



# HEALTH OF BOSTON 2023

THE CANCER REPORT

BISOLA OJIKUTU MD, MPH, FIDSA  
COMMISSIONER OF PUBLIC HEALTH, CITY OF BOSTON  
EXECUTIVE DIRECTOR, BOSTON PUBLIC HEALTH COMMISSION





## ACKNOWLEDGEMENTS

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We'd like to acknowledge Dana Farber Cancer Institute for generating their Community Health Needs Assessment which helped inspire content in this report.

Boston Public Health Commission acknowledges the role of racism in creating and perpetuating systems of oppression that undermine the social determinants of health and have resulted in the historic marginalization and subsequent inequities in health outcomes of Boston residents of color.

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## SUGGESTED CITATION

Boston Public Health Commission, *Health of Boston 2023: The Cancer Report (Boston, Massachusetts 2023)*



## FOREWORD

Welcome to the Boston Public Health Commission's (BPHC) Health of Boston 2023: The Cancer Report. This is part of a series of reports providing disease-specific surveillance data on the health of Boston residents. Specifically, this report aims to provide residents, medical and public health professionals, health policy makers, and community advocates with actionable information on the cancer experience of Boston residents.

This provisional cancer report highlights trends in cancer screening, incidence, and mortality. Data sources include the United States (US) Census; Massachusetts death and cancer registries; and surveys that describes individual health conditions and behaviors of Boston residents. These data reflect much of what had been generated for the 2022 Dana-Farber Community Health Needs Assessment (CHNA), a project providing deeper understanding of cancer-related health issues facing Boston residents including cancer risks and cancer experiences (<https://www.dana-farber.org/about-us/community-outreach/community-health-needs-assessment-reporting/>). Health of Boston 2023: The Cancer Report largely summarizes the CHNA secondary data findings for five of the leading types of cancer involved in cancer mortality in Boston: lung, female breast, prostate, colorectal, and liver. As this analysis largely relies on previously summarized data, deaths resulting from pancreatic cancer are not yet included but will be added in a future update. Additionally, cancer screening data updated through 2021 are provided here.

For many indicators, trends over time are highlighted, as well as differences across neighborhoods and between racial and ethnic groups and other subgroups (e.g., employment, education, and housing status).

BPHC plans to subsequently release an updated version of this report in the weeks ahead that will provide additional ranked leading types of cancer mortality (e.g., pancreatic) over time stratified by race/ethnicity and gender.

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



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## INTRODUCTION

In 2021, cancer was the second leading cause of death in the US (1). According to the National Cancer Institute, cancer is a term for diseases in which abnormal cells divide without control and can invade nearby tissues (2). 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 (3).

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. Dana-Farber contracted with Health Resources in Action (HRiA), a Boston-based public health organization, to develop a cancer-specific report.

The Population Health and Research 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. Secondary data for this report come from a variety of sources. Data sources include the Boston Behavioral Risk Factor Surveillance System (BBRFSS), the Massachusetts Cancer Registry, and vital records.

Boston Public Health Commission acknowledges the role of racism in creating and perpetuating systems of oppression that undermine the social determinants of health and have resulted in the historic marginalization and subsequent inequities in health outcomes of Boston residents of color.

For more information on the cancer experience in Boston, please visit:

[https://www.dana-farber.org/uploadedFiles/Pages/About\\_Us/Community\\_Outreach/cancer-chna-report-2022.pdf](https://www.dana-farber.org/uploadedFiles/Pages/About_Us/Community_Outreach/cancer-chna-report-2022.pdf)

## SECTION 1. CANCER MORTALITY

**Table 1. Leading Types of Cancer Mortality† by Year**

| All residents         |                                    |                                    |                                    |                                    |                                    |
|-----------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Rank                  | 2017                               | 2018                               | 2019                               | 2020                               | 2021                               |
| 1                     | Lung Cancer, 175<br>(29.5)         | Lung Cancer, 198<br>(33.3)         | Lung Cancer, 162<br>(26.4)         | Lung Cancer, 160<br>(26.0)         | Lung Cancer, 165<br>(25.9)         |
| 2                     | Female Breast Cancer, 74<br>(21.5) | Pancreatic Cancer, 71<br>(12.2)    | Colorectal Cancer, 60<br>(9.8)     | Colorectal Cancer, 70<br>(10.6)    | Pancreatic Cancer, 90<br>(14.4)    |
| 3                     | Pancreatic Cancer, 60<br>(10.1)    | Female Breast Cancer, 60<br>(17.1) | Pancreatic Cancer, 59<br>(9.3)     | Female Breast Cancer, 62<br>(17.2) | Prostate Cancer, 56<br>(23.7)      |
| 4                     | Prostate Cancer, 58<br>(26.2)      | Prostate Cancer, 59<br>(26.2)      | Female Breast Cancer, 46<br>(12.9) | Pancreatic Cancer, 60<br>(9.9)     | Colorectal Cancer, 54<br>(8.7)     |
| 5                     | Colorectal Cancer, 57<br>(9.8)     | Colorectal Cancer, 54<br>(9.2)     | Liver Cancer, 43<br>(7.1)          | Prostate Cancer, 58<br>(24.7)      | Female Breast Cancer, 44<br>(12.3) |
| Cause of death, count |                                    |                                    |                                    |                                    |                                    |

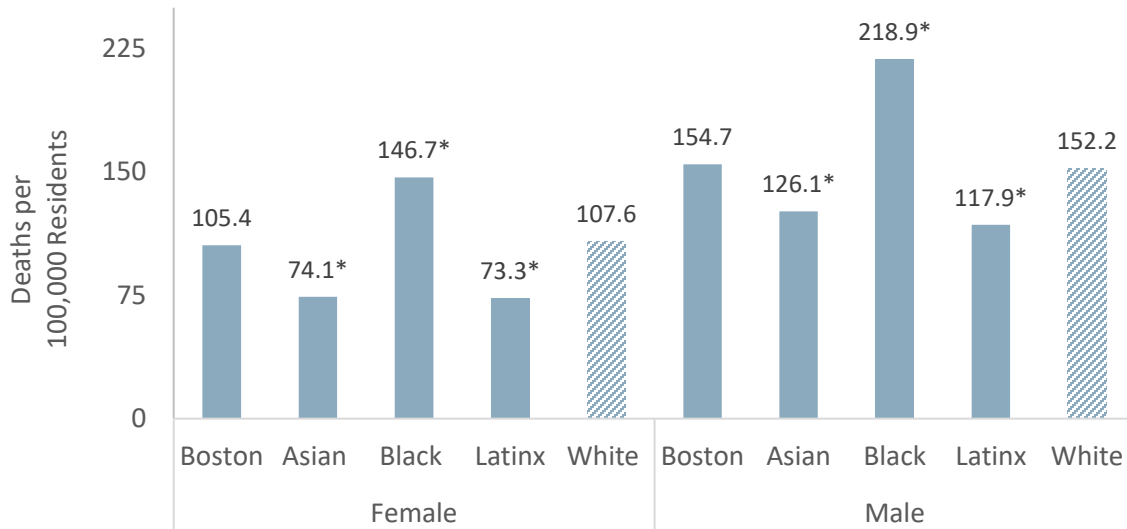
† Age-adjusted rates per 100,000 residents

NOTE: Rank is based on number of deaths. Both counts and rates are presented.

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

From 2017-2021, lung cancer was the leading type of cancer mortality for all residents. In 2017, female breast cancer was the second leading type of cancer mortality while pancreatic cancer was the third leading type of cancer mortality. In 2018, pancreatic cancer was the second leading type of cancer mortality while female breast cancer was the third leading type of cancer mortality. In 2019, colorectal cancer was the second leading type of cancer mortality while pancreatic cancer was the third leading type of cancer mortality. In 2020, colorectal cancer was the second leading type of cancer mortality while female breast cancer was the third leading type of cancer mortality. In 2021, pancreatic cancer was the second leading type of cancer mortality while prostate cancer was the third leading type of cancer mortality. In 2019, liver cancer was the fifth leading type of cancer mortality.

**Figure 1. All Invasive Cancer Mortality† by Sex and Race/Ethnicity, 2021**



\* Statistically significant difference when compared to reference group

† Age-adjusted rates per 100,000 residents

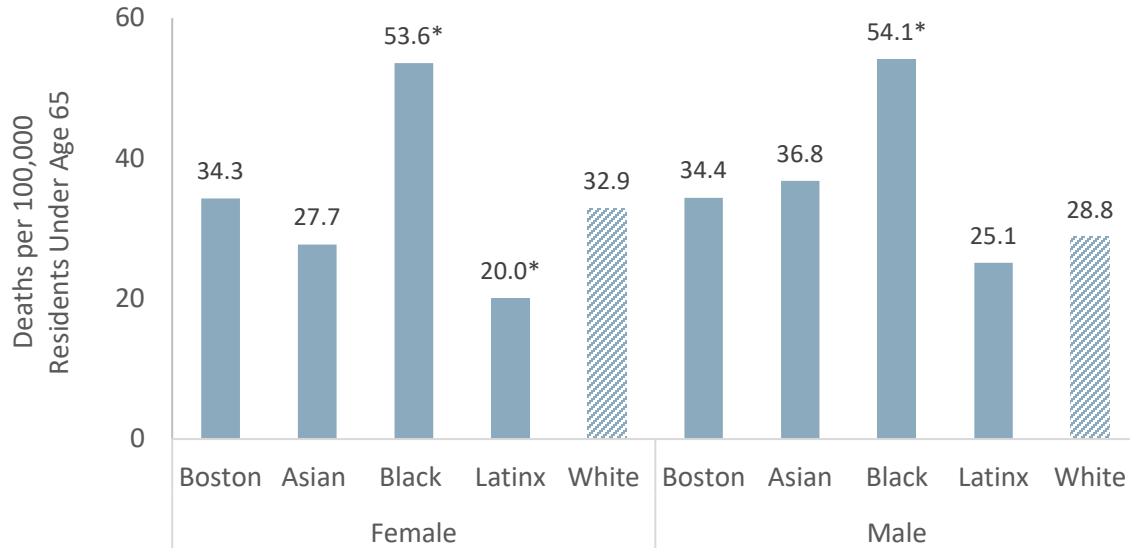
NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

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

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.

Rates of deaths from cancer were highest among Black males and females. For 2021, the female all-invasive cancer mortality rate was 105.4 per 100,000 female residents. The rate was higher for Black female residents (146.7) compared with White female residents (107.6). The rate was lower for Asian (74.1) and Latinx (73.3) female residents compared with White female residents. The male all-invasive cancer mortality rate was 154.7 per 100,000 residents. The rate was higher for Black male residents (218.9) compared with White male residents (152.2). The rate was lower for Asian (126.1) and Latinx male residents (117.9) male residents compared with White male residents.

**Figure 2. All Invasive Cancer Premature Mortality† by Sex and Race/Ethnicity, 2019-2021 Combined**



\* Statistically significant difference when compared to reference group

† Age-adjusted rates per 100,000 residents under age 65

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

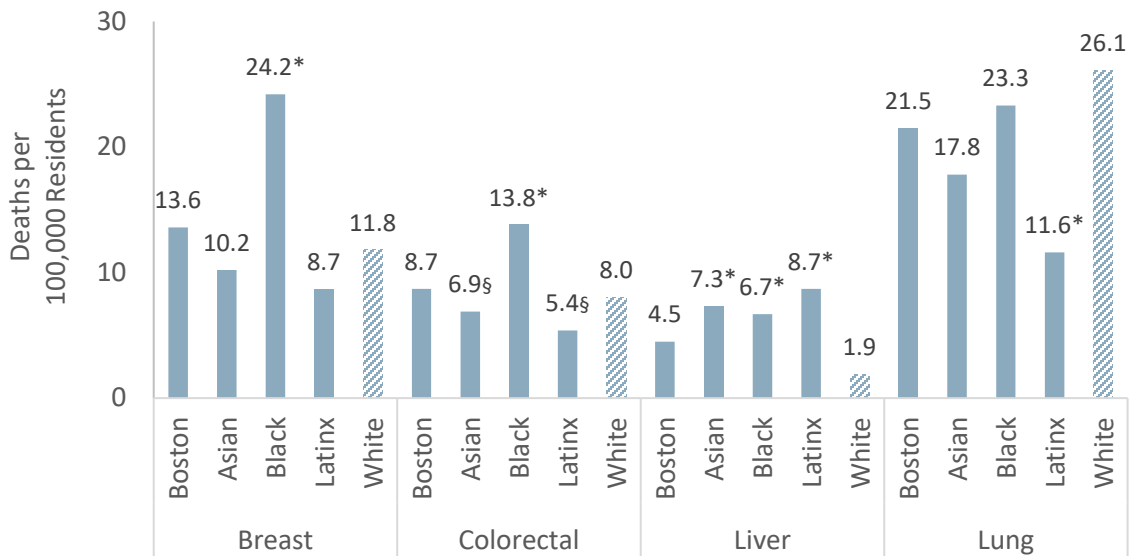
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

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.

For 2019-2021 combined, the female all-invasive cancer premature mortality rate (deaths among residents under age 65) was 34.3 per 100,000 female residents. The rate was higher for Black female residents (53.6) compared with White female residents (32.9). The rate was lower for Latinx female (20.0) residents compared with White female residents. The male all-invasive cancer premature mortality rate was 34.4 per 100,000 residents. The rate was higher for Black male residents (54.1) compared with White male residents (28.8).



**Figure 3. Cancer Mortality† by Race/Ethnicity and Type, Females, 2019-2021 Combined**



\* Statistically significant difference when compared to reference group

† Age adjusted rates per 100,000 residents

§ Indicates that rates are based on 20 or fewer deaths and should be interpreted with caution

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

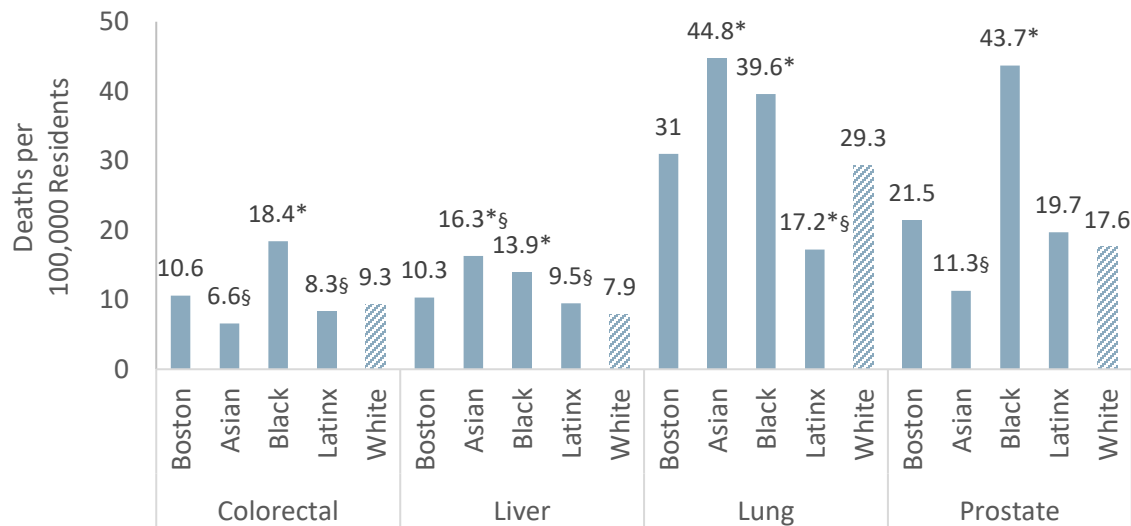
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

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For 2019-2021 combined, lung cancer at 21.5 per 100,000 female residents was the most common type of cancer-related death among female residents. The rate was lowest for Latinx female residents (11.6) compared with White female residents (26.1). Lung cancer mortality among Black and Asian women was similarly high compared with White female residents. The female breast cancer mortality rate was 13.6 per 100,000 female residents. The rate for Black female residents (24.2) was strikingly high. This rate is more than twice the rate for White female residents (11.8) and almost as high as the rate of lung cancer among White women which is one of the commonest types of cancer.

The female colorectal cancer mortality rate was 8.7 per 100,000 female residents. The rate was higher for Black female residents (13.8) compared with White female residents (8.0). The female liver cancer mortality rate was 4.5 per 100,000 female residents. The rate was strikingly higher for Asian (7.3), Latinx female (8.7) and Black male residents (6.7) compared to White female residents (1.9).

**Figure 4. Cancer Mortality† by Race/Ethnicity and Type, Males, 2019-2021 Combined**



\* Statistically significant difference when compared to reference group

† Age-adjusted rates per 100,000 residents

§ Indicates that rates are based on 20 or fewer deaths and should be interpreted with caution

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

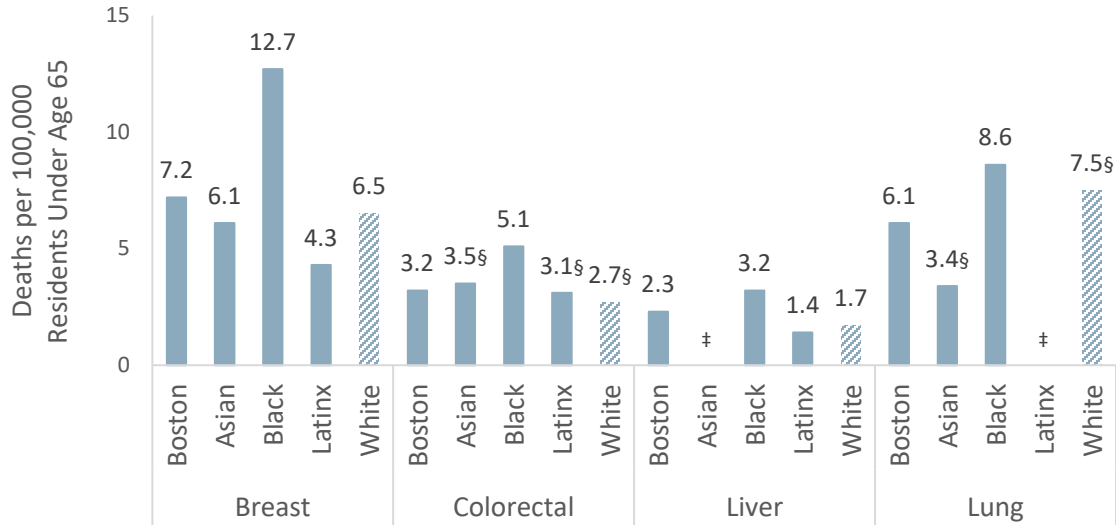
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

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As was the case among females, lung cancer mortality ranked highest among males for 2019-2021 combined at a rate of 31.0 per 100,000 male residents. The rate was higher for Asian (44.8) and Black (39.6) male residents compared with White male residents (39.6). The male colorectal cancer mortality rate was 10.6 per 100,000 male residents. The rate was higher for Black male residents (18.4) compared with White male residents (9.3).

The male liver cancer mortality rate was 10.3 per 100,000 male residents. The rate was higher for Asian (16.3) and Black (13.9) male residents compared to White male residents (7.9). The male prostate cancer mortality rate was 21.5 per 100,000 male residents. The rate for Black male residents (43.7) was over twice the rate of White male residents (17.6).

**Figure 5. Premature Cancer Mortality† by Race/Ethnicity and Type, Females, 2019-2021 Combined**



† Age-adjusted rates per 100,000 residents under age 65

§ Indicates that rates are based on 20 or fewer deaths and should be interpreted with caution

‡ Indicates that data is suppressed due to less than 5 deaths

NOTE: Bars with gradient fill color indicate the reference group within each selected indicator.

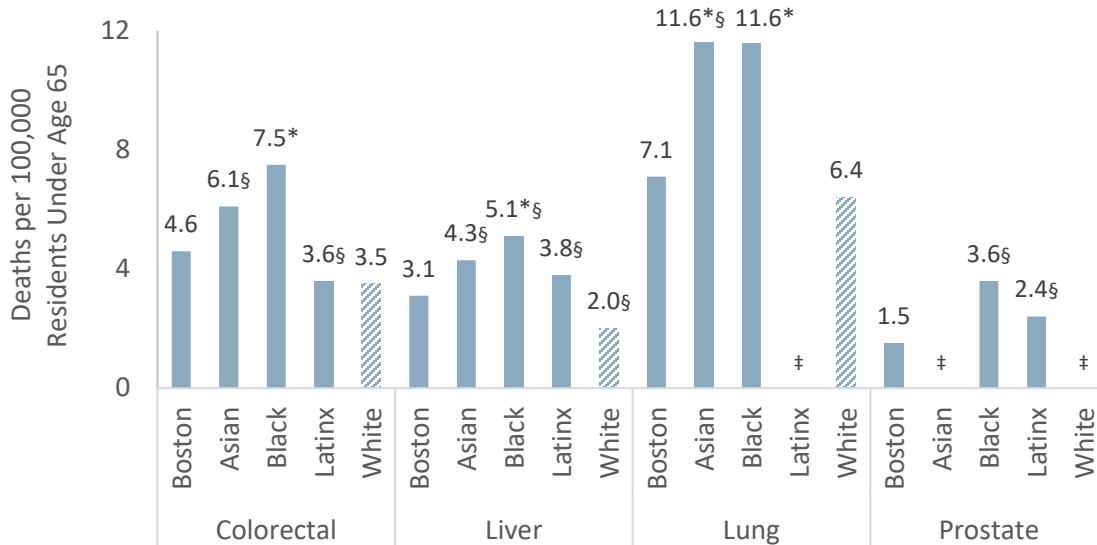
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

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For 2019-2021 combined, the female breast cancer premature mortality rate was 7.2 per 100,000 residents and ranked highest among these four common cancer types for mortality.

Black female residents had the highest rates of premature cancer mortality across all four cancer types reported here: breast (12.7), lung (8.6), colorectal (5.1) and liver (3.2).

**Figure 6. Premature Cancer Mortality† by Race/Ethnicity and Type, Males, 2019-2021 Combined**



\* Statistically significant difference when compared to reference group

† Age-adjusted rates per 100,000 residents under age 65

§ Indicates that rates are based on 20 or fewer deaths and should be interpreted with caution

‡ Indicates that data is suppressed due to less than 5 deaths

NOTE: Bars with gradient fill color indicate the reference group within each selected indicator.

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

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.

For 2019-2021 combined, among male residents, lung cancer (7.1 per 100,000 residents) was the leading cause of cancer-related premature mortality among the four types presented, followed by colorectal (4.6), liver (3.1) and prostate cancer (1.5).

Among Black male residents, lung cancer (11.6) was the leading type of premature cancer mortality followed by colorectal (7.5), liver and prostate cancers. The premature mortality rate of colorectal cancer for Black male residents (7.5) was over twice the rate for White male residents (3.5). The premature mortality rate of lung cancer for Black male residents was higher than the rate for White male residents (6.4). The premature mortality rate for liver cancer among Black male residents (5.1) was more than twice the rate for White male residents (2.0). The lung cancer premature mortality rate for Asian male residents (11.6) was strikingly high and nearly twice the rate for White male residents (6.4).

**Table 2. Statistically Significant Changes in Cancer Mortality Over Time for 2015-2021**

|                          | <b>Mortality</b> | <b>Premature Mortality (&lt;65 Years)</b> |
|--------------------------|------------------|---|
| <b>All Cancers</b>       | ↓                | ↓   |
| <b>Breast Cancer</b>     | ↓                | ↓   |
| <b>Colorectal Cancer</b> | ↓                | No Change                                 |
| <b>Liver Cancer</b>      | ↓                | ↓   |
| <b>Lung Cancer</b>       | ↓                | ↓   |
| <b>Prostate Cancer</b>   | No Change        | No Change                                 |

↓ Arrow indicates statistically significant decrease over time.

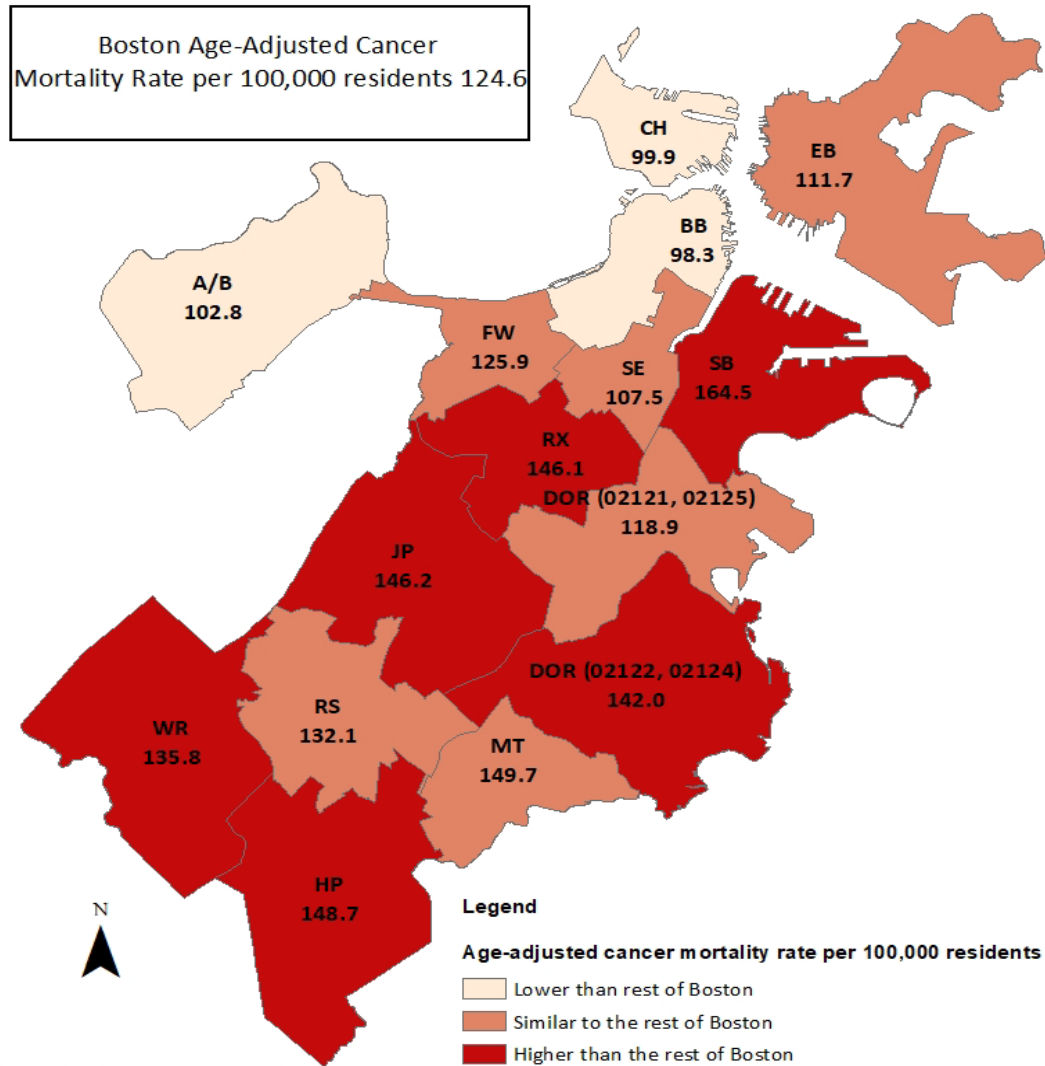
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health, 2015-2021

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.

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

From 2015 to 2021, the cancer mortality rate decreased for all invasive cancers and for breast cancer, colorectal cancer, liver cancer, and lung cancer. The premature mortality rate decreased for all invasive cancers and for breast cancer, liver cancer, and lung cancer.

**Figure 7. Cancer Mortality† by Neighborhood, 2019-2021**



† Age-adjusted rates per 100,000 residents

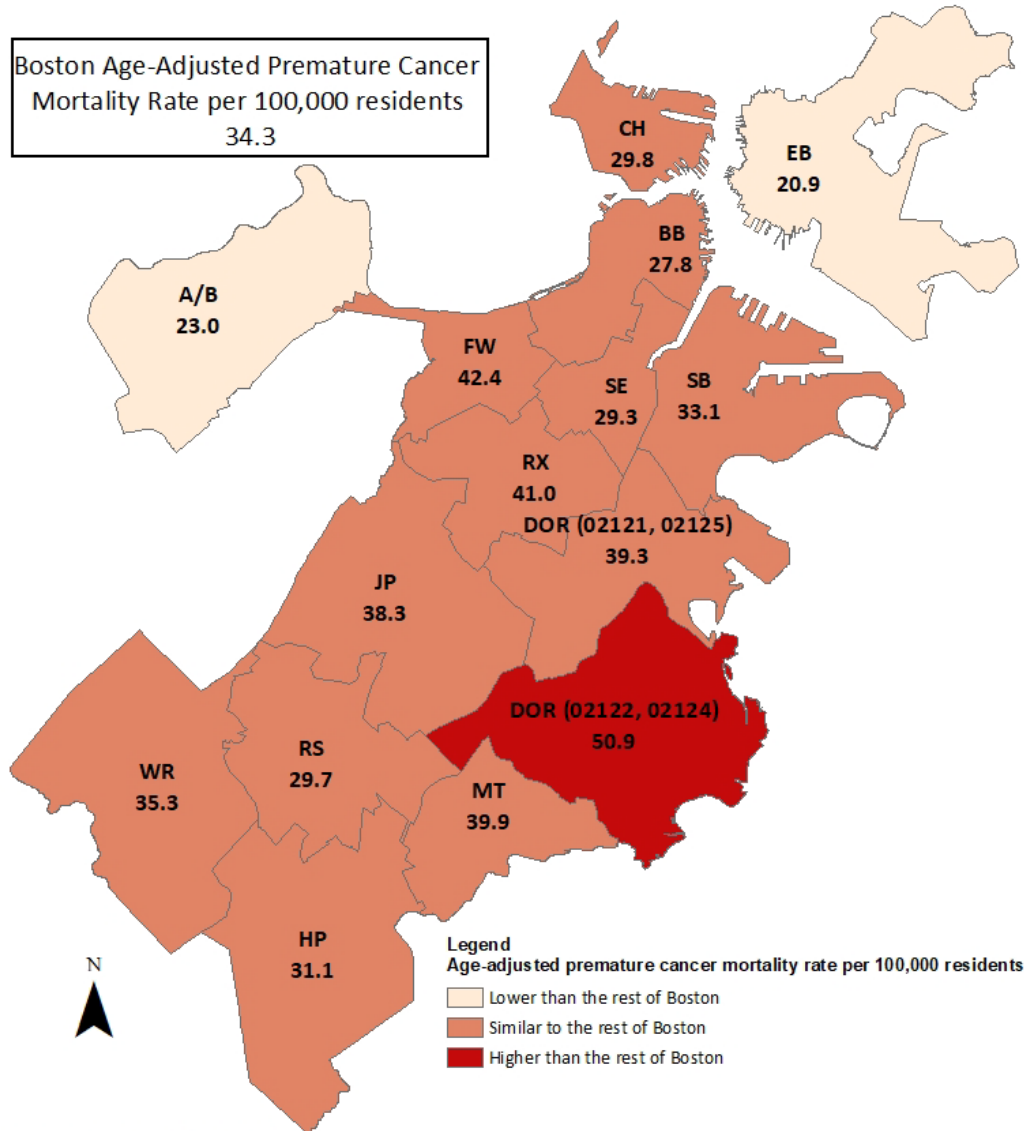
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

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.

Shading in map based on statistically significant differences between neighborhood point estimate and rest of Boston. Thus, Mattapan has a higher rate (149.7) than other neighborhoods but is still considered “similar to the rest of Boston”.

For 2019-2021 combined, the age-adjusted cancer mortality rates were higher for Dorchester 02122, 02124, Hyde Park, Jamaica Plain, Roxbury, South Boston, and West Roxbury compared to the rest of Boston.

**Figure 8. Premature Cancer Mortality† by Neighborhood, 2019-2021**



† Age-adjusted rates per 100,000 residents

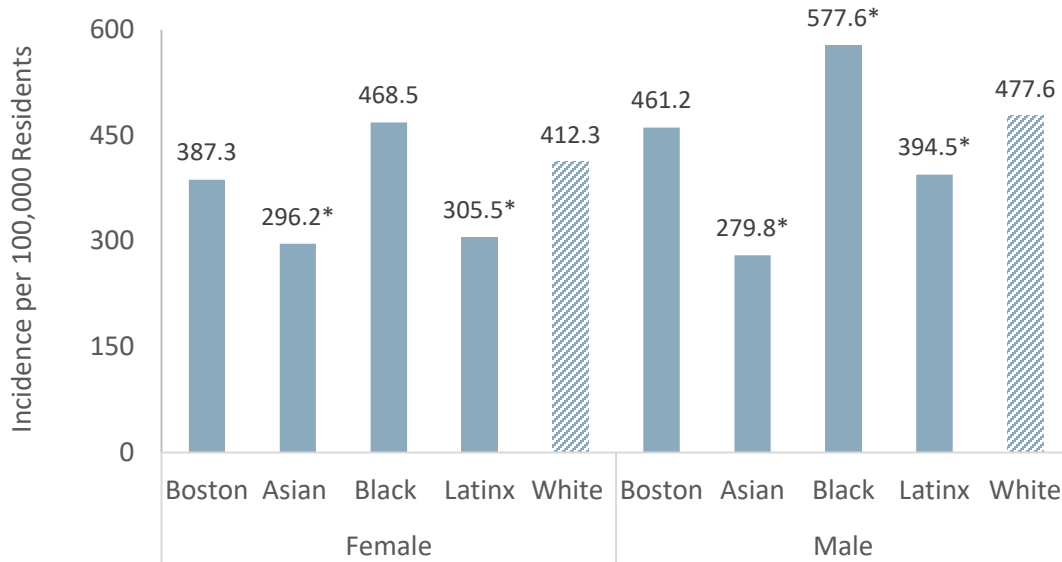
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health

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.

For 2019-2021 combined, the age-adjusted premature (under age 65) cancer mortality rate was higher for Dorchester 02122, 02124 compared to the rest of Boston.

## SECTION 2. CANCER INCIDENCE

**Figure 9. All Invasive Cancer Incidence† by Sex and Race/Ethnicity, 2018**



\* Statistically significant difference when compared to reference group

† Age-adjusted rates per 100,000 residents

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

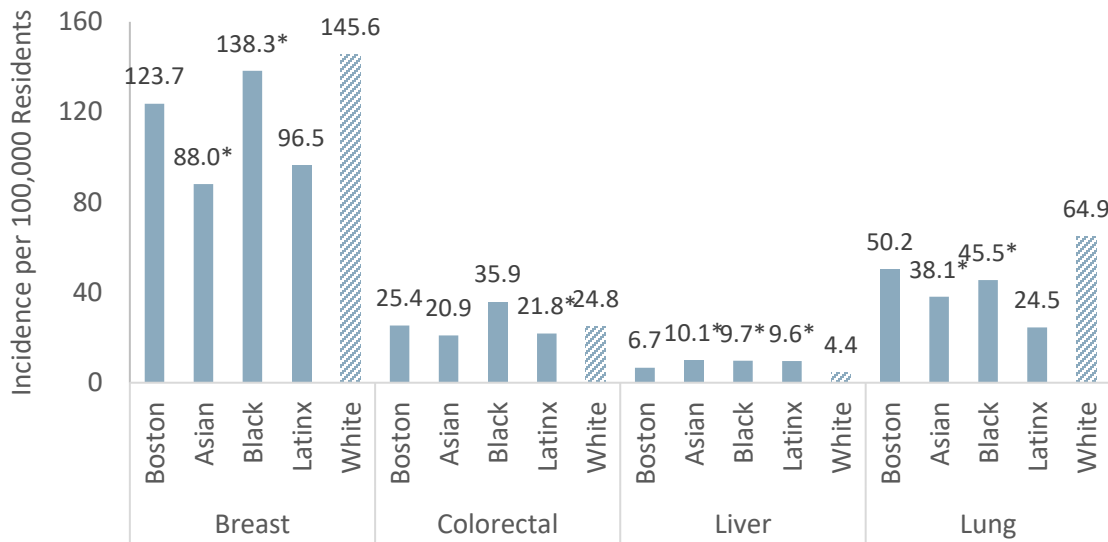
DATA SOURCE: Massachusetts Cancer Registry, Massachusetts Department of Public Health

For 2018, the age-adjusted incidence rate for all invasive cancer was 387.3 cases per 100,000 female residents. Black female residents (468.5) had the highest rate among Boston female residents. The rates for Asian (296.2) and Latinx (305.5) female residents were lower than the rate for White female residents (412.3).

For male residents, the incidence rate for all invasive cancer was 461.2 cases per 100,000 residents. Black male residents (577.6) had the highest rate of all invasive cancers. Compared to White male residents (477.6), the rate for Asian (279.8) and Latinx (394.5) male residents was significantly lower.



**Figure 10. Cancer Incidence† by Race/Ethnicity and Type, Females, 2016-2018 Combined**



\* Statistically significant difference when compared to reference group

† Age-adjusted rates per 100,000 residents

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

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

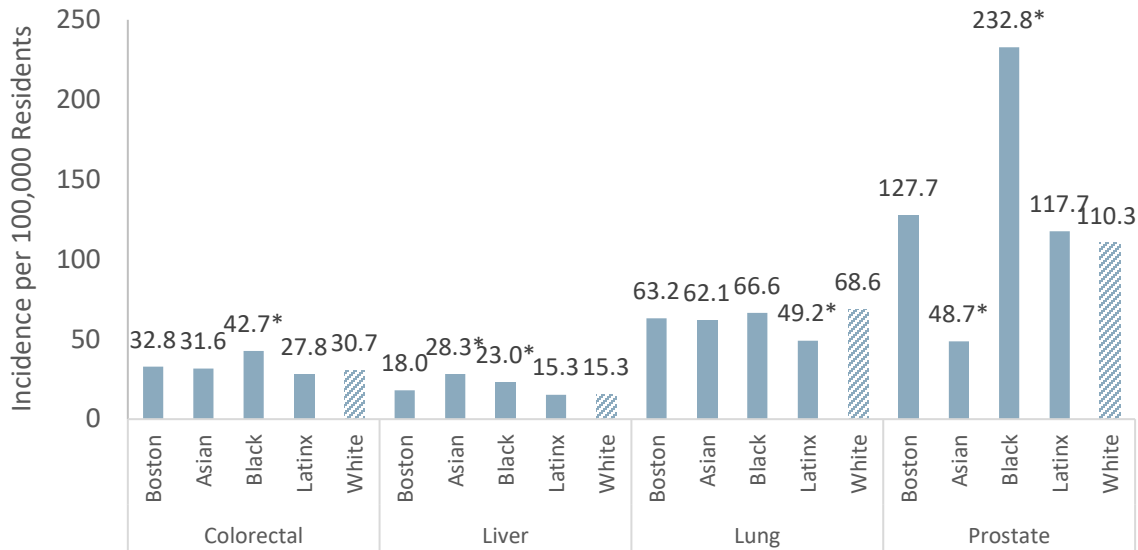
For 2016-2018 combined, the incidence rate for breast cancer was 123.7 cases per 100,000 Boston female residents. White (145.6) and Black (138.3) female residents had the highest rates. Compared to White female residents the rates of breast cancer were lower among Latinx female (96.5) and Asian (88.0) female residents.

The incidence rate for colorectal cancer was 25.4 cases per 100,000 Boston female residents. The rate of colorectal cancer was higher among Black female residents (35.9) compared to White female residents (24.8).

The incidence rate for liver cancer was 6.7 cases per 100,000 Boston female residents. The rates for Asian (10.1), Black (9.7), and Latinx (9.6) female residents were higher than the rate for White female residents (4.4).

The incidence rate for lung cancer was 50.2 per 100,000 Boston female residents. The rates for Asian (38.1) and Latinx (24.5) female residents were lower than the rate for White female residents (64.9).

**Figure 11. Cancer Incidence† by Race/Ethnicity and Type, Males, 2016-2018 Combined**



\* Statistically significant difference when compared to reference group

† Age-adjusted rates per 100,000 residents

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

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

For 2016-2018 combined, the incidence rate for colorectal cancer was 32.8 cases per 100,000 Boston male residents. The rate for Black male residents (42.7) was higher than the rate for White male residents (30.7).

The incidence rate for liver cancer was 18.0 cases per 100,000 Boston male residents. The rates for Asian (28.3) and Black (23.0) male residents were higher than the rate for White male residents (15.3).

The incidence rate for lung cancer was 63.2 per 100,000 Boston male residents. The rate for Latinx male residents (49.2) was lower than the rate for White male residents (68.6).

The incidence rate for prostate cancer was 127.7 per 100,000 Boston male residents. The rate for Black male residents (232.8) was over twice the rate for White male residents (110.3). The rate for Asian male residents (48.7) was lower than the rate for White male residents.

**Table 3. Statistically Significant Changes in Cancer Incidence Over Time, by Sub-Group, 2010-2018**

|                   | Asian Males | Asian Females | Latinx Males | Latinx Females | Black Males | Black Females | White Males | White Females |
|-------------------|-------------|---------------|--------------|----------------|-------------|---------------|-------------|---------------|
| All Cancers       |             |               | ↓            | ↓              | ↓           |               | ↓           | ↓             |
| Breast Cancer     |             |               |              |                |             |               |             |               |
| Colorectal Cancer |             | ↓             | ↓            |                |             | ↓             | ↓           | ↓             |
| Liver Cancer      |             |               | ↓            |                |             |               |             |               |
| Lung Cancer       |             |               |              |                | ↓           |               | ↓           | ↓             |
| Prostate Cancer   |             |               | ↓            |                | ↓           |               |             |               |

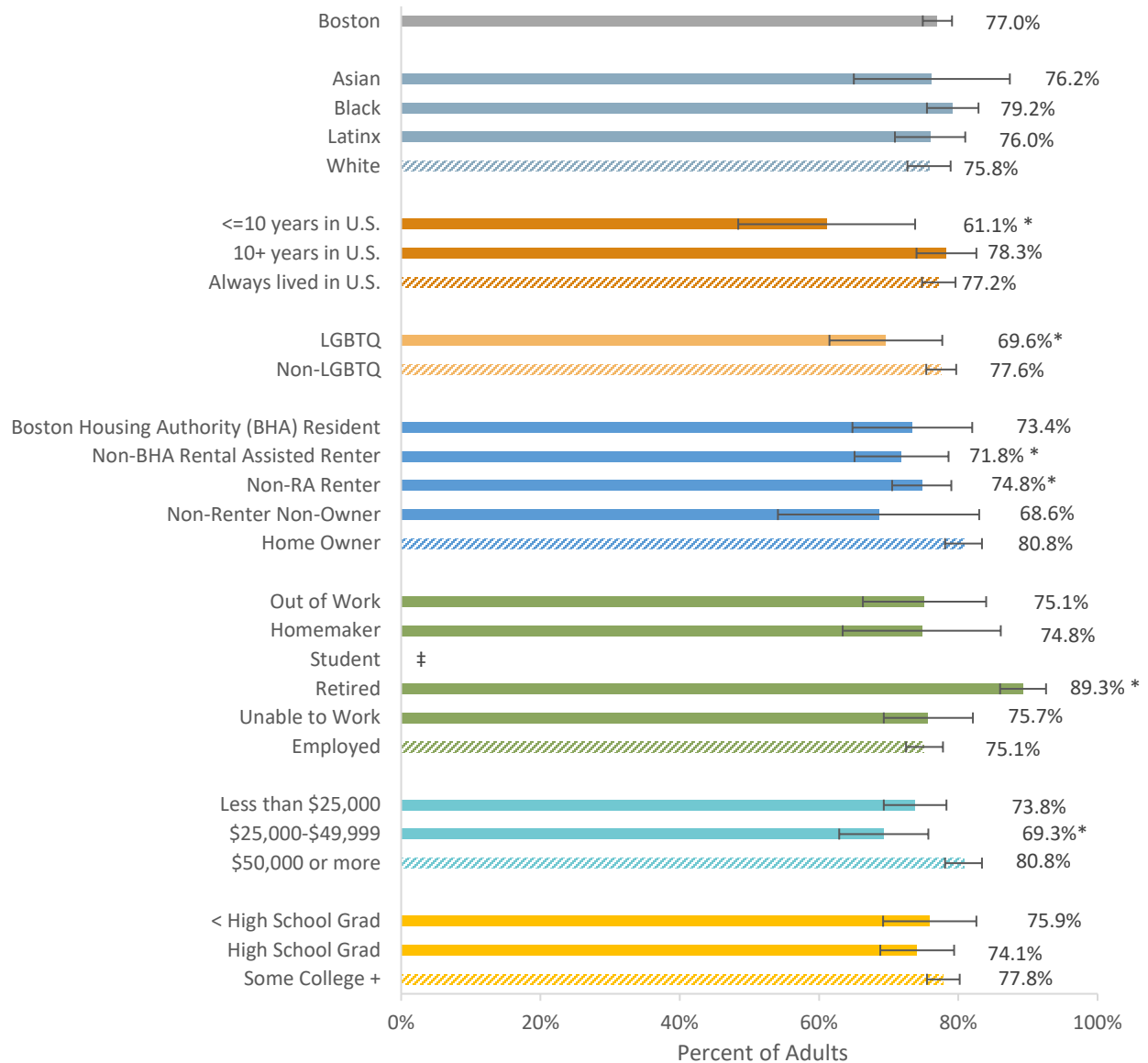
↓ Arrow Indicates statistically significant decrease over time

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

Cancer incidence decreased for different types of cancers covered in this report and specific racial-gender groups. Specifically, from 2010-2018, the all-invasive cancer incidence rate per 100,000 residents decreased for Latinx male residents, Latinx female residents, Black male residents, White male residents, and White female residents. The colorectal cancer incidence rate decreased for Asian female residents, Latinx male residents. Black female residents, White male residents, and White female residents. The liver cancer incidence rate decreased for Latinx male residents. The lung cancer incidence rate decreased for Black male residents, White male residents, and White female residents. The prostate cancer incidence rate decreased for Latinx male residents and for Black male residents.

### SECTION 3. CANCER SCREENING

**Figure 12. Received a Mammogram in the Past 2 Years among Women 40+ Years by Selected Demographics, 2017, 2019, 2021 Combined**



\* Statistically significant difference when compared to reference group

‡ Indicates that data is suppressed due to small sample size

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Surveillance System (2017, 2019, 2021), Boston Public Health Commission



During 2017, 2019, and 2021 combined, 77.0% of Boston adult female residents ages 40+ reported receiving a mammogram in the past 2 years.

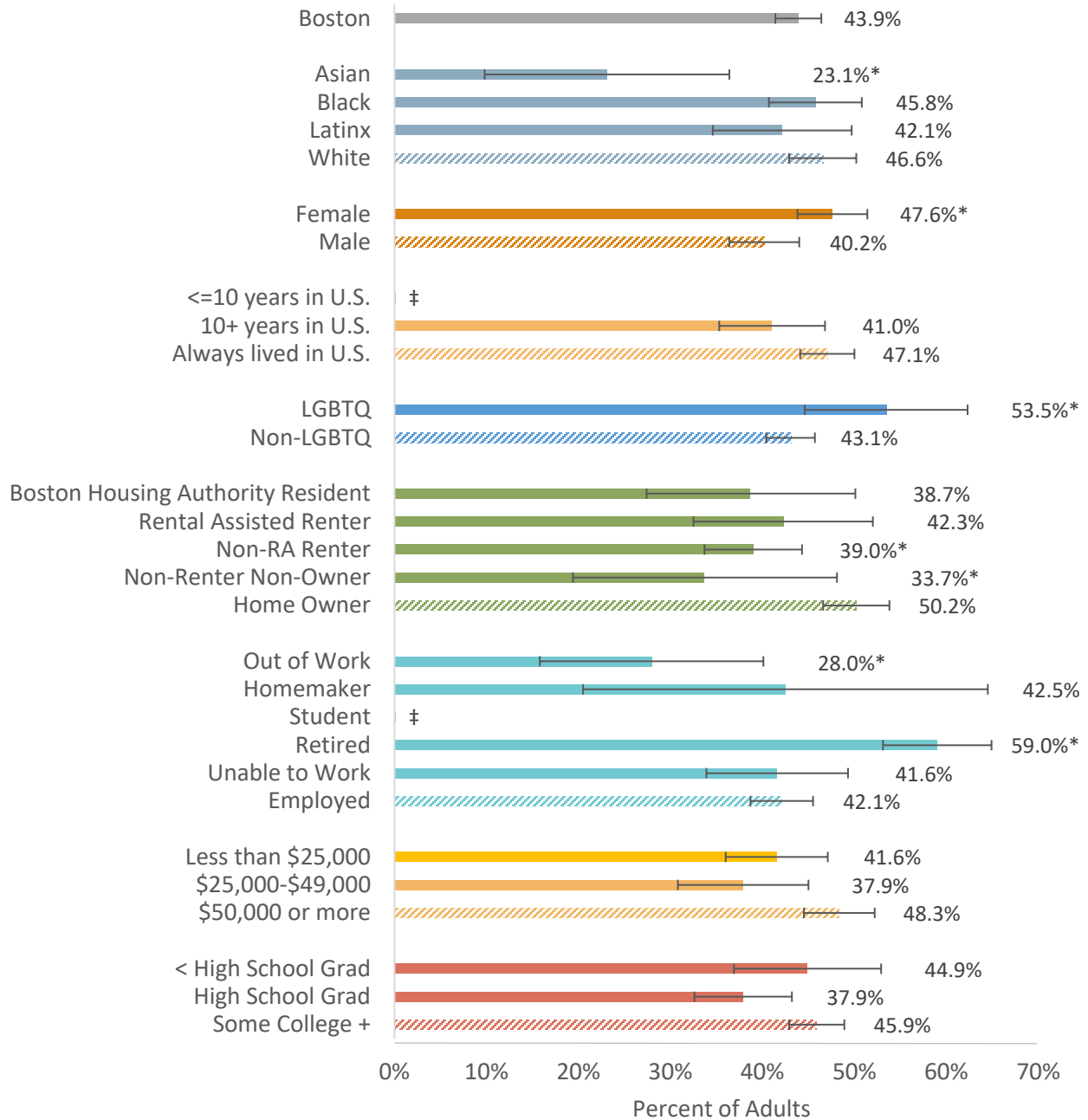
The percentage of adult female residents ages 40+ who received a mammogram was higher for the following groups:

- Adults who were and retired (89.3%) , compared to adults who were employed (75.1%)

The percentage of adults who received a mammogram was lower for the following groups:

- Adults who lived in the US for ten or fewer years (61.1%) compared to adults who were born in the US (77.2%)
- Adults who lived in non-Boston Housing Authority rental assisted housing (71.8%) compared with homeowners (80.8%)
- Adults with a household income of less than \$25,000 (73.8%) or \$25,000-\$49,999 (69.3%), compared to residents with an income of \$50,000 or more (80.8%).

**Figure 13. Colonoscopy in Past 5 Years among Adults Ages 50+ Years by Selected Demographics, 2017, 2019, 2021 Combined**



\* Statistically significant difference when compared to reference group

‡ Indicates that data is suppressed due to less than 5 cases

NOTE: Bars with hatch marks indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Surveillance System (2017, 2019, 2021), BPHC



During 2017, 2019, and 2021 combined, 43.9% of Boston adult residents ages 50+ years reported receiving a colonoscopy in the past 5 years.

The percentage of residents who received a colonoscopy was higher for the following groups:

- Adult females (47.6%) compared to adult males (40.2%)
- LGBTQ adults (53.5%) compared to non-LGBTQ adults (43.1%)
- Adults who were retired (59.0%) compared to adults who were employed (42.1%)

The percentage of adults who received a colonoscopy was lower for the following groups:

- Asian adults (23.1%) compared to White adults (46.6%)
- Adults who were non-rental assistance renters (39.0%) compared to adults who were homeowners (50.2%)
- Adults who were out of work (28.0%) compared to adults who were employed (42.1%)
- Adults with household income between \$25,000-\$49,999 (37.9%) compared to adults with an income of \$50,000 or more (48.3%)



## SUMMARY

Although there have been significant improvements in both cancer incidence and mortality, inequities remain. Black male residents have the highest rates of all-invasive cancer incidence, as well as colorectal cancer, liver cancer, and prostate cancer compared to White male residents. Black and Asian male residents all have higher rates of liver cancer compared to White male residents. Black female residents had higher incidence rates of breast cancer compared to White residents. Asian, Latinx female, and Black female residents all had higher incidence rates of liver cancer compared to White residents.

Black female and black male residents had higher rates of both mortality and premature mortality compared to their White counterparts. Black female residents had higher breast cancer premature mortality and mortality rates and higher rates of colorectal cancer mortality rates compared to White female residents. Black male residents had higher rates of premature mortality and mortality for all analyzed cancer types compared to White residents.



## GLOSSARY OF STATISTICAL TERMS

**Age-Adjusted Rate (AAR):** Age-adjustment is a statistical process applied to rates of disease and death which allows populations or groups with different age structures to be compared. The occurrence of disease and death is often associated with age, and the age distribution between populations may differ considerably. Thus, AARs are helpful when comparing rates over time and between groups or populations. An AAR is derived by: 1) calculating the age-specific rates (ASRs) across all age groups 2) multiplying by age-specific weights that come from a proportion of the 2000 US standard population within each age group 3) summing the adjusted age-specific rates. In this report, AARs are used for the presentation of diabetes hospitalizations and mortality. All AARs are based on a standard population distribution that covers all ages.

**Confidence Interval:** A range of values based on a chosen probability level within which the true value of a population parameter is likely found. With a 95% confidence interval, one can assume the true value has a high probability of being contained within the interval (i.e., falling between the two values that define the endpoints of the interval).

**Incidence:** The number of new cases of disease or injury in a population over a specified period of time.

**Rates:** A rate is a measure of a type of event, disease, or condition occurring among a population per unit(s) of time, for instance, the number of deaths due to diabetes per 100,000 population for a given year or across multiple years. Two types of rates are presented in this report: crude rates and age-adjusted rates (AARs). In this report, death rates are based on the primary cause only. The population denominators used for calculating rates is derived through interpolation or extrapolation using data from the 2020 and 2010 US Census. Linear interpolation/extrapolation involves the calculation of an average annual percent change for use in estimating population denominators. Linear interpolation is preferred to using a single year of US Census data when calculating rates for intercensal years.

**Statistical Significance:** An attribute of data based on statistical testing. A statistical test examines differences between rates or percentages to help determine if that observed difference reflects a true difference in the actual population experience, as opposed to one observed simply due to chance. Statistical significance means that an observed difference is most likely true; it does not mean that the difference is necessarily clinically meaningful or important.



## DATA SOURCES

**Boston Behavioral Risk Factor Surveillance System, (Boston BRFSS), Population Health and Research Office, Boston Public Health Commission:** The Boston Behavioral Risk Factor Surveillance System (Boston BRFSS) is a system of telephone health surveys of adults living in non-institutional household settings ages 18 and over that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. The Boston Public Health Commission (BPHC) conducts an independent survey approximately every other year modeled after the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS) survey. Over time, the survey has been modified by BPHC to be more reflective of health determinants specific to the Boston population. However, the Boston Behavioral Risk Factor Surveillance System survey has maintained many standard core questions included in the BRFSS used by the Massachusetts Department of Public Health. Results from the survey are used by BPHC to plan and implement health initiatives; to identify health problems within populations; to identify racial/ethnic inequities in access to and utilization of health care, in risk behaviors, and selected health conditions; to establish and monitor health objectives; to support health-related legislative activities; to evaluate disease prevention activities and programs; and to assist in receiving grants and other funding. This report uses Boston BRFSS data from the following years: 2015, 2017, 2019, 2021.

**Boston Resident Deaths, Registry of Vital Records and Statistics, Office of Data Management and Outcomes Assessment, Massachusetts Department of Public Health:** Death data used by the Boston Public Health Commission pertains only to Boston residents. This report used death data from 2017 to 2021. Death records are completed with the assistance of an informant, typically a family member or funeral director, which may result in errors (for example, in race/ethnicity reporting) that would not occur in self-reported data. 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.

**Boston Resident Cancer Incidence, Massachusetts Cancer Registry, Massachusetts Department of Public Health:** Cancer incidence data used by the Boston Public Health Commission pertains only to Boston residents. This report used cancer incidence data from 2010 to 2018 from the Massachusetts Cancer Registry (MCR). The MCR collects data on newly diagnosed cases of cancer in Massachusetts and uses coding and abstracting practices compatible with the following programs: National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program, the Centers for Disease Control and Prevention's National Program of Cancer Registries (CDC/NPCR), the North American Association of Central Cancer Registries (NAACCR) and the American College of Surgeons (ACoS), including the Commission on Cancer (COC) and American Joint Committee on Cancer (AJCC). These procedures allow for comparisons between the data present, Massachusetts, and the nation.

## REFERENCES

- 1) Murphy SL, Kochanek KD, Arias, E. Mortality in the United States, 2021. National Center for Health Statistics Data Brief: 456, 2022.
- 2) National Cancer Institute. NCI Dictionary of Cancer Terms [04/11/23]. Available from: <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/cancer>
- 3) Dana Farber Cancer Institute. 2022 Cancer-Focused Community Health Needs Assessment (CHNA) Report. [4/11/23] Available from: [https://www.dana-farber.org/uploadedFiles/Pages/About\\_Us/Community\\_Outreach/cancer-chna-report-2022.pdf](https://www.dana-farber.org/uploadedFiles/Pages/About_Us/Community_Outreach/cancer-chna-report-2022.pdf)