Chapter 9
Cancer
Cancer

Cancer is a disease in which normal, healthy cells are damaged or changed, and begin to multiply abnormally. Since 1998, the overall incidence of cancer has slowly declined and stabilized in the United States (1), but some types have been more difficult to control than others. Cancer was the second leading cause of death in the U.S. in 2014, when the age-adjusted mortality rate attributable to cancer was 161.2 per 100,000 population (2). Nationally, the leading types of cancer deaths in 2015 were lung and bronchus, prostate in men, breast in women, colon and rectum, pancreas, and liver and intrahepatic bile duct in men, ovary in women (3).

Inequities by race and ethnicity are observed for some types of cancer. For example, although the risk of getting breast cancer is comparable between Black and White women, in 2014 Black women died of breast cancer at a higher rate (28.1 per 100,000 women) than White women (20.1) (2). In the past, studies have identified inequities in the utilization of mammography screening between Black and White women, which coincided with the difference in the breast cancer mortality rate between Black and White women (2, 4, 5). The mammography screening rates are now similar between Black and White women, but the inequity in the breast cancer mortality rate remains. Inequities by education and income are found for breast cancer screening. U.S. women ages 40 and older reporting lower educational attainment or lower household income are less likely to have received a mammogram (2, 6). Similar inequities across education and income are found for colorectal cancer screening among U.S. men 50 years and older (7).

Risk factors and prevention

Some risk factors are out of our control, like family history or age. However, many causes of cancer have been identified, and about a third of cancer cases can be prevented (8). Tobacco use and exposure to cigarette smoke causes about 22% of cancers every year (8). Alcohol consumption is another risk factor. Both alcohol use and smoking damage DNA and block the use of many protective antioxidants and vitamins (9, 10). There are a host of other things that encourage cancer formation, including some environmental chemicals and toxins, excessive sunlight or use of tanning beds, ionizing radiation, some viruses and bacteria, and certain hormones (11).

Fortunately, the factors that improve health overall also help prevent cancer. Daily physical activity, regular intake of fruits and vegetables, and a healthy weight diminish risk for some of the most common cancers (12).
Early detection
Cancer screening is at the center of the fight against cancer. For many cancers, early detection increases the person’s survival rate. Early detection has been especially successful with detecting breast, cervix, rectum and colon cancer, and consistent screening has contributed significantly to the decrease in cancer rates over the past twenty years (13).

For those who are at the highest risk of developing cancer, evidence-based guidelines have been developed to ensure that any abnormal cells are caught early. There are well-established recommendations for breast, cervix, and colon cancer screening, and within the past 4 years, new lung cancer screening guidelines have been released: those with a history of smoking are encouraged to be screened for lung cancer up to 15 years after they quit smoking.

The percent of U.S. adults that report screening for breast, cervix, and colon cancer from recent years suggests that there is room for improvement. According to the 2014 Behavioral Risk Factor Surveillance System (14), 75% of all U.S. adult women reported having a pap test in the last 3 years, and 73% of women ages 40 and older reported having a mammogram within the past two years. Further, only 69% of U.S. adults ages 50 and older reported ever having a sigmoidoscopy or colonoscopy (14). Although screening methods are not perfect, knowing your risk for developing cancer will help you and your doctor determine whether screening is right for you.
During the combined years of 2010, 2013, and 2015, 85% of Boston female residents ages 40-74 responded having had a mammogram within the past 2 years. The percentage was higher for the following groups:

- Black females (88%) compared with White females (84%)
- Females ages 50-59 (89%), 60-69 (89%), or 70-74 (90%) compared with females ages 40-49 (78%)

Having had a mammogram within the past 2 years was lower for the following groups:

- Asian females (70%) compared with White females (84%)
- Females with no health insurance (55%) compared with those who had health insurance (86%)

**Breast Cancer Screening**

**Healthy People 2020 Target:** 81.1%

**U.S. median 2014:** 73.0%

**MA 2014:** 82.1% (80.6-83.6)

**Boston 2015:** 85.2% (83.6-86.8)
During 2013 and 2015 combined, 84% of Boston female residents ages 21-65 responded having had a pap test within the past 3 years.

The percentage was lower for the following groups:

- Asian females (59%) and Black females (82%) compared with White females (89%)
- Females ages 21-29 (72%), 45-59 (85%), or 60-65 (76%) compared with females ages 30-44 (94%)
- Females with no health insurance (66%) compared with those who had health insurance (85%)
- Females with an annual household income of less than $25,000 (79%) compared with those with a household income of $50,000 or more (89%)

**Cervical Cancer Screening**

Healthy People 2020 Target: 93.0%

U.S. median 2014: 82.6%

MA 2014: 88.0% (86.5-89.6)

Boston 2015: 83.9% (81.9-85.9)
During 2013 and 2015 combined, 64% of Boston residents ages 50-75 reported having had a sigmoidoscopy or colonoscopy in the past 5 years. The percentage was higher for the following groups:

- Adults ages 60-69 (68%) or 70-75 (67%) compared with adults ages 50-59 (60%)

Having had a sigmoidoscopy or colonoscopy in the past 5 years was lower for the following groups:

- Asian adults (49%) compared with White adults (64%)
- Adults with less than a high school diploma (57%) compared with adults who completed at least some college (66%).
- Adults with no health insurance (42%) compared with those who had health insurance (64%)
- Adults with an annual household income of less than $25,000 (60%) compared with those with an annual household income of $50,000 or more (68%)

Colon Cancer Screening
Healthy People 2020 Target: 70.5%

U.S. median 2014: 66.6%
MA 2014: 76.5% (75.0-78.1)
Boston 2015: 63.6% (61.3-65.9)
In 2015, the cancer mortality rate for Boston residents was 162.6 deaths per 100,000 residents. From 2011 to 2015, the rate decreased by 12% among Boston residents overall and by 18% among Black residents.

Compared with White residents (170.5), the cancer mortality rate was 30% lower for Asian residents (119.9) and 35% lower for Latino residents (110.6) in 2015.

From 2011 to 2015, the cancer mortality rate decreased by 16% for male residents. There was no change in the rate for female residents over the same time period.

In 2015, the cancer mortality rate for females (139.3 deaths per 100,000 residents) was 29% lower than the rate for males (197.0).

Cancer Mortality

Healthy People 2020 Target: 161.4 deaths per 100,000 population

U.S. 2015: 158.5
MA 2015: 152.9
Boston 2015: 162.6
In 2015, the cancer mortality rate was 32% lower for Asian females (101.2 deaths per 100,000 residents) and 47% lower for Latino females (79.3) compared with White females (148.3).

The rate for Latino males (157.2) was 22% lower than the rate for White males (200.4).

From 2011 to 2015, lung cancer was the most common cause of cancer mortality in Boston. The next most common cause of cancer death was colorectal cancer.

Lung Cancer Mortality
Healthy People 2020 Target: 45.5 deaths per 100,000 population

U.S. 2015: 40.5
MA 2015: 38.9
Boston 2015: 36.2
Colon/Rectum Cancer Mortality
Healthy People 2020 Target: 14.5 deaths per 100,000 population

U.S. 2015: 14.3
MA 2015: 12.0
Boston 2015: 13.3
### Figure 9.8c Leading Types of Cancer Mortality† by Year

#### Latino Residents

<table>
<thead>
<tr>
<th>Rank</th>
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<th>2012</th>
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<th>2014</th>
<th>2015</th>
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<td>Lung 11</td>
<td>Lung 9</td>
<td>Lung 13</td>
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<td>(19.9) §</td>
<td>(22.2) §</td>
<td>(23.2) §</td>
<td>(16.2) §</td>
<td>(19.0) §</td>
</tr>
<tr>
<td>2</td>
<td>Colon/rectum 6</td>
<td>Pancreas 7</td>
<td>Colon/rectum 11</td>
<td>Stomach 5</td>
<td>Pancreas 7</td>
</tr>
<tr>
<td></td>
<td>(14.2) §</td>
<td>(13.3) §</td>
<td>(18.0) §</td>
<td>(8.2) §</td>
<td>(8.7) §</td>
</tr>
<tr>
<td>3</td>
<td>Prostate 5</td>
<td>Colon/rectum 7</td>
<td>Liver 9</td>
<td>†</td>
<td>Liver 6</td>
</tr>
<tr>
<td></td>
<td>(23.7) §</td>
<td>(12.8) §</td>
<td>(15.2) §</td>
<td></td>
<td>(11.1) §</td>
</tr>
<tr>
<td>4</td>
<td>Liver 5</td>
<td>Stomach 7</td>
<td>Stomach 6</td>
<td>†</td>
<td>Kidney 6</td>
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<td>(7.9) §</td>
<td>(8.3) §</td>
<td>(9.7) §</td>
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<td>(7.3) §</td>
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<td>Non-Hodgkin</td>
<td>Pancreas 5</td>
<td>†</td>
<td>†</td>
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<tr>
<td></td>
<td>(7.3) §</td>
<td>lymphoma 6</td>
<td>(5.2) §</td>
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</tbody>
</table>

Cancer type, count (rate per 100,000 residents)

† Age-adjusted rates per 100,000 residents
‡ Rates not presented due to a small number of cases
§ Rates based on 20 or fewer cases should be interpreted with caution.

NOTE: Rank is based on number of deaths. Both counts and rates are presented. Beginning in October 2014, the method for collecting race/ethnicity for mortality data changed. Interpret with caution.
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

### Female Breast Cancer Mortality

Healthy People 2020 Target: 20.7 deaths per 100,000 population

U.S. 2015: 20.3
MA 2015: 17.7
Boston 2015: 18.9
Lung cancer was the leading type of cancer mortality among both female and male Boston residents from 2011 to 2015. For females, breast cancer was the second leading type of cancer mortality and for males, prostate cancer was the second leading type of cancer mortality.
For 2011-2015, lung cancer was the most common cause of cancer mortality for male and female residents of all racial/ethnic groups except for Latino female residents.

### Figure 9.10a Leading Types of Cancer Mortality† 2011-2015
**Female Residents by Race/Ethnicity**

<table>
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<tr>
<th>Rank</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lung  30 (22.6)</td>
<td>Lung 123 (30.6)</td>
<td>Colon/rectum 17 (9.3) §</td>
<td>Lung 333 (43.5)</td>
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<tr>
<td>2</td>
<td>Colon/rectum 14 (10.1) §</td>
<td>Female breast 88 (22.8)</td>
<td>Lung 16 (10.9) §</td>
<td>Female breast 160 (19.9)</td>
</tr>
<tr>
<td>3</td>
<td>Pancreas 12 (9.0) §</td>
<td>Colon/rectum 69 (17.6)</td>
<td>Female breast 13 (6.4) §</td>
<td>Colon/rectum 106 (12.1)</td>
</tr>
<tr>
<td>4</td>
<td>Female breast 11 (8.1) §</td>
<td>Pancreas 48 (12.0)</td>
<td>Pancreas 12 (6.0) §</td>
<td>Pancreas 85 (10.7)</td>
</tr>
<tr>
<td>5</td>
<td>Liver 10 (7.3) §</td>
<td>Uterine 46 (11.3)</td>
<td>Non-Hodgkin lymphoma 10 (6.7) §</td>
<td>Ovary 66 (8.8)</td>
</tr>
</tbody>
</table>

Cancer type, count (rate per 100,000 residents)

### Figure 9.10b Leading Types of Cancer Mortality† 2011-2015
**Male Residents by Race/Ethnicity**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Asian</th>
<th>Black</th>
<th>Latino</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lung  56 (51.8)</td>
<td>Lung 140 (55.7)</td>
<td>Lung 42 (32.6)</td>
<td>Lung 340 (57.0)</td>
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<tr>
<td>2</td>
<td>Liver 30 (26.5)</td>
<td>Prostate 105 (50.5)</td>
<td>Prostate 21 (23.0)</td>
<td>Prostate 113 (19.4)</td>
</tr>
<tr>
<td>3</td>
<td>Colon/rectum 16 (14.6) §</td>
<td>Liver 59 (18.3)</td>
<td>Colon/rectum 15 (13.5) §</td>
<td>Colon/rectum 106 (17.7)</td>
</tr>
<tr>
<td>4</td>
<td>Pancreas 10 (9.2) §</td>
<td>Colon/rectum 58 (20.9)</td>
<td>Liver 15 (12.0) §</td>
<td>Pancreas 83 (13.4)</td>
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<tr>
<td>5</td>
<td>Stomach 8 (6.9) §</td>
<td>Pancreas 33 (12.6)</td>
<td>Pancreas 15 (12.0) §</td>
<td>Liver 79 (12.4)</td>
</tr>
</tbody>
</table>

Cancer type, count (rate per 100,000 residents)

† 5-year average annual age-adjusted rates per 100,000 residents
§ Rates based on 20 or fewer cases should be interpreted with caution.

NOTE: Rank is based on number of deaths. Both counts and rates are presented.
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.
Summary

Overall, the cancer death rate decreased by approximately 12% from 2011 to 2015, more so among Black residents. The five leading types of cancer deaths among Boston residents were generally consistent with what is observed for the U.S. overall, with lung cancer as the top cause. Some patterns emerge for lung cancer mortality rates across sex and race/ethnicity. Lung cancer mortality rates are generally higher in men than women. Across race/ethnicity, rates were generally lowest among Latinos.

Boston is doing well in meeting many of the Healthy People 2020 goals – including for breast cancer screening and mortality, lung cancer mortality and colorectal cancer mortality. Healthy People 2020 targets are still unmet for cervical and colon cancer screening. Inequities across age, race/ethnicity, insurance coverage, and income were also found for breast, cervical, and colon cancer screening tests. For breast, cervical, and colon cancer screening, inequities tend to disproportionately affect Asian adults as well as adults with no insurance coverage. Adults with household income less than $25,000 were also less likely to report cervical and colon cancer screening. Across age categories, younger adults in the target population were less likely to report screening for breast (ages 40-49), cervical (ages 21-29), and colon cancer (ages 50-59).
Cancer

From 2011-2015, the cancer mortality rate decreased

12% among all Boston residents

18% among Black residents

In 2015, 85% of women ages 40 years and older reported having a mammogram in the past two years.

In 2015, the cancer mortality rate for females was 29% lower than the rate for males.
Continuing the search to identify men at high risk for prostate cancer

By Mark W. Kennedy, MBA
Senior Program Manager, Chronic Disease Prevention and Control Division
Boston Public Health Commission

Prostate cancer is one of the most confusing areas of clinical management in modern medicine. In 2012, the U.S. Preventive Services Task Force (USPSTF) recommended against the use of the prostate-specific antigen test, or the PSA test, for the early detection of prostate cancer in healthy men, regardless of age or risk. The PSA test is a blood test primarily used to screen for prostate cancer. In April 2017, after continued review of the research, the USPSTF revised its recommendation. This “C recommendation” (recommendations are graded based on strength of evidence) supports the use of PSA testing in healthy men 55-69 years of age, when accompanied by a discussion with a physician about the harms and benefits of screening [1]. This change from a previously issued D recommendation paves the way for a population health approach that will be more inclusive for high risk men.

According to the Boston Public Health Commission, prostate cancer is still very common in Boston, and among Black men, prostate cancer deaths are over 2 times that of White men. The racial inequity for Black men in Boston is the largest for any major cancer. In the United States, 1 in 23 Black men with prostate cancer will die from the disease compared to 1 in 42 White men.

The shift toward equity has begun with the new draft recommendation. It continues by acknowledging that the PSA test is not best used as a diagnostic tool. Instead, measuring PSA levels in the blood is strongly prognostic of the long-term risk of aggressive disease [2]. Getting a man’s baseline PSA is a better predictor of risk than just looking at ethnicity or family history [3]. Those established considerations of risk should inform the decision to be screened, but baseline PSA is an important clinical tool that establishes actual risk and informs future screening intervals for men.

Screening recommendations may continue to change as more research is done. By talking with their healthcare providers, men can make informed decisions about whether getting the PSA test makes sense for them based on their risk factors. Building on public health approaches, like shared decision-making, better addresses high-risk populations. Proper use of PSA testing supports tailored, evidence-based early detection in primary care.

Our Point of View: Thoughts from a community resident

A warrior against prostate cancer

By Dr. Gary Taylor
Dr. Taylor is a cancer survivor and proud to be originally from Dorchester

My father had prostate cancer. Because of that, when I was still in my 40s, I requested periodic PSA antigen screening for cancer. That being said, I was totally shocked when my prostate biopsy revealed aggressive disease at age 58. As an experienced physician, I was aware prostate cancer is very different than any other type of cancer for several reasons:

- Prostate cancer kills more than twice as many Black men as Caucasian men, and we are at least 150% more likely to be diagnosed with it.

- Most men are diagnosed and treated without ever being evaluated by a cancer specialist.

- Prostate cancer is the only cancer that you are advised to wait until the disease gets worse before definitive therapy is recommended.

- And finally, there are no head to head studies comparing surgery to radiation or other therapeutic modalities.

Fortunately, we live in a city rich in medical resources. I obtained opinions from several specialists, including cancer, radiation, surgery and primary care – not to mention advice from many family members and friends. The Prostate Health Education Network (PHEN) provided invaluable information and support from men who had been diagnosed and treated successfully before me. After much discussion, I began treatment that included surgery, radiation and chemotherapy.

Today, I consider myself a warrior against prostate cancer. I encourage all men over the age of 40 – especially African Americans and those with a family history of prostate cancer – to discuss screening options with their healthcare providers. If the diagnosis is positive, get second opinions! There is perhaps no other cancer in which a second opinion is more important. Finally, and above all, tell anyone whom you trust and is willing to listen about your disease. Prostate cancer kills more men than any other non-skin cancer in the world. Today, we have options. We don’t have to suffer in silence.
References


