, 2010-2018

<table>
<thead>
<tr>
<th></th>
<th>Asian Males</th>
<th>Asian Females</th>
<th>Latino Males</th>
<th>Latina Females</th>
<th>Black Males</th>
<th>Black Females</th>
<th>White Males</th>
<th>White Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>↓</td>
<td></td>
<td>↓</td>
<td></td>
<td>↓</td>
<td></td>
<td>↓</td>
<td></td>
</tr>
<tr>
<td>Breast Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal</td>
<td>↓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Cancer Registry, Massachusetts Department of Public Health, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Green arrow indicates statistically significant decrease over time

Incidence rates for all cancers overall declined significantly among Latino residents, White residents and Black men between 2010-2018. There have also been several significant declines across specific cancers and subgroups, as highlighted in the table above. It is important to note that incidence rates did not improve for all groups during this time period:

- Colorectal cancer incidence rates did not significantly improve among Asian men, Latina women and Black men
- Liver cancer incidence rates did not significantly improve among Asian residents, Latina women, Black residents or White residents
- Lung cancer incidence rates did not significantly improve among Asian residents, Latino residents, or Black women
- Prostate cancer incidence rates did not significantly improve among Asian men or White men

Unfortunately, there has been no significant change over time for breast cancer incidence rates for any groups in Boston during this time period.

Cancer Mortality
Prior to the COVID-19 pandemic, in the years 2017, 2018, and 2019, cancer and heart disease were the leading causes of death in Boston. However, in 2020, the leading cause of death among Boston residents was COVID-19 (134.8 per 100,000 residents), followed by cancer (127.1 per 100,000 residents) and heart disease (123.8 per 100,000 residents).

Between 2015 and 2021 the overall cancer mortality rate and the overall cancer premature mortality rate in Boston declined significantly. Overall cancer mortality declined for White, Black, Asian and Latino residents between 2010-2021. However, this was not the case in all Boston neighborhoods; Fenway, Hyde Park, Jamaica Plain, Roslindale and West Roxbury did not have declining cancer mortality rates during this period.
The mortality rates for all Boston residents in aggregate for breast, colorectal, liver, and lung cancer have declined significantly between 2015-2021. It is important to note some disparities, however, since the decline in mortality rates does not apply to all groups for all cancers:

- Breast cancer mortality rates – did not decrease among Black, Asian and Latina women
- Liver cancer mortality – did not decrease among Black and Latino residents
- Lung cancer mortality – did not decrease among Asian residents

Unfortunately, there has been no significant improvement over time for prostate cancer mortality rates for any groups in Boston between 2010 and 2021.

Additionally, while premature mortality rates for those under 65 years of age for colorectal and prostate cancer have not significantly changed, premature mortality rates for breast, liver, and lung cancer have declined significantly between 2015-2021.

### Table 5. Statistically Significant Changes in Cancer Mortality Over Time for 2015-2021 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>↓</td>
<td>↓</td>
</tr>
<tr>
<td>Colorectal</td>
<td>↓</td>
<td>No change</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>↓</td>
<td>↓</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>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Green arrow indicates statistically significant decrease over time

The tables below present mortality rates by gender and race/ethnicity and highlight disparities compared to White residents.

### Table 6. Cancer Mortality per 100,000 Residents for Boston Males, by Race/Ethnicity, 2019-2021

<table>
<thead>
<tr>
<th></th>
<th>All Males</th>
<th>Asian Males</th>
<th>Black Males</th>
<th>Latino Males</th>
<th>White Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>154.7</td>
<td>126.1*</td>
<td>218.9*</td>
<td>117.9*</td>
<td>152.2</td>
</tr>
<tr>
<td>All Cancers (&lt;65 Years)</td>
<td>34.4</td>
<td>36.8</td>
<td>54.1*</td>
<td>25.1</td>
<td>28.8</td>
</tr>
<tr>
<td>Colorectal</td>
<td>10.6</td>
<td>6.6*</td>
<td>18.4*</td>
<td>8.3*</td>
<td>9.3</td>
</tr>
<tr>
<td>Colorectal (&lt;65 Years)</td>
<td>4.6</td>
<td>6.1*</td>
<td>7.5*</td>
<td>3.6*</td>
<td>3.5</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>10.3</td>
<td>16.3**</td>
<td>13.9*</td>
<td>9.5*</td>
<td>7.9</td>
</tr>
</tbody>
</table>
### Table 7. Cancer Mortality per 100,000 Residents for Boston Females, by Race/Ethnicity, 2019-2021

<table>
<thead>
<tr>
<th>Cancer</th>
<th>All Females</th>
<th>Asian Females</th>
<th>Black Females</th>
<th>Latina Females</th>
<th>White Females</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Cancers</strong></td>
<td>105.4</td>
<td>74.1*</td>
<td>146.7*</td>
<td>73.3*</td>
<td>107.6</td>
</tr>
<tr>
<td><strong>All Cancers (&lt;65 Years)</strong></td>
<td>34.3</td>
<td>27.7</td>
<td>53.6*</td>
<td>20.0*</td>
<td>32.9</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>13.6</td>
<td>10.2</td>
<td>24.2*</td>
<td>8.7</td>
<td>11.8</td>
</tr>
<tr>
<td>Breast Cancer (&lt;65 Years)</td>
<td>7.1</td>
<td>6.1</td>
<td>12.7*</td>
<td>4.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Colorectal</td>
<td>8.7</td>
<td>6.9*</td>
<td>13.8*</td>
<td>5.4*</td>
<td>8.0</td>
</tr>
<tr>
<td>Colorectal (&lt;65 Years)</td>
<td>3.2</td>
<td>3.5*</td>
<td>5.1</td>
<td>3.1*</td>
<td>2.7*</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>4.5</td>
<td>7.3*</td>
<td>6.7*</td>
<td>8.7*</td>
<td>1.9</td>
</tr>
<tr>
<td>Liver Cancer (&lt;65 Years)</td>
<td>2.3</td>
<td>NA</td>
<td>3.2</td>
<td>1.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>21.5</td>
<td>17.8</td>
<td>23.3</td>
<td>11.6*</td>
<td>26.1</td>
</tr>
</tbody>
</table>
CANCER SURVIVORSHIP

Support Groups
Some focus group participants discussed support groups as an important resource, particularly when going through the cancer treatment process, and many participated in remote support groups due to the ongoing pandemic. They noted that support groups provide a space to share the highs and lows of their cancer experiences and to grow their systems of support, with whom they described being in regular communication. Some participants noted that technological barriers can limit support group participation for older residents.

General Digital Access
Participants described an increase in virtual communications, including remote support groups and community discussions, noting that in some cases participation increased and in other cases participation declined. Some focus group participants described online platforms as important sources of community news and cancer-related resources such as recommendations for how to get wigs. Several participants thought that most communities have access to digital resources. Key informants emphasized several barriers to digital access, including lacking regular access to the internet, computers, and smart phones and limited digital literacy (e.g., how to access online resources, download and use apps) and comfort using technology. Older adults and low-income households emerged in key informant discussions as populations who experience significant digital barriers. Some participants noted that residents may have access to computers and smart phones but may not know how to use them well.

COVID-19 Pandemic Restricts Access to Cancer Survivorship Resources
One key informant discussed how COVID-19 protocols, such as reduced operating hours, capacity restrictions, and receipt of services by appointment made it more difficult for cancer patients to access cancer-related self-care products and wigs.
COMMUNITY SUGGESTIONS FOR THE FUTURE: CANCER-FOCUSED INITIATIVES, PROGRAMS, & SERVICES

Participants in the 2022 Dana-Farber CHNA shared several ideas for developing and improving access to cancer prevention services and resources and strengthening initiatives, programs, and services focused on cancer screening, cancer treatment and care, and survivorship.

Develop and Improve Access to Cancer and Chronic Disease Prevention Services or Resources

- **Improve Access to Health Care Including Addressing Systemic Racism**: Participants discussed the importance of improving access to primary care; cancer screenings; mental health care for cancer patients, caregivers, and their families; and addressing delays in health care. Key informants emphasized the importance of ramping up cancer screenings that have been delayed due to the COVID-19 pandemic, basing cancer screenings in low-income communities, making cancer screenings available during the evenings and weekends for residents who cannot take time off of work, and hiring bilingual staff. Some cancer patients and survivors recommended providing mental health resources within the hospital setting where they were getting treatment, which they also noted would be helpful given the physical and emotional challenges of cancer treatments.

The Black Boston 2022 Report identified several recommendations to address systemic racism in health care institutions to promote the health of Black communities. A key recommended priority involves building a health care culture that centers racial equity by creating space for institutions and members to work together to learn about and become leaders in racial equity. The Report also recommends developing a process – within and across organizations – to deepen understanding about how systemic racism shapes health inequities and take action to improve the social determinants of health and health of Boston’s Black community. Another recommendation included investing in models that prepare Black community members to affect positive change within the health care system and prioritizing health care access for Black communities who are uninsured and experience poverty by concentrating high quality healthcare in predominantly Black neighborhoods.

- **Diversify and Train Health Professionals to Provide Multilingual and Culturally Sensitive Services**: Diversifying the health care workforce and hiring and training bilingual and culturally responsive providers and staff across the cancer spectrum was a key theme across discussions. Participants cited the importance of diversifying and providing cultural sensitivity training to doctors and a range of support staff, including cancer screening staff and medical and treatment appointments. The Black Boston 2022 Report recommended expanding the number of health care professionals and leadership who identify as Black and people of color and who would bring important lived experience and understanding of how to talk with patients of color.

- **Develop Gender-Inclusive Practices**: To address health care systems-level factors that contribute to cancer inequities among LGBTQIA+ communities, recommendations from experts in the wellbeing of sexual and gender minoritized communities include developing gender-inclusive practices that do not gender cancer screening, diagnosis, and treatment such as focusing on cancer sites and body parts
when referring to cancer and cancer resources (e.g., “women’s health center” vs. “breast health center”), being aware of biases that can affect assessing and addressing health care needs, developing resources to support LGBTQIA+ populations after cancer treatment, and asking about sexual orientation and gender identity when relevant and treating this as sensitive information.

**Encourage People to Resume Cancer Screenings**

- **Improve Health Literacy and Communication Regarding Cancer Prevention and Screening:** Some cancer patients, survivors, caregivers, and organizational staff called for community conversations about early detection and cancer screening, factors that contribute to high cancer rates in certain racial/ethnic populations, nutrition education, physical activity resources for cancer prevention and for cancer patients and survivors, and support in identifying cancer-related questions to ask providers. Tailoring prevention and screening efforts to reach men and LGBTQIA+ populations also emerged as a priority. Participants noted that these discussions need to be available in residents’ primary languages and at community-based locations (e.g., faith-based organizations). Other recommendations to improve cancer screening included mentioning providers’ COVID-19 safety protocols to address patients’ concerns about COVID exposures and making breast cancer screening gender neutral (e.g., label as “breast center” vs. “women’s center,” offer non-pink gowns).

Recommended modes for communicating cancer screening availability included: word of mouth, pamphlets, flyers, television, social media. Stakeholders engaged in the 2019 Massachusetts Department of Public Health Assessment of Colorectal Cancer Screening Attitudes and Practices among Asian Communities in Massachusetts recommended partnering with cultural organizations and ethnic media to develop a strategy to improve health education about colorectal cancer and screening.

- **Funding:** Key informants cited the need for funding to support cancer prevention and early detection initiatives and emphasized the importance of supporting smaller community-based groups through grant opportunities and facilitating networking.

**Expand Initiatives or Services to Support Access to Cancer Treatment and Survivorship**

- **Financial, Childcare, and Transportation Support:** Organizational staff, cancer patients, survivors, and caregivers provided several recommendations to lessen the financial strain of cancer care, including providing free or low-cost childcare for cancer patients, providing or directing patients to financial assistance, connecting survivors to financial resources to save their housing, and connecting patients with community-based initiatives that provide fresh produce. Participants also recommended providing free transportation to medical and cancer treatment appointments and simplifying transportation services for patients who are not fluent in English.

- **Partner with Communities and Increase and Institutionalize Lay Health Worker Models:** Key informants and some focus group participants recommended growing community health worker and patient navigator models and integrating them across the cancer continuum. To institutionalize lay health worker models, they suggested integrating these models into operational budgets, rather than funding in a piecemeal fashion with grants. Relatedly, the Black Boston 2022 Report recommended that health care institutions authentically partner with Black communities to develop strategies to improve the health of Black residents.
• **Increase Access to and Information about Resources Available to Cancer Patients and Their Caregivers:** Some participants recommended improving access to and information about resources such as prescription medications to address cancer treatment side effects and resources typically concentrated outside of the healthcare sector, such as support with housing, transportation, and nutritional assistance. One caregiver cited the importance of making cancer education more accessible so that caregivers understand what cancer patients might experience during their treatment, how to support patients during their treatment, and preparing for end of life. Finally, while some participants perceived that cancer information was available, they were not familiar with how to access it or would have appreciated receiving it earlier in their cancer journey.

• **Improve Awareness of and Access to Support Groups:** Cancer patients, survivors, caregivers, and organizational staff discussed the importance of improving awareness of and access to support groups, particularly support groups that are culturally responsive and available in residents’ primary languages, led by affected groups (e.g., Haitian-led support groups), and available to LGBTQIA+ communities. They recommended that providers refer cancer patients to support groups early in their diagnosis and treatment, and that hospital staff remind patients of available resources when scheduling and confirming appointments. Support groups for family members of cancer patients also emerged as a recommendation, as family members may not fully understand the experiences of cancer patients, may be stressed by the diagnosis, and may struggle to access cancer information that cancer patients.

• **Support for Survivors:** To better support cancer survivors, one recommendation involved incorporating a post-treatment assessment of the social determinants of health to ensure a strong clinical follow-up plan and provide continuity of support after treatment. Additionally, as noted above, another recommendation was to develop resources to support LGBTQIA+ survivors.

• **Accurate Data Collection and Reporting for Marginalized Populations:** Some key informants recommended accurate data collection and analysis of data pertaining to sexual orientation and gender identity minoritized populations and marginalized racial/ethnic groups. They noted the importance of data reporting by trained analysts who are structurally and culturally responsive and sharing these findings with communities who are disproportionately affected by cancer.
KEY THEMES

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

- While cancer mortality rates have declined in recent years, cancer remains a leading cause of death in Boston. There are significant disparities in mortality compared to White residents:

  **Black residents**
  - Highest rates of overall cancer mortality
  - Significantly higher rates of breast, colorectal and liver cancer mortality
  - Black men have a significantly higher lung cancer mortality rate
  - Significantly higher prostate cancer mortality that continues to be 2.5 times that of White men

  **Asian residents**
  - Significantly higher liver cancer mortality rates
  - Asian men have a significantly higher lung cancer mortality rate which is still the single highest mortality rate across all groups for all 5 cancer types included in this CHNA

  **Latina women**
  - Significantly higher liver cancer mortality rate

- Despite overall declines in mortality rates, disparities persist since some groups do not have declining mortality rates.

  There has been no significant change for prostate cancer mortality rates from 2015 to 2021. During this period the overall cancer mortality rate and the mortality rates for breast, colorectal, liver, and lung cancer have declined significantly for all residents combined. However, younger adults under age 65 did not have a decline in cancer mortality during this period. Despite overall improvements, it is also critical to acknowledge that some populations have not had these cancer mortality declines:

  o **Black and Latino** residents did not have a decline in mortality rates for breast and liver cancer.
  o **Asian** residents did not have a decline in mortality rates for breast and lung cancer.

- Breast and prostate cancers continue to be the most frequent types of cancer diagnosed in Boston and prostate mortality rates have not improved. White and Black women have the highest incidence of breast cancer and **Black men have the highest incidence of prostate cancer, more than double that of White men**. Additionally, disparities in incidence rates exist across the following groups compared to White residents:

  o Colorectal cancer incidence rates are significantly higher for **Black** residents, consistent with the 2019 CHNA.
  o Liver cancer incidence rates are significantly higher for **Black, Asian** and **Latina** residents
  o Prostate cancer incidence rates are significantly higher for **Black men**, consistent with 2019 CHNA.
• **Despite a continued downward trend in cancer incidence rates, inequities remain.** Between 2010 and 2018 incidence rates for cancer overall and for colorectal, lung, and prostate cancers have declined significantly while incidence rates for liver and breast cancer have remained relatively stable. White, Black, Latino and Asian residents had a significant decline in overall cancer incidence rates, but importantly, incidence rates have not declined for the following groups and cancer types:
  o Colorectal cancer incidence rates have not declined among **Asian males, Latina females** and **Black males**.
  o Lung cancer incidence rates have not declined among **Asian residents, Latino residents** and **Black females**.
  o Prostate cancer incidence rates have not declined among **Asian males**.

• **The COVID-19 pandemic has had a substantial impact on cancer screening, cancer care, support for cancer patients, and the mental health needs of cancer patients and their caregivers.** COVID-19 disrupted in-person screening programs, caused some residents to delay screenings due to fear of contracting the virus, resulted in long wait times for screening and treatment appointments (including to see specialists), and led to policies that restricted loved ones from accompanying patients to appointments. Some participants found telemedicine convenient in some cases, while others emphasized the importance of in-person doctor’s appointments and noted that older adults and those with low-incomes often have difficulty accessing telemedicine. Additionally, CHNA participants noted that, for immunocompromised cancer patients and survivors, the pandemic led to high levels of stress and anxiety about leaving home as well as isolation and depression. Encouraging residents to resume screenings in the context of the ongoing pandemic is a priority for future work.

• **While some screening rates have remained stable or improved, barriers to screening remain.** Fear of cancer diagnosis and difficulty taking time off work were identified as barriers to screening, consistent with the 2019 CHNA. Lower screening rates and barriers for certain populations were also identified:
  o **Asian Residents:** The percentage of Asian adults reporting having ever had a colonoscopy or sigmoidoscopy is significantly lower compared to White adults, as it was in the 2019 Dana-Farber CHNA.
  o **Immigrant Communities:** CHNA participants described barriers to screening for immigrant communities including limited experiences with and knowledge about preventive care, particularly among Asian immigrant communities, and language barriers (noted by Asian and Spanish-speaking participants). According to 2015-2019 BRFSS data, fewer than half of immigrants who have lived in the US for less than 10 years (48.7%) had a primary care provider, which is nearly half the prevalence seen for US-born adults (86.4%).
  o **Sexual and Gender Minoritized People:** In 2021, an estimated 7.1% of the US population – or 20 million people – self-identified as lesbian, gay, bisexual, transgender, or not heterosexual. Studies indicate that sexual and gender minoritized communities are less likely to have a regular primary care provider and to get cancer screening. A 2022 Dana-Farber CHNA participant noted that use of non-gendered language can encourage screening.

• **The COVID-19 pandemic exacerbated already difficult social and economic conditions that negatively impact cancer prevention, screening, and treatment.** In particular, the pandemic has worsened the following:
  o **Income inequalities.** Cancer treatment can carry extreme financial costs.
  o **Job/income loss.** Some survivors lost jobs or left due to health concerns about in-person work.
  o **Food insecurity.** It’s difficult to obtain food and especially healthy food during cancer treatment.
- **Housing.** Increased medical costs, job loss or reduced work during cancer treatment makes it harder to afford housing and lead to fears about losing housing.
- **Transportation.** Long distances to medical facilities can be a barrier to screening and treatment and is exhausting for those undergoing treatment.

**Data on smoking, obesity, physical activity, healthy food access and alcohol indicate that some Boston residents are at increased risk for cancer.** Certain groups smoke at higher rates such as Black residents, renters with assistance, low-income, those with less than a high school education and over 30% of those out of work. Obesity continues to be a concern with over half of Boston adults reporting as overweight or obese and certain neighborhoods such as Mattapan and Dorchester have particularly high rates of obesity. Black and Latino residents and those with low-incomes report higher obesity rates. Healthy food is difficult to access for some; seven Boston neighborhoods have areas with limited grocery stores. Some groups such as those with low-income, those with low educational attainment, Black residents and immigrants have a concerning combination of cancer risk factors with more smoking, more obesity and less physical activity. Alcohol mortality appears to have spiked among Black residents as it more than doubled from 2019-2020 and should be monitored over time.

**Access to health care services is vitally important for cancer prevention and treatment and some residents continue to face barriers to accessing services.** In addition to the challenges related to the COVID-19 pandemic described above, CHNA participants described barriers related to health insurance and costs and challenges navigating complex systems especially when working with multiple specialists. Participants also noted that the limited time spent with health care providers creates challenges related to understanding cancer diagnoses and building trusting relationships. Additionally, participants described a need for more providers who deliver culturally responsive care, particularly for immigrant communities and communities of color. Many of these themes were also present in the 2019 Dana-Farber CHNA.

**To improve access to health care across the cancer spectrum, CHNA participants recommended addressing systemic racism and biases and developing gender-inclusive practices and data reporting.** Cancer patients and survivors of color shared experiences of having their health concerns dismissed by providers before being diagnosed with cancer, doctors talking down to them, not being informed about all of their cancer treatment options, and feeling disrespected, which they experienced as racism.
- The Black Boston 2022 Report identified several recommendations to address systemic racism in health care institutions to promote the health of Black communities, as discussed further in the Community Suggestions for the Future section above.
- Additionally, diversifying health care workforce and hiring and training bilingual and culturally responsive providers and staff across the cancer spectrum was a key theme.
- Specific recommendations for developing gender-inclusive practices included: focusing on cancer sites and body parts when referring to cancer and cancer resources (e.g., “breast health center” instead of “women’s health center”), being aware of biases, and developing resources to support LGBTQIA+ populations after cancer treatment.
- Accurate collection and analysis of data pertaining to sexual orientation and gender identity minoritized populations and marginalized racial/ethnic groups was also recommended.

**Participants also offered recommendations on expansion of specific services and initiatives to support patients and caregivers across the cancer continuum.**
Similar to the 2019 Dana-Farber CHNA, participants recommended **expanding support groups** for both patients and caregivers and also recommended **integrating community health worker and patient navigator models** across the cancer continuum.

Holding multilingual **community conversations** on the topic of cancer, providing **financial support** to cancer patients, offering **educational resources to caregivers**, and developing **resources to support LGBTQIA+ survivors** were other specific recommendations.

While the need for encouraging diverse representation in clinical trials was identified in the 2019 Dana-Farber CHNA, this was not a prominent theme in the 2022 Dana-Farber CHNA.

- In synthesizing the data described in this CHNA, certain populations, including Black residents, Asian residents, and Latina women appear to have disproportionately higher levels of cancer burden and risk, warranting increased attention. Additionally, **immigrants** and residents with **low incomes** tend to have particularly difficult social determinants of health, higher rates of health risk behaviors and are less engaged in the health care system. Furthermore, the data confirms the need to prioritize efforts in Dana-Farber’s priority neighborhoods while also pointing to emerging areas of need in neighborhoods such as South Boston, Hyde Park and East Boston that may warrant additional consideration.

**CONCLUSION AND ACKNOWLEDGEMENTS**

Cancer remains a leading cause of death in Boston. While the CHNA findings indicate that collective efforts to advance cancer screening and prevention are making a difference, the overall burden of cancer across all types is significant 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 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), Roxbury Tenants of Harvard, Enhance Asian Community on Health, Boston Public Health Commission, Boston Breast Cancer Equity Coalition, Asian Women for Health and Dana-Farber’s External Advisory Committee members, among others, for their collaboration and support. In addition, we want to thank the organizations that participated in the Collaborative Boston CHNA/CHIP process. Please see [http://www.bostonchna.org/](http://www.bostonchna.org/) for a full list of organizations engaged in this process.

Approved by DFCI Trustees: 9/13/2022
Approved by External/DoN Advisory Committee: 9/15/22
BACKGROUND

Purpose and Scope of the 2022 Cancer Community Health Needs Assessment
Conducted every three years, 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. In addition to fulfilling the requirement by the IRS Section H/Form 990 mandate, the assessment provides data that can be used by stakeholders to plan and develop initiatives and identify impactful strategies to invest resources. This 2022 Dana-Farber Cancer Institute (Dana-Farber) CHNA will be approved in 2022 and will apply to fiscal years 2023 through 2025.

The 2022 Dana-Farber CHNA aimed to gain a deep understanding of health issues facing Boston residents including cancer risks and cancer experiences. This report presents findings from cancer-focused data collection and analysis and also integrates key results from a larger Boston CHNA (described below) to provide a deeper dive from the perspective of residents, cancer patients, and survivors regarding their experiences, concerns, supports, and challenges related to cancer prevention, screening, treatment, and survivorship within the larger framework of the social determinants of health. The ongoing COVID-19 pandemic, which has resulted in significant changes and inequities in health, the economy, and the workforce, has been an important and evolving backdrop to this CHNA.

Definition of Community Served
The 2022 Dana-Farber CHNA focused on the geographic area of the City of Boston (Figure 1.). Data are presented for Boston overall and by different sub-populations where appropriate and available. This includes by neighborhood, race/ethnicity, gender, LGBTQIA+ status, income, and other characteristics.
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.

**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 depicted in Figure 2 below – which are some of Boston’s most diverse communities. The Dana-Farber Community Benefits office has identified these neighborhoods as priority focus areas given that they are within Dana-Farber’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.
Dana-Farber Satellite Locations and Health Equity
In addition to the Main Campus located in the Longwood area of Boston, Dana-Farber also provides adult cancer care services at its hospital satellite facilities in Allston/Brighton, Milford, South Shore, Foxborough and Merrimack Valley. These satellite locations have direct access to Dana-Farber’s Community Benefits Office as part of the Institute’s expanded health equity strategy. In the neighborhoods of Allston/Brighton, Dana-Farber has strong partnerships with Charles River Community Health Center and the Allston Brighton Health Collaborative. While there are cancer related needs in Milford, the health equity analysis used for this assessment confirms the considerable health disparities that exist in Dana-Farber’s priority neighborhoods. We will continue to collaborate with community partners in Milford to share best practices to strengthen our collective outreach efforts. In addition, we are looking to strengthen our collaborations with local partners in the South Shore and Merrimack Valley regions to further the cancer prevention agenda in these areas. The most recent CHNA reports for Milford, Allston/Brighton, South Shore and Merrimack Valley can be found at:
https://www.milfordregional.org/about-us/community-benefits/
https://www.semc.org/community-health-outreach
https://www.southshorehealth.org/about-us/community-benefits
https://www.lawrencegeneral.org/about-us/community-benefits

Intersection with 2022 Boston Collaborative Community Health Needs Assessment
The Boston CHNA-CHIP Collaborative (the Collaborative) is a group of Boston community residents, community-based organizations, community development corporations, health centers, hospitals, and the Boston Public Health Commission. This multi-sector effort was launched to conduct the first large-scale joint citywide 2019 Community Health Needs Assessment for the City of Boston in an effort to collaborate to achieve sustainable positive change in the health of the city. The 2019 Boston CHNA then guided the city’s community health improvement plan (CHIP), a blueprint describing how the Collaborative would focus on collectively addressing the key priorities by aligning and coordinating resources between multi-sector stakeholders across Boston.
The 2022 Boston CHNA builds on those efforts by taking a deep dive into the key priority areas identified in the previous CHIP: financial stability and mobility, housing, behavioral health, and accessing services. Dana-Farber is actively engaged in the city-wide assessment, having representation on both the Steering Committee and work groups, and currently serves as the co-chair for the Collaborative. The 2022 Boston CHNA provides a comprehensive look at a range of health outcomes and social determinants that affect health in Boston, with a focus on how the COVID-19 pandemic has shaped the four aforementioned priority areas that emerged from the past community health improvement plan (financial stability and mobility, housing, behavioral health, and accessing services). That full report is available at www.BostonCHNA.org.

This city-wide collaborative effort provides data on a number of different health issues but does not focus in depth on specific issues across the cancer continuum. In 2022, Dana-Farber aimed to develop a deeper analysis of the issues across the cancer continuum. Dana-Farber contracted with Health Resources in Action (HRiA), a Boston-based public health organization, to develop this cancer-specific report.

METHODS

Social Determinants of Health Framework
The contexts in which people live, learn, work, and play have a profound impact on health. There is often a deep connection between how race, ethnicity, income, geography, and other factors shape health patterns. This CHNA focuses on the social determinants of health and also recognizes the need and imperative to focus on root causes in order to truly address inequities. As depicted in Figure 3, these root causes include but are not limited to structural and institutional barriers, distribution of resources, poverty, and racism.

Guided by this framework, 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.
NOTE: The Health Tree is adapted by Health Resources in Action from the Human Impact Partners’ Health Equity Guide

**2022 CHNA: A Snapshot in Time**

This 2022 Dana-Farber CHNA was conducted during an unprecedented time, including the COVID-19 pandemic, which exacerbated many social and economic inequalities that have been present for generations. The pandemic contributed to a staggering number of COVID-19 cases, deaths, and ongoing health challenges which disproportionately affected marginalized populations. During this same period, there has been a growing national movement calling for racial equity to address racial injustices in the U.S. The growth of this movement has been sparked by the killings of several Black Americans including George Floyd and Ahmaud Arbery. In 2020, the City of Boston declared racism as a public health crisis, underscoring the City’s commitment to dismantle structural racism and recognize historical injustice.

This context shaped the assessment approach and content, in that the 2022 Dana-Farber CHNA also explores how the pandemic and racial injustices have affected community health needs. Dana-Farber is committed to meeting the health needs of medically underserved populations and recognizes that many of the populations that Dana-Farber focused on in this 2022 Dana-Farber CHNA have been disproportionately impacted by the COVID-19 pandemic. Given the unprecedented nature of the COVID-19 pandemic, it is critical now, more than ever, to understand community needs, experiences, and opportunities for the future.
Review of Secondary Data
Secondary data for this report come from a variety of sources. Data sources include the Boston Behavioral Risk Factor Surveillance Survey (BBRFSS), the U.S. Census, the Massachusetts Cancer Registry, and vital records. As part of the BBRFSS, a separate COVID-19 Health Equity Survey was conducted in December 2020/January 2021 by the Boston Public Health Commission to better understand experiences among residents who have been most impacted by the pandemic. Data from this COVID-19 Health Equity Survey are also included in this report.

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. In this report, tests for significance are noted in the table or graph notes (where p<0.05), while the narrative uses the words “significant” or “significantly” to note statistically significant differences.


Dana-Farber Key Informant Survey
Dana-Farber designed a qualitative key informant survey. This survey was fielded with cancer survivors and representatives from organizations that serve individuals across the cancer continuum. The survey aimed to understand their experiences with cancer prevention, cancer care, and survivorship; recommendations for cancer and chronic disease prevention services and resources; the influence of the COVID-19 pandemic on access to cancer screening and health care; potential facilitators to increase cancer screening; and recommendations for addressing gaps in services and resources for cancer survivors. Of 27 people contacted, a total of 13 cancer survivors and community stakeholders representing community-based, public health, and health care organizations completed this qualitative survey.

Focus Groups and Interviews
Dana-Farber worked with a variety of partners to gather primary qualitative data through focus groups and interview discussions. Dana-Farber made a concerted effort to engage with populations and communities that have been historically marginalized. Dana-Farber partnered with Union Capital Boston (UCB), an organization focused on fostering community engagement, to conduct 5 focus groups over Zoom with caregivers, patients/survivors, and Spanish speakers. In total, 39 individuals participated in these UCB focus groups. Three additional focus groups were conducted: 1 in-person focus group, organized by Roxbury Tenants of Harvard, was conducted in Cantonese with 11 cancer patients, survivors and caregivers and 2 virtual Spanish language focus groups were conducted with 19 patients and survivors from a Dana-Farber Spanish-speaking support group. Additionally, 4 interview discussions with cancer survivors and caregivers were facilitated by Dana-Farber and organized by Enhance Asian Community on Health, Inc. Altogether, 8
focus groups with 69 participants and 4 interview discussions were conducted specifically for this CHNA. Key themes from two additional data sources were also analyzed and are incorporated into this CHNA. First, the Boston Breast Cancer Equity Coalition (BBCEC) shared key themes from 9 interviews conducted with small, local non-profit organizations who support BIPOC communities. Second, the Boston Public Health Commission also shared key findings from a focus group conducted with their 10-member Racial Health Equity Advisory Committee (RHEAC) to garner input to inform the creation of a lung cancer communication campaign.

This report also integrates findings from data collected as part of the 2022 Boston CHNA-CHIP Collaborative’s process. The Collaborative’s Community Engagement Work Group facilitated 29 virtual and in-person focus group discussions with a total of 309 residents who have been disproportionately burdened by social, economic, and health challenges including: youth and adolescents, older adults, persons with disabilities, low-resourced individuals and families, LGBTQIA+ populations, racially/ethnically diverse populations (e.g., African American, Latino, Haitian, Cape Verdean, Vietnamese, Chinese), limited-English speakers, immigrant and asylee communities, families affected by incarceration and/or violence, and veterans. Some focus groups were conducted in languages other than English, including Spanish, Chinese, and Vietnamese.

Collaborative members also conducted key informant interviews with 62 individuals. These represented a cross-section of sectors to identify areas of action and perspectives on the community. These interviewees included leaders and staff from public health, health care, behavioral health, the faith community, immigrant services, housing organizations, economic development, community development, racial justice organizations, social service organizations, education, community coalitions, the business community, childcare centers, elected government offices, and others.

**Limitations**

While the data sources used in this CHNA are robust and highly credible, there are some considerations that are important to keep in mind. Qualitative discussions use small sample sizes and non-random sampling methods, the latter of which is an important approach to incorporating the perspectives of communities who have been underrepresented and underserved in the past and many of whom experience structural disadvantages related to the social determinants of health. Moreover, due to the ongoing COVID-19 pandemic, the majority of interviews and focus group discussions were conducted remotely, which may have affected participation – both in terms of who is able to participate remotely and the information elicited in remote discussions.

Secondary data may have a time lag and apply different ways of measuring variables such as neighborhoods. Additionally, BBRFSS data from 2015-2019 are the most recent data available regarding the experiences, health behaviors, and self-reported health and health care patterns among Boston residents. Given the need to aggregate data across years to look at patterns across neighborhoods and population groups, data from the 2015-2019 period overlap with data reported in the 2019 Dana-Farber CHNA. Finally, COVID-19 data included in this report provide a snapshot of one moment in time in the ongoing pandemic and are not necessarily representative of the entire pandemic.

Throughout this report, comparisons are made to findings from the previous 2019 CHNA conducted for Dana-Farber. It should be noted that although many focus group questions from 2019 were repeated for this CHNA, there is some variation in the questions posed. Additionally, while all focus groups were conducted in person for the previous CHNA, most were conducted virtually this time.
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 2022 Boston CHNA, Dana-Farber’s 2022 Cancer CHNA, and the creation of the Implementation Plan, which will be completed in November 2022.

The prioritization of focus areas included 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 health equity across the cancer continuum, Dana-Farber’s Community Benefits activities will continue to focus on the following priority areas:
1. Addressing the cancer burden
2. Reducing access barriers
3. Promoting survivorship, particularly in communities of color
4. Addressing the social determinants of health
5. Leveraging community strengths

These priorities have been reaffirmed as areas of need based on findings from Dana-Farber’s 2022 Cancer CHNA and the 2022 Boston CHNA. In addition, they provide the umbrella under which Dana-Farber’s community outreach activities are organized and will be reflected in Dana-Farber’s Implementation Plan. These areas reflect a continued commitment to meeting the health needs of medically underserved populations in Dana-Farber’s priority neighborhoods and leveraging the hospital’s unique role in the continuum of care as a comprehensive cancer center. Many of these needs have remained consistent over time.

Since the 2019 CHNA, Dana-Farber has continued to provide a variety of cancer prevention, education, and screening programs to address these ongoing needs. These programs have included tobacco cessation counseling, patient navigation, breast cancer screening and navigation, skin cancer screening and navigation, HPV education and outreach, clinical trials education and outreach, and building and sustaining community partnerships. In addition, Dana-Farber has made significant investments in the community to address the social determinants of health including housing, food insecurity, environmental justice, and economic mobility.

Stakeholder Engagement
In September 2022, key findings from both the 2022 Boston CHNA and the 2022 Dana-Farber Cancer CHNA were presented to the Board of Trustees’ Community Programs Committee and the External/DoN Advisory Committee. Following each of these presentations, the attendees were engaged in a discussion and provided feedback on the five priority areas listed above and specific strategies for Dana-Farber’s Community Benefits Office.

Committee members reaffirmed current areas of focus, including building awareness of existing services and resources (cancer prevention, screening, financial support, patient navigation, etc.); focusing on specific neighborhoods and populations of need; building partnerships with community-based and faith-based organizations that serve hard-to-reach populations; better understanding liver cancer inequities; ensuring access to care; and supporting transitions into survivorship. Committee members also
recommended key suggestions for future work, including improving access to telehealth; diversifying the healthcare workforce to provide culturally and linguistically appropriate care; focusing on mental/behavioral health needs; and building connections to social services. This feedback will help guide the upcoming Implementation Plan.

Additionally, Dana-Farber reviewed the priority areas that emerged from the Boston CHNA-CHIP Collaborative. These citywide priority areas will be considered as important context during the development of the upcoming Implementation Plan. In May-June 2022, the Boston CHNA-CHIP Collaborative undertook a collaborative prioritization process to solicit community input on the key strategies for collective impact to focus their 2022 community health improvement plan. These discussions reaffirmed the continued need for an overarching focus on achieving racial and health equity and reaffirmed the following four priority areas for collaborative action:

1. Accessing services
2. Housing
3. Economic mobility and inclusion
4. Mental and behavioral health

**CHNA Priorities for Future Programs, Services, and Initiatives**

CHNA participants also offered feedback on priorities for future programs, services, and initiatives. This feedback from CHNA participants aligns with the Dana-Farber Community Benefits Office Focus Areas shown below and will help guide the upcoming Implementation Plan. Examples of suggestions are described in the table below.

<table>
<thead>
<tr>
<th>Dana-Farber Community Benefits Office Priority Areas</th>
<th>Suggestions from CHNA Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Addressing the Cancer Burden</strong></td>
<td>• Cancer screening initiatives</td>
</tr>
<tr>
<td></td>
<td>• Community outreach / health education</td>
</tr>
<tr>
<td></td>
<td>• Support groups and caregiver support / resources</td>
</tr>
<tr>
<td><strong>2. Reducing Access Barriers</strong></td>
<td>• Awareness of / access to patient navigators and social workers</td>
</tr>
<tr>
<td></td>
<td>• Gender-inclusive practices</td>
</tr>
<tr>
<td></td>
<td>• Diversifying and training health care professionals</td>
</tr>
<tr>
<td></td>
<td>• Addressing systemic racism and biases</td>
</tr>
<tr>
<td><strong>3. Promoting Survivorship</strong></td>
<td>• Support groups</td>
</tr>
<tr>
<td></td>
<td>• Support for LGBTQIA+ populations after cancer treatment</td>
</tr>
<tr>
<td></td>
<td>• Post-treatment assessments of SDoH</td>
</tr>
<tr>
<td><strong>4. Addressing the Social Determinants of Health (SDoH)</strong></td>
<td>• Financial support, including to maintain housing</td>
</tr>
<tr>
<td></td>
<td>• Access to healthy food, including fresh produce</td>
</tr>
<tr>
<td></td>
<td>• Free transportation</td>
</tr>
<tr>
<td></td>
<td>• Workforce development &amp; economic mobility opportunities for youth and adults</td>
</tr>
<tr>
<td><strong>5. Leveraging Community Strengths</strong></td>
<td>• Partnerships with communities to increase community health worker and patient navigator models</td>
</tr>
<tr>
<td></td>
<td>• Community conversations on the topic of cancer</td>
</tr>
</tbody>
</table>
BOSTON POPULATION

Boston’s population is incredibly diverse in terms of race and ethnicity, country of birth, and languages spoken. The racial and ethnic distribution across Boston has remained similar since the 2019 Dana-Farber CHNA.

Age Distribution
Boston’s population represents a range of age groups, but the distribution of these ages varies across neighborhoods. Overall, according to 2020 Census estimates, 20% of Boston’s residents are 19 years old or younger, 35% are 20-34 years old, 13% are 35-44 years old, 21% are 45-64 years old, and 12% are 65 years or older. Dorchester, Fenway, Longwood, and Roxbury have the largest proportions of children 19 years of age or younger. West Roxbury has the largest proportion of older residents. (Data not shown, see the previous CHNA issued by Dana-Farber for additional data and age distribution by neighborhood. The 2019 Dana-Farber CHNA is available at: https://www.dana-farber.org/about-us/community-outreach/community-health-needs-assessment-reporting/).

Race and Ethnic Diversity
Historic disinvestment in communities of color are the root causes of racial inequities in the social determinants of health. Racial and ethnic health care inequities are persistent and among the leading public health challenges of our time. For example, people of color experienced a disproportionate burden of COVID-19-related income loss, cases, and deaths, whereas White residents appeared to weather the COVID-19 pandemic with fewer social, economic, and health costs. Understanding the racial, ethnic, and language profiles of Boston residents provides context to data about health status and the structural, discriminatory, and social factors that contribute to health inequities.

Participants engaged in the 2022 Boston CHNA discussed the racial diversity of residents across Boston as a unique strength, highlighting Black/African American, African, Latino, Cape Verdean, Haitian, Asian, and other Caribbean communities in the Boston area. The 2020 Census data show that nearly half of foreign-born Boston residents are from Latin America (Figure 4) and over half of Boston residents identify with a category other than White alone (Figure 5).

Figure 4. Origins of Boston Immigrants, from 2020 Census Data
Figure 5. Race and Ethnicity of Boston residents, from 2020 Census Data

According to 2020 Census estimates (Table 1), approximately 3 in 5 (60.0%) Boston residents identify as people of color. Mattapan, Hyde Park, Dorchester, and Roxbury are home to the largest proportion of Boston residents who identify as Black. East Boston, Roxbury, Hyde Park, and Dorchester's 02121 and 02125 zip codes have the largest percent of residents who identify as Latino. Fenway and Allston/Brighton are home to the largest proportion of Asian residents.

Table 1. Racial and Ethnic Distribution, by Boston and Neighborhood, 2020

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
<th>Two or More Races</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>9.7%</td>
<td>25.2%</td>
<td>19.8%</td>
<td>44.5%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Allston/Brighton</td>
<td>19.3%</td>
<td>4.9%</td>
<td>11.1%</td>
<td>59.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Back Bay</td>
<td>12.7%</td>
<td>3.5%</td>
<td>7.4%</td>
<td>71.9%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Charlestown</td>
<td>8.6%</td>
<td>5.2%</td>
<td>10.9%</td>
<td>71.3%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Dorchester (02121, 02125)</td>
<td>11.4%</td>
<td>33.5%</td>
<td>23.7%</td>
<td>17.7%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Dorchester (02122, 02124)</td>
<td>8.6%</td>
<td>39.5%</td>
<td>15.5%</td>
<td>29.1%</td>
<td>5.3%</td>
</tr>
<tr>
<td>East Boston</td>
<td>4.5%</td>
<td>3.3%</td>
<td>50.4%</td>
<td>36.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Fenway</td>
<td>24.1%</td>
<td>6.6%</td>
<td>9.0%</td>
<td>55.0%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Hyde Park</td>
<td>2.2%</td>
<td>45.7%</td>
<td>24.7%</td>
<td>21.9%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Jamaica Plain</td>
<td>7.6%</td>
<td>10.0%</td>
<td>20.3%</td>
<td>56.2%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Mattapan</td>
<td>1.0%</td>
<td>68.3%</td>
<td>21.0%</td>
<td>2.5%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Roslindale</td>
<td>3.7%</td>
<td>15.4%</td>
<td>20.4%</td>
<td>55.3%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Roxbury</td>
<td>11.0%</td>
<td>35.7%</td>
<td>27.3%</td>
<td>19.4%</td>
<td>5.0%</td>
</tr>
<tr>
<td>South Boston</td>
<td>5.1%</td>
<td>4.2%</td>
<td>10.4%</td>
<td>76.6%</td>
<td>2.9%</td>
</tr>
<tr>
<td>South End</td>
<td>15.6%</td>
<td>12.6%</td>
<td>14.7%</td>
<td>52.4%</td>
<td>3.9%</td>
</tr>
<tr>
<td>West Roxbury</td>
<td>7.4%</td>
<td>13.3%</td>
<td>13.0%</td>
<td>62.2%</td>
<td>3.3%</td>
</tr>
</tbody>
</table>
DATA SOURCE: U.S. Census, Decennial Census of Population and Housing, 2020
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; Latino includes residents who identify as Latino regardless of race and race categories may include residents who identify as Latino; therefore, the percentages may not add up to 100%

Language and Immigrant Communities
A theme among participant discussions for the 2022 Boston CHNA was that immigrant communities in the Boston area are hardworking, family- and community-oriented, willing to help others, eager to contribute socially and economically, and passionate about local issues and issues in their home countries. Several participants observed that undocumented immigrants experienced additional barriers to housing, health insurance, and accessing resources and assistance programs, which they perceived were based on legal status and fear of deportation.

Participants in the 2022 Boston CHNA noted many languages spoken among residents, including Cantonese, Mandarin, Russian, Spanish, Haitian Creole, Cape Verdean Creole, and indigenous languages. Some residents described free English classes as an important resource for residents for whom English is not their first language. However, language barriers still emerged as an important issue affecting immigrant communities.

COMMUNITY ASSETS AND STRENGTHS
Understanding the strengths of community members and community resources and services helps to identify the assets that can be drawn upon to promote community health and address any existing gaps. When asked about community strengths, 2022 Boston CHNA participants discussed racial and ethnic diversity in Boston as a key strength. Residents also highlighted a strong sense of community among residents, especially those who have lived in neighborhoods for years. Participants recalled their neighbors as supporting each other even when they themselves have limited resources and described neighbors as “resilient” and “resourceful” even under difficult circumstances. Participants in the 2022 Boston CHNA talked about their communities as being vibrant, full of rich cultural traditions, having a strong history of activism and art, intelligent, innovative, and committed to solving problems. Relatedly, in the Black Boston 2022 Report, Black Boston residents noted that trusted and caring personal networks such as family and friends, Black churches, barbershops, and hairdressers are critical sources of support and information.

When asked about strengths as they relate to experiences with cancer, several 2022 Dana-Farber CHNA participants mentioned that they turned to others and to their faith and prayer when possible. Several survivors and caregivers stressed the importance of a strong support system to provide emotional and tangible support, such as accompaniment to appointments, driving to appointments, and picking up medication and groceries. Support groups also emerged as an important asset discussed among 2022 Dana-Farber CHNA participants. Some cancer survivors mentioned practicing gratitude by working to appreciate each day and people in their lives and taking time to learn about and care for themselves during their cancer diagnosis and therapy.

“I think [specific neighborhoods] are great for new immigrants. When you first come to the United States, you need help from others.”
- Focus group participant

“People have high levels of anxiety, and they call on faith.”  – Key informant
treatment. Others noted that they developed new friendships with other cancer patients and were able to support each other in their cancer journeys.

SOCIAL AND ECONOMIC CONTEXT OF BOSTON RESIDENTS

Jobs that pay a living wage enable workers to live in neighborhoods that promote health (e.g., built environments that promote physical activity and resident engagement, better access to affordable healthy foods), and provide income and benefits to access health care. In contrast, unemployment, underemployment, and job instability make it difficult to afford housing, goods and services that are linked with health, and health care, and also contribute to stressful life circumstances that affect multiple aspects of health.

Income and Poverty

Participants in the 2022 Boston CHNA described financial stability as critically important for health. Participants shared that the COVID-19 pandemic has worsened income inequalities and the level and severity of poverty for low-income residents across Boston. According to the COVID-19 Health Equity Survey, income loss during the pandemic has disproportionately affected Boston residents of color and low-income residents, described in more detail below. Participants noted that low-income communities in Boston generally include residents of color, immigrants, people with disabilities, LGBTQIA+ residents, and older adults on fixed incomes. Recognizing that racism creates barriers for Black communities to access basic needs and social systems, the Black Boston 2022 Report highlighted the importance of providing support for housing, employment, and food assistance for Black communities.

Participants engaged in the 2022 Boston CHNA noted that low-wage work and minimum wage is not enough for many families to survive in Boston, and that many residents are having to work multiple jobs to make ends meet. Several participants discussed that while income loss has affected many people, they were most concerned about those residents who were already struggling before the pandemic – this includes low-income communities, residents of color and in particular immigrants, people with disabilities, and residents with a criminal record. They described the cost of living as high and rising and cited the escalation of housing and food costs while wages have not increased. As one participant noted, “Food prices have gone up a lot while my wage has stayed the same.” From April 2021 to April 2022, food prices increased an estimated 9.4%.

Some 2022 Dana-Farber CHNA participants also described poverty and economic insecurity as a barrier to cancer screenings and health care appointments, citing barriers such as limited, inconsistent, or no health care coverage; lack of access to preventive health care; and difficulties of taking time off of work for low-
wage workers. Several cancer survivors and caregivers mentioned the high financial costs and strain of a cancer diagnosis and treatment.

As shown in Figure 6, over 4 in 10 Boston adults (43.7%) reported that they had experienced a loss of income during the COVID-19 pandemic. Residents who identified as Black or Latino were most affected by income loss, with almost two-thirds (62.3%) of Latino respondents indicating that they had experienced income loss during the pandemic and nearly half of Black residents (49.9%) reporting income loss, which is significantly higher than the percent of White adults (33.1%) reporting income loss. Relative to their counterparts, a significantly higher percent of adults 35-64 years of age (51.6%), adults with incomes less than $25,000 (63.8%), and adults with incomes $25,000-$50,000 (52.8%) reported income loss during the pandemic. When looking at income loss by occupational status, a higher proportion of adults who were out of work or retired reported income loss during the pandemic, compared to employed adults.

Figure 6. Percent Adults Reporting Experiencing an Income Loss During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021. This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.

Food Insecurity
Struggling to make ends meet is directly linked with struggling to put food on the table. Food insecurity, namely barriers to accessing healthy, affordable food emerged, as a key priority issue across many interviews and focus groups.

Pre-pandemic, 2015-2019 BBRFSS data show that about 17.8% of Boston residents were identified as food insecure – in that the food they purchased ran out before they had money to buy more (Figure 7). More than one quarter of residents in Mattapan (30.3%), Dorchester (02121 and 02125 zip codes: 27.8%; 02122 and 02124 zip codes: 25.1%), and East Boston (26.1%) reported food insecurity.
Figure 7. Percent Adults Reporting Food Purchased Did Not Last and Did Not Have Money to Get More, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting it was sometimes or often true that the food did not last and they did not have money to get more; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval

A significantly higher proportion of Latino (34.7%) and Black (28.3%) adults reported experiencing food insecurity, compared to White residents (7.8%) (Figure 8). More than one in five adults with a child at home (23.0%) reported food insecurity, which is significantly higher than percent of adults with no children in the home (15.6%) who reported food insecurity.

Figure 8. Percent Adults Reporting Food Purchased Did Not Last and Did Not Have Money to Get More, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined. This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office. NOTES: Data show percentage of adults reporting it was sometimes or often true that the food didn’t last and they did not have money to get more; Error bars show 95% confidence interval
For race/ethnicity, of the 201 respondents classified as Other, non-Hispanic, 23% identified as American Indian/Alaskan Native. The remainder are either multi-race or some other race.
Participants in the 2022 Boston CHNA noted that healthy food is available, but not accessible to lower-income residents. As described by a focus group participant, “We live in a food desert. I have to travel out of town to find healthy food. The grocery store in [my neighborhood] doesn’t carry the same healthy foods as towns that are more affluent. I feel badly for those who don’t have a car and don’t have access to healthier food.”

Participants also talked about how the cost of food is rising, contributing to growing levels of food insecurity as residents struggle to afford food, let alone healthy food. As one focus group participant mentioned, “Access to healthy food is challenging because food costs are so high. When you have a big family, it gets very complicated. Healthy food is very connected to a healthy community.” Several participants underscored that many low-income residents have not been able to eat healthy foods during the COVID-19 pandemic due to financial constraints and some residents – such as older adults – face barriers to safely accessing food due to concern about virus transmission.

Many residents are accessing food assistance. According to the COVID-19 Health Equity Survey, about 23.1% of Boston adults reported using food assistance services during the COVID-19 pandemic (Figure 9). Approximately 40% of Latino (40.4%) and Black (39.3%) adults reported using food assistance services during the COVID-19 pandemic, which is significantly higher than the percent of White adults (7.9%) who reported using food assistance. Additionally, 38.0% of adults with children in the home reported using food assistance during the COVID-19 pandemic, which is significantly higher than the 17.3% of adults who did not have children in the home. These rates are lower than for the state of Massachusetts. According to a survey conducted by the Greater Boston Food Bank in January 2021, 30% (1.6 million) adults in Massachusetts reported experiencing food insecurity. Of these, 42% were households with children; 58% were Latino, 45% were Black, 26% were Asian, and 24% were White. Further, according to the 2021 Greater Boston Food bank survey, over half (56%) of Massachusetts adults have only 2-4 servings or less of vegetables per week.

**Figure 9. Percent Adults Reporting Utilizing Food Assistance Services During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021.** This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.

NOTES: Food assistance services include food banks, food stamps, or other sources; Error bars show 95% confidence interval.
Some 2022 Dana-Farber CHNA participants described food assistance programs as an insufficient patchwork that does not address underlying economic and food system factors that shape food insecurity and noted that some food programs that offer leftover food do not treat recipients with dignity. One key informant shared: "[There is] lack of trust, as well as disrespect of our community. For example, community refrigerators. Why do we get leftover food vs fresh food at affordable prices? They address the acute need, but not the systemic issue." Some caregivers shared that it is difficult to get food, let alone healthy food, when undergoing cancer treatment and noted that it is difficult to get assistance with access to healthy food when undergoing cancer treatment. Some focus group participants described community-based resources to ease the challenges of getting groceries during treatment, including a neighborhood shuttle service to the grocery store and loved ones providing food or dropping off groceries during their treatment.

**Employment**

Employment provides income, benefits, and economic stability, which is important for health. A key theme that emerged from interviews and focus groups was significant job loss linked with the COVID-19 pandemic. Similar to the rest of the country, the greater Boston metropolitan area’s unemployment rate fluctuated dramatically during the pandemic. According to the Bureau of Labor Statistics, the Boston metro area’s unemployment rate was 16.0% during the early stages of the pandemic in April 2020 and dropped to 3.7% nearly two years later in February 2022. Additionally, as of December 2021, an estimated 56,900 workers in Massachusetts have left the labor force; this pattern is not reflected in current unemployment rates. Nearly half -- 45.5% -- of Boston residents indicated that they worked outside of their home during the COVID-19 pandemic (see Appendix A).

Some 2022 Dana-Farber CHNA participants noted that the COVID-19 pandemic contributed to job and income loss, with some cancer survivors experiencing job loss or needing to leave their job due to health concerns about working in-person, which affects mental health. One focus group participant shared, “When COVID first hit, we did not know how this was going to end. [This] led to anxiety. Also, people losing jobs – many did not know how they were going to pay their bills, which increased mental health impact.” Key informants and some survivors and caregivers engaged in the 2022 Dana-Farber CHNA noted that work was a barrier to cancer screening and treatment, particularly for residents with low-paying jobs that do not provide benefits. They cited the difficulty of taking time off work and needing to choose between going to the doctor or working as a challenge for residents in low-wage jobs, and also for those who are undergoing cancer treatment. One cancer survivor mentioned that it was...
difficult to get time off work because this individual had several appointments and was not informed about the days and times of the appointments with enough notice to arrange time off with their employer. Another focus group participant explained that it was difficult to keep their job because they felt incredibly sick when they were receiving cancer treatment. One focus group participant shared, “I was working full time and part time at the same time during the day and asking for time off in the classroom was hard but now I have to do it.”

**Education**

Education is an important issue to Boston residents and a critical factor affecting health. The 2019 CHNA reported that college education differs dramatically by race/ethnicity and neighborhood. Nearly 70% of Boston White residents graduated college compared to only 20% of Black and Latino residents. East Boston and Roxbury have a greater proportion of residents without a high school diploma compared to Boston overall. Further, participants engaged in the 2022 Boston CHNA and 2022 Dana-Farber CHNA mentioned how many children struggle in school, especially during the pandemic. However, education was not discussed frequently during interviews and focus groups. Based on the COVID-19 Health Equity Survey, about 14.5% of Boston adults with children reported that they had unmet educational needs for children or teens during the COVID-19 pandemic (See Figure 5 in Appendix).

**Housing**

Housing is typically the largest household expense, and, for homeowners, housing can be an important source of wealth.xii,xiii For low-income residents, housing instability, the stress of unaffordable housing costs, and poor housing quality increase the risk of adverse health outcomes.xiv Housing concerns in the city have been pervasive for years as Boston has one of the most expensive rental markets in the U.S. Many 2022 Boston CHNA participants reported being even more concerned about being able to afford where they live during the COVID-19 pandemic. Several caregivers engaged in the 2022 Dana-Farber CHNA mentioned expensive and rising housing costs, particularly for renters, and cited several challenges related to housing instability, including difficulties finding affordable housing, significant costs and logistics of moving, and barriers to finding a safe area to move. Some caregivers noted that it was difficult to keep up with the rent during the COVID-19 pandemic. Other housing concerns that emerged included housing instability, mold and other environmental and safety issues that are unaddressed by landlords, and fear of losing housing due to medical costs and job loss or reduced work during cancer treatment. One focus group participant explained the trade-offs of moving to be closer to their cancer care, noting that they left their support system behind during their cancer treatment and their relocation affected their emotional well-being.

Pre-pandemic, in 2015-2019 an estimated 6.7% of Boston BBRFSS adult respondents reported moving in the past three years due to housing affordability. Reports of moving due to housing costs were highest for residents in Dorchester (02122 and 02124 zip codes: 10.3%; 02121 and 02125 zip codes: 9.6%), Allston/Brighton (9.2%), and East Boston (9.0%) (Figure 10). In discussions, participants were even more concerned about high housing costs during the pandemic, especially given fluctuations in employment. In the COVID-19 Health Equity Survey, more than 4 in 10 respondents (41.5%) reported that they have had

“Every year they raise the rent. They stopped during the pandemic, but I was told that they are going to raise it again. I can’t imagine how much they are going to raise it. I can’t move to other places because it’s worse there.” – Focus group participant
trouble paying their rent or mortgage during the COVID-19 pandemic. Compared to White respondents (24.8%), Latino (71.2%), Asian (52.1%), and Black (49.9%) adults were twice as likely or more to have trouble paying rent or mortgage. Further, more than half of adults with children in the home (54.7%) reported having trouble paying their rent or mortgage, compared to about one-third of adults with no children in the home (36.3%) (Figure 11).

Figure 10. Percent Adults Reporting Moving in Past Three Years Because They Could No Longer Afford Their Home, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval
Figure 11. Percent Adults Reporting Having Trouble Paying Their Rent or Mortgage During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021. This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.


NOTES: Data show percentage of adults reporting that it was somewhat or very difficult to pay the full amount of their rent or mortgage now; Error bars show 95% confidence interval.

Transportation
Participants engaged in the 2022 Dana-Farber CHNA cited several transportation barriers to cancer screening and treatment and other cancer care resources. They explained that often cancer patients live far from hospitals where they are receiving treatment, which makes for a long and exhausting commute. Some cancer patients and survivors mentioned relying on family members or public transportation – such as the train or multiple buses – to get cancer care because of expensive parking costs. Driving oneself to cancer care or taking a taxi were other transportation solutions that cancer survivors noted, particularly when they did not have a loved one who could drive them to their treatment, though they also discussed exhaustion from cancer treatments and commuting to receive care. Participants also cited ineligibility for transportation services due to age and language limitations when arranging transportation as barriers to using shuttle services or taxis or ride shares. Some focus group participants cited subsidized parking resources as helpful, and some focus group participants were interested in learning about resources to subsidize parking costs. One survivor shared that valet parking at one hospital was helpful for easing travel to and from the hospital for treatment.

In 2015-2019, 11.9% of Boston BRFSS adult respondents reported having transportation difficulties in the past year (Figure 12). Reports of transportation difficulties were highest in Dorchester’s 02121 and 02125 zip codes (20.4%), Mattapan (17.2%), and South Boston (16.2%).
Figure 12. Percent Adults Reporting Having Transportation Difficulties in Past Year, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting to that transportation difficulties have kept them from medical appointments, meetings, work, or from getting things needed for daily living in the past 12 months; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval.
BEHAVIORAL HEALTH

Behavioral health is an overarching term for the connection between behaviors and people’s mental and physical health. In 2022 Dana-Farber CHNA discussions, participants discussed discrimination in healthcare settings and concerns about violence against Asian Americans as stressors that affect health and access to and quality of health care. The connection between mental health and cancer diagnosis and treatment was also noted.

Trauma, Discrimination, and Racism

Trauma and related issues were discussed among a number of participants in the 2022 Boston CHNA. Several participants discussed the characteristics of childhood trauma – such as racism, violence, poverty, home environments, housing conditions, addiction, neglect, and the loss of loved ones – and how they have affected all aspects of a person’s life, including their health and their economic opportunity. The Black Boston 2022 Report highlighted the need for having safe spaces for Boston’s Black community to unwind from, process, and recharge in the face of ongoing discrimination.

While not discussed among all participants, some 2022 Dana-Farber CHNA participants in a caregivers focus group mentioned experiences of racism in healthcare settings, citing poor treatment from doctors and hospital staff such as security guards. One caregiver described racism in healthcare settings as “a way of life” and one cancer survivor described interacting with providers as a “fight.” As one focus group participant elaborated, “[Providers] don’t see our humanity, you are spoken to differently. You’re not listened to.” A few cancer patients and survivors of color discussed experiences of having their health concerns dismissed by providers before being diagnosed with cancer, instances of doctors talking down to them, doctors expressing surprise at their knowledge of their cancer diagnosis, not being informed about all of their cancer treatment options, and feeling disrespected, which they linked with racism. Echoing these sentiments, the Black Boston 2022 Report found that patients perceived that some providers respond to people’s race, class, and gender, and do not see and recognize their full humanity. Black Boston 2022 Report participants described experiences of doctors dismissing patients’ knowledge about their bodies and health and emphasized the importance of providers listening to and following through on Black patients’ questions and concerns.

As shown in Figure 13, 6.4% of BBRFSS respondents in 2015-2019 indicated that they have been threatened at least a few times a month due to discrimination. This is significantly greater among Black and Latino residents (9.5% and 8.2%, respectively) compared to White residents (4.4%). These numbers increase dramatically for residents who indicated they have been threatened at least once a year because of discrimination, with 17.3% of all Boston residents reporting this (see 2022 Boston CHNA).
Figure 13. Percent Adults Reporting Being Threatened At Least a Few Times a Month Due to Discrimination, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined. This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.

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<tbody>
<tr>
<td>Boston</td>
<td>6.4%</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>9.5%</td>
<td></td>
</tr>
<tr>
<td>Latino</td>
<td>8.2%</td>
<td></td>
</tr>
<tr>
<td>Less than HS graduate</td>
<td>9.9%</td>
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</tbody>
</table>

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting being threatened or harassed due to discrimination a few times a month, at least once a week, or almost every day;

Community Violence and Interactions with the Police

Community violence and interactions with the police are public health issues that contribute to trauma and affect physical and mental health. Experiences with violence and with racism in non-health care settings emerged as a concern for 2022 Dana-Farber CHNA participants. For example, one participant noted that the broader context of social unrest and community violence is top of mind for residents. The Black Boston 2022 Report highlighted that it is important for overall health and wellbeing to ensure that Boston’s Black residents feel safe around state authorities.

Some 2022 Dana-Farber CHNA participants discussed anti-Asian hate crimes and physical and verbal attacks as increasing and contributing to fear of seeking health care among Asian American residents. For example, one focus group participant described concern about reports of racist incidents against Asian residents that were shared on social media and perceived racist attacks as “inevitable.” One key informant observed that anti-Asian hate crimes affect health, including cancer screening and mental well-being.

According to 2015-2019 BBRFSS data, 14.4% of Boston residents perceived their neighborhoods as unsafe, with the highest percentage of residents from Dorchester (02121 and 02125 zip codes: 34.3%; 02122 and 02124 zip codes: 24.5%), Mattapan (29.5%), and Roxbury (29.3%) indicating concerns about neighborhood safety (Figure 14). Many 2022 Boston CHNA participants reiterated these sentiments and

“Also [the] focus on social unrest and violence in the community is also at the top of people’s minds and overshadowing preventative health and cancer.” – Focus group participant

“The number of Asian hate crimes has increased and women with Asian backgrounds are targeted. Many are afraid to go out to the point they don’t want to go to their doctors’ offices. In addition to their mental health being affected, their physical health, including breast health, is at risk.” – Key informant
also expressed that they were concerned about a decrease in neighborhood safety, particularly around gang-affiliated violence during the pandemic.

**Figure 14. Percent Adults Reporting Their Neighborhood Unsafe, by Boston and Neighborhood, 2017 and 2019 Combined**

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>2017</th>
<th>2019</th>
<th>Significance</th>
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</thead>
<tbody>
<tr>
<td>Boston</td>
<td>14.4%</td>
<td></td>
<td></td>
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<tr>
<td>Allston/Brighton</td>
<td>1.5%</td>
<td></td>
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<tr>
<td>Back Bay</td>
<td>2.8%</td>
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<tr>
<td>Charlestown</td>
<td>7.6%</td>
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<tr>
<td>Dorchester (02121, 02125)</td>
<td>34.3%</td>
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<tr>
<td>East Boston</td>
<td>24.5%</td>
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<tr>
<td>Fenway</td>
<td>14.7%</td>
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<td>*</td>
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<tr>
<td>Hyde Park</td>
<td>1.2%</td>
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<tr>
<td>Jamaica Plain</td>
<td>8.4%</td>
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<td>*</td>
</tr>
<tr>
<td>Mattapan</td>
<td>8.2%</td>
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<tr>
<td>Roslindale</td>
<td>1.9%</td>
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<tr>
<td>Roxbury</td>
<td>14.5%</td>
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<tr>
<td>South Boston</td>
<td>17.2%</td>
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<tr>
<td>South End</td>
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<tr>
<td>West Roxbury</td>
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**DATA ANALYSIS:** Boston Public Health Commission, Research and Evaluation Office

**NOTES:** Data show percentage of adults reporting considering their neighborhood to be unsafe from crime; NA denotes where data are not presented due to insufficient sample size; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval

**Cancer and Mental Health**

Some cancer patients and survivors discussed mental health issues related to processing cancer diagnosis, learning about cancer treatments, navigating challenges associated with cancer treatment, and worrying about the possibility of cancer, which they noted contributes to poor sleep and depressive symptoms. One caregiver shared, “Every time before she went for an operation she cannot sleep, she was preparing herself to suffer for 1-2 weeks after the operation.” Several 2022 Dana-Farber CHNA participants discussed the impact of the COVID-19 pandemic on mental health, citing high levels of stress and anxiety and fear about leaving home, feeling depressed, and isolation for cancer patients and survivors who felt like they could not leave home due to the ongoing pandemic and their

“I think mental health is another area that [there is] not really a lot of support... Everything we talk about is more about physical or treatment or something like that. I know a lot of people they really have mental issues. Fear is [a] really big issue when you have the treatment and assessment in each stage... I think there’s no support by that time.” – Key informant
immunocompromised health status. One focus group participant shared “I can imagine people with cancer are isolated [in the COVID-19 pandemic]. You’re already very sick. In case you have issues and ask for [help], nobody can help you [because of risk of virus transmission].” A few 2022 Dana-Farber CHNA participants also described how the easing of COVID-19 restrictions impacted mental health particularly for those affected by cancer. For example, one focus group participant described lifting mask mandates and reducing other public health protections to minimize COVID-19 risk as stressful. Staying in touch with family and friends, therapy, developing a hobby, and finding ways to get out of the house and minimize cancer risks – such as going for walks and wearing a mask in public settings – emerged as resources and strategies that focus group participants perceived were helpful for supporting mental health issues linked with the pandemic.

According to the COVID-19 Health Equity Survey, during the COVID-19 pandemic 16.8% of Boston adults reported experiencing persistent sadness – defined as feeling down, depressed, or hopeless more than half of the days in the previous 2 weeks (see Figure 8 in Appendix). Substance use is discussed below, in the Health Promotion and Cancer Prevention section.

**Behavioral and Mental Health Care: Access and Barriers to Care**

Based on the COVID-19 Health Equity Survey, 9.9% of Boston adults reported delaying mental health care due to the pandemic (see 2022 Boston CHNA), and about 7.1% reported delaying mental health care specifically because of cost (See Figure 9 in Appendix).

Participants in the 2022 Dana-Farber CHNA and the 2022 Boston CHNA discussed several barriers to accessing mental health care. On the supply and demand side, participants observed a limited number of mental health providers in the community and in school settings, long wait lists, and few mental health services for children. One provider noted that behavioral health referrals were at the highest level that they could recall. Indeed, one Dana-Farber CHNA participant described long waiting lists to see a mental health professional, noting that they have been on a waiting list since 2020. Financial barriers to mental health care identified by participants in the 2022 Boston CHNA included bureaucratic barriers, such as needing a referral from a primary care provider, and limited mental health options for low-income communities. Several participants described a lack of culturally appropriate and linguistically congruent care for low-income residents, residents of color, and LGBTQIA+ residents. Some participants discussed stigma surrounding mental health care, particularly for immigrant communities, communities of color, and youth. As one resident noted, “They think asking for help is a weakness, not a strength.”
HEALTH PROMOTION AND CANCER PREVENTION

Healthy lifestyles, such as healthy eating behaviors, staying active, and avoiding tobacco and alcohol misuse, can help reduce risk of cancer. These behaviors are strongly influenced by one’s environment and upstream factors such as housing, employment status, and educational opportunities. Cancer prevention services may employ a wide range of approaches. Examples include providing education and raising awareness, promoting healthy lifestyles, and addressing upstream factors and root causes that influence cancer risk. This section discusses cancer prevention services, substance use, obesity, physical activity, and healthy eating.

Cancer Prevention Services Access and Delivery
Several participants engaged in the 2022 Dana-Farber CHNA discussed the lack of cancer prevention resources and barriers to accessing those resources in their communities. One participant emphasized how accessing resources is more difficult for low-income residents and residents of color, sharing: “There aren’t resources out there for people like me. The existing resources are for white suburbanites.”

Some key informants from the 2022 Dana-Farber CHNA noted that the pandemic shifted the operational focus of their organizations from health promotion activities such as raising awareness about breast health to supporting COVID-19 testing and vaccination. One key informant shared, “[We] had to pivot into a space of the unknown in order to leverage their expertise in having positive influences on the community by turning their attention to activities that combat COVID ... The health ministries were called on to work on something other than breast health because they had to focus on COVID for their respective congregations.”

In Dana-Farber CHNA focus group discussions and in the 2019 Massachusetts Department of Public Health Assessment of Colorectal Cancer Screening Attitudes and Practices among Asian Communities in Massachusetts, some participants discussed preventive services and programs as a new concept for some immigrant communities who had limited access to social and health care resources in their home communities.

Substance Use
Evidence linking substance use to risk of cancer is well-documented. For example, tobacco use causes nine out of ten cases of lung cancer and is also linked to other cancers throughout the body. Alcohol use can increase risk of mouth and throat, voice box, esophagus, colon and rectum, liver, and breast cancer.

While substance use emerged as a key concern among Boston residents prior to the pandemic, substance use was less commonly discussed as a health concern during 2022 Boston CHNA and 2022 Dana-Farber CHNA focus groups and interviews. Notably, the 2022 Dana-Farber CHNA did not explicitly ask participants about substance use. Some 2022 Boston CHNA participants did discuss substance use concerns, including misuse of drugs, overusing prescriptions and over-the-counter medicines, and smoking nicotine and marijuana. Participants discussed substance use concerns as particularly affecting LGBTQIA+ residents and youth, and described substance use as a coping mechanism for dealing with stress. Several participants perceived that substance use was increasing, particularly among Cape
Verdean, Asian, and Vietnamese communities. As one participant described, “I can remember as a child how it was; it was a close-knit community. When drugs started being introduced to [our] community, the children dropping out of school, it started to change.”

According to BBRFSS data, the percent of Boston adults who reported smoking declined from a high of 18.4% in 2013 to a low of 12.2% in 2019 (see Appendix A, Figure 11). The declining trend in smoking is consistent with the trend reported in the 2019 Dana-Farber CHNA. BBRFSS data show that in 2015-2019 combined, 14.4% of Boston adults reported smoking. Compared to their counterparts, reports of smoking were highest among Black adults (17.8%), men (18.4%), renters (15.8% to 29.9%), US-born adults (16.3%), and those who are out of work or otherwise not formally employed (30.5% and 17.0%, respectively) (Figure 15). Of note, the percent of low-income respondents (15.7% to 23.4%) who reported smoking was nearly double that reported for higher income respondents (9.5%). Similarly, compared with respondents with at least some college education (8.2%), nearly double the percent of respondents with a lower level of educational attainment (16.2% to 21.6%) report smoking. During the 2015-2019 period, 18.6% of LGBTQ adults reported smoking.

Figure 15. Percent Adults Reporting Smoking, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined. This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.

According to the COVID-19 Health Equity Survey, about 27.8% of Boston adults reported increased drinking habits during the COVID-19 pandemic (Figure 16). Almost 1 in 3 adults 18-34 years of age (31.7%) and over 1 in 4 adults 35-64 years of age (26.4%) reported increased drinking during the COVID-19 pandemic, compared to 11.8% of adults 65 years of age or over.

In 2015-2019, 8.6% of Boston adults reported drinking heavily (Figure 17). Compared to their counterparts, reports of binge drinking were highest among White adults (12.4%), higher-income adults (12.7%), US-born residents (10.8%), and higher educated adults (11.3%). The percent of residents who reported binge drinking was highest in South Boston, Allston/Brighton, and Back Bay (see Appendix A).
Nearly one-quarter (24.1%) of Boston residents reported binge drinking in 2015-2019 (Figure 17). This proportion is similar to the rate reported in the 2019 Dana-Farber CHNA. Compared to their counterparts, reports of binge drinking were highest among White adults (32.0%), men (28.9%), renters who do not receive rental assistance (30.1%), higher income residents (32.0%), US-born adults (27.7%), and those with some college education or higher (30.1%). More than one-quarter (29.1%) of LGBTQ adults reported binge drinking. Self-reported binge drinking was highest in South Boston, Allston/Brighton, and Back Bay (see Appendix A, Figures 17-18).

**Figure 16. Percent Adults Reporting Heavy Drinking, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined.** This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.

**Figure 17. Percent Adults Reporting Binge Drinking, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined.** This figure presents groups with rates significantly higher than their respective reference groups. See Appendix for data on all groups analyzed.
Alcohol mortality data over time indicate that alcohol mortality rates for Boston residents overall have remained relatively stable over time (from 17.9 per 100,000 in 2015 to 23.7 in 2020) but have increased significantly for Black residents from 13.5 deaths per 100,000 residents in 2015 to 40.6 deaths per 100,000 residents in 2020 (Figure 18).

**Figure 18. Alcohol Mortality Rate, by Boston and Race/Ethnicity, Age-Adjusted Rate per 100,000 Residents 12 Years and Over, 2015-2020**

![Graph showing alcohol mortality rates by race/ethnicity in Boston from 2015 to 2020](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>Boston</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>17.9</td>
<td>13.5</td>
<td>19.0</td>
<td>23.9</td>
</tr>
<tr>
<td>2016</td>
<td>20.1</td>
<td>15.1</td>
<td>32.6</td>
<td>24.2</td>
</tr>
<tr>
<td>2017</td>
<td>17.1</td>
<td>18.1</td>
<td>24.3</td>
<td>19.9</td>
</tr>
<tr>
<td>2018</td>
<td>17.7</td>
<td>12.9</td>
<td>27.1</td>
<td>21.1</td>
</tr>
<tr>
<td>2019</td>
<td>16.9</td>
<td>17.5</td>
<td>18.7</td>
<td>21.3</td>
</tr>
<tr>
<td>2020</td>
<td>23.7</td>
<td>40.6</td>
<td>25.7</td>
<td>22.4</td>
</tr>
</tbody>
</table>

* indicates rates are based on 20 or fewer deaths and should be interpreted with caution; Asterisk (*) denotes rate changed significantly over time (from 2015 to 2020). Change over time was statistically significant for Black residents (increase over time). Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

**Obesity**

Obesity was not a key topic of conversation during qualitative discussions. Similar to the 2013-2017 BBRFSS data reported in the 2019 Dana-Farber CHNA, in 2015-2019, more than half (57.9%) of Boston adults reported being overweight or obese. In 2015-2019, compared to their counterparts, the highest percentages of overweight and obesity are seen among Black (70.0%) and Latino (69.4%) adults, men (61.5%), renters who do not receive rental assistance (69.0%), low-income residents (60.4% to 62.5%), immigrants who have lived in the US for more than 10 years (66.1%), and adults with lower educational attainment (58.8% to 66.4%) (Figure 19). Similar to patterns across Boston, about half (54.3%) of LGBTQ adults met the criteria for being overweight or obese. The neighborhoods of Mattapan, Hyde Park, Dorchester (all zip codes), East Boston, South Boston, and West Roxbury had the highest percent of residents who reported being overweight or obese (see Appendix A, Figure21).
**Figure 19.** Percent Adults Reporting Being Overweight or Obese, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined. This figure presents groups with rates significantly higher than their respective reference groups. See Appendix A for data on all groups analyzed.

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval.

**Physical Activity and Healthy Eating**
Some 2022 Dana-Farber CHNA participants described exercise as important for promoting physical and mental health, particularly when living with cancer. Some caregivers and cancer survivors discussed limiting physical activity during the pandemic due to concerns about virus exposure. According to BBRFSS data, the percent of Boston adults who met the CDC guidelines for physical activity declined from 24.1% in 2013 to 19.0% in 2019 (see Appendix A). In 2015-2019, compared to their counterparts a lower proportion of Asian adults (14.7%), Latino adults (13.9%), renters (15.8% to 16.1%), low-income residents (13.8% to 15.2%), immigrants (13.0% to 14.8%), and adults with less than a high school education (12.6%) met the CDC guidelines for physical activity (Figure 20). Among LGBTQ adults, 22.5% reported levels of physical activity consistent with the CDC guidelines.

**Figure 20.** Percent Adults Reporting Meeting CDC Guidelines for Physical Activity, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined. This figure presents groups with rates significantly lower than their respective reference groups. See Appendix A for data on all groups analyzed.

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval.
Participants in the 2019 and 2022 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 mentioned earlier, 2022 Dana-Farber CHNA participants discussed healthy eating as important for health promotion, yet noted that the costs of healthy, fresh foods and cancer treatments are barriers to healthy eating.

As shown in Figure 21, 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 also lack 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.
Figure 21. Access to Food Retailers, by Type and Neighborhood, 2019

DATA SOURCE: Courtesy of Metropolitan Area Planning Council, 2019
CANCER SCREENING
Cancer screening can lead to early detection, when treatment is likely to work best. Assessment participants highlighted how the COVID-19 pandemic has led to delays in cancer screenings, in addition to other relevant barriers.

Perceptions of and Barriers to Cancer Screening
Participants engaged in the 2022 Dana-Farber CHNA cited several barriers to cancer screenings (and potential cancer diagnoses), including:

- Disruption in in-person wellness programs that promote screening due to the COVID-19 pandemic
- Delays in screening due to fear of contracting COVID-19 at screening facility and when taking public transportation to get to cancer screening appointment
- Long wait times for screening appointments since the onset of the COVID-19 pandemic
- COVID-19 policies that restrict patients from being accompanied by loved ones
- Concerns about changes to the recommended frequency of cancer screenings, and a desire for more frequent screenings and earlier breast cancer screening for those with a family history
- Fear of a cancer diagnosis

“[W]e often had to pause in-person services and programming workshops and pivot to virtual programming. This has limited the number of in-person health and wellness activities that [we have] been able to facilitate, including cancer screenings.”
– Key informant

Additionally, in the Black Boston 2022 Report, cancer screening emerged as an important component of health care, though one Report participant mentioned experiencing delays in cancer screening despite discussing symptoms with their medical provider years before they were diagnosed with cancer.

Barriers to Screening for Sexual and Gender Minoritized (SGM) People
In 2021, an estimated 7.1% of the US population – or 20 million people – self-identified as lesbian, gay, bisexual, transgender, or not heterosexual. Sexual and gender minoritized populations often encounter multiple intersecting forms of oppression, such as gender, sexuality, race, class, age, (dis)ability, and religion. Studies indicate that sexual and gender minoritized communities are more likely to experience poverty, lack health insurance, and smoke. They are less likely to have a regular primary care provider and to get cancer screening. When compared to heterosexual counterparts, gay men are more likely to report a cancer diagnosis and some gynecological cancers are higher among lesbians and bisexual women.

Transgender people experience unique health care barriers. For example, the prevalence of reported discrimination in health care settings as experienced by transgender people is higher than that reported by LGBTQ populations.
Table 2: Cancer Screening Rates by Sub-Group, 2015-2019

<table>
<thead>
<tr>
<th>Sub-Group</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>
<th>High School or Less</th>
<th>Renter</th>
<th>10 yrs or less in U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography</td>
<td>87.1%</td>
<td>85.7%</td>
<td>74.0%</td>
<td>91.7%</td>
<td>88.2%</td>
<td>88.2%</td>
<td>87.2%</td>
<td>86.6%</td>
<td>85.6%</td>
<td>***</td>
</tr>
<tr>
<td>Colonoscopy or sigmoidoscopy</td>
<td>78.4%</td>
<td>81.2%</td>
<td>62.7%</td>
<td>77.4%</td>
<td>77.9%</td>
<td>74.3%</td>
<td>47.6%</td>
<td>73.5%</td>
<td>70.6%</td>
<td>51.3%</td>
</tr>
<tr>
<td>Pap Smear (2013, 2015, 2017 combined)</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>
<td>76%</td>
<td>74%-84%</td>
<td>63.5%</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.

NOTE: Pap smear data is from the 2019 CHNA and was not available for the 2022 CHNA.


Breast Cancer Screening

Key informants engaged in the 2022 Dana-Farber CHNA mentioned several breast cancer-specific prevention and screening resources specifically for residents of color, including: breast health education through faith-based programs and networks, primary health care services, breast cancer screening access (e.g., Mammography Van, transportation to facilities), breast cancer literature, and post-screening navigation support.

According to 2015-2019 BBRFSS data, 87.1% of Boston female adults aged 50-74 years reported having a mammogram in the past two years (Figure 22). This proportion exceeds the Healthy People 2030 (HP2030) target of 80.5% and is slightly lower than the mammography rate reported in the 2019 Dana-Farber CHNA (88.3%). There was not a statistically significant difference in mammogram patterns across social and economic groups and over the time period 2013 to 2019 there was no significant change in this proportion (see Appendix A). Of note, 2015-2019 BBRFSS data are the most recent data available pertaining to cancer screening patterns. However, these data were collected before the COVID-19 pandemic, when cancer screening rates declined for many of the reasons elucidated in the section above.
Figure 22. Percent Female Adults (Aged 50-74 Years) Reporting Having Had a Mammogram in Past Two Years, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Bars with pattern indicate reference group for its specific category; “Other” includes: student, retired, homemaker, unable to work. Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05); Error bars show 95% confidence interval; NA denotes where rates are not shown due to insufficient sample size

Colorectal Cancer Screening
Prior to the onset of the COVID-19 pandemic, in 2015-2019 combined, just over three-quarters (78.4%) of Boston adults 50-75 years of age reported ever receiving colon cancer screening (Figure 23). This is slightly higher than the HP2030 target of 74.4% and is also higher than the colorectal cancer screening rate reported in the 2019 Dana-Farber CHNA (64.5%). Compared to their counterparts, the percent of adults reporting colon cancer screening was lowest among Asian adults (62.7%), men (73.8%), renters who do not receive housing assistance (70.6%), low-income adults (74.3% to 76.6%), and adults with less than a high school education (73.5%). While the percentage of Asian adults reporting having ever had a colonoscopy or sigmoidoscopy is significantly lower compared to their White counterparts, as it was in the 2019 Dana-Farber CHNA, the percentage of Asian adults reporting having received these screenings has increased from the 2019 CHNA (from 49.7% to 62.7%). Notably, just over half of recent immigrants (51.3%) reported ever receiving a colonoscopy, compared with 80.7% of US-born respondents. Again, it should be noted that these data were collected before the COVID-19 pandemic, when cancer screening rates declined.

The 2019 Massachusetts Department of Public Health Assessment of Colorectal Cancer Screening Attitudes and Practices among Asian Communities in Massachusetts identified several barriers and facilitators to colorectal cancer screening. Barriers included:

- Limited experiences with and knowledge about preventive care, particularly among Asian immigrant communities;
- Challenges of navigating the health care system;
- The time and financial burden of preventive care;
- Low awareness of colorectal cancer;
- Limited language and translation support;
- Challenges translating the concept of and technicalities related to colorectal cancer in many native languages;
- Transportation barriers;
- Fear about screening procedures and potential results; and
• Prioritization of non-Western medical approaches for some older generations and recent immigrants

Ongoing interactions with the healthcare system and positive relationships with providers were key facilitators to colorectal cancer screening.

**Figure 23. Percent Adults (Aged 50-75 Years) Reporting Having Ever Had a Colonoscopy or Sigmoidoscopy, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined.** This figure presents groups with rates significantly lower than their respective reference groups. See Appendix for data on all groups analyzed.

![Graph showing colorectal cancer screening rates by various indicators.]


**DATA ANALYSIS:** Boston Public Health Commission, Population Health and Research

**NOTES:** Error bars show 95% confidence interval.

**Other Screenings**

**Cervical Cancer Screening**

The most recent available data on cervical cancer screening rates in Boston was collected in 2017 and is reported in the 2019 Dana-Farber CHNA. As described in that report, in 2013-2017, 84% of Boston women (21-64 years of age) reported receiving a pap smear test in the past two years. This rate is nearly the same as the HP2030 target of 84.3%. 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. Also, 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.
**Lung Cancer Screening**

As reported in the 2019 Dana-Farber CHNA, 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. The U.S. Preventive Services Task Force updated their guidelines in March of 2021. These guidelines recommend yearly lung cancer screening with LDCT for individuals who have a history of heavy smoking, and smoke now or have quit within the past 15 years and are between 50 and 80 years old. In 2020, rates of lung cancer screening in Massachusetts were 19.7%. While data on lung cancer screening rates in Boston is not currently available, it is anticipated that future BBRFSS data collection will include this.

**Prostate Cancer Screening**

In 2017 the U.S. Preventive Services Task Force (USPSTF) updated its guidance for prostate cancer screening and recommended individual decision making with a physician about the test for men between the ages of 55 and 69 years. Following the USPSTF change, the prostate cancer screening rate appeared to increase by 12.1% among 55 to 69 year-old men. According to the National Cancer Institute Cancer Trends Progress Report in 2018 39.0% of all men in the U.S. were screened for prostate cancer within the past year. However, the prostate cancer screening rate among Black and Latino men (37.0% and 33.2%, respectively) appears lower than among White men (40.4%). Research suggests that screening Black men for prostate cancer at a younger age may substantially decrease the likelihood of diagnosis of metastatic prostate cancer and reduce the probability of dying from it xxvii.

**HPV Vaccination**

While cervical and rectal cancers have routine screening tests, as noted in the 2019 Dana-Farber CHNA, 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 2020, rates of HPV vaccine completion among adolescents ages 13-17 in Massachusetts were 75% among females and 72% among malesxxviii. Although Massachusetts has higher HPV vaccination rates than the US and Massachusetts’s rate has increased since 2017, it still falls short of the HP2030 goal of 80% vaccination among eligible youth.
HEALTH CARE UTILIZATION, CANCER INCIDENCE, AND MORTALITY

Use and Perceptions of the Health Care System
As discussed earlier, several 2022 Dana-Farber CHNA participants noted that limited access to primary care providers is a barrier to health care utilization. Often, primary care providers play a key role in recommending when patients get appropriate cancer screenings, coordinating screenings, and making referrals for cancer screenings.\textsuperscript{xiii} As such, lacking a primary care provider is a key barrier to cancer screenings. According to 2015-2019 BBRFSS data, 81.0% of Boston adults report having a personal doctor or health care provider and 19.0% of Boston adults surveyed do not; these proportions are similar to those reported in the 2019 DANA-FARBER CHNA. Compared to their counterparts, a lower percentage of men (74.8%), Asian residents (63.9%), Latino residents (72.1%), renters who do not receive rental assistance (74.6%), residents with other living arrangements (74.9%), low-income residents (76.8% to 79.3%), and residents with a lower educational attainment (78.0% to 79.3%) reported having a personal doctor. Notably, fewer than half of immigrants who have lived in the US for less than 10 years (48.7%) had a primary care provider, which is nearly half the prevalence seen for US-born adults (86.4%). About 84.3% of LGBTQ adults reported having a personal doctor. The neighborhoods of Fenway (59.3%), East Boston (72.5%), and Allston/Brighton (73.4%) had the lowest percent of residents who report having a personal doctor or health care provider (see Appendix A, Figures 32-34).

Figure 24. Percent Adults Reporting Having a Personal Doctor or Health Care Provider, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined. This figure presents groups with rates significantly lower than their respective reference groups. See Appendix for data on all groups analyzed.

Accessing Health Care Services for Cancer Prevention and Treatment: Barriers and Facilitators
Access to health care services is vitally important for cancer prevention and treatment. Participants in the 2022 Dana-Farber CHNA identified various factors that can facilitate or hinder access to health care.

- **COVID-19 Health Care Access Delays:** Several participants noted that the COVID-19 pandemic contributed to delays in health care access, including primary care visits, cancer screenings, and cancer treatment. They cited longer patient waitlists and patient concerns about COVID-19 risks as factors that contribute to delays in health care.
• **Access to Preventive Health Care:** Some participants discussed lack of access to preventive health care as a key barrier to health care utilization. Participants noted that for some immigrant communities who do not have a primary care provider there is limited experience with and understanding of the role of primary care provider and, in turn, reliance on urgent care to address acute health issues.

• **Language Barriers:** Asian and Spanish-speaking participants identified the following language barriers: limited resources available in patients’ primary language, difficulties accessing credible health information, and challenges communicating with providers. One key informant shared, “Resources are not often translated in Asian languages, and many hard-working low-income Asian Americans/immigrants don’t find time to access resources or be able to visit a local clinic/hospital.” Relatedly, participants discussed how language barriers contribute to a feeling of powerlessness when interacting with doctors. Caregivers and survivors described interpretation services in health care settings as both a facilitator and a barrier. For example, some participants noted that the two-way interpretation support used during telemedicine calls was helpful; some participants also noted that they relied on family members for interpretation, though these family members may not know how to interpret specific medical concepts.

• **Health Insurance:** Cancer patients and survivors described lack of health insurance, changes in health insurance plans, and unaffordable and uncertain health care charges (e.g., deductibles, co-pays) as major barriers to accessing routine check-ups and cancer screening and to maintaining and finding primary care doctors. Participants cited limitations of in-network provider options as a factor that contributes to delayed primary and specialty care. Further, some participants observed that cancer patients have different treatment options, depending on their health insurance, and noted that higher-income patients had more options available. Additionally, some caregivers discussed the difficulty of having to advocate with health insurance companies to get treatment covered.

• **Navigating the Health Care System:** Participants in the RHEAC focus group discussed difficulties of navigating the complexities of health care systems and interactions with providers and medical staff. In one key informant discussion, participants noted that working with specialists contributes to multiple appointments to which patients must travel, navigation of multiple bureaucracies, and multiple co-pays and other charges and expenses. One organizational staff member described the patchwork of working with multiple specialists and being billed for services as feeling like “a-la-carte care,” rather than a cohesive set of services, which several participants largely attributed to difficulties with health insurance coverage and billing.

“**We can accompany her [parent] for a limited stage... Once she told me when she was waiting in the operation room she felt cold. She [didn’t] know how to express herself – she said ‘cool, cool’ but it wasn’t understood. Someone beside her thought she was saying ‘great!’”** – Focus group participant

“**If you have the best insurance you get the best care. If you have the lowest, those people aren’t going to get the same treatment, and it’s sad.”** – Focus group participant
• **Long Waits and Limited Time with Doctors:** Some cancer patients and survivors recalled having trouble reaching hospital staff in a timely manner to make cancer appointments. Some participants observed that delays to see a cancer specialist and for cancer imaging and surgeries have increased with the COVID-19 pandemic. Participants also noted that short appointments limit the opportunity for patients to explain how they are feeling and diminish trust in doctors and shared that they often do not receive post-visit summaries. Caregivers discussed how challenging it was to understand cancer diagnoses, sharing that doctors may have different medical opinions and it was important for doctors to clearly explain cancer information. In contrast, some participants emphasized that they have received great care where they receive cancer treatment. While not specifically focused on cancer, the Black Boston 2022 Report echoed the theme of the importance of doctors taking time to get to know and develop a relationship with patients, practice and demonstrate respect for patients, and create safe spaces for discussions.

• **COVID-19 Policies that Limit Social Support:**
Cancer survivors and caregivers discussed how COVID-19 policies that prevent patients from being accompanied during cancer screenings, doctor’s visits, and treatment contribute to delays in health care and limit the social support that they can rely upon during what they described as scary, serious, and sometimes overwhelming medical appointments and treatment.

• **Health Information:** Some participants described limited and inconsistent health information from providers as a factor that undermines trust in providers. One caregiver described the difficulty of processing and discussing complex health information with providers, “A lot of patients go in to the doctors and the form that they talk to people; it isn’t broken down to where they really understand it.” Trusted sources of health information that emerged included: local community organizing groups, local community representatives, faith-based organizations, schools, libraries, worker unions, clinics and community health centers, gyms, barbershops, supermarkets, shelters, train stations, taxi cabs, newspapers, brochures and newsletters, radio stations, and social media (e.g., Facebook, Instagram, YouTube, and WhatsApp).

• **Caregiving Responsibilities:** Caregiving responsibilities and identities as caregivers emerged as a barrier to preventing illness, accessing health care, and managing side effects from cancer treatment. One participant shared, “My sense of identity within the family circle involves my ability to keep a household functioning […] If I’m either too sick to provide, or not present because of hospital stays, it could strip my identity as a functioning organizer for the home and a caretaker for those that live in my home.” Participants also cited eldercare and pet care as caregiving burdens during cancer treatment. One key informant discussed the stigma of illness as a reason for not asking for caregiving support: “[There is] the stigma of being sick in underserved communities. People want to keep things private, not letting anyone know that they are sick.”

“It’s not about care, it’s about money for the doctor. I only get 15 minutes. This is why people use WebMD.” – Focus group participant

“[N]ot being able to go to appointments with loved ones was very difficult and sometimes discourages people from going to the doctor…” – Focus group participant
Perceptions of Cancer Treatment and Support Services

- **Barriers to Cancer Treatment for Sexual and Gender Minoritized People:** Compared to cisgender people, transgender people may be diagnosed with cancer at later stages, are less likely to receive cancer treatment, and have worse survival outcomes. Within health care systems, gender is infused in multiple cancer diagnosis and treatment protocols and practices, including chemotherapy dosing, cardiac monitoring, renal function, and toxicity risks. Assumptions about sexual behavior, family formation, and family planning can contribute to missed opportunities for cancer screening, biases about LGBTQIA+ family and marital statuses, assumptions about how hormone replacement may affect cancer and treatment, and missed opportunities to discuss fertility options.

- **Cancer Care Communication and Coordination:** Several participants described the cancer diagnosis and early cancer treatment stages as particularly difficult as patients process their diagnosis and navigate the cancer care system. Some participants discussed overall distrust with the health care system and wondered whether providers were withholding information about cancer outcomes and treatment options. Some key informants noted the challenge of referring residents to providers who deliver culturally responsive care, particularly for immigrant communities and communities of color. Also, some participants discussed feeling pressured into a certain cancer treatment plan. On this note, one participant described the process of understanding their diagnosis and treatment options as “challenging to navigate differing medical opinions and figuring out what is actually medically necessary.” The importance of providers treating the whole cancer patient, rather than simply the disease, emerged in discussions. Despite the critique from many, some cancer survivors described ongoing communication with their doctors, which they noted was helpful for learning about and planning their cancer treatment and feeling cared for and comfortable.

- **Quality of Care:** Some participants described poor quality cancer care that they linked with the challenges of the COVID-19 pandemic, such as labor shortages and provider workloads. They mentioned slow medical assistance during hospital stays (e.g., providing blanket, responding to call button) and delays in communications and receiving health information from providers after a cancer diagnosis. A couple of participants mentioned receiving poor service from reception staff. In the Black Boston 2022 Report, one cancer caregiver described their experience in which their partner who was undergoing cancer treatment was told to take Tylenol for their pain, when years later a provider emphasized that they should have been in a pain management program. This experience resonates with evidence indicating that Black patients’ pain is dismissed and less likely to be taken seriously and treated appropriately by health care providers.

- **Sources of Support that Have Been Most Helpful for Cancer Care:** General resources that key informants described as available to people with breast cancer include culturally-specific education and psychological support for residents of color; educational and informational resources available in residents’ primary languages; community empowerment efforts; and support with housing, food, childcare, nutritional education, health care, physical activity, and health literacy. Few participants...
discussed supports for other cancers outside of breast cancer. Some participants also mentioned importance of cancer-specific support groups.

- **Support for Caregivers:** From the perspective of caregivers who support cancer patients and survivors, some noted a need for more support for caregivers such as providing information early on in the cancer journey about how patients will feel when undergoing cancer treatment, how to support patients during treatment, and understanding physical, emotional, and social needs at the end of life.

- **Social Workers and Patient Navigators:** Some cancer patients and survivors described social workers as important resources during their cancer journey, while others were not aware that social workers were available to support them. Also, some participants described patient navigators as available in their community, noting that navigators support patients in understanding where to go for health care services and accessing information about resources available to cancer patients (e.g., transportation, financial, etc.), health, and cancer in particular. Several cancer survivors and caregivers were not familiar with patient navigators and expressed interest in connecting with navigators who are fluent in residents’ primary languages and who could support them with processing complex health information, direct them to services, and help them to understand resources available before and after cancer treatment. Additionally, some participants requested a concise list of resources available including contact information for patient navigators.

- **Telemedicine:** Participants had mixed perceptions of the rise of telemedicine in the COVID-19 pandemic. Some participants appreciated being able to connect remotely with their doctor for non-urgent medical appointments (e.g., prescription refill, quick medical advice), being able to arrange a telemedicine appointment quickly, avoiding travel, and avoiding risk of COVID-19 exposure. However, in other cases, participants shared negative perceptions of telemedicine appointments which they described as less personal and making it difficult for providers to fully assess patients and make accurate diagnoses. They also expressed interest in resuming in-person doctor’s appointments. While some participants noted good experiences using interpretation services during telemedicine visits, some key informants shared that language barriers can be magnified during telemedicine appointments. In addition to access to the internet, computers, and smart phones, using technology (e.g., working camera, microphone) also emerged as barriers to effective telemedicine visits.

“I think having a navigator would have been very helpful during this process. For me, personally, once the diagnosis happened things went from zero to 100 so quickly so the amount of info that was needed to sit and process, there really was no transition to understand the full scope of what was going on ...” – Focus group participant

“I feel a different feeling when we go to his office to see the doctor...I think [telemedicine is] not that good according to me.” – Key informant
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 2016-2018, in aggregate for Boston and by race/ethnicity and gender, and data over time are included in Appendix A. 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 2018, the overall cancer incidence rate in Boston was 415.7 per 100,000 residents. Overall cancer incidence rates for Asian (287.1 per 100,000) and Latino (333.5 per 100,000) residents in Boston were significantly lower than for White residents (434.9 per 100,000) (Figure 25). Both Latino and Asian males and females had significantly lower overall cancer incidence rates than their White counterparts (Figure 26 and Figure 27). Black residents overall and Black males had significantly higher incidence rates for overall cancer compared to their White counterparts (Figure 26 and Figure 27). Women had lower overall cancer incidence rates than men.

Figure 25. All Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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 26. Male All Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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 27. Female All Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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)
### Table 3: Cancer Incidence per 100,000 for Boston Males by Race/Ethnicity, 2016-2018

<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><strong>All Cancers (2018)</strong></td>
<td>461.2</td>
<td>279.8*</td>
<td>394.5*</td>
<td>577.6*</td>
<td>477.6</td>
</tr>
<tr>
<td><strong>Colorectal Cancer</strong></td>
<td>32.8</td>
<td>31.6</td>
<td>27.8</td>
<td>42.7*</td>
<td>30.7</td>
</tr>
<tr>
<td><strong>Liver Cancer</strong></td>
<td>18.0</td>
<td>28.3*</td>
<td>15.3</td>
<td>23.0*</td>
<td>15.3</td>
</tr>
<tr>
<td><strong>Lung Cancer</strong></td>
<td>63.2</td>
<td>62.1</td>
<td>49.2*</td>
<td>66.6</td>
<td>68.6</td>
</tr>
<tr>
<td><strong>Prostate Cancer</strong></td>
<td>127.7</td>
<td>48.7*</td>
<td>117.7</td>
<td>232.8*</td>
<td>110.3</td>
</tr>
</tbody>
</table>

Asterisk (*) denotes estimate was significantly different compared to White reference group within specific category (p <0.05)  
Yellow denotes statistically significantly higher than White comparison group  
DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018

### Table 4: Cancer Incidence per 100,000 for Boston Females by Race/Ethnicity, 2016-2018

<table>
<thead>
<tr>
<th></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><strong>All Cancers (2018)</strong></td>
<td>387.3</td>
<td>296.2*</td>
<td>305.5*</td>
<td>468.5</td>
<td>412.3</td>
</tr>
<tr>
<td><strong>Breast Cancer</strong></td>
<td>123.7</td>
<td>88.0*</td>
<td>96.5*</td>
<td>138.3</td>
<td>145.6</td>
</tr>
<tr>
<td><strong>Colorectal Cancer</strong></td>
<td>25.4</td>
<td>20.9</td>
<td>21.8</td>
<td>35.9*</td>
<td>24.8</td>
</tr>
<tr>
<td><strong>Liver Cancer</strong></td>
<td>6.7</td>
<td>10.1*</td>
<td>9.6*</td>
<td>9.7*</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Lung Cancer</strong></td>
<td>50.2</td>
<td>38.1*</td>
<td>24.5*</td>
<td>45.5</td>
<td>64.9</td>
</tr>
</tbody>
</table>

Asterisk (*) denotes estimate was significantly different compared to White reference group within specific category (p <0.05)  
Yellow denotes statistically significantly higher than White comparison group  
DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018

In summary, the following groups had statistically significantly higher incidence rates of cancer compared to White residents:
- **Black males** – colorectal, liver, prostate cancer and all cancers
- **Black females** – colorectal and liver cancer
- **Asian residents** – liver cancer
- **Latina females** – liver cancer

**Cancer Incidence Over Time**
Overall cancer incidence rates have declined significantly in Boston between 2010 (496.7 per 100,000) and 2018 (415.7 per 100,000), as have incidence rates for colorectal, lung, and prostate cancers. Incidence rates for liver and breast cancer, by contrast, in Boston have remained relatively stable. The downward trend in cancer incidence rates overall and in colorectal, lung, and prostate cancer incidence rates is consistent with the trends reported in the 2019 CHNA. The 2019 CHNA noted an upward trend in liver cancer incidence rates, while the updated data included here shows a stable trend in liver cancer.
incidence rates over time. Cancer incidence rates over time by sex and race/ethnicity are provided in Appendix A.

The following table (Table 5) summarizes cancer incidence rates over time by race/ethnicity and sex. Incidence rates for all cancers overall declined significantly among Latino residents, White residents and Black men between 2010-2018. There have also been several significant declines across specific cancers and subgroups, as highlighted in the table below. It is important to note that incidence rates did not improve for all groups during this time period:

- Colorectal cancer incidence rates did not improve among Asian men, Latina women and Black men
- Liver cancer incidence rates did not improve among Asian residents, Latina women, Black residents or White residents

Unfortunately, there has been no significant change over time for breast cancer incidence rates for any groups in Boston during this time period.

Table 5: Statistically Significant Changes in Cancer Incidence Over Time, by Sub-Group, 2010-2018

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Asian Males</th>
<th>Asian Females</th>
<th>Latino Males</th>
<th>Latina Females</th>
<th>Black Males</th>
<th>Black Females</th>
<th>White Males</th>
<th>White Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver Cancer</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung Cancer</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Cancer Registry, Massachusetts Department of Public Health, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Green arrow indicates statistically significant decrease over time

**Breast Cancer Incidence**

In 2016-2018, the breast cancer incidence rate in Boston was 123.7 per 100,000 females (Figure 28). Asian (88.0 per 100,000) and Latina (96.5 per 100,000) female residents had significantly lower rates of breast cancer than White female residents (145.6 per 100,000). Looking at the time period 2010-2018, there has been no significant change in breast cancer incidence rate overall or by any racial/ethnic subgroups (see Appendix A).
Figure 28. Female Breast Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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)

Colorectal Cancer Incidence
Data from the Massachusetts Cancer Registry show that the overall colorectal cancer rate was 28.7 per 100,000 in 2016-2018 (Figure 29). Rates were significantly higher for Black residents (39.4 per 100,000) compared to White residents (27.3 per 100,000). Black male residents (42.7 per 100,000) and female residents (35.9 per 100,000) had significantly higher colorectal cancer rates than White male and female residents (30.7 and 24.8 per 100,000, respectively) (Figure 30 and Figure 31). Over the time period of 2010 to 2018, there was a significant decrease in colorectal cancer incidence rates for Boston residents overall, for male and female residents, and for Asian, Black, Latino, and White residents (see Appendix A).

Figure 29. Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
Liver Cancer Incidence

In 2016-2018, the overall rate of liver cancer incidence for Boston residents was 11.7 per 100,000 (Figure 32). Asian residents (18.3 per 100,000) and Black residents (15.5 per 100,000) had significantly higher rates of liver cancer than White residents (9.3 per 100,000). The liver cancer incidence rate is also higher among Asian males and females, and Black males and females, compared to White males and females (Figure 33 and Figure 34). Additionally, the liver cancer incidence rate for Latina females (9.6 per 100,000) is significantly higher than for White females (6.7 per 100,000). While there has been no significant change in the liver cancer incidence rate for Boston residents overall, there have been significant decreases for Latino residents and Male residents (see Appendix A, Figures 42-44).
Figure 32. Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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 33. Male Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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 34. Female Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

![Liver Cancer Incidence Rate Chart]

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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)

Lung Cancer Incidence
In 2016-2018, the lung cancer incidence rate in Boston was 55.4 per 100,000 residents (Figure 35). White residents had the highest rates of lung cancer among all racial/ethnic groups; this was also noted in the 2019 and 2016 Dana-Farber CHNA. The rate was significantly lower for Asian (48.6 per 100,000) and Latino (33.8 per 100,000) residents than for White residents (66.1 per 100,000). Both Latino males and Latino females had significantly lower rates of lung cancer than their White counterparts (Figure 36 and Figure 37). Asian females also had significantly lower rates than White females. While there has been a decrease in the lung cancer incidence rate overall for Boston residents from 2010-2018, as well as for White and Black residents, over this time period there has been no significant change over time in the lung cancer incidence rate for Latino and Asian residents (see Appendix A, Figures 45-47).

Figure 35. Lung Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

![Lung Cancer Incidence Rate Chart]
Figure 36. Male Lung Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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 37. Female Lung Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2016-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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)

Prostate Cancer Incidence
In 2016-2018, the overall incidence of prostate cancer in Boston was 127.7 per 100,000 male residents (Figure 38). Prostate cancer incidence rates were significantly higher for Black males (232.8 per 100,000) and significantly lower for Asian males (48.7 per 100,000) compared to White males (110.3 per 100,000). This is a similar pattern to that reported in the 2019 and 2016 CHNAs. While there has been a significant decrease in the prostate cancer incidence rate from 2010 to 2018 among Boston males
overall and among Black and Latino males, there has been no significant change during this time period among Asian and White males (see Appendix A, Figure 4).

Figure 38. Prostate Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2016-2018

Cancer Mortality

Leading Causes of Death

Prior to the COVID-19 pandemic, in the years 2017, 2018, and 2019, cancer and heart disease were the leading causes of death in Boston (Table 6). However, in 2020, the leading cause of death among Boston residents was COVID-19 (134.8 per 100,000 residents), followed by cancer (127.1 per 100,000 residents) and heart disease (123.8 per 100,000 residents). In 2020, COVID-19 was the leading cause of death for Black, Latino, and Asian residents; cancer was the leading cause of death for White residents (Table 7).

Table 6. Leading Causes of Mortality in Boston, Age-Adjusted Rate per 100,000 Residents, 2017-2020

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cancer</td>
<td>142.4</td>
<td>Cancer</td>
<td>152.4</td>
</tr>
<tr>
<td>2</td>
<td>Heart Disease</td>
<td>114.1</td>
<td>Heart Disease</td>
<td>113.8</td>
</tr>
<tr>
<td>3</td>
<td>Accidents</td>
<td>49.4</td>
<td>Accidents</td>
<td>44.8</td>
</tr>
<tr>
<td>4</td>
<td>Cerebrovascular Diseases</td>
<td>27.2</td>
<td>Cerebrovascular Diseases</td>
<td>25.9</td>
</tr>
</tbody>
</table>
Table 7. Leading Causes of Mortality, by Boston and Race/Ethnicity, Age-Adjusted Rate per 100,000 Residents, 2020

<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>5</td>
<td>Chronic Lower Respiratory Diseases 27.4</td>
<td>Accidents 17.1 †</td>
<td>Cerebrovascular Diseases 52.8</td>
<td>Diabetes 27.4</td>
<td>Chronic Lower Respiratory Diseases 24.7</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2020
DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Please be advised that 2020-2022 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Dagger (†) denotes where rates are based on 20 or fewer deaths and may be unstable.

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 2019-2021 and over time, in aggregate for Boston.

Between 2015 and 2021 the overall cancer mortality rate and the overall cancer premature mortality rate in Boston declined significantly, as described in Table 8 below. While there has been no significant change over time for prostate cancer mortality rates, the mortality rates for breast, colorectal, liver, and lung cancer have declined significantly over this period.
Quantitative data about cancer mortality provided by the Massachusetts Department of Public Health show that the overall cancer mortality rate in Boston was 124.6 per 100,000 residents in 2010-2021 (Figure 39). Rates of cancer mortality differ, however, across different subgroups. Of all racial/ethnic groups, Black residents experienced the highest rates of cancer mortality, 172.2 deaths per 100,000 residents. Overall cancer mortality rates were significantly lower among Asian (96.6 per 1000,000) and Latino (90.6 per 100,000) residents, compared to White (124.8 per 100,000) residents. This pattern is similar to that reported in the 2019 CHNA, although in the data shown here the cancer mortality rate for Black residents is significantly higher than for White residents (whereas in the 2019 CHNA, it was higher but not statistically significant). Females (105.4 per 100,000) in Boston overall had significantly lower cancer mortality rates than males (154.7 per 100,000) in 2019-2021. Asian (74.1 per 100,000) and Latino women (73.3 per 100,000) had significantly lower mortality rates than White women (107.6 per 100,000), while Black women (146.7 per 100,000) had significantly higher rates (Figure 40). Black men (218.9 per 100,000) had significantly higher rates of cancer mortality than White men (152.2 per 100,000), while Asian (126.1 per 100,000) and Latino (117.9 per 100,000) men had significantly lower rates.

Figure 39. Cancer Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined
Figure 40. Boston Cancer Mortality, by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2019-2021 Combined

In Boston the rate of all cancer premature mortality was 34.3 per 100,000 residents in 2019-2021; rates of premature cancer mortality were significantly higher for Black residents (53.9 per 100,000) and significantly lower for Latino residents (22.2 per 100,000) compared to White residents (30.7 per 100,000) (Figure 41). This pattern is similar to that reported in the 2019 CHNA, although in the data shown here the premature cancer mortality rate for Latino residents is significantly lower than for White residents (whereas in the 2019 CHNA, it was lower but not statistically significant). Both Black females (53.6 per 100,000) and males (54.1 per 100,000) had premature cancer mortality rates significantly higher than their white counterparts (32.9 and 28.8 per 100,000, respectively) (Figure 42).
**Figure 41. Cancer Premature Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined**

<table>
<thead>
<tr>
<th>Group</th>
<th>Rate per 100,000 Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>34.3</td>
</tr>
<tr>
<td>Asian</td>
<td>31.8</td>
</tr>
<tr>
<td>Black</td>
<td>53.9*</td>
</tr>
<tr>
<td>Latino</td>
<td>22.2*</td>
</tr>
<tr>
<td>White</td>
<td>30.7</td>
</tr>
<tr>
<td>Female</td>
<td>34.3</td>
</tr>
<tr>
<td>Male</td>
<td>34.4</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021

**DATA ANALYSIS:** Boston Public Health Commission, Population Health and Research

**NOTES:** Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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 42. Boston Premature Cancer Mortality, by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2019-2021 Combined**

**DATA SOURCE:** Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021

**DATA ANALYSIS:** Boston Public Health Commission, Population Health and Research

**NOTES:** Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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.

The tables below (Table 9 and Table 10) 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></th>
<th>All Males</th>
<th>Asian Males</th>
<th>Black Males</th>
<th>Latino Males</th>
<th>White Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancers</td>
<td>154.7</td>
<td>126.1*</td>
<td>218.9*</td>
<td>117.9*</td>
<td>152.2</td>
</tr>
<tr>
<td>All Cancers (&lt;65 Years)</td>
<td>34.4</td>
<td>36.8</td>
<td>54.1*</td>
<td>25.1</td>
<td>28.8</td>
</tr>
<tr>
<td>Colorectal</td>
<td>10.6</td>
<td>6.6⁺</td>
<td>18.4*</td>
<td>8.3*</td>
<td>9.3</td>
</tr>
<tr>
<td>Colorectal (&lt;65 Years)</td>
<td>4.6</td>
<td>6.1⁺</td>
<td>7.5*</td>
<td>3.6⁺</td>
<td>3.5</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>10.3</td>
<td>16.3**</td>
<td>13.9*</td>
<td>9.5⁺</td>
<td>7.9</td>
</tr>
<tr>
<td>Liver Cancer (&lt;65 Years)</td>
<td>3.1</td>
<td>4.3*</td>
<td>5.1**</td>
<td>3.8*</td>
<td>2.0⁺</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>31</td>
<td>44.8*</td>
<td>39.6*</td>
<td>17.2**</td>
<td>29.3</td>
</tr>
<tr>
<td>Lung Cancer (&lt;65 Years)</td>
<td>7.1</td>
<td>11.6**</td>
<td>11.6*</td>
<td>NA</td>
<td>6.4</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>21.5</td>
<td>11.3⁺</td>
<td>43.7*</td>
<td>19.7</td>
<td>17.6</td>
</tr>
<tr>
<td>Prostate Cancer (&lt;65 Years)</td>
<td>1.5</td>
<td>NA</td>
<td>3.6⁺</td>
<td>2.4⁺</td>
<td>NA</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Asterisk (*) denotes estimate was significantly different compared to White reference group within specific category (p <0.05); Yellow denotes statistically significantly higher than White comparison group. Plus sign (+) denotes that rates are based on 20 or fewer deaths and should be interpreted with caution; NA indicates data not available, data suppressed due to <5 deaths.

Black men in Boston have the highest mortality rates for overall cancers, premature (under age 65) overall cancers, colorectal cancer, premature colorectal cancer, premature liver cancer, lung cancer, premature lung cancer (equal to rate for Asian men), prostate cancer, and premature prostate cancer. Compared to White men, the mortality rate for Black men is statistically significantly higher for all cancers, premature all cancers, colorectal cancer, premature colorectal cancer, liver cancer, premature liver cancer, lung cancer, premature lung cancer, and prostate cancer as noted with yellow highlighting. Asian men experience significantly higher rates of premature mortality due to liver cancer, lung cancer, and premature lung cancer. Asian men also have the highest liver cancer mortality rate and the highest premature lung cancer mortality rate (equal to rate for Black men); looking across populations, the single highest mortality rate for any specific type of cancer is the lung cancer mortality rate among Asian men (44.8 per 100,000 residents).
Table 10. Cancer Mortality per 100,000 Residents for Boston Females, by Race/Ethnicity, 2019-2021

<table>
<thead>
<tr>
<th></th>
<th>All Females</th>
<th>Asian Females</th>
<th>Black Females</th>
<th>Latina Females</th>
<th>White Females</th>
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<tbody>
<tr>
<td>All Cancers</td>
<td>105.4</td>
<td>74.1*</td>
<td>146.7*</td>
<td>73.3*</td>
<td>107.6</td>
</tr>
<tr>
<td>All Cancers (&lt;65 Years)</td>
<td>34.3</td>
<td>27.7</td>
<td>53.6*</td>
<td>20.0*</td>
<td>32.9</td>
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<tr>
<td>Breast Cancer</td>
<td>13.6</td>
<td>10.2</td>
<td>24.2*</td>
<td>8.7</td>
<td>11.8</td>
</tr>
<tr>
<td>Breast Cancer (&lt;65 Years)</td>
<td>7.1</td>
<td>6.1</td>
<td>12.7*</td>
<td>4.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Colorectal</td>
<td>8.7</td>
<td>6.9*</td>
<td>13.8*</td>
<td>5.4*</td>
<td>8.0</td>
</tr>
<tr>
<td>Colorectal (&lt;65 Years)</td>
<td>3.2</td>
<td>3.5*</td>
<td>5.1</td>
<td>3.1*</td>
<td>2.7*</td>
</tr>
<tr>
<td>Liver Cancer</td>
<td>4.5</td>
<td>7.3*</td>
<td>6.7*</td>
<td>8.7*</td>
<td>1.9</td>
</tr>
<tr>
<td>Liver Cancer (&lt;65 Years)</td>
<td>2.3</td>
<td>NA</td>
<td>3.2</td>
<td>1.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Lung Cancer</td>
<td>21.5</td>
<td>17.8</td>
<td>23.3</td>
<td>11.6*</td>
<td>26.1</td>
</tr>
<tr>
<td>Lung Cancer (&lt;65 Years)</td>
<td>6.1</td>
<td>3.4*</td>
<td>8.6</td>
<td>NA</td>
<td>7.5</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Asterisk (*) denotes estimate was significantly different compared to White reference group within specific category (p <0.05); Yellow denotes statistically significantly higher than White comparison group. Plus sign (+) denotes that rates are based on 20 or fewer deaths and should be interpreted with caution; NA indicates data not available, data suppressed due to <5 deaths

Black women in Boston have the highest mortality rates for overall cancers, premature (under age 65) overall cancers, breast cancer, premature breast cancer, colorectal cancer, premature colorectal cancer, premature liver cancer, and premature lung cancer. Compared to White women, the mortality rate for Black women is statistically significantly higher for all cancers, premature all cancers, breast cancer, premature breast cancer, colorectal cancer, and liver cancer as noted with yellow highlighting. Asian women and Latina women also experience significantly higher rates of liver cancer mortality compared to White women. Compared to White women, the mortality rate for Latina women is statistically significantly lower for all cancers, premature all cancers, and lung cancer.

Cancer mortality rates also differ across Boston neighborhoods, in some cases significantly (Figure 43). In 2019-2021, South Boston (164.5 per 100,000), Mattapan (149.7 per 100,000), and Hyde Park (148.7 per 100,000) had the highest mortality rates compared to all of Boston, while Charlestown (99.9 per 100,000) and Back Bay (98.3 per 100,000) had significantly lower rates. Dorchester (02121 and 02124)
(50.9 per 100,000) and Fenway (42.4 per 100,000) had significantly higher rates of premature cancer mortality than all of Boston, while rates in East Boston (20.9 per 100,000) and Allston/Brighton (23.0 per 100,000) were lower (Figure 44).

Figure 43. Cancer Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

Figure 44. Cancer Premature Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined
Continuing the downward trend described in the 2019 CHNA, overall cancer mortality rates have declined significantly in Boston from 2015 to 2021, from 154.3 to 122.4 deaths per 100,000 residents (Figure 45). Premature cancer mortality rates have also significantly declined over this time period, from 49.7 per 100,000 residents to 35.1 per 100,000 residents (Figure 46). This is also consistent with the premature mortality trend described in the 2019 CHNA.

Figure 45. Cancer Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021

Figure 46. Cancer Premature Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Change over time was statistically significant (decrease over time)

**Breast Cancer Mortality**

The overall breast cancer mortality in Boston was 13.6 deaths per 100,000 female residents in 2019-2021 (Figure 47). This is slightly better than the HP2030 target of 15.3 deaths per 100,000 females. Rates were significantly higher for Black women (24.2 per 100,000) compared to White women (11.8 per 100,000). The premature breast cancer mortality rate is also significantly higher for Black women (12.7 per 100,000) compared to White women (6.5) (Figure 48).

**Figure 47. Female Breast Cancer Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined**

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate per 100,000</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>13.6</td>
<td>10.2</td>
<td>24.2*</td>
<td>8.7</td>
<td>11.8</td>
</tr>
<tr>
<td>0-44 years old</td>
<td>0.7*</td>
<td>6.1</td>
<td>12.7*</td>
<td>4.3</td>
<td>6.5</td>
</tr>
<tr>
<td>45-64 years old</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>65+ years old</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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; * indicates rates are based on 20 or fewer deaths and should be interpreted with caution

**Figure 48. Female Breast Cancer Premature Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined**

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate per 100,000</th>
<th>Asian*</th>
<th>Black</th>
<th>Latino*</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>7.1</td>
<td>6.1</td>
<td>12.7*</td>
<td>4.3</td>
<td>6.5</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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); * indicates rates are based on 20 or fewer deaths and should be interpreted with caution
Breast cancer mortality rates vary across Boston neighborhoods, with Mattapan (22.7 per 100,000) and Roxbury (22.2 per 100,000) experiencing the highest rates compared to Boston overall, though this difference was not significant (Figure 49). Fenway (15.3 per 100,000) experiences premature mortality rates due to breast cancer that are significantly higher than all of Boston (7.1 per 100,000) (Figure 50).

**Figure 49. Female Breast Cancer Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined**

![Bar chart showing breast cancer mortality rates by neighborhood in Boston, with Mattapan and Roxbury having the highest rates.](chart)

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; NA indicates data suppressed due to <5 deaths; * indicates rates are based on 20 or fewer deaths and should be interpreted with caution.
Figure 50. Female Breast Cancer Premature Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); NA indicates data suppressed due to <5 deaths; ⁺ indicates rates are based on 20 or fewer deaths and should be interpreted with caution.

Figure 51 shows breast cancer mortality over time. Although there were no statistically significant differences in mortality rates over the 2011 to 2017 time period included in the 2019 Dana-Farber CHNA, over the six year period of 2015 to 2021 shown here the decline in breast cancer mortality was significant (from 17.9 per 100,000 residents in 2015 to 11.1 per 100,000 residents in 2021). Likewise, while there was no statistically significant change in premature mortality rates due to breast cancer over the 2011 to 2017 time period, over the six year period of 2015 to 2021 the decline in breast cancer premature mortality was significant (from 7.9 per 100,000 residents in 2015 to 4.1 per 100,000 residents in 2021) (Figure 52).
**Figure 51. Female Breast Cancer Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021**

![Graph showing female breast cancer mortality rate per 100,000 residents from 2015 to 2021.](image)

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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**Figure 52. Female Breast Cancer Premature Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021**

![Graph showing female breast cancer premature mortality rate per 100,000 residents from 2015 to 2021.](image)

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Change over time was statistically significant (decrease over time)

**Colorectal Cancer Mortality**

The overall colorectal cancer mortality rate in Boston in 2019-2021 was 9.5 per 100,000 residents (Figure 53). This is higher than the HP2030 target of 8.9 deaths per 100,000. Rates are significantly higher for Black residents (15.5 per 100,000) compared to White residents (8.5 per 100,000). Data by sex and race/ethnicity reveal that in 2019-2021, Black females (13.8 per 100,000) and Black males (18.4 per 100,000) had significantly higher rates of colorectal cancer mortality compared to their White counterparts (8.0 and 9.3 per 100,000, respectively) (Figure 54).
Figure 53. Colorectal Cancer Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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Figure 54. Boston Colorectal Cancer Mortality, by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2019-2021 Combined

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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Premature mortality rates for colorectal cancer were significantly higher among Black (6.1 per 100,000) residents compared to White (3.1 per 100,000) (Figure 55). Data by sex and race/ethnicity reveal that in 2019-2021, Black males (7.5 per 100,000) had a significantly higher premature colorectal cancer mortality rate compared to White males (3.5 per 100,000) but that there was no significant difference between the rates for Black and White females (Figure 56).

Figure 55. Colorectal Cancer Premature Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

<table>
<thead>
<tr>
<th></th>
<th>Rate per 100,000 Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>3.9</td>
</tr>
<tr>
<td>Asian⁺</td>
<td>4.7</td>
</tr>
<tr>
<td>Black</td>
<td>6.1*</td>
</tr>
<tr>
<td>Latino⁺</td>
<td>3.3</td>
</tr>
<tr>
<td>White</td>
<td>3.1</td>
</tr>
<tr>
<td>Female</td>
<td>3.2</td>
</tr>
<tr>
<td>Male</td>
<td>4.6</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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; ⁺ indicates rates are based on 20 or fewer deaths and should be interpreted with caution
No statistically notable differences relative to colorectal cancer mortality are evident across neighborhoods (Figure 57). However, looking at premature mortality across Boston neighborhoods, Mattapan (7.2 per 100,000) and Dorchester (6.4-6.8 per 100,000) experienced significantly higher colorectal cancer premature mortality rates than Boston overall (3.9 per 100,000) (Figure 58).
Figure 57. Colorectal Cancer Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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Figure 58. Colorectal Cancer Premature Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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Continuing a downward trend reported in the 2019 CHNA, colorectal mortality rates have seen a significant decline between 2015 (11.6 per 100,000) and 2021 (7.4 per 100,000) (Figure 59). There was no significant change in premature mortality colorectal cancer rates over this time period (Figure 60).

**Figure 59. Colorectal Cancer Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021**

![Colorectal Cancer Mortality Chart](image)

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Change over time was statistically significant (decrease over time).

**Figure 60. Colorectal Cancer Premature Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021**

![Colorectal Cancer Premature Mortality Chart](image)

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
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Liver Cancer Mortality

In 2019-2021, the liver cancer mortality rate in Boston was 6.9 per 100,000 residents (Figure 61). No HP2030 target has been set for liver cancer. The mortality rate was significantly higher among Asian (11.2 per 100,000), Black (9.5 per 100,000) and Latino (9.5 per 100,000) residents compared to White residents (4.6 per 100,000). Liver cancer mortality rates among Boston males (10.3 per 100,000) was more than twice as high as for Boston females (4.5 per 100,000). Among Boston females, the liver cancer mortality rate was significantly higher for Latino, Asian, and Black women (8.7, 7.3, and 6.7 per 100,000, respectively) compared to White women (1.9 per 100,000) (Figure 62). Among Boston males, the liver cancer mortality rate was significantly higher for Asian and Black men (16.3 and 13.9 per 100,000, respectively) compared to White men (7.9 per 100,000) (Figure 62).

Figure 61. Liver Cancer Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>6.9</td>
</tr>
<tr>
<td>Asian</td>
<td>11.2*</td>
</tr>
<tr>
<td>Black</td>
<td>9.5*</td>
</tr>
<tr>
<td>Latino</td>
<td>9.5*</td>
</tr>
<tr>
<td>White</td>
<td>4.6</td>
</tr>
<tr>
<td>Female</td>
<td>4.5*</td>
</tr>
<tr>
<td>Male</td>
<td>10.3</td>
</tr>
<tr>
<td>0-44 years old</td>
<td>NA</td>
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<tr>
<td>45-64 years old</td>
<td>9.0</td>
</tr>
<tr>
<td>65+ years old</td>
<td>39.7</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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); NA indicates data suppressed due to <5 deaths; For age stratifications, rates are age-specific rates per 100,000 residents.
Premature mortality due to liver cancer in Boston was 2.8 per 100,000 residents (Figure 63). Black residents (4.1 per 100,000) experienced significantly higher rates of premature mortality than White residents (1.9 per 100,000). Black men (5.1 per 100,000) experienced higher rates of premature mortality due to liver cancer than White men (2.0 per 100,000) (Figure 64).
Liver cancer mortality rates are significantly higher in Roxbury (11.6 per 100,000) and significantly lower in Allston/Brighton (3.3 per 100,000) compared to all of Boston (6.9 per 100,000) (Figure 65). Data about premature mortality due to liver cancer by neighborhood is unavailable in many neighborhoods due to small sample size (Figure 66).
Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); NA indicates data suppressed due to <5 deaths; * indicates rates are based on 20 or fewer deaths and should be interpreted with caution.

Figure 66. Liver Cancer Premature Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

No statistically significant liver cancer mortality trends were reported in the 2019 CHNA. However, in the time period of 2015 to 2021 shown here, liver cancer mortality rates declined significantly from 9.0 per 100,000 in 2015 to 6.4 per 100,000 in 2021 (Figure 67). Rates also declined significantly for premature mortality due to liver cancer, from 4.0 per 100,000 in 2015 to 1.6 per 100,000 in 2021 (Figure 68).

Figure 67. Liver Cancer Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021
Figure 68. Liver Cancer Premature Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Population Health and Research, Boston Public Health Commission
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Lung Cancer Mortality
The overall lung cancer mortality rate in Boston was 25.4 per 100,000 residents. This is slightly higher than the HP2030 target of 25.1 deaths per 100,000. Latino residents (14.0 per 100,000) experienced significantly lower rates than White residents (27.2 per 100,000) and females (21.5 per 100,000) experiencing significantly lower rates than males (31.0 per 100,000) (Figure 69). Among female residents, Latino women (11.6 per 100,000) experience a significantly lower lung cancer mortality rate compared to White women (26.1 per 100,000) (Figure 70). Similarly, among male residents, Latino men (17.2 per 100,000) experience a significantly lower lung cancer mortality rate compared to White men (29.3 per 100,000) (Figure 70).
Figure 69. Lung Cancer Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate per 100,000 Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>25.4</td>
</tr>
<tr>
<td>Asian</td>
<td>29.5</td>
</tr>
<tr>
<td>Black</td>
<td>29.4</td>
</tr>
<tr>
<td>Latino</td>
<td>14.0*</td>
</tr>
<tr>
<td>White</td>
<td>27.2</td>
</tr>
<tr>
<td>Female</td>
<td>21.5*</td>
</tr>
<tr>
<td>Male</td>
<td>31.0</td>
</tr>
<tr>
<td>0-44 years</td>
<td>NA</td>
</tr>
<tr>
<td>45-64 years</td>
<td>23.5*</td>
</tr>
<tr>
<td>65+ years</td>
<td>159.7</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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); NA indicates data suppressed due to <5 deaths; For age stratifications, rates are age-specific rates per 100,000 residents

Figure 70. Boston Lung Cancer Mortality, by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2019-2021 Combined

<table>
<thead>
<tr>
<th>Category</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>17.8</td>
<td>23.3</td>
<td>11.6*</td>
<td>17.2*</td>
</tr>
<tr>
<td>Male</td>
<td>44.8</td>
<td>39.6</td>
<td>29.3</td>
<td></td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Population Health and Research, Boston Public Health Commission
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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
The premature lung cancer mortality rate was 6.6 per 100,000 residents in 2015-2021 (Figure 71). Premature mortality rates among Latino (1.5 per 100,000) residents was lower than among White (7.0 per 100,000) residents while premature mortality rates among Black (9.9 per 100,000) residents was significantly higher. While there are no significant differences by race/ethnicity among female residents, Asian and Black men (11.6 and 11.6 per 100,000, respectively) have significantly higher premature lung cancer mortality rates compared to White men (6.4 per 100,000) (Figure 72).

**Figure 71. Lung Cancer Premature Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined**

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>6.6</td>
</tr>
<tr>
<td>Asian</td>
<td>7.1</td>
</tr>
<tr>
<td>Black</td>
<td>9.9*</td>
</tr>
<tr>
<td>Latino⁺</td>
<td>1.5*</td>
</tr>
<tr>
<td>White</td>
<td>7.0</td>
</tr>
<tr>
<td>Female</td>
<td>6.1</td>
</tr>
<tr>
<td>Male</td>
<td>7.1</td>
</tr>
</tbody>
</table>

**Figure 72. Boston Lung Cancer Premature Mortality, by Sex and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2019-2021 Combined**

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>3.4*</td>
</tr>
<tr>
<td>Male</td>
<td>11.6</td>
</tr>
<tr>
<td>Female</td>
<td>7.5</td>
</tr>
<tr>
<td>Male</td>
<td>6.4</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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; * indicates rates are based on 20 or fewer deaths and should be interpreted with caution.

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Population Health and Research, Boston Public Health Commission
Lung cancer mortality rates are significantly higher in South Boston (43.8 per 100,000), and Dorchester zip codes 02122 and 02124 (32.5 per 100,000) compared to Boston overall (25.4 per 100,000) and significantly lower in Back Bay (18.5 per 100,000) (Figure 73). Premature deaths due to lung cancer are significantly higher in Dorchester zip codes 02121 and 02125 (14.1 per 100,000) compared to all of Boston (6.6 per 100,000) (Figure 74).

**Figure 73. Lung Cancer Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined**
Figure 74. Lung Cancer Premature Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>2019 Rate</th>
<th>2020 Rate</th>
<th>2021 Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>6.6</td>
<td>NA</td>
<td>3.9</td>
</tr>
<tr>
<td>Allston/Brighton</td>
<td>NA</td>
<td>10.8</td>
<td>NA</td>
</tr>
<tr>
<td>Back Bay*</td>
<td>NA</td>
<td>14.1</td>
<td>*</td>
</tr>
<tr>
<td>Charlestown</td>
<td>4.1</td>
<td>5.8</td>
<td>6.6</td>
</tr>
<tr>
<td>Dorchester (02121, 02125)</td>
<td>3.4</td>
<td>6.3</td>
<td>4.2</td>
</tr>
<tr>
<td>Dorchester (02122, 02124)</td>
<td>5.8</td>
<td>5.8</td>
<td>7.2</td>
</tr>
<tr>
<td>East Boston*</td>
<td>6.3</td>
<td>5.8</td>
<td>8.3</td>
</tr>
<tr>
<td>Fenway*</td>
<td>6.6</td>
<td>5.8</td>
<td>6.6</td>
</tr>
<tr>
<td>Hyde Park*</td>
<td>4.1</td>
<td>5.8</td>
<td>6.6</td>
</tr>
<tr>
<td>Jamaica Plain*</td>
<td>3.4</td>
<td>6.3</td>
<td>4.2</td>
</tr>
<tr>
<td>Mattapan*</td>
<td>4.2</td>
<td>5.8</td>
<td>8.3</td>
</tr>
<tr>
<td>Roslindale*</td>
<td>7.2</td>
<td>5.8</td>
<td>8.3</td>
</tr>
<tr>
<td>Roxbury*</td>
<td>8.3</td>
<td>5.8</td>
<td>NA</td>
</tr>
<tr>
<td>South Boston*</td>
<td>6.6</td>
<td>5.8</td>
<td>7.2</td>
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<tr>
<td>South End*</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>West Roxbury*</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); * indicates rates are based on 20 or fewer deaths and should be interpreted with caution; NA indicates data suppressed due to <5 deaths

Continuing a downward trend reported in the 2019 CHNA, lung cancer mortality rates in Boston have declined significantly between 2015 (34.3 per 100,000) and 2021 (24.9 per 100,000) (Figure 75). The premature mortality rate also declined significantly between 2015 (11.8 per 100,000) and 2021 (6.7 per 100,000) (Figure 76).
Figure 75. Lung Cancer Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Population Health and Research, Boston Public Health Commission
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Change over time was statistically significant (decrease over time)

Figure 76. Lung Cancer Premature Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Population Health and Research, Boston Public Health Commission
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; Change over time was statistically significant (decrease over time)
Prostate Cancer Mortality

The cancer mortality rate for prostate cancer in Boston was 21.5 per 100,000 residents in 2019-2021. This is higher than the HP2030 rate of 16.9 prostate cancer deaths per 100,000. Prostate cancer rates were significantly and dramatically higher for Black males (43.7 per 100,000) compared to White males (17.6 per 100,000) (Figure 77). This substantial difference was also noted in the 2016 CHNA and the 2019 CHNAs, when the rate was also significantly higher for Black males (49.8 per 100,000) compared to White (19.1 per 100,000). The premature mortality rate for prostate cancer in Boston overall was 1.5 per 100,000 residents in 2017-2021 (Figure 78).

Figure 77. Male Prostate Cancer Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined

<table>
<thead>
<tr>
<th></th>
<th>Age-Adjusted Rate per 100,000 Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>21.5</td>
</tr>
<tr>
<td>Asian</td>
<td>11.3</td>
</tr>
<tr>
<td>Black</td>
<td>43.7*</td>
</tr>
<tr>
<td>Latino</td>
<td>19.7</td>
</tr>
<tr>
<td>White</td>
<td>17.6</td>
</tr>
</tbody>
</table>

0-44 years old | NA  
45-64 years old* | 6.0*  
65+ years old | 142.1

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; 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; " indicates rates are based on 20 or fewer deaths and should be interpreted with caution; NA indicates data suppressed due to <5 deaths

Figure 78. Male Prostate Cancer Premature Mortality, by Boston and Selected Indicators, Age-Adjusted Rate per 100,000 Residents, 2017-2021 Combined

<table>
<thead>
<tr>
<th></th>
<th>Age-Adjusted Rate per 100,000 Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>1.5</td>
</tr>
<tr>
<td>Asian</td>
<td>NA</td>
</tr>
<tr>
<td>Black</td>
<td>3.6*</td>
</tr>
<tr>
<td>Latino</td>
<td>2.4</td>
</tr>
<tr>
<td>White</td>
<td>NA</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2019-2021
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
Looking across Boston neighborhoods, prostate cancer mortality rates are highest in Hyde Park (58.1 per 100,000) and Mattapan (45.6 per 100,000) (Figure 79). However, there are no statistically significant differences in male prostate cancer mortality across neighborhoods. Data about premature mortality are not available at the neighborhood level due to small sample size.

**Figure 79. Male Prostate Cancer Mortality, by Boston and Neighborhood, Age-Adjusted Rate per 100,000 Residents, 2019-2021 Combined**

Similar to the 2019 CHNA (which examined change over time between 2011 and 2017), prostate cancer mortality rates and premature mortality rates have not changed significantly in Boston between 2015 and 2021 (Figure 80 and Figure 81).
Figure 80. Male Prostate Cancer Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2015-2021
DATA ANALYSIS: Population Health and Research, Boston Public Health Commission
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.

Figure 81. Male Prostate Cancer Premature Mortality, by Boston and Over Time, Age-Adjusted Rate per 100,000 Residents, 2015-2021

DATA SOURCE: Massachusetts Department of Public Health, Boston Resident Deaths, 2016-2020
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Massachusetts Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events; * indicates rates are based on 20 or fewer deaths and should be interpreted with caution; † 2018 data suppressed due to <5 deaths.
CANCER SURVIVORSHIP SERVICES AND RESOURCES

Support Groups
Some focus group participants discussed support groups as an important resource, particularly when going through the cancer treatment process, and many participated in remote support groups due to the ongoing pandemic. They noted that support groups provide a space to share the highs and lows of their cancer experiences and to grow their systems of support, with whom they described being in regular communication. Some participants noted that technological barriers can limit support group participation for older residents. Citing the importance of support groups, one key informant noted that “Not enough doctors are referring to support groups as a part of treatment.” Additionally, some focus group participants noted that social workers were a helpful resource.

General Digital Access
Key informants and cancer survivors described an increase in virtual communications, including remote support groups and remote community discussions. Key informants discussed a variation in participation for remote programs and support groups when organizations transitioned to virtual meetings due to the COVID-19 pandemic, noting that in some cases participation increased and in other cases participation declined. Some focus group participants described online platforms as important sources of community news and cancer-related resources such as recommendations for how to get wigs.

Several 2022 Dana-Farber CHNA participants thought that most communities have access to digital resources. Key informants emphasized several barriers to digital access, including lacking regular access to the internet, computers, and smart phones and limited digital literacy (e.g., how to access online resources, download and use apps) and comfort using technology. Older adults and low-income households emerged in key informant discussions as populations who experience significant digital barriers. Some participants noted that residents may have access to computers and smart phones but may not know how to use them well. One key informant also described participation in remote activities as distinct from in-person community-building efforts: “We used to meet in person and the women enjoyed that level of socialization and comradesry. COVID put us in virtual mode and what I have noticed is that over the time of the pandemic we have had less participation. Women have begun to drift away from the organization.”

COVID-19 Pandemic Restricts Access to Cancer Survivorship Resources
One key informant discussed how COVID-19 protocols, such as reduced operating hours, capacity restrictions, and receipt of services by appointment made it more difficult for cancer patients to access cancer-related self-care products and wigs.

“Meetings were conducted virtually, and attendance numbers actually went up. However, there were issues with people who didn’t have internet access, as well as those who were not computer savvy. Did we miss the ones we most want to serve?” – Key informant
COMMUNITY SUGGESTIONS FOR THE FUTURE: CANCER-FOCUSED INITIATIVES, PROGRAMS, & SERVICES

Participants in the 2022 Dana-Farber CHNA shared several ideas for developing and improving access to cancer prevention services and resources and strengthening initiatives, programs, and services focused on cancer screening, cancer treatment and care, and survivorship.

Develop and Improve Access to Cancer and Chronic Disease Prevention Services or Resources

- **Improve Access to Health Care Including Addressing Systemic Racism:** Participants discussed the importance of improving access to primary care; cancer screenings; mental health care for cancer patients, caregivers, and their families; and addressing delays in health care. Key informants emphasized the importance of ramping up cancer screenings that have been delayed due to the COVID-19 pandemic, basing cancer screenings in low-income communities, making cancer screenings available during the evenings and weekends for residents who cannot take time off of work, and hiring bilingual staff. Some cancer patients and survivors recommended providing mental health resources within the hospital setting where they were getting treatment, which they also noted would be helpful for the physical and emotional challenges of cancer treatments.

The Black Boston 2022 Report identified several recommendations to address systemic racism in health care institutions to promote the health of Black communities. A key recommended priority involves building a health care culture that centers racial equity by creating space for institutions and members to work together to learn about and become leaders in racial equity. The Report also recommends developing a process – within and across organizations – to deepen understanding about how systemic racism shapes health inequities and take action to improve the social determinants of health and health of Boston’s Black community. Another recommendation included investing in models that prepare Black community members to affect positive change within the health care system and prioritizing health care access for Black communities who are uninsured and experience poverty by concentrating high quality healthcare in predominantly Black neighborhoods.

- **Diversify and Train Health Professionals to Provide Multilingual and Culturally Sensitive Services:** Diversifying health care workforce and hiring and training bilingual and culturally responsive providers and staff across the cancer spectrum was a key theme across discussions. Participants cited the importance of diversifying and providing cultural sensitivity training to doctors and a range of support staff, including cancer screening staff and medical and treatment appointments. The Black Boston 2022 Report recommended expanding the number of health care professionals and leadership who identify as Black and people of color and who would bring important lived experience and understanding of how to talk with patients of color.

- **Develop Gender-Inclusive Practices:** To address health care systems-level factors that contribute to cancer inequities among LGBTQIA+ communities, recommendations from experts in the wellbeing of sexual and gender minoritized communities include developing gender-inclusive practices that do...
not gender cancer screening, diagnosis, and treatment such as focusing on cancer sites and body parts when referring to cancer and cancer resources (e.g., “women’s health center” vs. “breast health center”), being aware of biases that can affect assessing and addressing health care needs, developing resources to support LGBTQIA+ populations after cancer treatment, and asking about sexual orientation and gender identity when relevant and treating this as sensitive information.

**Encourage People to Resume Cancer Screenings**

- **Improve Health Literacy and Communication Regarding Cancer Prevention and Screening:** Some cancer patients, survivors, caregivers, and organizational staff called for community conversations about early detection and cancer screening, factors that contribute to high cancer rates in certain racial/ethnic populations, nutrition education, physical activity resources for cancer prevention and for cancer patients and survivors, and support in identifying cancer-related questions to ask providers. Tailoring prevention and screening efforts to reach men and LGBTQIA+ populations also emerged as a priority. Participants noted that these discussions need to be available in residents’ primary languages and at community-based locations (e.g., faith-based organizations). Other recommendations to improve cancer screening included mentioning providers’ COVID-19 safety protocols to address patients’ concerns about COVID exposures and making breast cancer screening gender neutral (e.g., label as “breast center” vs. “women’s center,” offer non-pink gowns). Recommended modes for communicating cancer screening availability included: word of mouth, pamphlets, flyers, television, social media. Stakeholders engaged in the 2019 Massachusetts Department of Public Health Assessment of Colorectal Cancer Screening Attitudes and Practices among Asian Communities in Massachusetts recommended partnering with cultural organizations and ethnic media to develop a strategy to improve health education about colorectal cancer and screening.

- **Enhance Funding:** Key informants cited the need for funding to support cancer prevention and early detection initiatives and emphasized the importance of supporting smaller community-based groups through grant opportunities and facilitating networking.

**Expand Initiatives or Services to Support Access to Cancer Treatment and Survivorship**

- **Financial, Childcare, and Transportation Support:** Organizational staff, cancer patients, survivors, and caregivers provided several recommendations to lessen the financial strain of cancer care, including providing free or low-cost childcare for cancer patients, providing or directing patients to financial assistance, connecting survivors to financial resources to save their housing, and connecting patients with community-based initiatives that provide fresh produce. Participants also recommended providing free transportation to medical and cancer treatment appointments and simplifying transportation services for patients who are not fluent in English.
• **Partner with Communities and Increase and Institutionalize Lay Health Worker Models:** Key informants and some focus group participants recommended growing community health worker and patient navigator models and integrating them across the cancer continuum. To institutionalize lay health worker models, they suggested integrating these models into operational budgets, rather than funding in a piecemeal fashion with grants. Relatedly, the Black Boston 2022 Report recommended that health care institutions authentically partner with Black communities to develop strategies to improve the health of Black residents.

• **Increase Access to and Information about Resources Available to Cancer Patients and Their Caregivers:** Some participants recommended improving access to and information about resources such as prescription medications to address cancer treatment side effects and resources typically concentrated outside of the healthcare sector, such as support with housing, transportation, and nutritional assistance. One caregiver cited the importance of making cancer education more accessible so that caregivers understand what cancer patients might experience during their treatment, how to support patients during their treatment, and preparing for end of life. Finally, while some participants perceived that cancer information was available, they were not familiar with how to access it or would have appreciated receiving it earlier in their cancer journey.

• **Improve Awareness of and Access to Support Groups:** Cancer patients, survivors, caregivers, and organizational staff discussed the importance of improving awareness of and access to support groups, particularly support groups that are culturally responsive and available in residents’ primary languages, led by affected groups (e.g., Haitian-led support groups), and available to LGBTQIA+ communities. They recommended that providers refer cancer patients to support groups early in their diagnosis and treatment, and that hospital staff remind patients of available resources when scheduling and confirming appointments. Support groups for family members of cancer patients also emerged as a recommendation, as family members may not fully understand the experiences of cancer patients, may be stressed by the diagnosis, and may struggle to access cancer information that cancer patients.

• **Support for Survivors:** To better support cancer survivors, one recommendation involved incorporating a post-treatment assessment of the social determinants of health to ensure a strong clinical follow-up plan and provide continuity of support after treatment. Additionally, as noted above, another recommendation was to develop resources to support LGBTQIA+ survivors.

• **Accurate Data Collection and Reporting for Marginalized Populations:** Some key informants recommended accurate data collection and analysis of data pertaining to sexual orientation and gender identity minoritized populations and marginalized racial/ethnic groups. They noted the importance of data reporting by trained analysts who are structurally and culturally responsive and sharing these findings with communities who are disproportionately affected by cancer.

“...support groups to socialize and connect with others who have survived and shared their same experiences.”—Key informant

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KEY THEMES

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

- While cancer mortality rates have declined in recent years, cancer remains a leading cause of death in Boston. There are significant disparities in mortality compared to White residents:

  **Black residents**
  - Highest rates of overall cancer mortality
  - Significantly higher rates of breast, colorectal and liver cancer mortality
  - Black men have a significantly higher lung cancer mortality rate
  - Significantly higher prostate cancer mortality that continues to be 2.5 times that of White men

  **Asian residents**
  - Significantly higher liver cancer mortality rates
  - Asian men have a significantly higher lung cancer mortality rate which is still the single highest mortality rate across all groups for all 5 cancer types included in this CHNA

  **Latina women**
  - Significantly higher liver cancer mortality rate

- Despite overall declines in mortality rates, disparities persist since some groups do not have declining mortality rates.

  There has been no significant change for prostate cancer mortality rates from 2015 to 2021. During this period the overall cancer mortality rate and the mortality rates for breast, colorectal, liver, and lung cancer have declined significantly for all residents combined. However, younger adults under age 65 did not have a decline in cancer mortality during this period. Despite overall improvements, it is also critical to acknowledge that some populations have not had these cancer mortality declines:

  o **Black and Latino** residents did not have a decline in mortality rates for breast and liver cancer.
  o **Asian** residents did not have a decline in mortality rates for breast and lung cancer.

- Breast and prostate cancers continue to be the most frequent types of cancer diagnosed in Boston and prostate mortality rates have not improved. White and Black women have the highest incidence of breast cancer and Black men have the highest incidence of prostate cancer, more than double that of White men. Additionally, disparities in incidence rates exist across the following groups compared to White residents:

  o Colorectal cancer incidence rates are significantly higher for **Black** residents, consistent with the 2019 CHNA.
  o Liver cancer incidence rates are significantly higher for **Black, Asian** and **Latina** residents
  o Prostate cancer incidence rates are significantly higher for **Black men**, consistent with 2019 CHNA.
• Despite a continued downward trend in cancer incidence rates, inequities remain. Between 2010 and 2018 incidence rates for cancer overall and for colorectal, lung, and prostate cancers have declined significantly while incidence rates for liver and breast cancer have remained relatively stable. White, Black, Latino and Asian residents had a significant decline in overall cancer incidence rates, but importantly, incidence rates have not declined for the following groups and cancer types:
  o Colorectal cancer incidence rates have not declined among Asian males, Latina females and Black males.
  o Lung cancer incidence rates have not declined among Asian residents, Latino residents and Black females.
  o Prostate cancer incidence rates have not declined among Asian males.

• The COVID-19 pandemic has had a substantial impact on cancer screening, cancer care, support for cancer patients, and the mental health needs of cancer patients and their caregivers. COVID-19 disrupted in-person screening programs, caused some residents to delay screenings due to fear of contracting the virus, resulted in long wait times for screening and treatment appointments (including to see specialists), and led to policies that restricted loved ones from accompanying patients to appointments. Some participants found telemedicine convenient in some cases, while others emphasized the importance of in-person doctor’s appointments and noted that older adults and those with low-incomes often have difficulty accessing telemedicine. Additionally, CHNA participants noted that, for immunocompromised cancer patients and survivors, the pandemic led to high levels of stress and anxiety about leaving home as well as isolation and depression. Encouraging residents to resume screenings in the context of the ongoing pandemic is a priority for future work.

• While some screening rates have remained stable or improved, barriers to screening remain. Fear of cancer diagnosis and difficulty taking time off work were identified as barriers to screening, consistent with the 2019 CHNA. Lower screening rates and barriers for certain populations were also identified:
  o Asian Residents: The percentage of Asian adults reporting having ever had a colonoscopy or sigmoidoscopy is significantly lower compared to White adults, as it was in the 2019 Dana-Farber CHNA.
  o Immigrant Communities: CHNA participants described barriers to screening for immigrant communities including limited experiences with and knowledge about preventive care, particularly among Asian immigrant communities, and language barriers (noted by Asian and Spanish-speaking participants). According to 2015-2019 BBRFSS data, fewer than half of immigrants who have lived in the US for less than 10 years (48.7%) had a primary care provider, which is nearly half the prevalence seen for US-born adults (86.4%).
  o Sexual and Gender Minoritized People: In 2021, an estimated 7.1% of the US population – or 20 million people – self-identified as lesbian, gay, bisexual, transgender, or not heterosexual. Studies indicate that sexual and gender minoritized communities are less likely to have a regular primary care provider and to get cancer screening. A 2022 Dana-Farber CHNA participant noted that use of non-gendered language can encourage screening.

• The COVID-19 pandemic exacerbated already difficult social and economic conditions that negatively impact cancer prevention, screening, and treatment. In particular, the pandemic has worsened the following:
  o Income inequalities. Cancer treatment can carry extreme financial costs.
Job/income loss. Some survivors lost jobs or left due to health concerns about in-person work.

Food insecurity. It’s difficult to obtain food and especially healthy food during cancer treatment.

Housing. Increased medical costs, job loss or reduced work during cancer treatment makes it harder to afford housing and lead to fears about losing housing.

Transportation. Long distances to medical facilities can be a barrier to screening and treatment and is exhausting for those undergoing treatment.

- Data on smoking, obesity, physical activity, healthy food access and alcohol indicate that some Boston residents are at increased risk for cancer. Certain groups smoke at higher rates such as Black residents, renters with assistance, low-income, those with less than a high school education and over 30% of those out of work. Obesity continues to be a concern with over half of Boston adults reporting as overweight or obese and certain neighborhoods such as Mattapan and Dorchester have particularly high rates of obesity. Black and Latino residents and those with low-incomes report higher obesity rates. Healthy food is difficult to access for some; seven Boston neighborhoods have areas with limited grocery stores. Some groups such as those with a low income, those with low educational attainment, Black residents and immigrants have a concerning combination of cancer risk factors with more smoking, more obesity and less physical activity. Alcohol mortality appears to have spiked among Black residents as it more than doubled from 2019-2020 and should be monitored over time.

- Access to health care services is vitally important for cancer prevention and treatment and some residents continue to face barriers to accessing services. In addition to the challenges related to the COVID-19 pandemic described above, CHNA participants described barriers related to health insurance and costs and challenges navigating complex systems especially when working with multiple specialists. Participants also noted that the limited time spent with health care providers creates challenges related to understanding cancer diagnoses and building trusting relationships. Additionally, participants described a need for more providers who deliver culturally responsive care, particularly for immigrant communities and communities of color. Many of these themes were also present in the 2019 Dana-Farber CHNA.

- To improve access to health care across the cancer spectrum, CHNA participants recommended addressing systemic racism and biases and developing gender-inclusive practices and data reporting. Cancer patients and survivors of color shared experiences of having their health concerns dismissed by providers before being diagnosed with cancer, doctors talking down to them, not being informed about all of their cancer treatment options, and feeling disrespected, which they experienced as racism.
  - The Black Boston 2022 Report identified several recommendations to address systemic racism in health care institutions to promote the health of Black communities, as discussed further in the Community Suggestions for the Future section above.
  - Additionally, diversifying health care workforce and hiring and training bilingual and culturally responsive providers and staff across the cancer spectrum was a key theme.
  - Specific recommendations for developing gender-inclusive practices included: focusing on cancer sites and body parts when referring to cancer and cancer resources (e.g., “breast health center” instead of “women’s health center”), being aware of biases, and developing resources to support LGBTQIA+ populations after cancer treatment.
Accurate collection and analysis of data pertaining to sexual orientation and gender identity minoritized populations and marginalized racial/ethnic groups was also recommended.

Participants also offered recommendations on expansion of specific services and initiatives to support patients and caregivers across the cancer continuum.

- Similar to the 2019 Dana-Farber CHNA, participants recommended expanding support groups for both patients and caregivers and also recommended integrating community health worker and patient navigator models across the cancer continuum.
- Holding multilingual community conversations on the topic of cancer, providing financial support to cancer patients, offering educational resources to caregivers, and developing resources to support LGBTQIA+ survivors were other specific recommendations.
- While the need for encouraging diverse representation in clinical trials was identified in the 2019 Dana-Farber CHNA, this was not a prominent theme in the 2022 Dana-Farber CHNA.

In synthesizing the data described in this CHNA, certain populations, including Black residents, Asian residents, and Latina women appear to have disproportionately higher levels of cancer burden and risk, warranting increased attention. Additionally, immigrants and residents with low incomes tend to have particularly difficult social determinants of health, higher rates of health risk behaviors and are less engaged in the health care system. Furthermore, the data confirms the need to prioritize efforts in Dana-Farber’s priority neighborhoods while also pointing to emerging areas of need in neighborhoods such as South Boston, Hyde Park and East Boston that may warrant additional consideration.

CONCLUSION AND ACKNOWLEDGEMENTS

Cancer remains a leading cause of death in Boston. While the CHNA findings indicate that collective efforts to advance cancer screening and prevention are making a difference, the overall burden of cancer across all types is significant 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 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), Roxbury Tenants of Harvard, Enhance Asian Community on Health, Boston Public Health Commission, Boston Breast Cancer Equity Coalition, Asian Women for Health and Dana-Farber’s External Advisory Committee members, among others, for their collaboration and support. In addition, we want to thank the organizations that participated in the Collaborative Boston CHNA/CHIP process. Please see http://www.bostonchna.org/ for a full list of organizations engaged in this process.

Approved by DFCI Trustees: 9/13/2022
Approved by External/DoN Advisory Committee: 9/15/22
APPENDIX A. ADDITIONAL DATA TABLES

Appendix A.1 BEHAVIORAL HEALTH

Figure 1. Percent Adults Reporting Experiencing an Income Loss During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting their household had experienced a loss of employment income since COVID-19 occurred; 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
Figure 2. Percent Adults Reporting Food Purchased Did Not Last and Did Not Have Money to Get More, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting it was sometimes or often true that the food didn’t last and they did not have money to get more; 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
For race/ethnicity, of the 201 respondents classified as Other, non-Hispanic, 23% identified as American Indian/Alaskan Native. The remainder are either multi-race or some other race.

Figure 3. Percent Adults Reporting Utilizing Food Assistance Services During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Food assistance services include food banks, food stamps, or other sources; 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

Figure 4. Percent Adults Reporting Working Outside of the Home During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting they worked at least part of the time at a workplace outside of home since the COVID-19 pandemic began; Percentage does not include adults who did not work for pay at all; Bars with pattern indicate reference group for its specific category; No significant differences compared to reference groups within specific categories were observed (p>0.05); Error bars show 95% confidence interval
Figure 5. Percent Adults with Children Reporting Having Unmet Education Needs for Children or Teens in Household During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: NA denotes where data are not available because only respondents who indicated having at least one child present in the household were asked this question; 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

Figure 6. Percent Adults Reporting Having Trouble Paying Their Rent or Mortgage During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
Figure 7. Percent Adults Reporting Being Threatened At Least a Few Times a Month Due to Discrimination, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

<table>
<thead>
<tr>
<th>Category</th>
<th>Threatened At Least a Few Times a Month Due to Discrimination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>6.4%</td>
</tr>
<tr>
<td>Asian</td>
<td>5.0%</td>
</tr>
<tr>
<td>Black</td>
<td>9.5% *</td>
</tr>
<tr>
<td>Latino</td>
<td>8.2% *</td>
</tr>
<tr>
<td>Other</td>
<td>9.1%</td>
</tr>
<tr>
<td>White</td>
<td>4.4%</td>
</tr>
<tr>
<td>Less than HS graduate</td>
<td>9.9% *</td>
</tr>
<tr>
<td>HS graduate</td>
<td>6.9%</td>
</tr>
<tr>
<td>Some college or more</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting being threatened or harassed due to discrimination a few times a month, at least once a week, or almost every day; 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
For race/ethnicity, of the 201 respondents classified as Other, non-Hispanic, 23% identified as American Indian/Alaskan Native. The remainder are either multi-race or some other race.
Figure 8. Percent Adults Reporting Persistent Sadness During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>16.8%</td>
</tr>
<tr>
<td>Asian</td>
<td>6.9%</td>
</tr>
<tr>
<td>Black</td>
<td>12.4%</td>
</tr>
<tr>
<td>Latino</td>
<td>27.3%</td>
</tr>
<tr>
<td>Other</td>
<td>11.4%</td>
</tr>
<tr>
<td>White</td>
<td>17.0%</td>
</tr>
<tr>
<td>At least one child in home</td>
<td>17.1%</td>
</tr>
<tr>
<td>No children in home</td>
<td>16.8%</td>
</tr>
</tbody>
</table>

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Persistent sadness is defined as feeling down, depressed or hopeless for more than half of the days within the past 2 weeks; Bars with pattern indicate reference group for its specific category; No significant differences compared to reference groups within specific categories were observed (p>0.05); Error bars show 95% confidence interval

Figure 9. Percent Adults Reporting Not Seeking Mental Health Care Due to Cost During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>7.1%</td>
</tr>
<tr>
<td>Asian</td>
<td>7.0%</td>
</tr>
<tr>
<td>Black</td>
<td>3.9%</td>
</tr>
<tr>
<td>Latino</td>
<td>9.7%</td>
</tr>
<tr>
<td>Other</td>
<td>5.9%</td>
</tr>
<tr>
<td>White</td>
<td>7.8%</td>
</tr>
<tr>
<td>18-34 years old</td>
<td>10.5%</td>
</tr>
<tr>
<td>35-64 years old</td>
<td>4.8%</td>
</tr>
<tr>
<td>65+ years old</td>
<td>3.5%</td>
</tr>
<tr>
<td>Less than $25,000</td>
<td>10.3%</td>
</tr>
<tr>
<td>$25,000-$50,000</td>
<td>9.0%</td>
</tr>
<tr>
<td>More than $50,000</td>
<td>4.4%</td>
</tr>
<tr>
<td>At least one child in home</td>
<td>5.0%</td>
</tr>
<tr>
<td>No children in home</td>
<td>7.9%</td>
</tr>
</tbody>
</table>

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Data show percentage of adults reporting there was a time when they needed to see a mental health professional but could not because of cost since March 1, 2020; Bars with pattern indicate reference group for its specific category; No significant differences compared to reference groups within specific categories were observed (p>0.05); Error bars show 95% confidence interval.

Figure 10. Percent Adults Reporting Smoking, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: “Other” includes: student, retired, homemaker, unable to work. 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.
Figure 11. Percent Boston Adults Reporting Smoking, 2013-2019

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval. Asterisk (*) indicates change over time was statistically significant (decrease over time)

Figure 12. Percent Adults Reporting Smoking, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05). Error bars show 95% confidence interval.
Figure 13. Percent Adults Reporting Increased Drinking Habits During the COVID-19 Pandemic, by Boston and Selected Indicators, December 2020-January 2021

DATA ANALYSIS: Boston Public Health Commission, Research and Evaluation Office
NOTES: Increased drinking habits is defined as increased weekly alcohol intake or started drinking and did not before since March 1, 2020; 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
Figure 14. Percent Adults Reporting Heavy Drinking, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Heavy drinking refers to consuming over 60 drinks for males and over 30 drinks for females in the past 30 days. "Other" includes: student, retired, homemaker, unable to work. 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; NA denotes where rates are not shown due to insufficient sample size
Figure 15. Percent Boston Adults Reporting Heavy Drinking, 2013-2019

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Heavy drinking refers to consuming over 60 drinks for males and over 30 drinks for females in the past 30 days. Error bars show 95% confidence interval.

Figure 16. Percent Adults Reporting Heavy Drinking, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Heavy drinking refers to consuming over 60 drinks for males and over 30 drinks for females in the past 30 days; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval
Figure 17. Percent Adults Reporting Binge Drinking, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Binge drinking refers to consuming over 5 drinks for males and over 4 drinks for females in one setting within the past 30 days. "Other" includes: student, retired, homemaker, unable to work. 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.
Figure 18. Percent Boston Adults Reporting Binge Drinking, 2013-2019

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Binge drinking refers to consuming over 5 drinks for males and over 4 drinks for females in one setting within the past 30 days; Error bars show 95% confidence interval

Figure 19. Percent Adults Reporting Binge Drinking, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Binge drinking refers to consuming over 5 drinks for males and over 4 drinks for females in one setting within the past 30 days; Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval.

Figure 20. Percent Adults Reporting Being Overweight or Obese, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: “Other” includes: student, retired, homemaker, unable to work. 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.
Figure 21. Percent Boston Adults Reporting Being Overweight or Obese, 2013-2019

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval

Figure 22. Percent Adults Reporting Being Overweight or Obese, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05). Error bars show 95% confidence interval
Figure 23. Percent Adults Reporting Meeting CDC Guidelines for Physical Activity, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: "Other" includes: student, retired, homemaker, unable to work. 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.
Figure 24. Percent Boston Adults Reporting Meeting CDC Guidelines for Physical Activity, 2013-2019

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval; Asterisk (*) indicates change over time was statistically significant (decrease over time)

Figure 25. Percent Adults Reporting Meeting CDC Guidelines for Physical Activity, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05). Error bars show 95% confidence interval
Appendix A. 2 CANCER SCREENING

Figure 26. Percent Adults (Aged 50-75 Years) Reporting Having Ever Had a Colonoscopy or Sigmoidoscopy, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
Other Screenings

NOTES: Bars with pattern indicate reference group for its specific category; "Other" includes: student, retired, homemaker, unable to work. Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05); Error bars show 95% confidence interval.
Figure 27. Percent Adults (Aged 50-75 Years) Reporting Having Ever Had a Colonoscopy or Sigmoidoscopy, 2013-2019

![Graph showing percent adults reporting colonoscopy or sigmoidoscopy by year from 2013 to 2019. The graph shows a trend of increasing percent reporting, with values ranging from 77.0% in 2013 to 79.4% in 2019.]

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval

Figure 28. Percent Adults (Aged 50-75 Years) Reporting Having Ever Had a Colonoscopy or Sigmoidoscopy, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

![Bar chart showing percent adults reporting colonoscopy or sigmoidoscopy by neighborhood. The chart includes data for various neighborhoods, such as Dorchester, Charlestown, and East Boston, with percentage values shown for each year.]

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval
Figure 29. Percent Female Adults (Aged 50-74 Years) Reporting Having Had a Mammogram in Past Two Years, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Bars with pattern indicate reference group for its specific category; “Other” includes: student, retired, homemaker, unable to work; Asterisk (*) denotes where estimate was significantly different compared to reference group within specific category (p <0.05); Error bars show 95% confidence interval; NA denotes where rates are not shown due to insufficient sample size
**Figure 30. Percent Female Boston Adults (Aged 50-74 Years) Reporting Having Had a Mammogram in Past Two Years, 2013-2019**

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval

**Figure 31. Percent Female Adults (Aged 50-74 Years) Reporting Having Had a Mammogram in Past Two Years, by Boston and Neighborhood, 2015, 2017, and 2019 Combined**

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval
Figure 32. Percent Adults Reporting Having a Personal Doctor or Health Care Provider, by Boston and Selected Indicators, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: “Other” includes: student, retired, homemaker, unable to work. 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.
Figure 33. Percent Adults Reporting Having a Personal Doctor or Health Care Provider, 2013-2019

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Error bars show 95% confidence interval

Figure 34. Percent Adults Reporting Having a Personal Doctor or Health Care Provider, by Boston and Neighborhood, 2015, 2017, and 2019 Combined

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTES: Asterisk (*) denotes where neighborhood estimate was significantly different compared to all of Boston (p < 0.05); Error bars show 95% confidence interval
Appendix A.4 CANCER INCIDENCE RATES OVER TIME

Figure 35. All Cancer Incidence Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>496.7</td>
<td>498.4</td>
<td>470.6</td>
<td>477.9</td>
<td>448.9</td>
<td>467.5</td>
<td>438.6</td>
<td>401.0</td>
<td>415.7</td>
</tr>
<tr>
<td>Asian</td>
<td>370.8</td>
<td>393.4</td>
<td>307.7</td>
<td>348.8</td>
<td>309.6</td>
<td>350.4</td>
<td>339.3</td>
<td>290.4</td>
<td>287.1</td>
</tr>
<tr>
<td>Black</td>
<td>550.1</td>
<td>576.7</td>
<td>542.7</td>
<td>561.8</td>
<td>529.0</td>
<td>560.6</td>
<td>560.2</td>
<td>463.2</td>
<td>512.4</td>
</tr>
<tr>
<td>Latino</td>
<td>433.9</td>
<td>388.3</td>
<td>424.2</td>
<td>355.9</td>
<td>343.9</td>
<td>340.3</td>
<td>346.5</td>
<td>325.3</td>
<td>333.5</td>
</tr>
<tr>
<td>White</td>
<td>531.1</td>
<td>520.9</td>
<td>492.2</td>
<td>515.8</td>
<td>495.1</td>
<td>496.2</td>
<td>466.0</td>
<td>449.0</td>
<td>434.9</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston overall and all race/ethnicities (decrease over time)
Figure 36. Male All Cancer Incidence Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

Data Source: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2018
Data Analysis: Boston Public Health Commission, Population Health and Research
Note: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston overall and all race/ethnicities (decrease over time)
Figure 37. Female All Cancer Incidence Rate Over Time, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston overall and for White and Latino females (decrease over time)
**Figure 38. Female Breast Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018**

![Graph showing breast cancer incidence rates by Boston and race/ethnicity from 2010 to 2018.]

<table>
<thead>
<tr>
<th></th>
<th>2010-2012</th>
<th>2013-2015</th>
<th>2016-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>122.5</td>
<td>129.6</td>
<td>123.7</td>
</tr>
<tr>
<td>Asian</td>
<td>107.7</td>
<td>77.5</td>
<td>88.0</td>
</tr>
<tr>
<td>Black</td>
<td>126.3</td>
<td>147.7</td>
<td>138.3</td>
</tr>
<tr>
<td>Latino</td>
<td>95.4</td>
<td>92.8</td>
<td>96.5</td>
</tr>
<tr>
<td>White</td>
<td>139.5</td>
<td>149.4</td>
<td>145.6</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: No significant change over time
Figure 39. Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

<table>
<thead>
<tr>
<th></th>
<th>2010-2012</th>
<th>2013-2015</th>
<th>2016-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>42.3</td>
<td>40.0</td>
<td>28.7</td>
</tr>
<tr>
<td>Asian</td>
<td>40.6</td>
<td>31.3</td>
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<td>White</td>
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DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston overall and for all race/ethnicities (decrease over time)
Figure 40. Male Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston males overall and for Latino males (decrease over time)
Figure 41. Female Colorectal Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston females overall and for Black, White, and Asian females (decrease over time)
Figure 42. Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

![Liver Cancer Incidence Rate Chart](image)

<table>
<thead>
<tr>
<th></th>
<th>2010-2012</th>
<th>2013-2015</th>
<th>2016-2018</th>
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</thead>
<tbody>
<tr>
<td>Boston</td>
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<tr>
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<td>19.0</td>
<td>13.8</td>
<td>11.7</td>
</tr>
<tr>
<td>White</td>
<td>9.8</td>
<td>10.8</td>
<td>9.3</td>
</tr>
</tbody>
</table>

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Latino residents (decrease over time)

Figure 43. Male Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

![Male Liver Cancer Incidence Rate Chart](image)

<table>
<thead>
<tr>
<th></th>
<th>2010-2012</th>
<th>2013-2015</th>
<th>2016-2018</th>
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<tbody>
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<tr>
<td>White</td>
<td>15.1</td>
<td>16.1</td>
<td>15.3</td>
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</table>

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Latino males (decrease over time)
Figure 44. Female Liver Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); No significant changes over time; + indicates rates are based on 20 or fewer deaths and should be interpreted with caution

Figure 45. Lung Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
Figure 46. Male Lung Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018

DATA ANALYSIS: Boston Public Health Commission, Population Health and Research

NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston residents overall and Black and White residents (decrease over time)
Figure 47. Female Lung Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

![Graph showing female lung cancer incidence rates by Boston and Race/Ethnicity from 2010 to 2018.](image)

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
DATA ANALYSIS: Boston Public Health Commission, Population Health and Research
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2018); Change over time was statistically significant for Boston females overall and White females (decrease over time)

Figure 48. Prostate Cancer Incidence Rate, by Boston and Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2018

![Graph showing prostate cancer incidence rates by Boston and Race/Ethnicity from 2010 to 2018.](image)

DATA SOURCE: Massachusetts Department of Public Health, Massachusetts Cancer Registry, 2010-2018
Appendix A. 5 CANCER MORTALITY RATES OVER TIME

Figure 49. All Cancer Mortality Rate, by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2021

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health
DATA ANALYSIS: Population Health and Research, Boston Public Health Commission
NOTE: Asterisk (*) denotes rate changed significantly over time (from 2010 to 2021); Change over time was statistically significant for Asian, Black, Latino, and White residents. Please be advised that 2020-2021 data are preliminary and subject to change. Raw preliminary data may be incomplete or inaccurate, have not been fully verified, and revisions are likely to occur following the production of these data. The Department of Public Health strongly cautions users regarding the accuracy of statistical analyses based on preliminary data and particularly with regard to small numbers of events.
Figure 50. Female Breast Cancer Mortality Rate, by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2021

Boston overall (2021): 11.1

<table>
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<tr>
<th></th>
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<td>21.8</td>
<td>17.3</td>
<td>18.3</td>
<td>11.8</td>
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Figure 51. Colorectal Cancer Mortality Rate, by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2021

Boston overall (2021): 7.4

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<td>15.3</td>
<td>12.4</td>
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Figure 52. Liver Cancer Mortality Rate, by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2021

<table>
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<td>7.6</td>
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Boston overall (2021): 6.4

Figure 53. Lung Cancer Mortality Rate, by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2021

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<tr>
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<tr>
<td>White</td>
<td>49.3</td>
<td>43.9</td>
<td>39.9</td>
<td>27.2</td>
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Boston overall (2021): 24.9
Figure 54. Male Prostate Cancer Mortality Rate, by Race/Ethnicity, Age-Adjusted Rates per 100,000 Residents, 2010-2021

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<td>17.8</td>
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REFERENCES


Dizon, D.S. “Don’t Ask, Can’t Count. Addressing the Invisibility of the SGM Community Across the Cancer Trajectory Experience.”


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