

Chapter 15

Death





Death

The increase in life expectancy over the last century has been remarkable. In the early 1900s, infant mortality was so high that the average life expectancy was not much more than 50 years (1, 2). In 2014, the life expectancy in the United States was 78.8 years (3). This increase is mostly due to improvements in infant survival paired with important shifts in the leading causes of death from infectious disease to chronic conditions, which cause death later in life (3). Public health breakthroughs such as vaccines against smallpox, polio, and measles, as well as better and less crowded housing, clean drinking water, and better nutrition have all played a role, especially in the early part of the 20th century when the risk of death from infection was high at every age and only a small proportion of people reached old age (4). Today, all individuals, regardless of race/ethnicity, are living longer. The most recent research shows that life expectancy is continuing to increase for people over the age of 80 (4). The observed gain in life expectancy among the oldest segments of our population raises questions about how we plan for an aging population as families and as a society (4).

Premature mortality

Premature mortality refers to deaths that occur before a person reaches the expected or average age of death in their population group. The CDC estimates that almost 900,000 Americans die prematurely from the five leading causes of death (heart disease, cancer, chronic lower respiratory diseases, stroke, and unintentional injuries) and that up to 40% of these deaths are preventable (2). Many premature deaths are caused by inequities in the social, environmental, economic, and geographic attributes of the neighborhoods in which people live and work. High poverty rates, income inequality, and low levels of social mobility increase the risk of poor health outcomes and premature deaths. Premature deaths can be prevented through public health programs and policies that address the social determinants of health that contribute to poor health outcomes (5).

Racial and ethnic differences

Over the last decade, life expectancy in the U.S. has followed a general trend in which White individuals live longer than Black individuals, and women live longer than men. In 1999, the differences in life expectancy between Black and White individuals was 5.9 years (6), but narrowing of the life expectancy gap is evident, with 2014 data showing a 3.6 year difference in life expectancy between Black and White individuals (3). In 2014, the life expectancy was 72.0 years for Black males, 78.1 years for Black females, 79.2 years for Latino males, 84.0 years for Latino females, 76.5 years for White males, and 81.1 years for White females. Life expectancy data for Asian individuals were not available (7). Despite this narrowing, racial inequities in life span continue to persist (3). In 2014, the average risk of death for Black individuals was 17.1% higher than for White individuals (3). This difference may be explained by a higher death rate from chronic disease, cancer, homicide, and perinatal conditions for Black individuals in comparison with White individuals (8).

Leading causes of death

Examining leading causes of death helps public health and medical professionals prioritize prevention, treatment, and research efforts to improve health. In 2014, the ten leading causes of death in the U.S. were heart disease, cancer, chronic lower respiratory diseases, unintentional injuries, stroke, Alzheimer's disease, diabetes, influenza and pneumonia, kidney disease, and suicide. These causes accounted for 74% of the 2.6 million deaths that year (7). From 2004 to 2014, the age-adjusted death rates from heart disease and cancer decreased by 25% and 14%, respectively (8). In contrast, the suicide rate increased by 21% over that decade, and the drug poisoning death rate involving heroin increased more than five-fold (7).

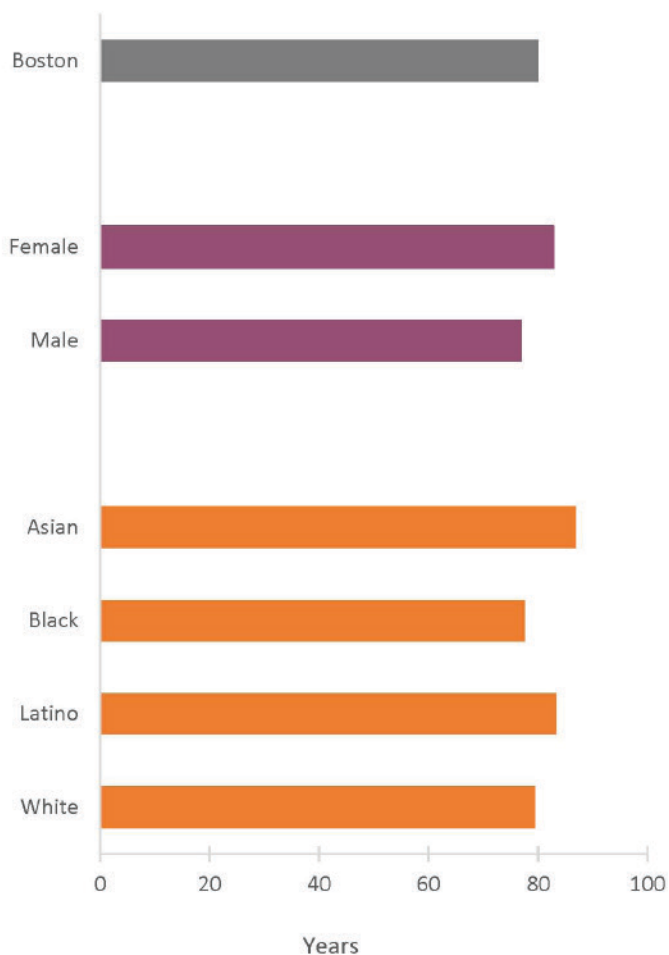
Social determinants of health

Deaths can be attributed to three broad categories or causes: social factors, disease or physiology, and behavior. Social factors or determinants refer to issues such as low educational attainment, racial segregation, low income, and area-level poverty. These factors have been attributed to causing death (9). In their 2011 study, Galea et al. estimated that the number of deaths attributable to social determinants of health in the U.S. was comparable to the number associated with disease/biology (e.g. heart attacks, lung cancer) and behavioral causes (e.g. lung cancer due to tobacco use) (9). Life expectancy is impacted by the social determinants of health, and racial/ethnic differences in death rates highlight the importance of examining health care delivery, public health systems, and social infrastructure (e.g. schools, employment, transportation, education and housing) with a health equity focus (10).

Racism is also a social determinant of health that can impact a racial/ethnic group's death rate. Much research has linked experiencing explicit and implicit racism to negative health outcomes and a higher death rate (11-14). A recent study found that in U.S. counties where White residents acknowledged more open racial bias, the differences between the rate of death from heart diseases among Black residents and White residents were greater, with Black residents having a higher death rate. At the same time, in these same areas, the heart disease death rate among White residents was higher than in counties where White residents acknowledged less racial bias. Racial biases have a negative effect on life expectancy among those holding the racial bias, as well as those experiencing the discrimination. It is thought that communities with more racial discrimination also have lower social capital (a social determinant of health), such as trust between neighbors, which negatively impacts health outcomes (15).

In this section, we present Boston-specific data on life expectancy, premature mortality, all-cause mortality rate, and leading causes of death. Disease-specific mortality data are also included within other chapters of this report.

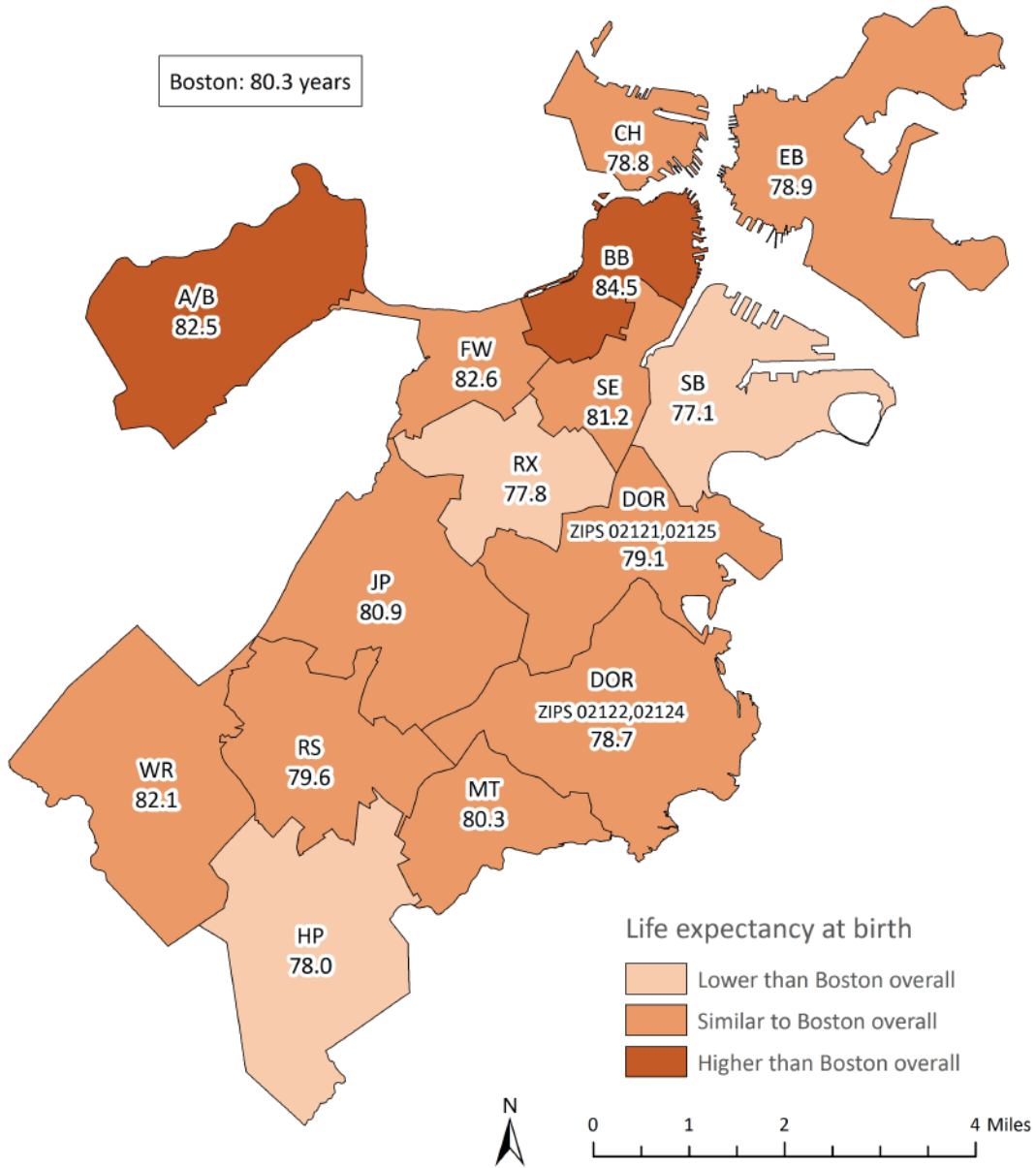
Figure 15.1 Life Expectancy at Birth
by Selected Indicators, 2015



DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

In 2015, the life expectancy at birth for a Boston resident was 80.0 years. Life expectancy at birth was 82.8 years for females and 77.0 for males. It was 86.9 years for Asian residents, 77.6 for Black residents, 83.3 for Latino residents, and 79.5 for White residents.

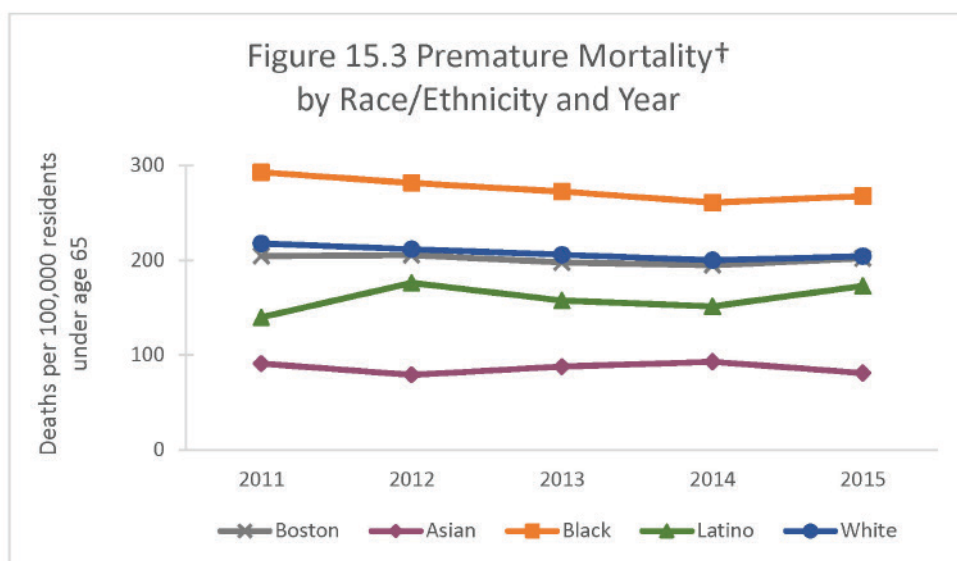
Figure 15.2 Life Expectancy at Birth by Neighborhood, 2011-2015



NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

For 2011-2015, life expectancy at birth was higher for Allston/Brighton and Back Bay compared with Boston overall. Life expectancy was lower in Hyde Park, Roxbury, and South Boston compared with Boston overall.



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

NOTE: Beginning in October 2014, the method for collecting race/ethnicity for mortality data changed. Interpret trends with caution.

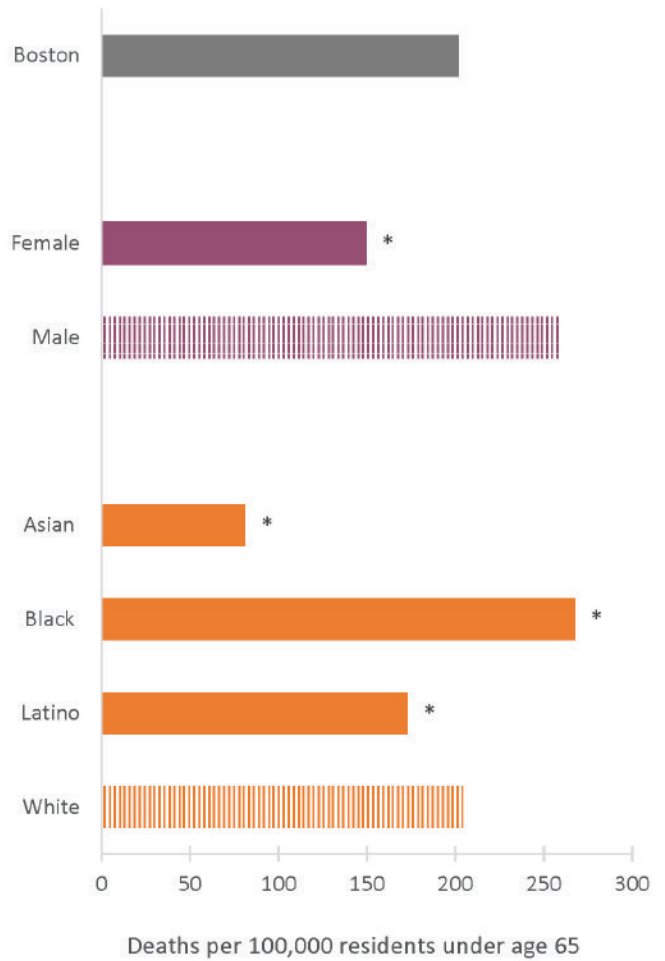
DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

From 2011-2015, there was no significant change in the premature mortality rate (i.e., deaths among residents under age 65) for Boston overall. This was also true for all racial/ethnic groups presented.

In 2015, the premature mortality rate for Asian residents (81.1 deaths per 100,000 residents under age 65) was 60% lower and the rate for Latino residents (172.8) was 15% lower compared with the rate for White residents (204.1). The rate for Black residents (267.5) was 31% higher than the rate for White residents.

In 2015, the premature mortality rate in Boston was 201.8 deaths per 100,000 residents under age 65. The premature mortality rate was 42% lower for females (149.3) compared with males (259.0). The rate was 60% lower for Asian residents (81.1), 15% lower for Latino residents (172.8), and 31% higher for Black residents (267.5) compared with White residents (204.1).

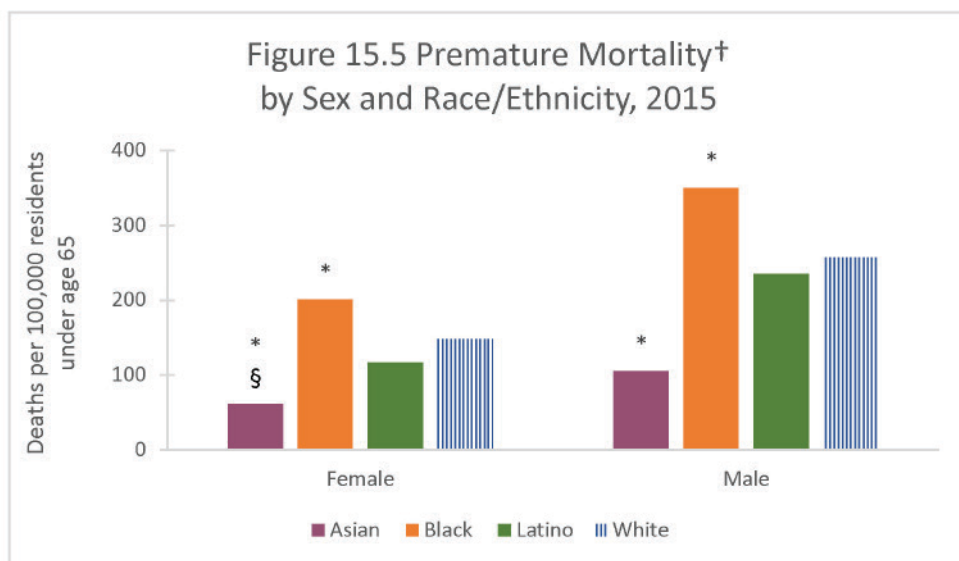
Figure 15.4 Premature Mortality† by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

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

NOTE: Bars with patterns indicate the reference group within each selected indicator.
 DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.



* Statistically significant difference when compared to reference group

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

§ Rates are based on 20 or fewer cases and should be interpreted with caution.

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

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016).

Data may be updated as more information becomes available.

In 2015, the premature mortality rate was 59% lower for Asian females (60.9 deaths per 100,000 residents under age 65) and 36% higher for Black females (200.5) compared with White females (147.9).

The rate was 59% lower for Asian males (105.2) and 36% higher for Black males (350.2) compared with White males (257.0).

Figure 15.6 Top 5 Leading Causes of Premature Mortality† by Year

Rank	2011	2012	2013	2014	2015
1	Cancer 288 (55.3)	Cancer 320 (59.6)	Cancer 295 (53.9)	Cancer 247 (44.5)	Cancer 277 (48.4)
2	Heart disease 154 (29.8)	Heart disease 172 (33.1)	Heart disease 149 (27.7)	Accidents 153 (28.5)	Accidents 182 (34.0)
3	Accidents 114 (21.3)	Accidents 110 (20.8)	Accidents 145 (27.5)	Heart disease 136 (25.0)	Heart disease 145 (25.6)
4	Homicide 55 (7.5)	Homicide 49 (6.6)	Chronic liver cirrhosis 36 (6.5)	Homicide 48 (7.3)	Suicide 39 (6.4)
5	Suicide 44 (7.9)	Chronic liver cirrhosis 43 (8.4)	Suicide 35 (6.0)	Diabetes 35 (6.3)	Homicide 35 (4.7)

Cause of death, count
(rate per 100,000 residents under age 65)

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

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.

Cancer was the leading cause of premature mortality for Boston residents from 2011 to 2015. Heart disease was the second leading cause of premature mortality from 2011 to 2013, but was replaced by accidents in 2014. Accidents include unintentional drug overdose.

In 2015, unintentional opioid overdoses accounted for 71% of deaths due to accidents for residents under age 65 (11% of all premature mortality) and would rank third if explicitly specified within the ranking scheme. For more information, see Chapter 14: Substance Use Disorders.

Cancer remained the top leading cause of premature mortality for both males and females from 2011 to 2015. Accidents surpassed heart disease as the second leading cause of premature mortality in 2013 for females and in 2014 for males. In 2015, cancer, accidents, and heart disease were the top three leading causes of premature mortality for males and females. For females in 2015, the top five also included chronic lower respiratory diseases and conditions originating in the perinatal period. For males in 2015, homicide and suicide were included in the top five.

In 2015, unintentional opioid overdoses accounted for 73% of deaths due to accidents for females and 70% for males under age 65. This accounted for 9% of all premature mortality for females and 13% for males, and would rank third if explicitly specified within the ranking scheme for both sexes. For more information see Chapter 14: Substance Use Disorders.

Figure 15.7a Top 5 Leading Causes of Premature Mortality† by Year, Female Residents

Rank	2011	2012	2013	2014	2015
1	Cancer 139 (51.6)	Cancer 135 (49.0)	Cancer 118 (41.5)	Cancer 113 (39.6)	Cancer 131 (44.6)
2	Heart disease 39 (14.7)	Heart disease 44 (16.9)	Accidents 42 (15.8)	Accidents 39 (14.2)	Accidents 52 (19.6)
3	Accidents 26 (9.8)	Accidents 22 (8.0)	Heart disease 32 (11.6)	Heart disease 38 (13.3)	Heart disease 46 (16.3)
4	Suicide 12 (4.2) §	Chronic liver cirrhosis 15 (5.5) §	Chronic liver cirrhosis 17 (5.7) §	Diabetes 11 (3.9) §	Perinatal 13 (5.6) §
5	Perinatal 10 (4.4) §	Diabetes 10 (3.3) §	Cerebrovascular diseases 12 (4.3) §	Chronic lower respiratory diseases 11 (3.6) §	Chronic lower respiratory diseases 13 (4.8) §
Cause of death, count (rate per 100,000 residents under age 65)					

Figure 15.7b Top 5 Leading Causes of Premature Mortality† by Year, Male Residents

Rank	2011	2012	2013	2014	2015
1	Cancer 149 (59.5)	Cancer 185 (71.5)	Cancer 177 (67.6)	Cancer 134 (50.2)	Cancer 146 (52.8)
2	Heart disease 115 (46.4)	Heart disease 128 (51.0)	Heart disease 117 (45.3)	Accidents 115 (43.6)	Accidents 130 (49.3)
3	Accidents 88 (33.4)	Accidents 88 (34.3)	Accidents 103 (39.8)	Heart disease 98 (37.8)	Heart disease 99 (36.0)
4	Homicide 46 (12.9)	Homicide 43 (11.8)	Suicide 30 (10.1)	Homicide 44 (13.9)	Homicide 32 (8.7)
5	Suicide 32 (11.9)	Chronic liver cirrhosis 28 (11.4)	Homicide 30 (7.9)	Diabetes 24 (9.0)	Suicide 27 (9.4)
Cause of death, count (rate per 100,000 residents under age 65)					

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

§ Rates are based on 20 or fewer cases and 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.

Figure 15.8 Top 5 Leading Causes of Premature Mortality†
by Race/Ethnicity, 2011-2015

Rank	Asian	Black	Latino	White
1	Cancer 93 (40.0)	Cancer 475 (68.1)	Cancer 172 (39.8)	Cancer 660 (51.5)
2	Heart disease 19 (8.4) §	Heart disease 282 (41.9)	Accidents 111 (23.1)	Accidents 406 (34.0)
3	Suicide 14 (4.9) §	Accidents 162 (25.6)	Heart disease 70 (16.6)	Heart disease 379 (30.6)
4	Accidents 13 (5.6) §	Homicide 138 (20.6)	Homicide 58 (9.1)	Suicide 106 (8.4)
5	Cerebrovascular diseases 6 (2.7) §	Diabetes 67 (9.5)	Perinatal 34 (5.5)	Chronic liver cirrhosis 86 (7.1)
Cause of death, count (rate per 100,000 residents under age 65)				

† 5-year average annual age-adjusted rates per 100,000 residents under age 65

§ Rates are based on 20 or fewer cases and 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.

For 2011-2015, cancer was the leading cause of premature mortality for all racial/ethnic groups presented. The second leading cause was heart disease for Asian and Black residents, and accidents for Latino and White residents. Cancer, heart disease, and accidents were in the top five for all racial/ethnic groups, though in various orders. Other top causes of premature mortality included suicide and cerebrovascular diseases for Asian residents, homicide and diabetes for Black residents, homicide and conditions originating in the perinatal period for Latino residents, and suicide and chronic liver cirrhosis for White residents.

Unintentional opioid overdoses accounted for 41% of deaths due to accidents for Black residents, 60% for Latino residents, and 70% for White residents under age 65. This accounted for 4% of all premature mortality for Black residents, 5% for Latino residents, and 11% for White residents. For more information see Chapter 14: Substance Use Disorders.

For 2011-2015, cancer was the leading cause of premature mortality for females and males of all racial/ethnic groups. Heart disease was the second leading cause for Black and Latino females, and for Asian, Black, and White males. Accidents were the second leading cause of premature mortality for White females and Latino males.

For 2011-2015, unintentional opioid overdoses accounted for 49% of deaths due to accidents for Black female residents, 45% for Latino female residents, and 71% for White female residents under age 65. This accounted for 4% of all premature mortality for Black female residents, 4% for Latino female residents, and 12% for White female residents. Unintentional opioid overdoses accounted for 37% of deaths due to accidents for Black male residents, 63% for Latino male residents, and 69% for White male residents under age 65. This accounted for 4% of all premature mortality for Black male residents, 4% for Latino male residents, and 12% for White male residents. For more information see Chapter 14: Substance Use Disorders.

Figure 15.9a Top 5 Leading Causes of Premature Mortality†, 2011-2015, Female Residents by Race/Ethnicity

Rank	Asian	Black	Latino	White
1	Cancer 41 (32.7)	Cancer 229 (59.3)	Cancer 79 (33.6)	Cancer 271 (44.0)
2	‡	Heart disease 93 (24.6)	Heart disease 25 (11.1)	Accidents 105 (19.2)
3	‡	Accidents 51 (14.7)	Accidents 22 (8.3)	Heart disease 77 (13.3)
4	‡	Diabetes 25 (6.3)	Chronic liver cirrhosis 12 (5.3) §	Chronic lower respiratory diseases 28 (4.4)
5	‡	Perinatal 23 (9.3)	Perinatal 12 (3.9) §	Suicide 27 (5.3)
Cause of death, count (rate per 100,000 residents under age 65)				

Figure 15.9b Top 5 Leading Causes of Premature Mortality†, 2011-2015, Male Residents by Race/Ethnicity

Rank	Asian	Black	Latino	White
1	Cancer 52 (48.6)	Cancer 246 (79.3)	Cancer 93 (47.6)	Cancer 389 (59.0)
2	Heart disease 17 (16.2) §	Heart disease 189 (64.0)	Accidents 89 (40.1)	Heart disease 302 (47.1)
3	Accidents 12 (11.0) §	Homicide 124 (40.2)	Homicide 51 (16.0)	Accidents 301 (47.5)
4	Suicide 10 (7.5) §	Accidents 111 (38.7)	Heart disease 45 (23.3)	Suicide 79 (11.5)
5	‡	Diabetes 42 (13.8)	Perinatal 22 (7.1)	Chronic liver cirrhosis 59 (9.5)
Cause of death, count (rate per 100,000 residents under age 65)				

† 5-year average annual age-adjusted rates per 100,000 residents under age 65

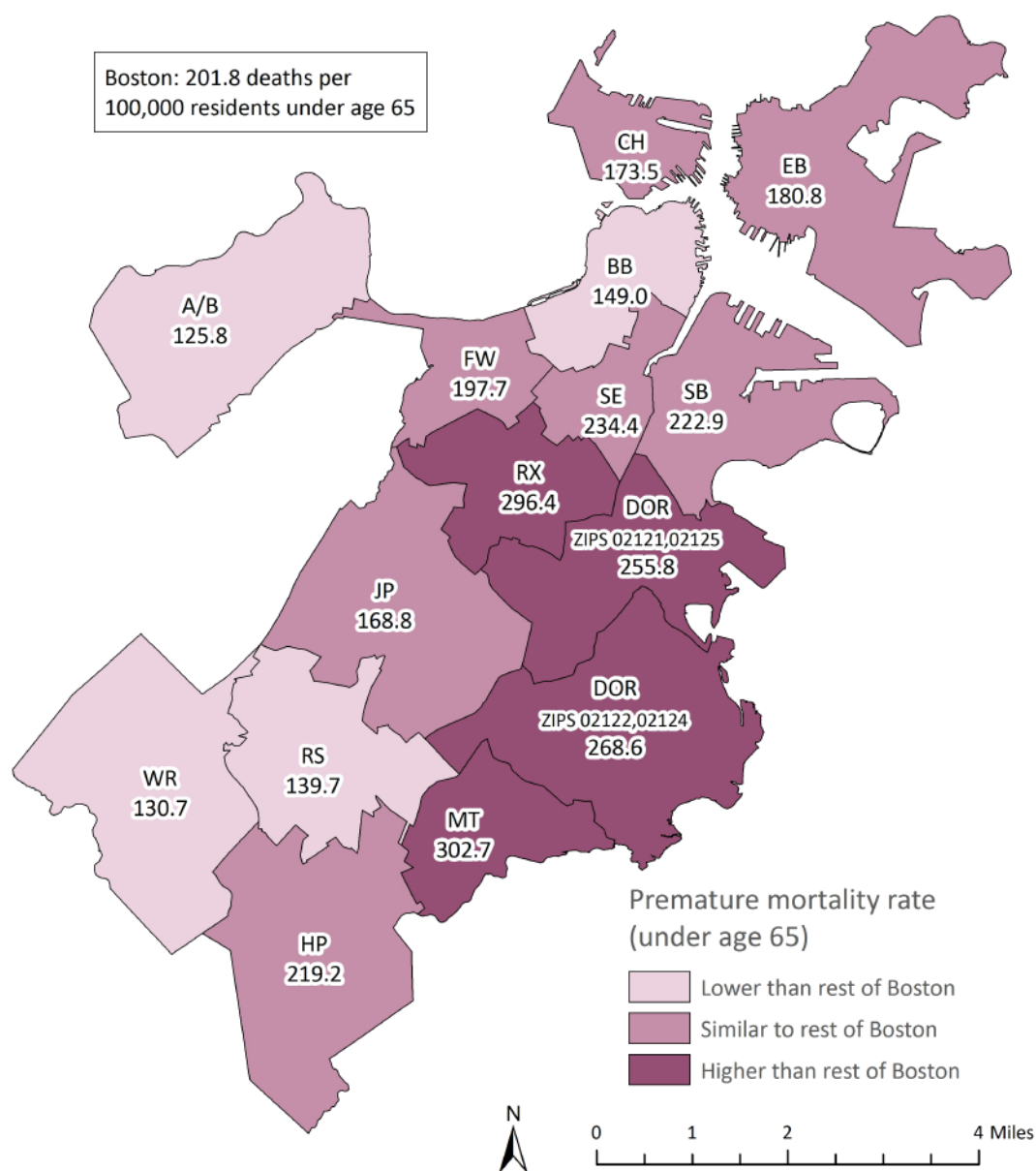
‡ Rates not presented due to a small number of cases

§ Rates are based on 20 or fewer cases and 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.

Figure 15.10 Premature Mortality†
by Neighborhood, 2015



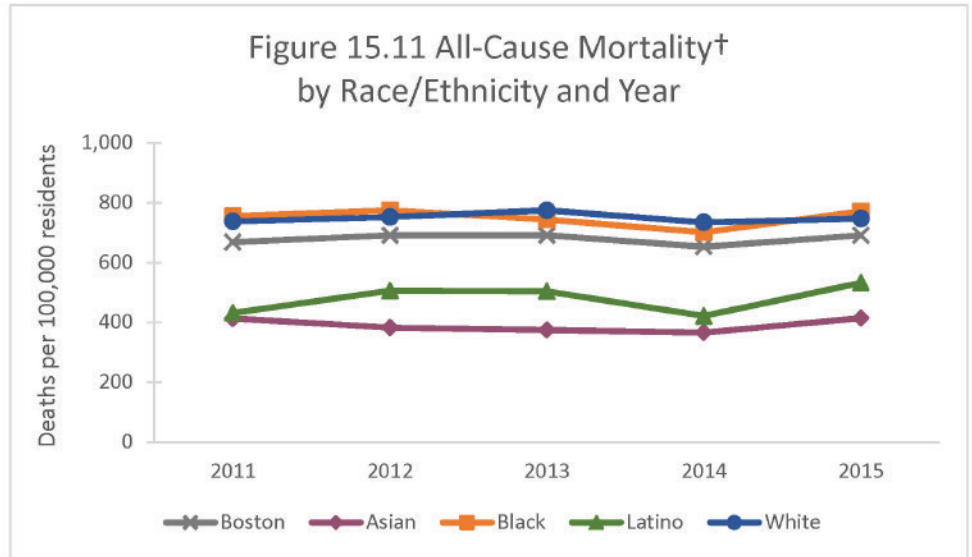
† Age-adjusted rates per 100,000 residents under age 65

NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
"SE" includes the South End and Chinatown.

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

In 2015, the premature mortality rate was higher in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), Mattapan, and Roxbury compared with the rest of Boston. The rate was lower in Allston/Brighton, Back Bay, Roslindale, and West Roxbury compared with the rest of Boston.

From 2011-2015, there was no significant change in the all-cause mortality rate for any of the racial/ethnic groups presented. In 2015, the rate for Asian residents (413.9 deaths per 100,000 residents) was 45% lower and the rate for Latino residents (532.2) was 29% lower when compared with the rate for White residents (747.2).

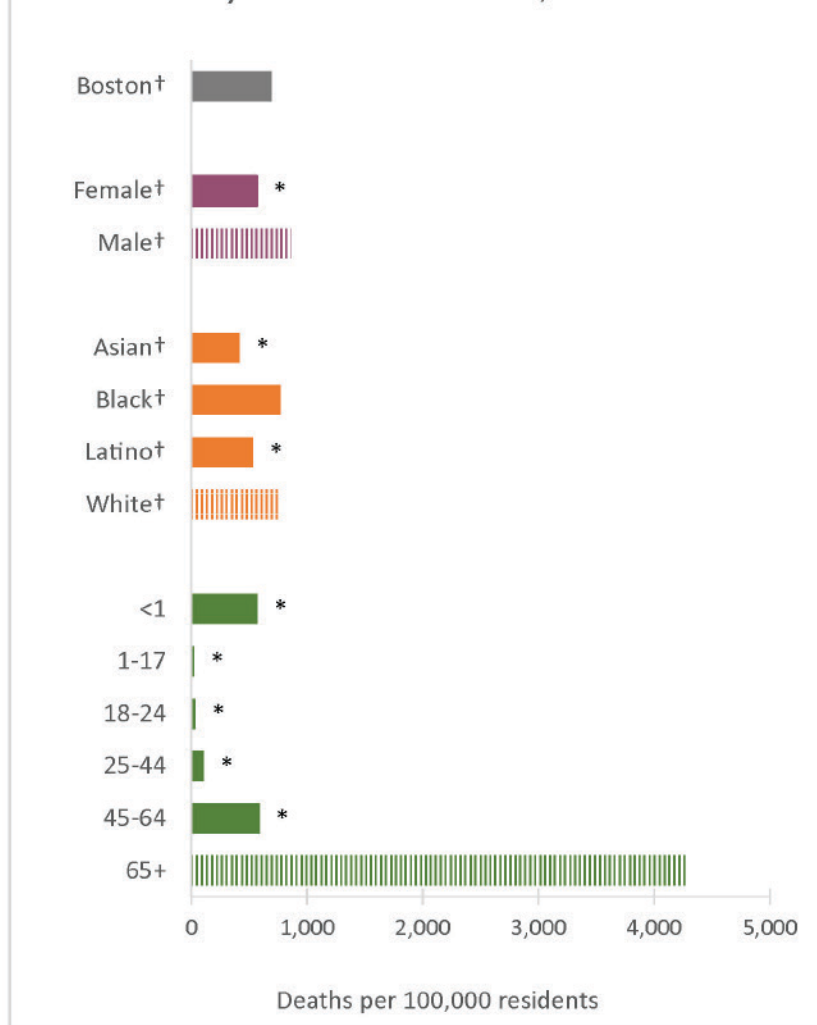


† Age-adjusted rates per 100,000 residents

NOTE: Beginning in October 2014, the method for collecting race/ethnicity for mortality data changed. Interpret trends 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.

Figure 15.12 All-Cause Mortality by Selected Indicators, 2015



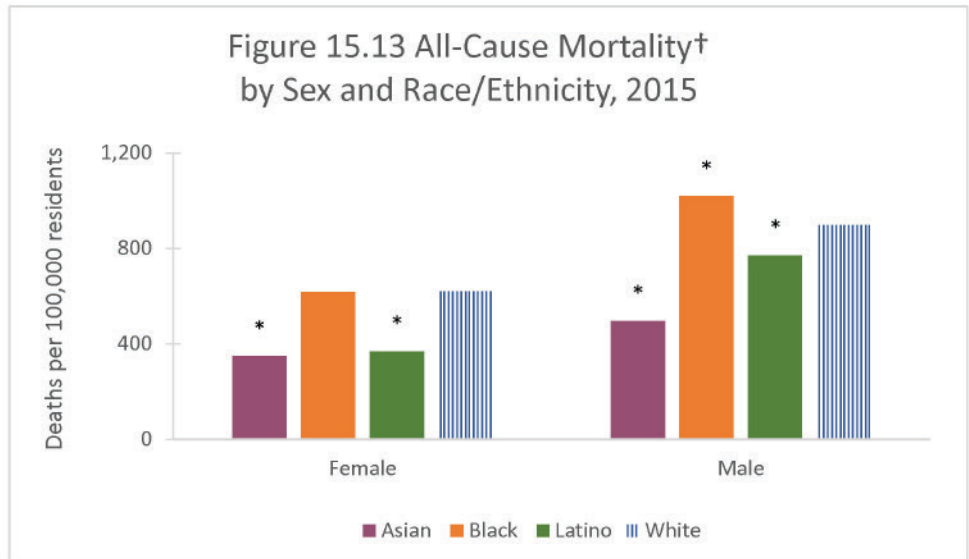
* Statistically significant difference when compared to reference group
 † Age-adjusted rates per 100,000 residents

NOTE: Bars with patterns indicate the reference group within each selected indicator.
 DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

In 2015, the all-cause mortality rate in Boston was 690.8 deaths per 100,000 residents. The rate for females (565.3) was 34% lower than the rate for males (859.2). The rate was 45% lower for Asian residents (413.9) and 29% lower for Latino residents (532.2) compared with White residents (747.2). The mortality rate was lower for all age groups compared with those ages 65 and older.

In 2015, the all-cause mortality rate was 44% lower for Asian female residents (348.6 deaths per 100,000 residents) and 40% lower for Latino females (369.4) compared with White females (620.1).

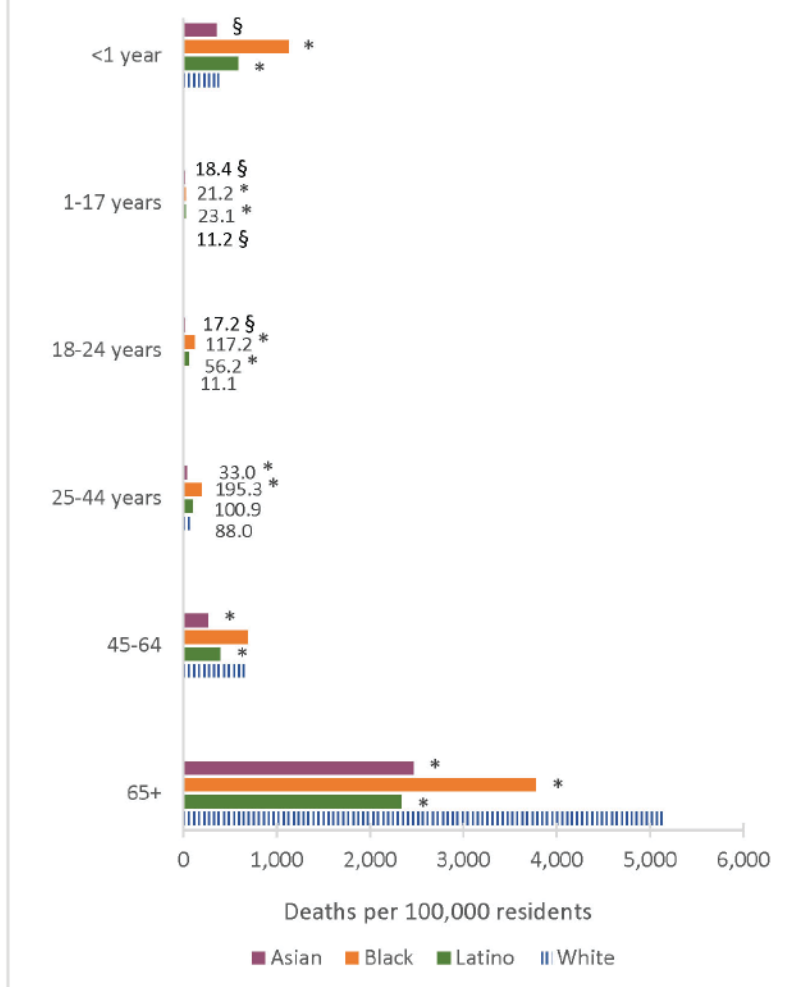
The rate was 45% lower for Asian male residents (497.2), 14% lower for Latino males (771.5), and 13% higher for Black males (1019.5) compared with White males (899.8).



* Statistically significant difference when compared to reference group
 † Age-adjusted rates per 100,000 residents

NOTE: Bars with patterns indicate the reference group within each selected indicator.
 DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016).
 Data may be updated as more information becomes available.

Figure 15.14 All-Cause Mortality¹
by Age and Race/Ethnicity, 2011-2015

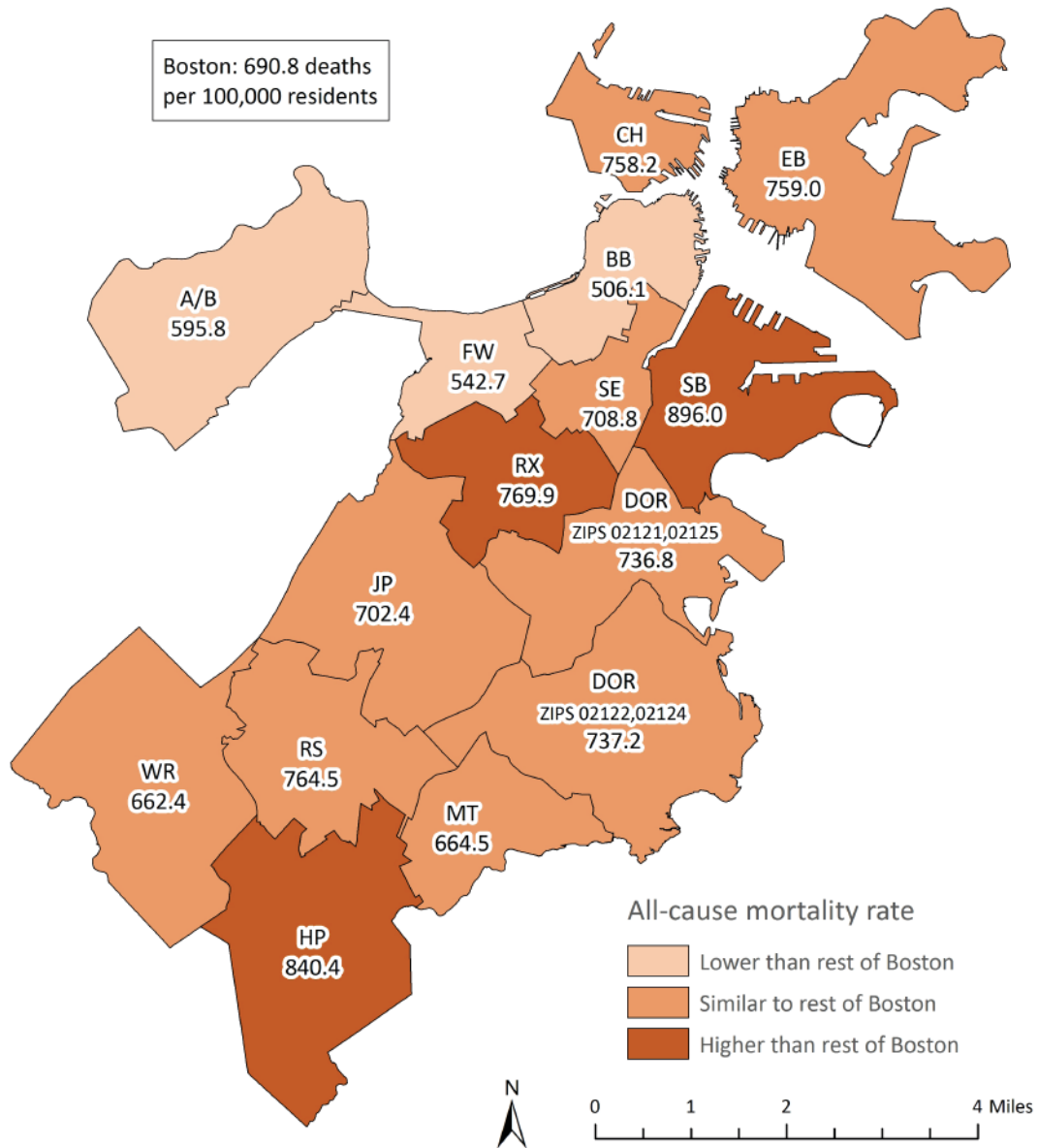


* Statistically significant difference when compared to reference group
 § Rates are based on 20 or fewer cases and should be interpreted with caution.
¹ 5-year average annual rates per 100,000 residents

NOTE: Bars with patterns indicate the reference group within each selected indicator.
 DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

During 2011-2015, the mortality rate varied by race/ethnicity within age group. For Asian residents, the age-specific mortality rate was lower compared with White residents for the following age groups: 25-44 (33.0 vs. 88.0 deaths per 100,000 residents), 45-64 (262.4 vs. 661.6), and 65 and older (2,464.7 vs. 5,139.6). For Black residents, the rate was higher than that of White residents for the following age groups: under 1 (1,131.9 vs. 382.4), 18-24 (117.2 vs. 11.1), and 25-44 (195.3 vs. 88.0). For Black residents ages 18-24, the mortality rate was 10.6 times that of White residents. Among residents ages 65 and older, the rate for Black residents (3,777.6) was lower than the rate for White residents (5,139.6). For Latino residents, the rate was higher for those under 1 (583.3 vs. 382.4), 1-17 (23.1 vs. 11.2), and 18-24 (56.2 vs. 11.1) and lower for those 45-64 (393.2 vs. 661.6) and 65 and older (2,334.9 vs. 5,139.6) compared with White residents.

Figure 15.15 All-Cause Mortality† by Neighborhood, 2015



† Age-adjusted rates per 100,000 residents

NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
"SE" includes the South End and Chinatown.

DATA SOURCE: Boston resident deaths, Massachusetts Department of Public Health (data as of December 2016). Data may be updated as more information becomes available.

In 2015, the all-cause mortality rate was higher in Hyde Park, Roxbury, and South Boston compared with the rest of Boston. The rate was lower in Allston/Brighton, Back Bay, and Fenway compared with the rest of Boston.

Figure 15.16 Top 5 Leading Causes of Mortality† by Year

Rate	2011	2012	2013	2014	2015
1	Cancer 906 (171.5)	Cancer 999 (187.3)	Cancer 943 (175.7)	Cancer 824 (153.1)	Cancer 889 (162.6)
2	Heart disease 693 (129.2)	Heart disease 710 (131.8)	Heart disease 724 (133.0)	Heart disease 687 (124.6)	Heart disease 743 (134.5)
3	Accidents 177 (30.7)	Cerebrovascular diseases 184 (34.4)	Accidents 198 (34.3)	Accidents 214 (36.4)	Accidents 245 (41.7)
4	Chronic lower respiratory diseases 147 (28.8)	Accidents 178 (31.3)	Chronic lower respiratory diseases 160 (30.4)	Cerebrovascular diseases 161 (29.8)	Cerebrovascular diseases 158 (28.9)
5	Cerebrovascular diseases 139 (26.1)	Chronic lower respiratory diseases 123 (23.5)	Cerebrovascular diseases 143 (26.6)	Chronic lower respiratory diseases 137 (25.6)	Chronic lower respiratory diseases 147 (27.9)
Cause of death, count (rate per 100,000 residents)					

† 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 (data as of December 2016).

Data may be updated as more information becomes available.

From 2011 to 2015, the top two leading causes of mortality in Boston were cancer and heart disease. In 2015, these two causes were followed by accidents, cerebrovascular diseases, and chronic lower respiratory diseases.

In 2015, unintentional opioid overdose mortality accounted for 54% of deaths due to accidents (3% of all mortality). For more information see Chapter 14: Substance Use Disorders.

Cancer

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

U.S. 2015: 158.5

MA 2015: 152.9

Boston 2015: 162.6

Cerebrovascular diseases

Healthy People 2020 Target: 34.8 deaths per 100,000 population

US 2015: 37.6

MA 2015: 28.4

Boston 2015: 28.9

Cancer and heart disease remained the top two leading causes of mortality for both males and females in Boston from 2011 to 2015. In 2015, the top five leading causes of death for females in order were: cancer, heart disease, cerebrovascular diseases, accidents, and chronic lower respiratory diseases. The top five for males were comprised of the same causes of death but in a different order: cancer, heart disease, accidents, chronic lower respiratory diseases, and cerebrovascular diseases.

In 2015, unintentional opioid overdoses accounted for 43% of deaths due to accidents for females and 59% for males. This accounted for 2% of all mortality for females and 5% for males and would rank tenth for females and third for males if explicitly specified within the ranking scheme. For more information see Chapter 14: Substance Use Disorders.

Figure 15.17a Top 5 Leading Causes of Mortality† by Year, Female Residents

Rank	2011	2012	2013	2014	2015
1	Cancer 429 (138.5)	Cancer 495 (160.0)	Cancer 459 (146.9)	Cancer 401 (128.5)	Cancer 439 (139.3)
2	Heart disease 319 (94.3)	Heart disease 349 (104.9)	Heart disease 365 (106.2)	Heart disease 329 (93.2)	Heart disease 349 (102.6)
3	Chronic lower respiratory diseases 88 (28.2)	Cerebrovascular diseases 114 (33.4)	Cerebrovascular diseases 95 (28.0)	Cerebrovascular diseases 91 (27.4)	Cerebrovascular diseases 92 (26.8)
4	Cerebrovascular diseases 79 (23.0)	Alzheimer's disease 82 (23.1)	Chronic lower respiratory diseases 92 (29.4)	Alzheimer's disease 76 (21.4)	Accidents 88 (28.2)
5	Alzheimer's disease 75 (20.4)	Chronic lower respiratory diseases 74 (23.2)	Alzheimer's disease 87 (24.4)	Accidents 66 (20.6)	Chronic lower respiratory diseases 76 (24.2)
Cause of death, count (rate per 100,000 residents)					

Figure 15.17b Top 5 Leading Causes of Mortality† by Year, Male Residents

Rate	2011	2012	2013	2014	2015
1	Cancer 477 (223.1)	Cancer 504 (227.7)	Cancer 484 (216.9)	Cancer 423 (188.6)	Cancer 450 (197.0)
2	Heart disease 374 (178.6)	Heart disease 361 (166.9)	Heart disease 359 (163.1)	Heart disease 358 (166.9)	Heart disease 394 (179.9)
3	Accidents 114 (42.9)	Accidents 118 (45.8)	Accidents 124 (45.5)	Accidents 148 (55.9)	Accidents 157 (56.7)
4	Cerebrovascular diseases 60 (29.1)	Cerebrovascular diseases 70 (34.3)	Chronic lower respiratory diseases 68 (32.8)	Chronic lower respiratory diseases 77 (36.1)	Chronic lower respiratory diseases 71 (33.8)
5	Chronic lower respiratory diseases 59 (30.2)	Diabetes 57 (26.0)	Diabetes 55 (24.8)	Cerebrovascular diseases 70 (33.0)	Cerebrovascular diseases 66 (31.1)
Cause of death, count (rate per 100,000 residents)					

† 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 (data as of December 2016). Data may be updated as more information becomes available.

Figure 15.18 Top 5 Leading Causes of Mortality†
by Race/Ethnicity, 2011-2015

Rank	Asian	Black	Latino	White
1	Cancer 298 (119.6)	Cancer 1251 (191.8)	Cancer 361 (117.7)	Cancer 2582 (184.3)
2	Heart disease 142 (58.5)	Heart disease 861 (137.1)	Heart disease 215 (86.2)	Heart disease 2298 (150.0)
3	Cerebrovascular diseases 51 (21.0)	Cerebrovascular diseases 224 (37.2)	Accidents 119 (23.8)	Accidents 625 (44.3)
4	Alzheimer's disease 48 (20.0)	Diabetes 222 (35.5)	Homicide 59 (8.3)	Chronic lower respiratory diseases 494 (34.5)
5	Chronic lower respiratory diseases 42 (17.2)	Accidents 212 (31.1)	Cerebrovascular diseases 49 (19.3)	Cerebrovascular diseases 446 (28.6)
Cause of death, count (rate per 100,000 residents)				

† 5-year average annual 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 (data as of December 2016).

Data may be updated as more information becomes available.

For 2011-2015, cancer and heart disease were the top two leading causes of mortality for Boston residents of all racial/ethnic groups presented. Alzheimer's disease was a leading cause of death that ranked in the top five only for Asian residents, as was the case with diabetes for Black residents and homicide for Latino residents.

For 2011-2015, unintentional opioid overdoses accounted for 31% of deaths due to accidents for Black residents, 55% for Latino residents, and 46% for White residents. This accounted for 1% of all mortality for Black residents, 4% for Latino residents, and 3% for White residents. For more information see Chapter 14: Substance Use Disorders.

For 2011-2015, the leading cause of death for infants under 1 year of age in Boston was due to conditions originating in the perinatal period. The leading cause of death for children ages 1-9 and adults ages 25-44 was accidents, while the leading cause for those ages 10-17 and 18-24 was homicide. The leading cause of death for adults ages 45-64 and 65 and older was cancer. Cancer was among the top four leading causes of death for all age groups except infants under 1 year of age. Accidents was one of the top five leading causes of death for all age groups except those under 1 year of age and those ages 65 and older.

For 2011-2015, unintentional opioid overdoses accounted for 38% of deaths due to accidents for residents ages 18-24, 72% for residents ages 25-44, and 55% for residents ages 45-64. This accounted for 8% of all mortality for residents ages 18-24, 21% for residents ages 25-44, and 5% for residents ages 45-64. For more information see Chapter 14: Substance Use Disorders.

Figure 15.19 Top 5 Leading Causes of Mortality¹ by Age, 2011-2015

Rank	<1	1-9	10-17	18-24	25-44	45-64	65+
1	Perinatal 126 (345.2)	Accidents 8 (3.2) §	Homicide 12 (5.6) §	Homicide 96 (15.1)	Accidents 303 (29.7)	Cancer 1253 (188.6)	Cancer 3134 (998.0)
2	Congenital malformations 33 (90.4)	Cancer 7 (2.8) §	Cancer 7 (3.3) §	Accidents 45 (7.1)	Cancer 154 (15.1)	Heart disease 642 (96.6)	Heart disease 2801 (891.9)
3	‡	‡	Accidents 5 (2.3) §	Suicide 26 (4.1)	Heart disease 106 (10.4)	Accidents 342 (51.5)	Cerebrovascular diseases 666 (212.1)
4	‡	‡	Suicide 5 (2.3) §	Cancer 6 (0.9) §	Homicide 95 (9.3)	Chronic liver cirrhosis 133 (20.0)	Chronic lower respiratory diseases 599 (190.7)
5	‡	‡	‡	Congenital malformations 6 (0.9) §	Suicide 76 (7.5)	Diabetes 130 (19.6)	Alzheimer's disease 505 (160.8)
Cause of death, count (rate per 100,000 residents)							

‡ Rates not presented due to a small number of cases

§ Rates are based on 20 or fewer cases and should be interpreted with caution

¹ 5-year average annual 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 (data as of December 2016).

Data may be updated as more information becomes available.

Summary

Life expectancy for a Boston resident was approximately 80 years in 2015. Consistent with national data, life expectancy was higher for female than male residents in 2015. Across race/ethnicity, life expectancy was highest for Asian residents and lowest for Black residents in Boston.

Inequities for premature mortality across categories of sex and race/ethnicity were similar to those found for life expectancy. Higher premature mortality rates in 2015 were observed in male residents in comparison with female residents, and Black residents in comparison with White residents. Lower premature mortality rates were observed in Asian and Latino residents in comparison with White residents. In 2014, accidents replaced heart disease as the second leading cause of premature mortality. In 2015, unintentional opioid overdose accounted for 71% of mortality from accidents. Compared to the rest of Boston, elevated premature mortality rates were observed in the neighborhoods of Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), Mattapan, and Roxbury.

The all-cause mortality rate for Boston in 2015 was 690.8 deaths per 100,000 residents, and inequities were found across categories of sex, race/ethnicity, and age. Consistent with the findings observed for life expectancy, the all-cause mortality rate was higher in male residents in comparison with female residents. Among residents in age categories younger than 25 years, the all-cause mortality rates were also generally higher in Black and Latino than White residents. The reverse pattern was observed among residents ages 65 years and older by race/ethnicity. While the all-cause mortality was lower for Asian than White residents among residents in age categories older than 24 years, no differences were found between Asian and White residents in younger age categories.

From 2011 to 2015, the top two leading causes of death for Boston residents were cancer and heart disease, but there was variation in the subsequent leading causes by sex and race/ethnicity. For example, cerebrovascular diseases were the third leading cause of death for female residents and for Asian and Black residents, while accidents was the third leading cause of death for male residents and for Latino and White residents. More variation was found in the leading causes of death across age. With exception to ages 10-24 years, with homicide as the leading cause of death, the leading causes observed for ages < 1 year (conditions originating in the perinatal period), 1-9 years (accidents), 25-44 years (accidents), and 45 years and over (cancer) were generally consistent with national data. We know that life expectancy and mortality are impacted by the social determinants of health. The racial/ethnic differences in death rates both nationally and among Boston residents highlight the importance of efforts to examine health delivery and public systems (e.g. schools, employment, transportation, education, and housing) with a health equity focus.

Death

Top 5 leading causes of death in 2015 among Boston residents



Cancer



Heart disease



Accidents including drug overdose deaths



Cerebrovascular diseases



Chronic lower respiratory diseases

Mortality rate for those under age 65 in 2015



*Rate per 100,000 residents under age 65



For 2011-2015, one of every five deaths among residents ages 25-44 was caused by an unintentional opioid overdose.

References

1. Bell FC, Miller ML. Life Tables for the United States Social Security Area 1900-2100: Actuarial Study No. 120. Social Security Administration; 2005.
2. Mather M, and Scommegna, P. Up to Half of U.S. Premature Deaths Are Preventable; Behavioral Factors Key 2016 [updated 5/8/2017; cited 2017].
3. Kochanek KD, Murphy SL, Xu J, Tejada-Vera B. Deaths: Final Data for 2014. National Vital Statistics Report. 2016;65(4):1-122.
4. National Institute on Aging. Living Longer: Global Health and Aging [03/31/17]. Available from: <https://www.nia.nih.gov/research/publication/global-health-and-aging/living-longer>.
5. Centers for Disease Control and Prevention. Up to 40 percent of annual deaths from each of five leading US causes are preventable. Atlanta, Georgia 2014.
6. National Center for Health Statistics. Leading Causes of Death Contributing to Decrease in Life Expectancy Gap between Black and White Populations: US, 1999-2013. 2015.
7. National Center for Health Statistics. Health, United States, 2015: With Special Feature on Racial and Ethnic Health Disparities. Hyattsville, MD 2016.
8. Kochanek KD, Arias E, Anderson RN. How Did Cause of Death Contribute to Racial Differences in Life Expectancy in the United States in 2010? NCHS data brief. 2013.
9. Galea S, Hoggatt K, Tracey M, DiMaggio C, Karpati A. Estimated Deaths Attributable to Social Factors in the United States. American journal of public health. 2011;101(8):1456-65.
10. Braveman P, Gottlieb L. The social determinants of health: it's time to consider the causes of the causes. Public health reports (Washington, DC : 1974). 2014;129 Suppl 2:19-31.
11. Chae DH, Clouston S, Hatzenbuehler ML, Kramer MR, Cooper HL, Wilson SM, et al. Association between an Internet-Based Measure of Area Racism and Black Mortality. PloS one. 2015;10(4):e0122963.
12. Kennedy BP, Kawachi I, Lochner K, Jones C, Prothrow-Stith D. (Dis)respect and black mortality. Ethnicity & disease. 1997;7(3):207-14.
13. Lee Y, Muennig P, Kawachi I, Hatzenbuehler ML. Effects of Racial Prejudice on the Health of Communities: A Multilevel Survival Analysis. American journal of public health. 2015;105(11):2349-55.
14. Williams DR, Mohammed SA. Racism and Health I: Pathways and Scientific Evidence. The American behavioral scientist. 2013;57(8).
15. Leitner JB, Hehman E, Ayduk O, Mendoza-Denton R. Blacks' Death Rate Due to Circulatory Diseases Is Positively Related to Whites' Explicit Racial Bias. Psychol Sci 2016 Oct;2. 2016;27(10):1299-311.