**CANCER INCIDENCE AND**

**MORTALITY**

**IN MASSACHUSETTS**

**2009 – 2013:**

STATEWIDE REPORT

The Office of Data Management and Outcomes Assessment

Massachusetts Department of Public Health

*June 2016 (update: August 2017)*

This page intentionally left blank.

**CANCER INCIDENCE AND**

**MORTALITY**

**IN MASSACHUSETTS**

**2009 – 2013:**

STATEWIDE REPORT

Charlie Baker, Governor

Karyn Polito, Lieutenant Governor

Marylou Sudders, Secretary of Health and Human Services

Monica Bharel, Commissioner of Public Health

Tom Land, Director, Office of Data Management and Outcomes Assessment

Susan T. Gershman, Director, Massachusetts Cancer Registry

Massachusetts Department of Public Health

*June 2016 (update: August 2017)*

This page intentionally left blank.

**ACKNOWLEDGMENTS**

This report was prepared by Susan T. Gershman, Director, Massachusetts Cancer Registry, and Massachusetts Cancer Registry staff and consultants. Special thanks are given to Annie MacMillan and Richard Knowlton for their diligent work in preparing the data for this report. Thanks are also given to consultant Nancy Weiss for her editing efforts. Thanks are given to Malena Hood of the Division of Research and Epidemiology for providing the mortality and population data. Thanks are also given to Joshua Nyambose of the Massachusetts Comprehensive Cancer Prevention and Control Network Bureau of Community Health and Prevention for his contribution to the special section “Obesity-related Cancers".

**Massachusetts Cancer Registry Staff**

Susan T. Gershman, MS, MPH, PhD, CTR, *Director*

Bruce Caldwell, *Research Analyst/Geocoder*

Nancy Donovan, MA, CTR, *Cancer Registrar*

Patricia J. Drew, CTR, *Cancer Registrar/Quality Assurance Coordinator*

Loi Huynh, *Software Developer*

Richard Knowlton, MS, *Epidemiologist*

Ann MacMillan, MPH, *Epidemiologist*

Mary Mroszczyk, CTR, *Geocoding/ Special*

 *Projects Coordinator*

Jeremiah Nesser, *Technical Assistant for Special Projects*

Jayne Nussdorfer, CTR, *Cancer Registrar*

Barbara J. Rhodes, CMA, CTR, *Cancer Registrar/Death Clearance Coordinator*

Pamela Shuttle, CTR, RHIT, *Cancer Registrar/Non-Hospital Reporting Coordinator*

Hung Tran, *Software Developer*

**Massachusetts Cancer Registry Advisory Committee**

 Lindsay Frazier, MD, ScM *(Chair)*

Anita Christie, RN, MHA, CPHQ

Jan Sullivan, MS

Deborah Dillon, MD

Joanna Haas, MD

Carol Lowenstein, CTR, MBA

Reggie Mead

Gail Merriam, MSW, MPH

J. David Naparstek, ScM., CHO

Larissa Nekhlyudov, MD, MPH

Al Ozonoff, MA, PhD

Paul C. Shroy, MD, MPH

Mark Smith, PhD, MS

Ingrid Stendhal, CTR

Susan Sturgeon, DrPH, MPH

The data in this report are intended for public use and may be reproduced without permission. Proper acknowledgement of the source is requested.

For further information, please contact the following:

 Massachusetts Cancer Registry……………………………………………(617) 624-5642

 Research and Epidemiology……………………………………………….(617) 624-5642

 Occupational Health Surveillance…………………………………………(617) 624-5632

 Bureau of Environmental Health…………………………………………..(617) 624-5757

 Cancer Prevention and Control Initiative………………………………….(617) 624-5479

 Massachusetts Department of Public Health website……………………...www.mass.gov/dph

We acknowledge the Centers for Disease Control and Prevention for its support of the staff and the printing and distribution of this report under cooperative agreement 5 NU58DP003920-04-00 awarded to the Massachusetts Cancer Registry at the Massachusetts Department of Public Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

This page intentionally left blank.

#### **TABLE OF CONTENTS**

Page

Executive Summary………………………………………………………………………………… 1

#### Introduction………………………………………………………………………………...………. 7

####  Overall Content………………………………………………………………………………… 9

Special Overview: Obesity-related Cancers ……………………………………………………… 11

Figures & Tables…………………………………………………………………………………… 17

 Figure 1. Percentage of cancer incident cases by cancer type and sex, Massachusetts,

 2009-2013…………………………………………………………………………………....18

 Figure 2. Incidence rates for ten leading cancer types by sex, Massachusetts, 2009-2013…… 19

 Figure 3. Percentage of cancer deaths by cancer type and sex, Massachusetts, 2009-2013…… 20

 Figure 4. Mortality rates for ten leading cancer types by sex, Massachusetts, 2009-2013……. 21

 Table 1. Age-specific incidence rates and median ages at diagnosis for selected cancer sites,

 Massachusetts, 2009-2013, males ………………………………………………………… 22

 Table 2. Age-specific incidence rates and median ages at diagnosis for selected cancer sites, Massachusetts, 2009-2013, females …………………………………………………. 23

 Table 3. Age-specific incidence rates and median ages at diagnosis for selected cancer sites,

 Massachusetts, 2009-2013, total ………………………………………………………….. 24

 Figure 5. Annual Percent Change (APC) in age-adjusted cancer rates

 among males, Massachusetts, 2009-2013 ………………………………………………….25

 Figure 6. Annual Percent Change (APC) in age-adjusted cancer rates

 among females, Massachusetts, 2009-2013……………………………………….……… 26

 Table 4. Annual age-adjusted incidence rates for selected cancer sites,

 Massachusetts, 2009-2013, males…………………………………………………………. 27

 Table 5. Annual age-adjusted incidence rates for selected cancer sites,

 Massachusetts, 2009-2013, females………………………………………………………... 28

 Table 6. Annual age-adjusted incidence rates for selected cancer sites,

 Massachusetts, 2009-2013, total ………………………………………………………….. 29

 Table 7. Annual age-adjusted mortality rates for selected cancer sites,

 Massachusetts, 2009-2013, males …………………………………………………………. 30

 Table 8. Annual age-adjusted mortality rates for selected cancer sites,

 Massachusetts, 2009-2013, females……………………………………… ……………….. 31

 Table 9. Annual age-adjusted mortality rates for selected cancer sites,

 Massachusetts, 2009-2013, total. …………………………………………………………..32

 Table 10. Five leading cancer incidence rates by race/ethnicity and sex,

 Massachusetts, 2009-2013 ………………………………………………………………… 33

 Table 11. Number and percentage of incident cases for selected cancer sites

 by race/ethnicity, Massachusetts, males, 2009-2013 ……………………………………… 34

 Table 12. Number and percentage of incident cases for selected cancer sites

 by race/ethnicity, Massachusetts, females, 2009-2013 ……………………………………. 35

 Table 13. Number and percentage of incident cases for selected cancer sites

 by race/ethnicity, Massachusetts, total, 2009-2013 ……………………… ………………. 36

 Table 14. Age-adjusted incidence rates and 95% confidence limits (95% CL) for

 selected cancer sites by race/ethnicity, Massachusetts, 2009-2013, males……………….. 37

 Table 15. Age-adjusted incidence rates and 95% confidence limits (95% CL) for

 selected cancer sites by race/ethnicity, Massachusetts, 2009-2013, females……………… 38

 Table 16. Age-adjusted incidence rates and 95% confidence limits (95% CL) for

 selected cancer sites by race/ethnicity, Massachusetts, 2009-2013, total…………………. 39

 Table 17. Five leading cancer mortality rates by race/ethnicity and sex,

 Massachusetts, 2009-2013 ………………………………………………………………… 40

 Table 18. Number and percentage of deaths for selected cancer sites by

 race/ethnicity, Massachusetts, 2009-2013, males …………………………………………. 41

 Table 19. Number and percentage of deaths for selected cancer sites by

 race/ethnicity, Massachusetts, 2009-2013, females ………………………………………. 42

 Table 20. Number and percentage of deaths for selected cancer sites by

 race/ethnicity, Massachusetts, 2009-2013, total …………………………………………... 43

 Table 21. Age-adjusted mortality rates and 95% confidence limits (95% CL) for

 selected cancer sites by race/ethnicity, Massachusetts, 2009-2013, males ………………... 44

 Table 22. Age-adjusted mortality rates and 95% confidence limits (95% CL) for

 selected cancer sites by race/ethnicity, Massachusetts, 2009-2013, females……..……….. 45

 Table 23. Age-adjusted mortality rates and 95% confidence limits (95% CL) for

 selected cancer sites by race/ethnicity, Massachusetts, 2009-2013, total ………………… 46

 Table 24. Incidence rates for selected cancer sites by sex,

 Massachusetts and U.S. (2009-2013) …………………………………………………….. 47

 Table 25. Mortality rates for selected cancer sites by sex,

 Massachusetts and U.S. (2009-2013) …………………………………………………….. 48

Appendices…………………………………………………………………………………………. 49

 Appendix I. ICD codes used for this report …………………………………………………… 50

 Appendix II. Population and rate changes ……………………………………………………... 52

 Appendix III. Population estimates by age, race/ethnicity, and sex,

 Massachusetts, 2009-2013………………………………………………………………… 53

 Appendix IV. Racial/Ethnic Breakdown of the Massachusetts and NAACCR

Populations, 2009-2013……………………………………………………………………. 54

References ………………………………………………………………………………………….. 55

This page intentionally left blank

**EXECUTIVE SUMMARY**

This page intentionally left blank.

**EXECUTIVE SUMMARY**

*Cancer Incidence and Mortality in Massachusetts, 2009-2013: Statewide Report* presents cancer incidence and mortality data for the Commonwealth from 2009 through 2013. The report includes numbers and rates for 24 types of cancer, information on age-specific patterns, an examination of patterns by race/ethnicity, and a comparison of Massachusetts and national cancer rates. A special section on obesity-related cancers is also included. Data are provided on invasive cancers only with the exceptions of urinary bladder (which includes *in situ* and invasive cancers combined) and *in situ* breast cancer.

**All counts and average annual age-adjusted rates presented in this Executive Summary are for the period 2009-2013 and are for Massachusetts residents, unless otherwise stated.**

OVERALL:

* Total number of new cases – 183,009, an average of 36,602 annually
* Total number of cancer deaths – 64,543, an average of 12,909 annually
* Incidence rate (age-adjusted) for all cancers combined for total population – 480.4 per 100,000 persons
* Mortality rate (age-adjusted) for all cancer deaths combined for total population – 162.9 per 100,000 persons.

MOST COMMONLY DIAGNOSED CANCERS & CANCER DEATH CAUSES BY SEX:

***Incidence (newly diagnosed cases)***

* Males – *prostate cancer* accounted for 25.4% of all newly diagnosed cancers among males
* Females – *invasive breast cancer* accounted for 29.4% of all newly diagnosed cancers among females.

***Mortality (causes of cancer death)***

* Males – *cancer of the bronchus and lung* accounted for 27.0% of all cancer deaths among males
* Females – *cancer of the bronchus and lung* accounted for 26.5% of all cancer deaths among females.

TRENDS 2009-2013:

***Statistically Significant Incidence Trends – Males***

* All cancers combined decreased 4.0% per year.
* Bronchus and lung cancer decreased 3.9% per year.
* Colon and rectum cancer decreased 4.3% per year.
* Prostate cancer decreased by 10.3% per year.

***Statistically Significant Mortality Trends – Males***

* All cancers deaths combined decreased 2.6% per year.
* Bronchus and lung cancer decreased 1.9% per year.
* Colon and rectum cancer decreased 3.6% per year.
* Breast cancer increased 45.2% per year. (Note: While this is a statistically significant increase, there were 53 deaths from 2009-2013 and the mortality rate increased from 0.1 to 0.5/100,000. With such small numbers even an increase of a few cases can result in a significant trend. The rates were comparable to national rates as well.)
* Leukemia increased 4.7% per year.
* Liver cancer increased 4.0% per year.

***Statistically Significant Incidence Trends – Females***

* Bronchus and lung cancer decreased 1.5% per year.
* Cervical cancer decreased 3.4% per year.
* Colon and rectum cancer decreased 3.6% per year.

***Statistically Significant Mortality Trends – Females***

* All cancers deaths combined decreased 2.1% per year.
* Bronchus and lung cancer decreased 2.1% per year.
* Esophagus cancer decreased 10.0% per year.

RATES BY RACE/ETHNICITY: *(Unless otherwise noted, the term ‘racial/ethnic groups’ in this report refers to white non-Hispanic, black non-Hispanic, Asian non-Hispanic and Hispanic).*

***Males Incidence***

* Black, non-Hispanic males had the highest total age-adjusted incidence rates, significantly higher than those of all other racial/ethnic groups.
* Cancers of prostate, bronchus and lung, and colon/rectum were the leading cancer types in each racial/ethnic group.
* White, non-Hispanic males had significantly higher rates of leukemia and urinary bladder cancer when compared to all other race/ethnic groups.
* Black, non-Hispanic males had significantly higher rates of multiple myeloma and prostate cancer when compared to all other race/ethnic groups.
* Asian, non-Hispanic males had significantly higher rates of liver and intrahepatic bile duct cancer when compared to white, non-Hispanic and black, non-Hispanic males.

***Males Mortality***

* Black, non-Hispanic males had the highest total cancer mortality rate, significantly higher compared to all other racial/ethnic groups.
* Cancer of the bronchus and lung was the leading cause of cancer death for each racial/ethnic group. White and black, non-Hispanics had significantly elevated rates compared to the other two racial/ethnic groups.
* The mortality rate for prostate cancer and for multiple myeloma was significantly elevated among black, non-Hispanic males compared to the other racial/ethnic groups.
* The mortality rate for liver and intrahepatic cancer was significantly elevated among Asian, non-Hispanics compared to white, non-Hispanics and Hispanics and non-significantly elevated compared to black, non-Hispanics.

***Females Incidence***

* White, non-Hispanic females had the highest total age-adjusted incidence rates, significantly higher than those of all other racial/ethnic groups.
* Breast cancer was the most commonly diagnosed cancer for each racial/ethnic group.
* The second most common cancer diagnosed was bronchus and lung among white non-Hispanics, black non-Hispanics, and Asian non-Hispanics and thyroid among Hispanics.
* Compared to all other racial/ethnic groups, white, non-Hispanic females had significantly higher rates of the following cancer types: invasive and *in situ* breast, bronchus and lung, uterus, ovary, and urinary bladder.
* Black, non-Hispanic females had significantly higher rates of multiple myeloma compared to all other racial/ethnic groups.
* Asian, non-Hispanic females had significantly higher liver and intrahepatic bile duct cancer rates compared to white non-Hispanics and black non-Hispanics, but not compared to Hispanics.

***Females Mortality***

* Black and white, non-Hispanic females had the highest total cancer mortality rates, significantly higher than for Asian, non-Hispanic and Hispanic females.
* Cancer of the bronchus and lung was the leading cause of cancer death among all racial/ethnic groups. White, non-Hispanic females had significantly elevated rates compared to the other racial/ethnic groups.
* Black, non-Hispanic females had significantly elevated breast and uterine cancer mortality rates when compared to the other racial/ethnic groups. Their breast cancer mortality rate was over double that of Asian, non-Hispanic and Hispanic females.

MASSACHUSETTS VS. NATIONAL RATES

***Males and Females Incidence***

Overall age-adjusted cancer incidence rates in Massachusetts were similar to national rates for males, and were significantly higher than national rates for females. Among the cancers significantly elevated for females were invasive and *in situ* breast, bronchus and lung, uterine, esophageal, melanoma of skin, oral cavity and pharynx, thyroid, and urinary bladder. Among those cancers significantly elevated for males were esophagus, liver and intrahepatic bile ducts, testicular, thyroid and urinary bladder. Incidence rates that were significantly lower compared to the U.S. among females were cervix uteri and colon and rectum, while among males the cancer types included bronchus and lung, colon and rectum, and prostate.

***Males and Females Mortality***

Overall age-adjusted cancer mortality rates in Massachusetts were significantly lower from national rates for both males and females. However, there were some individual cancers that had significantly elevated mortality rates compared to the U.S. These include female bronchus and lung; male liver and intrahepatic bile duct and esophagus; and male and female urinary bladder. Those that were significantly lower compared to the U.S. included breast, cervix uteri, kidney and renal pelvis, colon/rectum and non-Hodgkin lymphoma among females, and bronchus and lung, colon/rectum, kidney and renal pelvis, larynx, multiple myeloma, non-Hodgkin lymphoma and prostate among males.

***Obesity-related Cancers***

Overweight, obesity and physical inactivity together are associated with an approximately 20-30% increased risk of several cancers including breast, colon/rectum, endometrium, kidney, esophagus, pancreas, gallbladder and thyroid.

**INTRODUCTION**

This page intentionally left blank.

**INTRODUCTION**

The Massachusetts Cancer Registry (MCR) collects reports of newly diagnosed cases of cancer and routinely compiles summaries of cancer incidence and mortality data. This report, *Cancer Incidence and Mortality in Massachusetts, 2009-2013: Statewide Report* is produced annually with the most recently available statewide data. Another report, *Cancer Incidence in Massachusetts: City and Town Supplement*, is also produced annually and contains information for the 351 cities and towns in Massachusetts. Electronic versions of these reports may be found on the internet at [www.mass.gov/dph/mcr](http://www.mass.gov/dph/mcr).

**Overall Content**

This report:

* Provides statewide information on cancer incidence and mortality in Massachusetts for twenty-four types of cancer and for all cancers combined for 2009 through 2013;\*
* Provides detailed information on the most commonly occurring types of cancer for 2009 through 2013;
* Examines cancer incidence patterns by age, sex, and race/ethnicity;
* Reviews Massachusetts cancer incidence and mortality trends for 2009 through 2013;
* Compares Massachusetts incidence and mortality data with respective national data; and
* Features a special section on the epidemiology of obesity-related cancers.

The report is organized into the following sections:

* **SPECIAL OVERVIEW** which provides more detailed information on a specific topic of interest in Massachusetts. This report has a special overview of the epidemiology of obesity-related cancers.
* **FIGURES & TABLES** which present cancer incidence and mortality data for 24 types of cancer for 2009-2013. There are 6 figures and 24 tables in this section with breakdowns by sex, race/ethnicity, year, age group, state and national comparisons, and cancer type.
* **APPENDICES** which provide information supplemental to this report, including a listing of codes used to prepare the report, information on population and rate changes, and population estimates.
* **REFERENCES**

**\****The Massachusetts incidence data in this report include only invasive cancers for 22 of the 24 types of cancer. Cancer of the urinary bladder includes both in situ and invasive cases. Cancer of the breast in situ is presented as a separate category, but is not included in the “all sites combined” data.*

***Note: For more detailed information on the methods of the Massachusetts Cancer Registry, please refer to Cancer Incidence and Mortality in Massachusetts 2006-2010: Statewide Report (1). For national trends, please refer to the Annual Report to the Nation on the Status of Cancer, 1975-2011 (2).***

This page intentionally left blank.

**SPECIAL OVERVIEW:**

**Obesity-related Cancers**

This page intentionally left blank.

**OBESITY-RELATED CANCERS**

**BACKGROUND**

Obesity is a condition in which a person has an abnormally high and unhealthy proportion of body fat. A commonly used scale to measure obesity is known as the body mass index (BMI). BMI is calculated by dividing a person’s weight (in kilograms) by their height (in meters) squared. BMI is classified into the following categories: below 18.5 – underweight, 18.5-24.9 - normal, 25.0-29.9 -overweight, and 30.0 and above – obese.[[1]](#endnote-1)

In Massachusetts, nearly six in ten (60%) of adults,[[2]](#endnote-2) 22% of middle and high school youth[[3]](#endnote-3) and nearly a third of children ages two to five years participating in the Massachusetts Women Infants and Children (WIC) program are either overweight or obese.[[4]](#endnote-4) In the United States, the proportion of overweight and obesity among both children and adults has increased in the last 20 years.[[5]](#endnote-5) People who are overweight or obese are more likely to have type 2 diabetes, heart disease, stroke, high blood pressure, gallbladder disease, osteoarthritis, respiratory problems, musculoskeletal disorders, and certain types of cancer.[[6]](#endnote-6) In addition to its association with cancer and other chronic diseases, obesity has high economic costs. In 2008, medical care costs associated with obesity in the United States were estimated to be $147 billion.[[7]](#endnote-7)

Overweight, obesity, and physical inactivity together are associated with an approximately 20 to 30% increased risk of several cancers including, breast, colon/rectum, endometrium, kidney, esophagus,[[8]](#endnote-8) pancreas, gallbladder and thyroid.[[9]](#endnote-9) The proportion of cancer cases attributable to obesity varies by type of cancer.[[10]](#endnote-10)

A number of mechanisms have been proposed to explain the association of obesity with increased risk of certain cancers. These include high levels of estrogen produced by fat tissue, increased levels of insulin and insulin-like growth factor-1, and adipokines (hormones produced by fat cells that may stimulate or inhibit cell growth). Fat cells may also have direct and indirect effects on other tumor growth regulators. Additionally, obese people often have chronic low-level or “subacute” inflammation, which has been associated with increased cancer risk. Other possible mechanisms include altered immune responses, effects on the nuclear factor kappa beta system (a protein that acts as a switch to turn inflammation on and off in the body) and oxidative stress.[[11]](#endnote-11)

**CURRENT EVIDENCE**

In 2002, the International Agency for Research on Cancer (IARC)[[12]](#endnote-12) concluded that there is adequate evidence of an association between obesity and several cancers including colorectal, post-menopausal breast, endometrial, kidney, and esophageal. The IARC also estimated that the percentages of cancer attributed to obesity were as follows: endometrial (39%), esophageal (37%), kidney (25%), colorectal (11%) and postmenopausal breast (9%).[[13]](#endnote-13) Cancers of the pancreas, thyroid and gallbladder have also been associated with obesity.[[14]](#endnote-14) More detailed information on the association of obesity with each of these types of cancer is provided below. A complete list of risk factors for these and other types of cancer can be found at [www.cancer.org/cancer/index](http://www.cancer.org/cancer/index) (American Cancer Society), and <http://www.cancer.gov/types> (National Cancer Institute).

**COLORECTAL CANCER**

According to the IARC report, overweight and obesity, and lack of physical activity are the most important established diet-related risk factors for colorectal cancer.[[15]](#endnote-15) Case control and prospective studies show that a higher body mass index (BMI) is associated with an increased risk of colon cancer. An approximately two-fold higher risk in colorectal cancer is observed in individuals who are overweight or obese. However, a stronger association between obesity and colorectal cancer is observed in colon cancer and not with rectal cancer. This association between BMI and colon cancer is stronger for men than for women.[[16]](#endnote-16) The association between obesity and colon cancer varies with body fat distribution, with the strongest association observed among people with abdominal obesity.[[17]](#endnote-17)

* ***Strongest association between obesity and colorectal cancer is among people with abdominal obesity (also called central obesity).***
* ***The association between a higher body mass index (BMI) and colon cancer is stronger for men than for women****.*

**BREAST CANCER**

Studies have shown an increased association between obesity and post-menopausal breast cancer but these studies have also found an opposite effect of obesity among pre-menopausal women who have shown a consistent reduction in breast cancer.[[18]](#endnote-18) The possible explanation of the increased risk of post-menopausal breast cancer among obese women is that there is an increased level of estrogen among this group even after menopause when the ovaries stop producing hormones; obese women continue to produce estrogen from their fat tissue.[[19]](#endnote-19) Moreover, adult weight gain has been associated with an increased risk of post-menopausal breast cancer than just obesity or overweight. In addition, regardless of menopausal status, being overweight or obese has been shown to be strongly associated with poorer survival and increased likelihood of recurrence among women with breast cancer.[[20]](#endnote-20) For example, the death rate among obese women with BMI greater than 40 is higher than that among women with BMI less than 20.[[21]](#endnote-21) Similar results were found among taller women. Possible explanations for the increase in mortality among heavier women include the higher presence of estrogen receptor (ER) positive tumors. These tumors are exposed to more continuous stimulation in heavier women than in lean or normal weight women.[[22]](#endnote-22) In addition, heavier women may be less likely to receive mammography screening.[[23]](#endnote-23) An increased association between BMI and cancer was also observed among women who have never used hormone replacement therapy.[[24]](#endnote-24)

* ***Increased risk of breast cancer among post-menopausal women may be due to continued production of estrogen from fat tissue.***
* ***Regardless of menopausal status, women who are overweight or obese have poorer survival and increased likelihood of recurrence.***

**ENDOMETRIAL CANCER**

Most previous studies have shown a linear increase in the risk of endometrial cancer with increasing BMI. The risk of endometrial cancer ranges from two to four-fold higher among overweight and/or obese women than among normal weight women.[[25]](#endnote-25) Previous studies also have found that endometrial cancer increases with increasing weight among adults, especially those who have never used menopause hormone therapy (MHT).[[26]](#endnote-26) As in breast cancer, this elevated endometrial cancer risk among overweight or obese women may be due to circulating estrogens. Endometrial cancer rates are higher among post-menopausal women who take estrogens that are administered without a counter balance of progesterone. Women with higher circulating levels of total and bioavailable estrogens have elevated endometrial cancer risks.[[27]](#endnote-27) Diabetes along with inadequate physical activity may also explain some of the increased endometrial cancer risk.[[28]](#endnote-28)

* ***Elevated endometrial risk among overweight or obese women may be due to circulating estrogens.***
* ***Diabetes along with inadequate physical activity may also explain some of the increased endometrial cancer risk.***

**KIDNEY CANCER**

Overweight and obese people are 1.5 to 2.5 times more likely to have renal cancer than normal weight people[[29]](#endnote-29) and obesity accounts for almost a third (30%) of kidney cancers in both men and women.[[30]](#endnote-30) Previous studies have found a dose-response relationship between overweight/obesity and kidney cancer, particularly among women. However, it is not clear why overweight and obese women are more likely to have kidney cancer than overweight and obese men. Furthermore, the mechanism by which obesity is associated with kidney cancer is not clearly understood. Some studies have found that people with diabetes have an increased risk of kidney cancer, supporting the hypothesis that the association between BMI and kidney cancer may be through chronic hyperinsulinemia[[31]](#endnote-31) (a higher than normal amount of insulin in the blood). While some previous studies have found that high blood pressure is a known risk factor for kidney cancer,[[32]](#endnote-32) other studies have found that the association between obesity and cancer is independent of blood pressure, suggesting that both obesity and hypertension may be independently associated with kidney cancer.[[33]](#endnote-33)

* ***Overweight and obese women are more likely to have kidney cancer than overweight and obese men.***
* ***The mechanism by which obesity is associated with kidney cancer is not clearly understood.***

**ESOPHAGEAL CANCER**

The two most common types of esophageal cancer are adenocarcinoma and squamous cell.[[34]](#endnote-34) There has been a rapid increase in the incidence of adenocarcinoma of the esophagus, while the incidence of squamous cell carcinoma has been relatively stable or even declining. In epidemiologic studies of adenocarcinoma of the esophagus, elevated BMI has been consistently shown to be a risk factor.[[35]](#endnote-35) Obesity is associated with a two to threefold increase in cancer of the esophagus. It is not well understood how obesity increases risk of esophageal cancer. However, there is increasing evidence that the mechanism through which obesity is related to cancer is through gastroesophageal reflux and its transition to Barrett esophagus.[[36]](#endnote-36)

* ***Obesity is associated with a two to threefold increase in cancer of the esophagus.***
* ***Elevated BMI and frequent gastroesophageal reflux are associated with esophageal adenocarcinoma.***

**OTHER CANCERS ASSOCIATED WITH OBESITY**

Although there is strong evidence regarding the association between obesity and cancers of the breast, colon/rectum, kidney, esophagus and endometrium, recently obesity has also been associated with an increased risk of cancers of the pancreas, thyroid and gallbladder.

**PANCREATIC CANCER**

Many studies have reported a slight increase in risk of pancreatic cancer among overweight and obese individuals. Waist circumference may be an important factor in the association of overweight and obesity with pancreatic cancer.[[37]](#endnote-37)

**THYROID CANCER**

Increasing weight has been found to be associated with an increase in the risk of thyroid cancer. It is unclear what the mechanism might be.[[38]](#endnote-38)

**GALLBLADDER CANCER**

The risk of gallbladder cancer increases with increasing BMI. The increase in risk may be due to the higher frequency of gallstones, a strong risk factor for gallbladder cancer in obese individuals.[[39]](#endnote-39)

*Note: References for the Special Overview: Obesity-related Cancers are on page 57.*

**FIGURES & TABLES**

**Figure 1.**

**PERCENTAGE OF CANCER INCIDENT CASES BY CANCER TYPE AND SEX**

**Massachusetts, 2009-2013**

 **MALES (N=89,072) FEMALES (N=93,922)**

Source: Massachusetts Cancer Registry

**Figure 2.**

**INCIDENCE RATES1 FOR TEN LEADING CANCER TYPES BY SEX**

**Massachusetts, 2009-2013**

1Rates are age-adjusted to the 2000 U.S. Standard Population. NOS – Not Otherwise Specified.

 Source: Massachusetts Cancer Registry

**Figure 3.**

**PERCENTAGE OF CANCER DEATHS BY CANCER TYPE AND SEX**

**Massachusetts, 2009-2013**

 **MALES (N=32,417) FEMALES (N=32,123)**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Source: Massachusetts Vital Statistics

**Figure 4.**

**MORTALITY RATES[[40]](#footnote-1) FOR TEN LEADING CANCER TYPES BY SEX**

**Massachusetts, 2009-2013**

**Table 1**.

**AGE-SPECIFIC INCIDENCE RATES1 AND MEDIAN AGE AT DIAGNOSIS FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

**MALES**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **0-4** | **5-9** | **10-14** | **15-19** | **20-24** | **25-29** | **30-34** | **35-39** | **40-44** | **45-49** | **50-54** | **55-59** | **60-64** | **65-69** | **70-74** | **75-79** | **80-84** | **85+** | Median Age |
| **All Sites** | 29.6 | 14.0 | 13.1 | 24.2 | 38.6 | 54.7 | 72.0 | 99.3 | 165.5 | 296.4 | 586.0 | 959.7 | 1438.3 | 2037.6 | 2555.6 | 2810.7 | 2880.2 | 2948.8 | 66 |
| **Brain & Other Nervous System** | 6.2 | 4.4 | 2.9 | 3.0 | 2.2 | 4.6 | 4.0 | 3.9 | 5.0 | 7.6 | 8.4 | 12.4 | 17.0 | 19.7 | 25.3 | 30.9 | 25.6 | 23.3 | 58 |
| **Breast** | -- | 0.1 | -- | -- | -- | -- | 0.1 | 0.1 | 0.4 | 0.7 | 1.4 | 2.1 | 3.2 | 6.2 | 6.2 | 7.8 | 10.2 | 10.8 | 68 |
| **Breast *in situ*2**  | -- | -- | -- | -- | -- | -- | 0.1 |  | 0.1 | 0.2 | 0.1 | 0.6 | 0.2 | 0.2 | 0.7 | 0.9 | 0.4 | 0.9 | 60.5 |
| **Bronchus & Lung** | -- | -- | 0.1 | 0.2 | 0.6 | 0.3 | 1.4 | 2.8 | 8.7 | 20.7 | 57.0 | 106.1 | 170.5 | 286.5 | 429.4 | 533.7 | 559.7 | 452.8 | 70 |
| **Colon / Rectum** | -- | -- | 0.1 | 0.2 | 0.8 | 1.9 | 5.2 | 10.0 | 20.2 | 30.1 | 67.4 | 67.2 | 91.5 | 134.9 | 187.1 | 236.7 | 278.7 | 368.6 | 67 |
| **Esophagus** | -- | -- | -- | -- | 0.1 | 0.2 | 0.1 | 0.5 | 1.9 | 6.3 | 10.5 | 20.5 | 34.2 | 41.9 | 56.6 | 56.6 | 59.1 | 57.4 | 67 |
| **Hodgkin Lymphoma** | 0.1 | 0.4 | 1.4 | 2.8 | 5.5 | 5.2 | 4.8 | 3.7 | 4.2 | 3.5 | 3.2 | 2.9 | 4.3 | 3.5 | 5.3 | 5.2 | 4.5 | 4.7 | 41 |
| **Kidney & Renal Pelvis** | 2.6 | 0.9 | -- | 0.3 | 0.6 | 1.4 | 4.1 | 8.4 | 13.7 | 22.5 | 32.3 | 42.6 | 61.4 | 83.7 | 92.4 | 92.4 | 89.5 | 69.5 | 63 |
| **Larynx** | -- | -- | -- | -- | -- | 0.2 | 0.2 | 0.4 | 0.9 | 3.5 | 7.6 | 13.9 | 18.6 | 27.5 | 30.2 | 32.0 | 35.4 | 18.1 | 66 |
| **Leukemia** | 9.3 | 3.5 | 2.9 | 3.6 | 3.5 | 3.0 | 4.0 | 4.6 | 6.9 | 11.1 | 12.2 | 20.1 | 33.3 | 47.8 | 68.3 | 93.8 | 100.1 | 122.6 | 67 |
| **Liver & Intrahepatic Bile Ducts** | 1.2 | -- | 0.1 | 0.1 | 0.4 | 0.3 | 0.6 | 1.1 | 2.8 | 8.4 | 21.8 | 40.8 | 48.0 | 43.3 | 56.9 | 62.9 | 62.1 | 44.0 | 63 |
| **Melanoma of Skin** | -- | -- | 0.3 | 0.8 | 1.8 | 4.1 | 8.7 | 8.4 | 14.3 | 18.3 | 27.4 | 44.4 | 58.2 | 82.8 | 116.2 | 150.1 | 163.6 | 154.1 | 66 |
| **Multiple Myeloma** | -- | -- | -- | -- | -- | 0.3 | 0.2 | 1.6 | 2.5 | 6.0 | 8.6 | 14.1 | 19.7 | 26.3 | 45.2 | 45.9 | 60.6 | 48.8 | 68 |
| **Non-Hodgkin Lymphoma** | 1.3 | 1.2 | 0.9 | 2.4 | 3.5 | 3.3 | 6.0 | 8.3 | 11.8 | 19.6 | 26.2 | 36.7 | 50.4 | 73.9 | 98.5 | 119.8 | 144.1 | 154.5 | 66 |
| **Oral Cavity & Pharynx** | 0.1 | 0.1 | 0.1 | 0.5 | 0.8 | 1.6 | 2.1 | 4.5 | 9.8 | 20.8 | 32.5 | 46.7 | 61.7 | 64.3 | 62.6 | 70.4 | 53.4 | 55.2 | 61 |
| **Pancreas** | -- | -- | -- | -- | 0.1 | 0.2 | 0.6 | 1.4 | 2.7 | 6.4 | 12.6 | 24.6 | 34.8 | 54.8 | 71.0 | 90.6 | 91.8 | 115.7 | 69 |
| **Prostate** | 0.1 | -- | -- | -- | -- | -- | 0.1 | 0.5 | 10.8 | 45.7 | 163.6 | 317.6 | 521.9 | 720.4 | 728.7 | 570.9 | 354.0 | 349.2 | 65 |
| **Stomach** | -- | -- | 0.1 | -- | -- | 0.4 | 1.1 | 1.8 | 2.9 | 5.1 | 10.0 | 15.1 | 20.7 | 33.8 | 44.3 | 57.7 | 70.3 | 76.0 | 69 |
| **Testis** | 0.8 | 0.4 | 0.1 | 3.7 | 10.4 | 16.9 | 13.5 | 13.7 | 10.4 | 7.8 | 6.0 | 4.6 | 1.9 | 1.2 | 1.1 | 0.6 | 0.4 | 0.9 | 35 |
| **Thyroid** | 0.2 | -- | 0.4 | 1.1 | 3.1 | 5.6 | 6.8 | 10.5 | 13.7 | 16.2 | 17.2 | 22.3 | 24.6 | 25.4 | 24.0 | 20.8 | 15.8 | 8.6 | 55 |
| **Urinary Bladder** | 0.1 | -- | -- | 0.1 | 0.7 | 0.8 | 1.5 | 2.8 | 6.5 | 11.9 | 27.3 | 48.2 | 82.2 | 144.9 | 227.7 | 286.9 | 355.1 | 403.6 | 72 |
| **Other Sites** | 7.5 | 3.0 | 3.7 | 5.5 | 4.6 | 4.6 | 6.8 | 10.5 | 15.3 | 24.3 | 32.8 | 56.8 | 80.3 | 114.7 | 178.5 | 245.1 | 346.4 | 410.5 | 70 |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1 per 100,000 2 Breast *in situ* is excluded from ‘All Sites’. 3 Dashes indicate age groups with no incident cases. Source: Massachusetts Cancer Registry

**Table** **2**.

**AGE-SPECIFIC INCIDENCE RATES1 AND MEDIAN AGE AT DIAGNOSIS FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

## FEMALES

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cancer Site / Type | **0-4** | **5-9** | **10-14** | **15-19** | **20-24** | **25-29** | **30-34** | **35-39** | **40-44** | **45-49** | **50-54** | **55-59** | **60-64** | **65-69** | **70-74** | **75-79** | **80-84** | **85+** | **Median Age** |
| **All Sites** | 23.2 | 11.8 | 15.3 | 21.0 | 45.8 | 72.1 | 131.0 | 198.1 | 328.7 | 476.0 | 661.5 | 819.7 | 1119.1 | 1475.0 | 1801.9 | 2048.8 | 2139.7 | 1844.0 | 65 |
| **Brain & Other Nervous System** | 4.2 | 3.1 | 4.1 | 2.3 | 2.6 | 2.6 | 2.5 | 3.3 | 4.7 | 4.3 | 5.8 | 9.5 | 11.5 | 15.1 | 15.1 | 18.9 | 19.2 | 17.1 | 60 |
| **Breast** | -- | -- | 0.1 | 0.1 | 2.1 | 9.5 | 29.9 | 66.7 | 142.1 | 214.1 | 250.4 | 273.8 | 368.8 | 446.7 | 485.7 | 486.5 | 455.2 | 333.7 | 62 |
| **Breast *in situ*2** | -- | -- | -- | 0.3 | 0.2 | 1.1 | 4.0 | 17.6 | 68.8 | 108.2 | 109.9 | 99.4 | 108.0 | 128.5 | 115.9 | 108.4 | 71.1 | 28.6 | 56 |
| **Bronchus & Lung** | -- | -- | -- | 0.4 | 0.6 | 0.3 | 1.1 | 3.1 | 12.5 | 28.0 | 61.9 | 93.2 | 156.4 | 266.2 | 377.8 | 435.2 | 399.5 | 249.5 | 71 |
| **Cervix Uteri** | -- | -- | -- | 0.1 | 0.4 | 2.9 | 7.3 | 9.2 | 9.6 | 8.5 | 8.1 | 8.4 | 10.0 | 10.1 | 7.7 | 7.7 | 7.4 | 6.2 | 51 |
| **Colon / Rectum** | -- | 0.1 | 0.1 | 0.1 | 1.4 | 1.9 | 4.3 | 10.6 | 18.7 | 27.7 | 50.6 | 47.7 | 66.4 | 94.7 | 134.7 | 197.9 | 263.7 | 280.2 | 73 |
| **Corpus Uteri & Uterus, NOS** | -- | -- | 0.1 | -- | 0.1 | 1.2 | 2.9 | 8.4 | 14.4 | 29.0 | 55.8 | 86.5 | 115.8 | 125.0 | 119.6 | 98.7 | 82.4 | 56.6 | 63 |
| **Esophagus** | -- | -- | -- | -- | -- | -- | 0.3 | -- | 0.6 | 1.0 | 1.6 | 3.9 | 6.2 | 8.2 | 13.1 | 12.4 | 15.1 | 15.0 | 71 |
| **Hodgkin Lymphoma** | -- | 0.2 | 1.2 | 3.2 | 6.5 | 3.5 | 3.9 | 3.1 | 2.4 | 1.2 | 2.0 | 2.6 | 2.5 | 2.9 | 3.6 | 4.3 | 5.8 | 1.6 | 38 |
| **Kidney & Renal Pelvis** | 1.8 | 1.1 | 0.1 | 0.1 | 0.5 | 1.1 | 2.5 | 3.7 | 7.0 | 10.4 | 16.5 | 17.9 | 28.6 | 36.1 | 45.8 | 54.9 | 46.8 | 35.4 | 66 |
| **Larynx** | -- | -- | -- | -- | -- | -- | 0.1 | 0.1 | 0.3 | 1.2 | 2.9 | 3.9 | 3.2 | 8.3 | 9.0 | 7.3 | 5.5 | 4.3 | 67 |
| **Leukemia** | 8.0 | 4.0 | 2.3 | 1.8 | 2.9 | 2.8 | 3.1 | 3.4 | 5.7 | 5.7 | 9.0 | 13.6 | 19.3 | 24.2 | 36.8 | 49.6 | 55.7 | 60.5 | 68 |
| **Liver & Intrahepatic Bile Ducts** | 0.7 | -- | 0.1 | 0.2 | 0.2 | 0.1 | 0.5 | 0.5 | 0.9 | 1.8 | 3.7 | 8.7 | 11.3 | 13.9 | 17.1 | 19.7 | 23.1 | 16.9 | 69 |
| **Melanoma of Skin** | -- | -- | 0.2 | 1.6 | 5.8 | 10.8 | 13.7 | 13.5 | 16.9 | 21.2 | 28.3 | 32.3 | 39.0 | 43.7 | 54.4 | 57.5 | 63.9 | 59.7 | 61 |
| **Multiple Myeloma** | -- | -- | -- | -- | -- | 0.3 | 0.4 | 0.8 | 1.2 | 2.5 | 6.1 | 9.1 | 14.4 | 19.7 | 23.9 | 31.3 | 33.9 | 32.5 | 70 |
| **Non-Hodgkin Lymphoma** | -- | 0.7 | 0.9 | 1.3 | 1.4 | 2.7 | 4.4 | 6.7 | 7.9 | 11.7 | 19.1 | 28.8 | 41.0 | 56.5 | 69.2 | 81.8 | 101.8 | 88.1 | 68 |
| **Oral Cavity & Pharynx** | 0.1 | 0.1 | 0.2 | 0.6 | 0.4 | 0.3 | 1.6 | 3.0 | 4.0 | 5.3 | 10.4 | 15.7 | 17.8 | 25.9 | 27.3 | 30.5 | 35.3 | 31.5 | 66 |
| **Ovary** | 0.1 | 0.1 | 0.1 | 1.1 | 1.8 | 2.2 | 3.6 | 4.8 | 7.3 | 14.1 | 22.3 | 26.2 | 30.2 | 40.8 | 42.0 | 45.1 | 44.4 | 43.6 | 63 |
| **Pancreas** | -- | -- | -- | -- | 0.1 | 0.2 | 0.5 | 1.3 | 2.8 | 3.8 | 7.8 | 16.6 | 26.4 | 39.1 | 60.9 | 68.5 | 90.6 | 100.9 | 74 |
| **Stomach** | -- | -- | -- | 0.4 | 0.3 | 0.4 | 0.5 | 0.9 | 2.8 | 3.9 | 4.4 | 6.0 | 7.9 | 12.0 | 18.1 | 25.1 | 34.3 | 40.8 | 74 |
| **Thyroid** | 0.1 | 0.1 | 1.6 | 4.6 | 15.9 | 24.5 | 39.8 | 43.8 | 48.7 | 52.0 | 52.8 | 45.7 | 46.4 | 47.4 | 38.3 | 36.3 | 24.3 | 12.6 | 49 |
| **Urinary Bladder** | -- | -- | 0.1 | 0.2 | 0.1 | 0.1 | 0.7 | 1.0 | 1.9 | 4.7 | 8.4 | 16.6 | 26.6 | 40.8 | 60.4 | 80.3 | 86.7 | 87.1 | 74 |
| **Other Sites** | 8.3 | 2.2 | 4.0 | 3.1 | 2.8 | 4.9 | 7.3 | 10.3 | 16.2 | 23.9 | 33.5 | 53.0 | 69.3 | 97.7 | 141.4 | 199.2 | 245.0 | 270.5 | 72 |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1 per 100,000 2 Breast *in situ* is excluded from ‘All Sites’. 3 Dashes indicate age groups with no incident cases. Source: Massachusetts Cancer Registry

**Table 3**.

**AGE-SPECIFIC INCIDENCE RATES1 AND MEDIAN AGE AT DIAGNOSIS FOR SELECTED CANCER SITES**

Massachusetts, 2009-2013

#### **TOTAL**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **0-4** | **5-9** | **10-14** | **15-19** | **20-24** | **25-29** | **30-34** | **35-39** | **40-44** | **45-49** | **50-54** | **55-59** | **60-64** | **65-69** | **70-74** | **75-79** | **80-84** | **85+** | **Median Age** |
| **All Sites** | 26.5 | 12.9 | 14.2 | 22.6 | 42.2 | 63.5 | 101.9 | 149.7 | 249.0 | 388.2 | 624.8 | 887.3 | 1271.1 | 1737.5 | 2140.3 | 2373.7 | 2428.3 | 2187.3 | 66 |
| **Brain & Other Nervous System** | 5.2 | 3.7 | 3.5 | 2.6 | 2.4 | 3.6 | 3.2 | 3.6 | 4.9 | 6.0 | 7.1 | 10.9 | 14.1 | 17.2 | 19.7 | 24.0 | 21.7 | 19.0 | 59 |
| **Breast** | -- | 0.1 | 0.0 | 0.0 | 1.1 | 4.8 | 15.2 | 34.1 | 72.8 | 109.7 | 129.1 | 142.8 | 194.8 | 241.2 | 270.4 | 282.4 | 281.7 | 233.4 | 62 |
| **Breast *in situ2*** | -- | -- | -- | 0.1 | 0.1 | 0.5 | 2.1 | 9.0 | 35.2 | 55.4 | 56.4 | 51.7 | 56.7 | 68.6 | 64.1 | 62.5 | 43.5 | 20.0 | 57 |
| **Bronchus & Lung** | -- | -- | 0.0 | 0.3 | 0.6 | 0.3 | 1.3 | 3.0 | 10.7 | 24.4 | 59.5 | 99.4 | 163.2 | 275.7 | 400.9 | 477.2 | 461.9 | 312.6 | 71 |
| **Cervix Uteri** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Colon / Rectum** | -- | 0.1 | 0.1 | 0.1 | 1.1 | 1.9 | 4.8 | 10.3 | 19.5 | 28.9 | 58.8 | 57.2 | 78.3 | 113.4 | 158.3 | 214.4 | 269.6 | 307.6 | 70 |
| **Corpus Uteri & Uterus, NOS** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Esophagus** | -- | -- | -- | -- | 0.0 | 0.1 | 0.2 | 0.2 | 1.2 | 3.6 | 6.0 | 11.9 | 19.5 | 23.9 | 32.7 | 31.3 | 32.3 | 28.2 | 68 |
| **Hodgkin Lymphoma** | 0.1 | 0.3 | 1.3 | 3.0 | 6.0 | 4.4 | 4.3 | 3.4 | 3.3 | 2.3 | 2.6 | 2.7 | 3.4 | 3.2 | 4.4 | 4.7 | 5.3 | 2.5 | 40 |
| **Kidney & Renal Pelvis** | 2.2 | 1.0 | 0.0 | 0.2 | 0.5 | 1.3 | 3.3 | 6.0 | 10.3 | 16.4 | 24.2 | 29.8 | 44.2 | 58.3 | 66.7 | 70.9 | 63.5 | 46.0 | 64 |
| **Larynx** | -- | -- | -- | -- | -- | 0.1 | 0.1 | 0.2 | 0.6 | 2.3 | 5.2 | 8.7 | 10.5 | 17.3 | 18.5 | 17.8 | 17.2 | 8.6 | 66 |
| **Leukemia** | 8.7 | 3.7 | 2.6 | 2.7 | 3.2 | 2.9 | 3.6 | 4.0 | 6.3 | 8.4 | 10.6 | 16.7 | 26.0 | 35.2 | 51.0 | 68.4 | 73.0 | 79.8 | 67 |
| **Liver & Intrahepatic Bile Ducts** | 0.9 | -- | 0.1 | 0.1 | 0.3 | 0.2 | 0.5 | 0.8 | 1.9 | 5.0 | 12.5 | 24.2 | 28.8 | 27.6 | 34.9 | 38.2 | 38.3 | 25.3 | 64 |
| **Melanoma of Skin** | -- | -- | 0.2 | 1.2 | 3.8 | 7.5 | 11.2 | 11.0 | 15.6 | 19.8 | 27.9 | 38.1 | 48.1 | 61.9 | 82.1 | 97.0 | 102.8 | 89.0 | 64 |
| **Multiple Myeloma** | -- | -- | -- | -- | -- | 0.3 | 0.3 | 1.2 | 1.8 | 4.2 | 7.3 | 11.5 | 16.9 | 22.8 | 33.5 | 37.5 | 44.3 | 37.5 | 69 |
| **Non-Hodgkin Lymphoma** | 0.6 | 1.0 | 0.9 | 1.9 | 2.5 | 3.0 | 5.2 | 7.5 | 9.8 | 15.6 | 22.6 | 32.6 | 45.5 | 64.6 | 82.3 | 98.0 | 118.3 | 108.7 | 67 |
| **Oral Cavity & Pharynx** | 0.1 | 0.1 | 0.1 | 0.6 | 0.6 | 0.9 | 1.9 | 3.7 | 6.8 | 12.9 | 21.2 | 30.7 | 38.7 | 43.9 | 43.2 | 47.5 | 42.4 | 38.9 | 62 |
| **Ovary** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Pancreas** | -- | -- | -- | -- | 0.1 | 0.2 | 0.5 | 1.4 | 2.8 | 5.0 | 10.1 | 20.5 | 30.4 | 46.4 | 65.4 | 77.9 | 91.0 | 105.5 | 72 |
| **Prostate** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Stomach** | -- | -- | 0.0 | 0.2 | 0.1 | 0.4 | 0.8 | 1.3 | 2.8 | 4.5 | 7.2 | 10.4 | 14.0 | 22.2 | 29.9 | 39.0 | 48.4 | 51.7 | 71 |
| **Testis** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Thyroid** | 0.2 | 0.1 | 1.0 | 2.8 | 9.5 | 15.1 | 23.6 | 27.5 | 31.6 | 34.5 | 35.5 | 34.4 | 36.0 | 37.1 | 31.9 | 29.7 | 21.0 | 11.4 | 50 |
| **Urinary Bladder** | 0.1 | -- | 0.0 | 0.1 | 0.4 | 0.4 | 1.1 | 1.8 | 4.2 | 8.2 | 17.6 | 31.8 | 53.1 | 89.3 | 135.5 | 168.4 | 191.3 | 185.4 | 72 |
| **Other Sites** | 7.9 | 2.6 | 3.8 | 4.3 | 3.7 | 4.8 | 7.1 | 10.4 | 15.8 | 24.1 | 33.2 | 54.9 | 74.6 | 105.6 | 158.1 | 218.7 | 284.5 | 314.1 | 71 |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1 per 100,000 2 Breast *in situ* is excluded from ‘All Sites’. 3 Dashes indicate age groups with no incident cases or cancers found in only one sex. Source: Massachusetts Cancer Registry

**Figure 5.**

**ANNUAL PERCENT CHANGE (APC) IN AGE-ADJUSTED CANCER RATES AMONG MALES**

**Massachusetts, 2009-2013**

\*APCis statistically significant (p < 0.05). Values appearing directly on a bar have been bolded for ease of reading only. Source: Massachusetts Cancer Registry.

**Figure 6.**

**ANNUAL PERCENT CHANGE (APC) IN AGE-ADJUSTED CANCER RATES AMONG FEMALES**

**Massachusetts, 2009-2013**

\*APCis statistically significant (p < 0.05). Values appearing directly on a bar have been bolded for ease of reading only. Source: Massachusetts Cancer Registry.

**Table 4.**

**ANNUAL AGE-ADJUSTED1 INCIDENCE RATES2 FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

**MALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **2009** | **2010** | **2011** | **2012** | **2013** |
| **All Sites** | 569.9 | 532.9 | 538.4 | 499.3 | 481.0 |
| **Brain & Other Nervous System** | 7.8 | 8.3 | 7.9 | 7.4 | 9.0 |
| **Breast** | 1.5 | 1.2 | 1.5 | 1.2 | 1.5 |
| **Breast *in situ*3**  | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 |
| **Bronchus & Lung** | 79.7 | 73.3 | 74.5 | 71.0 | 66.3 |
| **Colon / Rectum** | 49.0 | 44.8 | 43.4 | 42.2 | 40.6 |
| **Esophagus** | 11.5 | 9.9 | 11.0 | 9.7 | 9.8 |
| **Hodgkin Lymphoma** | 3.2 | 3.4 | 3.6 | 3.6 | 3.1 |
| **Kidney & Renal Pelvis** | 23.1 | 20.0 | 20.6 | 20.8 | 23.2 |
| **Larynx** | 7.1 | 6.0 | 5.3 | 5.2 | 6.3 |
| **Leukemia** | 18.0 | 15.8 | 17.3 | 17.5 | 15.9 |
| **Liver & Intrahepatic Bile Ducts** | 13.4 | 12.9 | 12.5 | 14.1 | 12.5 |
| **Melanoma of Skin** | 27.0 | 25.0 | 29.0 | 25.8 | 24.6 |
| **Multiple Myeloma** | 8.2 | 7.8 | 7.9 | 8.2 | 8.8 |
| **Non-Hodgkin Lymphoma** | 26.4 | 23.7 | 22.1 | 22.5 | 23.1 |
| **Oral Cavity & Pharynx** | 17.1 | 17.7 | 17.9 | 18.6 | 16.8 |
| **Pancreas** | 14.7 | 13.0 | 14.3 | 14.3 | 14.7 |
| **Prostate** | 146.4 | 140.7 | 138.2 | 106.8 | 97.5 |
| **Stomach** | 9.7 | 9.9 | 9.0 | 8.9 | 10.3 |
| **Testis** | 6.5 | 5.6 | 6.7 | 6.7 | 6.6 |
| **Thyroid** | 10.4 | 9.4 | 10.8 | 10.4 | 9.3 |
| **Urinary Bladder** | 44.3 | 40.3 | 41.6 | 42.3 | 39.6 |

 Rates are age-adjusted to the 2000 U.S. Standard Population.

2per 100,000 males

3Breast *in situ* is excluded from “All Sites”

Source: Massachusetts Cancer Registry

**Table 5.**

**ANNUAL AGE-ADJUSTED1 INCIDENCE RATES2 FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

**FEMALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **2009** | **2010** | **2011** | **2012** | **2013** |
| **All Sites** | 465.4 | 444.1 | 457.4 | 456.5 | 445.8 |
| **Brain & Other Nervous System** | 5.5 | 5.8 | 6.3 | 5.6 | 6.0 |
| **Breast** | 136.1 | 130.7 | 137.3 | 137.1 | 137.4 |
| **Breast *in situ*3**  | 47.9 | 44.9 | 41.6 | 42.5 | 42.5 |
| **Bronchus & Lung** | 64.5 | 62.6 | 60.7 | 61.0 | 60.5 |
| **Cervix Uteri** | 5.5 | 5.6 | 5.1 | 5.0 | 4.9 |
| **Colon / Rectum**  | 38.3 | 35.9 | 34.3 | 33.2 | 33.1 |
| **Corpus Uteri & Uterus, NOS** | 30.2 | 28.0 | 31.2 | 28.4 | 29.8 |
| **Esophagus** | 2.6 | 2.4 | 2.0 | 1.7 | 2.4 |
| **Hodgkin Lymphoma** | 2.9 | 2.6 | 2.7 | 2.6 | 2.4 |
| **Kidney & Renal Pelvis** | 10.8 | 10.4 | 10.6 | 10.9 | 10.7 |
| **Larynx** | 1.9 | 1.5 | 1.4 | 1.8 | 1.2 |
| **Leukemia** | 9.7 | 10.7 | 10.3 | 9.9 | 10.1 |
| **Liver & Intrahepatic Bile Ducts** | 3.8 | 3.5 | 3.3 | 3.8 | 4.1 |
| **Melanoma of Skin** | 18.8 | 18.4 | 18.6 | 17.7 | 15.9 |
| **Multiple Myeloma** | 4.8 | 4.4 | 6.0 | 5.2 | 5.3 |
| **Non-Hodgkin Lymphoma** | 16.3 | 16.6 | 15.5 | 17.7 | 16.6 |
| **Oral Cavity & Pharynx** | 7.0 | 6.5 | 6.2 | 7.9 | 7.3 |
| **Ovary** | 13.1 | 10.6 | 12.2 | 12.9 | 10.5 |
| **Pancreas** | 12.1 | 10.7 | 11.0 | 10.9 | 11.6 |
| **Stomach** | 4.4 | 4.6 | 4.5 | 4.3 | 4.4 |
| **Thyroid** | 30.1 | 27.4 | 30.7 | 29.7 | 26.9 |
| **Urinary Bladder** | 11.5 | 10.9 | 12.1 | 11.7 | 10.7 |

 Rates are age-adjusted to the 2000 U.S. Standard Population.

2per 100,000 males

3Breast *in situ* is excluded from “All Sites”

Source: Massachusetts Cancer Registry

**Table 6.**

**ANNUAL AGE-ADJUSTED1 INCIDENCE RATES2 FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

**TOTAL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **2009** | **2010** | **2011** | **2012** | **2013** |
| **All Sites** | 505.9 | 479.3 | 489.6 | 471.7 | 457.9 |
| **Brain & Other Nervous System** | 6.6 | 7.0 | 7.0 | 6.4 | 7.4 |
| **Breast** | -- | -- | -- | -- | -- |
| **Breast *in situ*3**  | -- | -- | -- | -- | -- |
| **Bronchus & Lung** | 70.4 | 66.7 | 66.3 | 64.8 | 62.7 |
| **Cervix Uteri** | -- | -- | -- | -- | -- |
| **Colon / Rectum** | 43.0 | 39.8 | 38.2 | 37.2 | 36.4 |
| **Corpus Uteri & Uterus, NOS** | -- | -- | -- | -- | -- |
| **Esophagus** | 6.5 | 5.8 | 5.9 | 5.3 | 5.7 |
| **Hodgkin Lymphoma** | 3.0 | 3.0 | 3.1 | 3.1 | 2.7 |
| **Kidney & Renal Pelvis** | 16.4 | 14.7 | 15.3 | 15.5 | 16.4 |
| **Larynx** | 4.1 | 3.5 | 3.2 | 3.3 | 3.5 |
| **Leukemia** | 13.2 | 12.8 | 13.3 | 13.3 | 12.7 |
| **Liver & Intrahepatic Bile Ducts** | 8.1 | 7.8 | 7.5 | 8.5 | 8.0 |
| **Melanoma of Skin** | 22.0 | 21.1 | 22.9 | 20.9 | 19.4 |
| **Multiple Myeloma** | 6.3 | 5.9 | 6.9 | 6.5 | 6.9 |
| **Non-Hodgkin Lymphoma** | 20.7 | 19.8 | 18.3 | 19.7 | 19.6 |
| **Oral Cavity & Pharynx** | 11.6 | 11.7 | 11.6 | 12.9 | 11.7 |
| **Ovary** | -- | -- | -- | -- | -- |
| **Pancreas** | 13.2 | 11.8 | 12.5 | 12.6 | 13.0 |
| **Prostate** | -- | -- | -- | -- | -- |
| **Stomach** | 6.8 | 6.9 | 6.5 | 6.3 | 7.0 |
| **Testis** | -- | -- | -- | -- | -- |
| **Thyroid** | 20.5 | 18.7 | 21.0 | 20.3 | 18.4 |
| **Urinary Bladder** | 25.1 | 23.2 | 24.6 | 24.8 | 23.0 |

 Rates are age-adjusted to the 2000 U.S. Standard Population.

2per 100,000 total population

3Breast *in situ* is excluded from “All Sites”

4Dashes indicate cancers found in only one sex or predominantly in one sex (breast cancer).

Source: Massachusetts Cancer Registry

**Table 7.**

**ANNUAL AGE-ADJUSTED[[41]](#footnote-2) MORTALITY RATES[[42]](#footnote-3) FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

**MALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **2009** | **2010** | **2011** | **2012** | **2013** |
| **All Sites** | 204.8 | 203.9 | 197.0 | 190.1 | 185.8 |
| **Brain & Other Nervous System** | 5.5 | 5.0 | 5.1 | 4.9 | 5.1 |
| **Breast** | 0.1 | 0.3 | 0.3 | 0.5 | 0.5 |
| **Bronchus & Lung** | 52.5 | 51.4 | 49.5 | 50.4 | 48.2 |
| **Colon / Rectum** | 16.7 | 16.0 | 15.1 | 15.1 | 14.3 |
| **Esophagus** | 7.8 | 7.8 | 8.7 | 8.7 | 7.8 |
| **Hodgkin Lymphoma** | 0.7 | 0.5 | 0.2 | 0.3 | 0.4 |
| **Kidney & Renal Pelvis** | 4.2 | 3.7 | 4.1 | 4.7 | 4.9 |
| **Larynx** | 1.6 | 1.7 | 1.7 | 1.3 | 1.5 |
| **Leukemia** | 7.4 | 8.4 | 8.7 | 8.4 | 9.3 |
| **Liver & Intrahepatic Bile Ducts** | 8.7 | 9.4 | 9.3 | 9.2 | 10.7 |
| **Melanoma of Skin** | 4.1 | 4.2 | 3.8 | 3.9 | 4.2 |
| **Multiple Myeloma** | 3.8 | 3.4 | 3.9 | 3.8 | 3.4 |
| **Non-Hodgkin Lymphoma** | 6.3 | 7.0 | 7.4 | 6.1 | 6.5 |
| **Oral Cavity & Pharynx** | 2.9 | 4.1 | 3.6 | 3.8 | 3.7 |
| **Pancreas** | 11.2 | 11.1 | 12.3 | 11.7 | 12.8 |
| **Prostate** | 18.7 | 19.1 | 18.0 | 18.0 | 18.1 |
| **Stomach** | 4.3 | 3.9 | 3.9 | 4.1 | 3.5 |
| **Testis** | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 |
| **Thyroid** | 0.5 | 0.4 | 0.7 | 0.6 | 0.8 |
| **Urinary Bladder** | 7.7 | 8.8 | 7.7 | 7.4 | 8.0 |

**Table 8**

**ANNUAL AGE-ADJUSTED[[43]](#footnote-4) MORTALITY RATES[[44]](#footnote-5) FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

**FEMALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **2009** | **2010** | **2011** | **2012** | **2013** |
| **All Sites** | 149.4 | 142.5 | 139.1 | 138.6 | 136.2 |
| **Brain & Other Nervous System** | 4.1 | 3.1 | 3.4 | 3.6 | 2.9 |
| **Breast** | 20.5 | 18.0 | 18.4 | 18.7 | 18.4 |
| **Bronchus & Lung** | 39.3 | 37.7 | 36.7 | 37.1 | 35.6 |
| **Cervix Uteri** | 1.6 | 1.2 | 1.5 | 1.2 | 0.9 |
| **Colon / Rectum** | 11.8 | 12.1 | 10.1 | 10.8 | 11.2 |
| **Corpus Uteri & Uterus, NOS** | 4.0 | 4.0 | 4.5 | 4.1 | 5.0 |
| **Esophagus** | 2.0 | 1.7 | 1.5 | 1.4 | 1.3 |
| **Hodgkin Lymphoma** | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 |
| **Kidney & Renal Pelvis** | 2.5 | 1.8 | 2.3 | 2.0 | 2.1 |
| **Larynx** | 0.3 | 0.5 | 0.5 | 0.3 | 0.4 |
| **Leukemia** | 5.1 | 4.7 | 4.7 | 4.9 | 5.3 |
| **Liver & Intrahepatic Bile Ducts** | 3.1 | 3.4 | 3.0 | 3.3 | 3.8 |
| **Melanoma of Skin** | 1.8 | 1.7 | 1.8 | 1.8 | 2.1 |
| **Multiple Myeloma** | 2.3 | 2.6 | 2.8 | 2.6 | 2.7 |
| **Non-Hodgkin Lymphoma** | 4.0 | 4.4 | 4.1 | 4.1 | 4.4 |
| **Oral Cavity & Pharynx** | 1.2 | 1.7 | 1.1 | 1.1 | 1.2 |
| **Ovary** | 7.1 | 6.6 | 8.0 | 6.9 | 7.9 |
| **Pancreas** | 9.2 | 9.5 | 9.7 | 9.5 | 9.1 |
| **Stomach** | 2.1 | 2.4 | 2.1 | 2.3 | 2.5 |
| **Thyroid** | 0.6 | 0.6 | 0.5 | 0.3 | 0.5 |
| **Urinary Bladder** | 2.8 | 2.6 | 2.4 | 2.5 | 2.7 |

**Table 9.**

**ANNUAL AGE-ADJUSTED[[45]](#footnote-6) MORTALITY RATES[[46]](#footnote-7) FOR SELECTED CANCER SITES**

**Massachusetts, 2009-2013**

**TOTAL3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancer Site / Type** | **2009** | **2010** | **2011** | **2012** | **2013** |
| **All Sites** | 170.2 | 166.8 | 162.3 | 159.6 | 156.3 |
| **Brain & Other Nervous System** | 4.6 | 3.8 | 4.3 | 4.1 | 4.1 |
| **Breast** | - | - | - | - | - |
| **Bronchus & Lung** | 44.7 | 43.4 | 42.0 | 42.6 | 40.8 |
| **Cervix Uteri** | - | - | - | - | - |
| **Colon / Rectum** | 13.9 | 13.8 | 12.3 | 12.6 | 12.5 |
| **Corpus Uteri & Uterus, NOS** | - | - | - | - | - |
| **Esophagus** | 4.5 | 4.4 | 4.6 | 4.7 | 4.1 |
| **Hodgkin Lymphoma** | 0.5 | 0.4 | 0.2 | 0.2 | 0.3 |
| **Kidney & Renal Pelvis** | 3.2 | 2.6 | 3.1 | 3.2 | 3.3 |
| **Larynx** | 0.8 | 1.0 | 1.1 | 0.7 | 0.8 |
| **Leukemia** | 6.0 | 6.3 | 6.4 | 6.4 | 6.9 |
| **Liver & Intrahepatic Bile Ducts** | 5.6 | 6.1 | 5.9 | 5.9 | 6.9 |
| **Melanoma of Skin** | 2.8 | 2.8 | 2.7 | 2.7 | 2.9 |
| **Multiple Myeloma** | 3.2 | 2.8 | 3.2 | 3.3 | 3.0 |
| **Non-Hodgkin Lymphoma** | 4.9 | 5.5 | 5.5 | 4.9 | 5.3 |
| **Oral Cavity & Pharynx** | 2.0 | 2.8 | 2.2 | 2.3 | 2.4 |
| **Ovary** | - | - | - | - | - |
| **Pancreas** | 10.1 | 10.3 | 10.8 | 10.6 | 10.8 |
| **Prostate** | - | - | - | - | - |
| **Stomach** | 3.1 | 3.1 | 2.8 | 3.1 | 2.9 |
| **Testis** | - | - | - | - | - |
| **Thyroid** | 0.5 | 0.5 | 0.6 | 0.4 | 0.6 |
| **Urinary Bladder** | 4.8 | 5.1 | 4.5 | 4.4 | 4.8 |

**Table 10.**

**FIVE LEADING CANCER INCIDENCE RATES BY RACE/ETHNICITY AND SEX**

**Massachusetts, 2009-2013**

**MALES**

|  |
| --- |
| **AGE-ADJUSTED[[47]](#footnote-8) INCIDENCE RATE[[48]](#footnote-9)** |
| **RANK** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| 1 | Prostate115.2 | Prostate215.5 | Prostate65.1 | Prostate138.9 |
| 2 | Bronchus & Lung74.3 | Bronchus & Lung74.3 | Bronchus & Lung60.0 | Bronchus & Lung43.8 |
| 3 | Colon / Rectum43.8 | Colon / Rectum51.8 | Colon / Rectum34.2 | Colon / Rectum36.0 |
| 4 | Urinary Bladder43.8 | Liver & Intrahepatic Bile Ducts22.4 | Liver & Intrahepatic Bile Ducts31.2 | Liver & Intrahepatic Bile Ducts23.8 |
| 5 | Melanoma of Skin28.2 | Kidney & Renal Pelvis20.8 | Urinary Bladder14.6 | Non-Hodgkin Lymphoma20.0 |

**FEMALES**

|  |
| --- |
| **AGE-ADJUSTED1 INCIDENCE RATE2** |
| **RANK** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| 1 | Breast3141.4 | Breast119.3 | Breast87.4 | Breast89.9 |
| 2 | Bronchus & Lung65.4 | Bronchus & Lung44.8 | Bronchus & Lung32.1 | Thyroid27.5 |
| 3 | Colon / Rectum34.9 | Colon / Rectum38.0 | Colon / Rectum29.3 | Bronchus & Lung26.9 |
| 4 | Corpus Uteri &Uterus, NOS30.6 | Corpus Uteri &Uterus, NOS25.0 | Thyroid28.0 | Colon / Rectum26.9 |
| 5 | Thyroid29.1 | Thyroid24.3 | Corpus Uteri &Uterus, NOS15.1 | Corpus Uteri &Uterus, NOS21.2 |

**Table 11.**

**NUMBER AND PERCENTAGE OF INCIDENT CASES FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[49]](#footnote-10)**

**Massachusetts, 2009-2013**

**MALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races[[50]](#footnote-11)** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| **Cancer Site / Type** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** |
| **All Sites** | 89072 | 100.0 | 77100 | 100.0 | 4527 | 100.0 | 2058 | 100.0 | 3244 | 100.0 |
| **Brain & Other Nervous System** | 1341 | 1.5 | 1187 | 1.5 | 45 | 1.0 | 27 | 1.3 | 73 | 2.3 |
| **Breast3** | 233 | 0.3 | 210 | 0.3 | 10 | 0.2 | 8 | 0.4 | 4 | 0.1 |
| **Bronchus & Lung** | 12027 | 13.5 | 10874 | 14.1 | 515 | 11.4 | 327 | 15.9 | 268 | 8.3 |
| **Colon / Rectum** | 7327 | 8.2 | 6383 | 8.3 | 388 | 8.6 | 214 | 10.4 | 250 | 7.7 |
| **Esophagus** | 1789 | 2.0 | 1664 | 2.2 | 60 | 1.3 | 31 | 1.5 | 26 | 0.8 |
| **Hodgkin Lymphoma** | 551 | 0.6 | 437 | 0.6 | 42 | 0.9 | 17 | 0.8 | 48 | 1.5 |
| **Kidney & Renal Pelvis** | 3727 | 4.2 | 3278 | 4.3 | 172 | 3.8 | 74 | 3.6 | 164 | 5.1 |
| **Larynx** | 1040 | 1.2 | 917 | 1.2 | 44 | 1.0 | 12 | 0.6 | 52 | 1.6 |
| **Leukemia** | 2743 | 3.1 | 2415 | 3.1 | 90 | 2.0 | 59 | 2.9 | 105 | 3.2 |
| **Liver & Intrahepatic Bile Ducts** | 2345 | 2.6 | 1726 | 2.2 | 196 | 4.3 | 205 | 10.0 | 195 | 6.0 |
| **Melanoma of Skin** | 4372 | 4.9 | 4063 | 5.3 | 7 | 0.2 | 8 | 0.4 | 18 | 0.6 |
| **Multiple Myeloma** | 1371 | 1.5 | 1125 | 1.5 | 132 | 2.9 | 29 | 1.4 | 64 | 2.0 |
| **Non-Hodgkin Lymphoma** | 3927 | 4.4 | 3447 | 4.5 | 169 | 3.7 | 90 | 4.4 | 172 | 5.3 |
| **Oral Cavity & Pharynx** | 3157 | 3.5 | 2791 | 3.6 | 122 | 2.7 | 87 | 4.2 | 139 | 4.3 |
| **Pancreas** | 2378 | 2.7 | 2130 | 2.8 | 116 | 2.6 | 41 | 2.0 | 78 | 2.4 |
| **Prostate** | 22652 | 25.4 | 18315 | 23.8 | 1771 | 39.1 | 380 | 18.5 | 1003 | 30.9 |
| **Stomach** | 1591 | 1.8 | 1278 | 1.7 | 121 | 2.7 | 76 | 3.7 | 105 | 3.2 |
| **Testis** | 1022 | 1.1 | 906 | 1.2 | 16 | 0.4 | 22 | 1.1 | 62 | 1.9 |
| **Thyroid** | 1739 | 2.0 | 1476 | 1.9 | 60 | 1.3 | 93 | 4.5 | 70 | 2.2 |
| **Urinary Bladder** | 6747 | 7.6 | 6320 | 8.2 | 127 | 2.8 | 78 | 3.8 | 109 | 3.4 |
| **Other Sites** | 6993 | 7.9 | 6158 | 8.0 | 324 | 7.2 | 180 | 8.7 | 239 | 7.4 |

**Table 12.**

**NUMBER AND PERCENTAGE OF INCIDENT CASES FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[51]](#footnote-12)**

**Massachusetts, 2009-2013**

**FEMALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races[[52]](#footnote-13)** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| **Cancer Site / Type** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** |
| **All Sites** | 93922 | 100.0 | 82856 | 100.0 | 4165 | 100.0 | 2389 | 100.0 | 3423 | 100.0 |
| **Brain & Other Nervous System** | 1122 | 1.2 | 975 | 1.2 | 47 | 1.1 | 32 | 1.3 | 60 | 1.8 |
| **Breast3** | 27651 | 29.4 | 24522 | 29.6 | 1261 | 30.3 | 744 | 31.1 | 982 | 28.7 |
| **Bronchus & Lung** | 13100 | 13.9 | 12168 | 14.7 | 443 | 10.6 | 219 | 9.2 | 232 | 6.8 |
| **Cervix Uteri** | 956 | 1.0 | 691 | 0.8 | 93 | 2.2 | 61 | 2.6 | 99 | 2.9 |
| **Colon / Rectum** | 7574 | 8.1 | 6655 | 8.0 | 389 | 9.3 | 210 | 8.8 | 249 | 7.3 |
| **Corpus Uteri & Uterus, NOS** | 6263 | 6.7 | 5581 | 6.7 | 263 | 6.3 | 123 | 5.1 | 233 | 6.8 |
| **Esophagus** | 484 | 0.5 | 432 | 0.5 | 22 | 0.5 | 10 | 0.4 | 19 | 0.6 |
| **Hodgkin Lymphoma** | 461 | 0.5 | 387 | 0.5 | 21 | 0.5 | 12 | 0.5 | 38 | 1.1 |
| **Kidney & Renal Pelvis** | 2198 | 2.3 | 1920 | 2.3 | 126 | 3.0 | 40 | 1.7 | 93 | 2.7 |
| **Larynx** | 328 | 0.3 | 299 | 0.4 | 14 | 0.3 | 5 | 0.2 | 8 | 0.2 |
| **Leukemia** | 2058 | 2.2 | 1761 | 2.1 | 83 | 2.0 | 62 | 2.6 | 97 | 2.8 |
| **Liver & Intrahepatic Bile Ducts** | 793 | 0.8 | 619 | 0.7 | 52 | 1.2 | 63 | 2.6 | 54 | 1.6 |
| **Melanoma of Skin** | 3578 | 3.8 | 3256 | 3.9 | 11 | 0.3 | 10 | 0.4 | 29 | 0.8 |
| **Multiple Myeloma** | 1126 | 1.2 | 875 | 1.1 | 145 | 3.5 | 17 | 0.7 | 72 | 2.1 |
| **Non-Hodgkin Lymphoma** | 3500 | 3.7 | 3050 | 3.7 | 148 | 3.6 | 76 | 3.2 | 159 | 4.6 |
| **Oral Cavity & Pharynx** | 1476 | 1.6 | 1303 | 1.6 | 50 | 1.2 | 51 | 2.1 | 61 | 1.8 |
| **Ovary** | 2471 | 2.6 | 2209 | 2.7 | 92 | 2.2 | 66 | 2.8 | 81 | 2.4 |
| **Pancreas** | 2509 | 2.7 | 2237 | 2.7 | 135 | 3.2 | 54 | 2.3 | 71 | 2.1 |
| **Stomach** | 975 | 1.0 | 757 | 0.9 | 75 | 1.8 | 65 | 2.7 | 73 | 2.1 |
| **Thyroid** | 5251 | 5.6 | 4203 | 5.1 | 269 | 6.5 | 270 | 11.3 | 375 | 11.0 |
| **Urinary Bladder** | 2499 | 2.7 | 2310 | 2.8 | 65 | 1.6 | 18 | 0.8 | 51 | 1.5 |
| **Other Sites** | 7549 | 8.0 | 6646 | 8.0 | 361 | 8.7 | 181 | 7.6 | 287 | 8.4 |

**Table 13.**

**NUMBER AND PERCENTAGE OF INCIDENT CASES FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[53]](#footnote-14)**

**Massachusetts, 2009-2013**

**TOTAL2**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races3** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| **Cancer Site / Type** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** | **Cases** | **% of Cases** |
| **All Sites** | 183009 | 100.0 | 159966 | 100.0 | 8694 | 100.0 | 4448 | 100.0 | 6668 | 100.0 |
| **Brain & Other Nervous System** | 2464 | 1.3 | 2163 | 1.4 | 92 | 1.1 | 59 | 1.3 | 133 | 2.0 |
| **Breast4** | 27885 | 15.2 | 24733 | 15.5 | 1271 | 14.6 | 752 | 16.9 | 986 | 14.8 |
| **Bronchus & Lung** | 25128 | 13.7 | 23043 | 14.4 | 958 | 11.0 | 546 | 12.3 | 500 | 7.5 |
| **Cervix Uteri** | 956 | 0.5 | 691 | 0.4 | 93 | 1.1 | 61 | 1.4 | 99 | 1.5 |
| **Colon / Rectum** | 14903 | 8.1 | 13040 | 8.2 | 777 | 8.9 | 424 | 9.5 | 499 | 7.5 |
| **Corpus Uteri & Uterus, NOS** | 6263 | 3.4 | 5581 | 3.5 | 263 | 3.0 | 123 | 2.8 | 233 | 3.5 |
| **Esophagus** | 2273 | 1.2 | 2096 | 1.3 | 82 | 0.9 | 41 | 0.9 | 45 | 0.7 |
| **Hodgkin Lymphoma** | 1013 | 0.6 | 825 | 0.5 | 63 | 0.7 | 29 | 0.7 | 86 | 1.3 |
| **Kidney & Renal Pelvis** | 5925 | 3.2 | 5198 | 3.2 | 298 | 3.4 | 114 | 2.6 | 257 | 3.9 |
| **Larynx** | 1368 | 0.7 | 1216 | 0.8 | 58 | 0.7 | 17 | 0.4 | 60 | 0.9 |
| **Leukemia** | 4801 | 2.6 | 4176 | 2.6 | 173 | 2.0 | 121 | 2.7 | 202 | 3.0 |
| **Liver & Intrahepatic Bile Ducts** | 3140 | 1.7 | 2345 | 1.5 | 248 | 2.9 | 269 | 6.0 | 249 | 3.7 |
| **Melanoma of Skin** | 7950 | 4.3 | 7319 | 4.6 | 18 | 0.2 | 18 | 0.4 | 47 | 0.7 |
| **Multiple Myeloma** | 2497 | 1.4 | 2000 | 1.3 | 277 | 3.2 | 46 | 1.0 | 136 | 2.0 |
| **Non-Hodgkin Lymphoma** | 7429 | 4.1 | 6498 | 4.1 | 318 | 3.7 | 166 | 3.7 | 331 | 5.0 |
| **Oral Cavity & Pharynx** | 4633 | 2.5 | 4094 | 2.6 | 172 | 2.0 | 138 | 3.1 | 200 | 3.0 |
| **Ovary** | 2471 | 1.4 | 2209 | 1.4 | 92 | 1.1 | 66 | 1.5 | 81 | 1.2 |
| **Pancreas** | 4887 | 2.7 | 4367 | 2.7 | 251 | 2.9 | 95 | 2.1 | 149 | 2.2 |
| **Prostate** | 22652 | 12.4 | 18315 | 11.4 | 1771 | 20.4 | 380 | 8.5 | 1003 | 15.0 |
| **Stomach** | 2566 | 1.4 | 2035 | 1.3 | 196 | 2.3 | 141 | 3.2 | 178 | 2.7 |
| **Testis** | 1022 | 0.6 | 906 | 0.6 | 16 | 0.2 | 22 | 0.5 | 62 | 0.9 |
| **Thyroid** | 6991 | 3.8 | 5679 | 3.6 | 330 | 3.8 | 363 | 8.2 | 445 | 6.7 |
| **Urinary Bladder** | 9247 | 5.1 | 8631 | 5.4 | 192 | 2.2 | 96 | 2.2 | 160 | 2.4 |
| **Other Sites** | 14545 | 7.9 | 12806 | 8.0 | 685 | 7.9 | 361 | 8.1 | 527 | 7.9 |

**Table 14.**

**AGE-ADJUSTED[[54]](#footnote-15) INCIDENCE RATES[[55]](#footnote-16) AND 95% CONFIDENCE LIMITS (95% CL)**

**FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[56]](#footnote-17)**

**Massachusetts, 2009-2013**

**MALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races** | **White, non-Hispanics** | **Black, non-Hispanics** | **Asian, non-Hispanics** | **Hispanics** |
| **Cancer Site / Type** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** |
| **All Sites** | 523.0 | 519.5-526.5 | 520.4 | 516.6-524.1 | 575.6 | 557.5-593.7 | 331.7 | 316.3-347.0 | 424.2 | 407.5-441.0 |
| **Brain & Other Nervous System** | 8.1 | 7.6-8.5 | 8.6 | 8.1-9.2 | 5.0 | 3.4-6.5 | 3.5 | 2.0-4.9 | 7.2 | 5.1-9.3 |
| **Breast** | 1.4 | 1.2-1.6 | 1.4 | 1.2-1.6 | \* | \* | \* | \* | \* | \* |
| **Breast *in situ*4** | 0.1 | 0.1-0.2 | \* | \* | \* | \* | \* | \* | \* | \* |
| **Bronchus & Lung** | 72.8 | 71.5-74.1 | 74.3 | 72.9-75.7 | 74.3 | 67.4-81.2 | 60.0 | 53.1-66.9 | 43.8 | 38.0-49.7 |
| **Colon / Rectum** | 43.9 | 42.9-44.9 | 43.8 | 42.7-44.9 | 51.8 | 46.2-57.4 | 34.2 | 29.3-39.0 | 36.0 | 30.8-41.1 |
| **Esophagus** | 10.4 | 9.9-10.9 | 10.9 | 10.4-11.5 | 8.4 | 6.1-10.7 | 5.4 | 3.4-7.5 | 4.5 | 2.6-6.4 |
| **Hodgkin Lymphoma** | 3.4 | 3.1-3.6 | 3.4 | 3.1-3.7 | 3.7 | 2.6-4.9 | 1.6 | 0.8-2.3 | 4.2 | 2.7-5.7 |
| **Kidney & Renal Pelvis** | 21.6 | 20.9-22.3 | 22.0 | 21.3-22.8 | 20.8 | 17.4-24.1 | 10.7 | 8.1-13.4 | 18.5 | 15.2-21.7 |
| **Larynx** | 5.9 | 5.6-6.3 | 6.0 | 5.6-6.4 | 5.9 | 4.0-7.7 | \* | \* | 7.2 | 5.0-9.4 |
| **Leukemia** | 16.9 | 16.2-17.5 | 17.3 | 16.6-18.0 | 10.0 | 7.7-12.2 | 9.0 | 6.5-11.5 | 10.6 | 8.1-13.1 |
| **Liver & Intrahepatic Bile Ducts** | 13.1 | 12.5-13.6 | 11.0 | 10.5-11.6 | 22.4 | 19.0-25.7 | 31.2 | 26.7-35.8 | 23.8 | 20.0-27.5 |
| **Melanoma of Skin** | 26.3 | 25.5-27.1 | 28.2 | 27.3-29.1 | \* | \* | \* | \* | \* | \* |
| **Multiple Myeloma** | 8.2 | 7.7-8.6 | 7.7 | 7.2-8.1 | 18.7 | 15.3-22.2 | 4.7 | 2.9-6.6 | 9.0 | 6.5-11.5 |
| **Non-Hodgkin Lymphoma** | 23.6 | 22.8-24.3 | 23.9 | 23.1-24.7 | 19.9 | 16.6-23.1 | 13.1 | 10.2-16.0 | 20.0 | 16.5-23.5 |
| **Oral Cavity & Pharynx** | 17.6 | 17.0-18.3 | 18.0 | 17.3-18.7 | 14.4 | 11.7-17.2 | 12.1 | 9.4-14.9 | 17.9 | 14.5-21.2 |
| **Pancreas** | 14.2 | 13.6-14.8 | 14.4 | 13.8-15.0 | 16.9 | 13.6-20.2 | 7.4 | 5.0-9.9 | 11.4 | 8.5-14.3 |
| **Prostate** | 125.1 | 123.4-126.8 | 115.2 | 113.5-116.9 | 215.5 | 204.8-226.1 | 65.1 | 58.2-71.9 | 138.9 | 129.4-148.4 |
| **Stomach** | 9.6 | 9.1-10.1 | 8.8 | 8.3-9.2 | 16.8 | 13.6-20.1 | 12.8 | 9.7-15.9 | 14.8 | 11.6-18.1 |
| **Testis** | 6.4 | 6.0-6.8 | 7.6 | 7.1-8.1 | \* | \* | 1.9 | 1.1-2.7 | 3.6 | 2.6-4.5 |
| **Thyroid** | 10.0 | 9.6-10.5 | 10.4 | 9.8-10.9 | 6.5 | 4.8-8.2 | 11.3 | 8.9-13.7 | 6.2 | 4.6-7.8 |
| **Urinary Bladder** | 41.6 | 40.6-42.6 | 43.8 | 42.7-44.9 | 19.2 | 15.6-22.7 | 14.6 | 11.1-18.0 | 17.4 | 13.7-21.1 |

**Table 15.**

**AGE-ADJUSTED[[57]](#footnote-18) INCIDENCE RATES[[58]](#footnote-19) AND 95% CONFIDENCE LIMITS (95% CL)**

**FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[59]](#footnote-20)**

**Massachusetts, 2009-2013**

**FEMALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **All Races** | **White, non-Hispanics** | **Black, non-Hispanics** | **Asian, non-Hispanics** | **Hispanics** |
| **Cancer Site / Type** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** |
| **All Sites** | 453.8 | 450.9-456.8 | 466.3 | 463.0-469.6 | 401.8 | 389.3-414.2 | 300.9 | 288.3-313.5 | 325.6 | 313.8-337.4 |
| **Brain & Other Nervous System** | 5.9 | 5.5-6.2 | 6.2 | 5.7-6.6 | 4.2 | 3.0-5.5 | 3.6 | 2.3-4.9 | 4.7 | 3.4-6.1 |
| **Breast** | 135.8 | 134.2-137.4 | 141.4 | 139.6-143.2 | 119.3 | 112.6-126.0 | 87.4 | 80.9-93.8 | 89.9 | 83.9-95.8 |
| **Breast *in situ*4** | 43.9 | 42.9-44.8 | 45.6 | 44.6-46.7 | 40.0 | 36.2-43.9 | 31.1 | 27.4-34.9 | 32.4 | 28.9-35.9 |
| **Bronchus & Lung** | 61.8 | 60.7-62.9 | 65.4 | 64.2-66.6 | 44.8 | 40.5-49.0 | 32.1 | 27.7-36.5 | 26.9 | 23.2-30.6 |
| **Cervix Uteri** | 5.2 | 4.9-5.5 | 4.7 | 4.4-5.1 | 8.7 | 6.9-10.5 | 6.8 | 5.1-8.6 | 8.5 | 6.7-10.4 |
| **Colon / Rectum** | 34.9 | 34.1-35.7 | 34.9 | 34.1-35.8 | 38.0 | 34.2-41.9 | 29.3 | 25.2-33.5 | 26.9 | 23.3-30.6 |
| **Corpus Uteri & Uterus, NOS** | 29.5 | 28.8-30.3 | 30.6 | 29.7-31.4 | 25.0 | 21.9-28.1 | 15.1 | 12.4-17.9 | 21.2 | 18.4-24.1 |
| **Esophagus** | 2.2 | 2.0-2.4 | 2.2 | 2.0-2.4 | 2.1 | 1.2-3.0 | \* | \* | \* | \* |
| **Hodgkin Lymphoma** | 2.6 | 2.4-2.9 | 2.9 | 2.6-3.2 | 1.7 | 1.0-2.5 | \* | \* | 2.7 | 1.8-3.7 |
| **Kidney & Renal Pelvis** | 10.7 | 10.2-11.2 | 10.9 | 10.3-11.4 | 12.2 | 10.0-14.4 | 5.5 | 3.8-7.3 | 8.6 | 6.7-10.4 |
| **Larynx** | 1.6 | 1.4-1.7 | 1.6 | 1.4-1.8 | \* | \* | \* | \* | \* | \* |
| **Leukemia** | 10.1 | 9.7-10.6 | 10.1 | 9.6-10.6 | 7.8 | 6.1-9.6 | 7.3 | 5.4-9.1 | 8.6 | 6.7-10.5 |
| **Liver & Intrahepatic Bile Ducts** | 3.7 | 3.4-3.9 | 3.3 | 3.0-3.5 | 4.8 | 3.5-6.1 | 9.1 | 6.8-11.4 | 6.4 | 4.6-8.3 |
| **Melanoma of Skin** | 17.9 | 17.3-18.5 | 19.7 | 19.0-20.4 | \* | \* | \* | \* | 2.4 | 1.4-3.4 |
| **Multiple Myeloma** | 5.2 | 4.8-5.5 | 4.5 | 4.2-4.8 | 14.7 | 12.3-17.1 | \* | \* | 7.7 | 5.8-9.6 |
| **Non-Hodgkin Lymphoma** | 16.5 | 16.0-17.1 | 16.7 | 16.1-17.3 | 14.2 | 11.9-16.5 | 10.2 | 7.8-12.6 | 16.3 | 13.6-19.1 |
| **Oral Cavity & Pharynx** | 7.0 | 6.6-7.3 | 7.1 | 6.7-7.5 | 4.7 | 3.4-6.0 | 7.0 | 5.0-9.0 | 6.6 | 4.8-8.4 |
| **Ovary** | 11.9 | 11.4-12.3 | 12.4 | 11.9-12.9 | 8.6 | 6.8-10.4 | 7.7 | 5.8-9.7 | 7.2 | 5.6-8.9 |
| **Pancreas** | 11.3 | 10.8-11.7 | 11.4 | 10.9-11.9 | 13.7 | 11.4-16.1 | 8.2 | 5.9-10.5 | 8.0 | 6.0-10.0 |
| **Stomach** | 4.5 | 4.2-4.7 | 3.9 | 3.6-4.2 | 7.8 | 6.0-9.6 | 9.2 | 6.9-11.6 | 7.7 | 5.8-9.6 |
| **Thyroid** | 29.0 | 28.2-29.8 | 29.1 | 28.2-30.1 | 24.3 | 21.3-27.2 | 28.0 | 24.5-31.4 | 27.5 | 24.6-30.5 |
| **Urinary Bladder** | 11.4 | 10.9-11.9 | 11.9 | 11.4-12.4 | 6.9 | 5.2-8.6 | \* | \* | 5.8 | 4.1-7.4 |

**Table 16.**

**AGE-ADJUSTED[[60]](#footnote-21) INCIDENCE RATES[[61]](#footnote-22) AND 95% CONFIDENCE LIMITS (95% CL)**

**FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[62]](#footnote-23)**

**Massachusetts, 2009-2013**

**TOTAL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races** | **White, non-Hispanics** | **Black, non-Hispanics** | **Asian, non-Hispanics** | **Hispanics** |
| **Cancer Site / Type** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** |
| **All Sites** | 480.4 | 478.2-482.6 | 485.9 | 483.5-488.3 | 471.7 | 461.5-482.0 | 313.4 | 303.7-323.1 | 364.7 | 355.0-374.4 |
| **Brain & Other Nervous System** | 6.9 | 6.6-7.2 | 7.3 | 7.0-7.6 | 4.5 | 3.5-5.4 | 3.5 | 2.6-4.5 | 5.8 | 4.6-6.9 |
| **Breast** | --5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Breast *in situ*4** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Bronchus & Lung** | 66.1 | 65.3-66.9 | 68.7 | 67.8-69.6 | 56.2 | 52.5-59.9 | 44.6 | 40.7-48.5 | 33.8 | 30.6-37.0 |
| **Cervix Uteri** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Colon / Rectum** | 38.8 | 38.2-39.5 | 38.8 | 38.1-39.5 | 43.4 | 40.3-46.6 | 31.6 | 28.5-34.8 | 30.6 | 27.6-33.6 |
| **Corpus Uteri & Uterus, NOS** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Esophagus** | 5.8 | 5.6-6.1 | 6.1 | 5.9-6.4 | 4.6 | 3.6-5.6 | \* | \* | 3.2 | 2.2-4.1 |
| **Hodgkin Lymphoma** | 3.0 | 2.8-3.2 | 3.1 | 2.9-3.3 | 2.7 | 2.0-3.4 | 1.3 | 0.8-1.9 | 3.3 | 2.5-4.2 |
| **Kidney & Renal Pelvis** | 15.7 | 15.3-16.1 | 16.0 | 15.5-16.4 | 15.9 | 14.0-17.7 | 8.0 | 6.4-9.5 | 12.9 | 11.1-14.6 |
| **Larynx** | 3.5 | 3.3-3.7 | 3.6 | 3.4-3.8 | 3.3 | 2.4-4.2 | 1.4 | 0.7-2.1 | 3.5 | 2.5-4.4 |
| **Leukemia** | 13.0 | 12.7-13.4 | 13.3 | 12.8-13.7 | 8.7 | 7.4-10.1 | 7.9 | 6.4-9.4 | 9.5 | 7.9-11.0 |
| **Liver & Intrahepatic Bile Ducts** | 8.0 | 7.7-8.2 | 6.8 | 6.5-7.1 | 12.5 | 10.9-14.1 | 19.5 | 17.0-21.9 | 14.1 | 12.2-16.0 |
| **Melanoma of Skin** | 21.3 | 20.8-21.7 | 23.1 | 22.5-23.6 | \* | \* | \* | \* | 2.2 | 1.5-2.9 |
| **Multiple Myeloma** | 6.5 | 6.2-6.7 | 5.9 | 5.6-6.2 | 16.3 | 14.3-18.2 | 3.4 | 2.4-4.5 | 8.3 | 6.7-9.8 |
| **Non-Hodgkin Lymphoma** | 19.6 | 19.2-20.1 | 19.8 | 19.3-20.3 | 16.7 | 14.8-18.6 | 11.6 | 9.7-13.5 | 18.0 | 15.8-20.2 |
| **Oral Cavity & Pharynx** | 11.9 | 11.6-12.3 | 12.2 | 11.8-12.6 | 8.8 | 7.5-10.2 | 9.4 | 7.8-11.1 | 11.5 | 9.7-13.3 |
| **Ovary** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Pancreas** | 12.6 | 12.2-13.0 | 12.7 | 12.3-13.1 | 15.2 | 13.3-17.1 | 7.8 | 6.2-9.5 | 9.4 | 7.8-11.1 |
| **Prostate** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Stomach** | 6.7 | 6.4-6.9 | 6.0 | 5.7-6.3 | 11.5 | 9.8-13.2 | 10.8 | 8.9-12.7 | 10.7 | 9.0-12.4 |
| **Testis** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Thyroid** | 19.8 | 19.3-20.3 | 20.0 | 19.4-20.5 | 16.0 | 14.3-17.8 | 20.1 | 17.9-22.2 | 17.5 | 15.8-19.3 |
| **Urinary Bladder** | 24.1 | 23.6-24.6 | 25.5 | 24.9-26.0 | 11.9 | 10.1-13.6 | 8.0 | 6.3-9.6 | 10.5 | 8.7-12.3 |

**Table 17.**

**FIVE LEADING CANCER MORTALITY RATES BY RACE/ETHNICITY AND SEX**

**Massachusetts, 2009-2013**

**MALES**

|  |
| --- |
| **AGE-ADJUSTED[[63]](#footnote-24) MORTALITY RATE[[64]](#footnote-25)** |
| **RANK** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| 1 | Bronchus & Lung 54.4  | Bronchus & Lung 51.6  | Bronchus & Lung 37.6  | Bronchus & Lung 26.6  |
| 2 | Prostate 19.0  | Prostate 40.3  | Liver & Intrahepatic Bile Duct 21.6  | Prostate 14.7  |
| 3 | Colon/Rectum 16.4  | Colon/Rectum 19.0  | Colon/Rectum 9.1  | Liver & Intrahepatic Bile Duct 12.4  |
| 4 | Pancreas 12.7  | Liver & Intrahepatic Bile Duct 15.5  | Prostate 7.5  | Colon/Rectum 12.1  |
| 5 | Leukemia 9.2  | Pancreas 14.6  | Leukemia 5.4  | Pancreas 8.9  |

**FEMALES**

|  |
| --- |
| **AGE-ADJUSTED1 MORTALITY RATE2** |
| **RANK** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| 1 | Bronchus & Lung 41.0  | Bronchus & Lung 27.7  | Bronchus & Lung 15.7  | Bronchus & Lung 12.6  |
| 2 | Breast 19.7  | Breast 23.5  | Colon/Rectum 9.8  | Breast 10.8  |
| 3 | Colon/Rectum 11.3  | Colon/Rectum 14.2  | Breast 8.4  | Colon/Rectum 9.9  |
| 4 | Pancreas 9.8  | Pancreas 11.2  | Pancreas 6.3  | Pancreas 6.5  |
| 5 | Ovary 8.0  | Corpus Uteri & Uterus, NOS 7.6  | Liver & Intrahepatic Bile Duct 6.2  | Leukemia 4.8  |

**Table 18.**

**NUMBER AND PERCENTAGE OF DEATHS FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[65]](#footnote-26)**

**Massachusetts, 2009-2013**

**MALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races[[66]](#footnote-27)** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| **Cancer Site / Type** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** |
| **All Sites** | 32417 | 100.0 | 29354 | 100.0 | 1457 | 100.0 | 672 | 100.0 | 847 | 100.0 |
| **Brain & Other Nervous System** | 880 | 2.7 | 821 | 2.8 | 19 | 1.3 | 9 | 1.3 | 27 | 3.2 |
| **Breast** | 53 | 0.2 | 51 | 0.2 | 2 | 0.1 | 0 | 0.0 | 0 | 0.0 |
| **Bronchus & Lung** | 8760 | 27.0 | 8029 | 27.3 | 345 | 23.7 | 196 | 29.2 | 168 | 19.8 |
| **Colon / Rectum** | 2663 | 8.2 | 2400 | 8.2 | 134 | 9.2 | 54 | 8.0 | 69 | 8.1 |
| **Esophagus** | 1472 | 4.5 | 1380 | 4.7 | 44 | 3.0 | 23 | 3.4 | 21 | 2.5 |
| **Hodgkin Lymphoma** | 72 | 0.2 | 60 | 0.2 | 4 | 0.3 | 2 | 0.3 | 6 | 0.7 |
| **Kidney & Renal Pelvis** | 772 | 2.4 | 712 | 2.4 | 27 | 1.8 | 10 | 1.5 | 21 | 2.5 |
| **Larynx** | 278 | 0.9 | 247 | 0.8 | 12 | 0.8 | 4 | 0.6 | 13 | 1.5 |
| **Leukemia** | 1412 | 4.4 | 1306 | 4.5 | 38 | 2.6 | 29 | 4.3 | 36 | 4.3 |
| **Liver & Intrahepatic Bile Ducts** | 1741 | 5.4 | 1372 | 4.7 | 123 | 8.4 | 137 | 20.4 | 102 | 12.0 |
| **Melanoma of Skin** | 696 | 2.2 | 680 | 2.3 | 6 | 0.4 | 2 | 0.3 | 4 | 0.5 |
| **Multiple Myeloma** | 634 | 2.0 | 549 | 1.9 | 52 | 3.6 | 8 | 1.2 | 23 | 2.7 |
| **Non-Hodgkin Lymphoma** | 1124 | 3.5 | 1028 | 3.5 | 44 | 3.0 | 15 | 2.2 | 31 | 3.7 |
| **Oral Cavity & Pharynx** | 662 | 2.0 | 582 | 2.0 | 36 | 2.5 | 19 | 2.8 | 24 | 2.8 |
| **Pancreas** | 2086 | 6.4 | 1901 | 6.5 | 95 | 6.5 | 27 | 4.0 | 59 | 7.0 |
| **Prostate** | 3034 | 9.4 | 2705 | 9.2 | 214 | 14.7 | 30 | 4.5 | 75 | 8.9 |
| **Stomach** | 677 | 2.1 | 546 | 1.9 | 50 | 3.4 | 29 | 4.3 | 51 | 6.0 |
| **Testis** | 24 | 0.1 | 23 | 0.1 | 0 | 0.0 | 0 | 0.0 | 1 | 0.1 |
| **Thyroid** | 105 | 0.3 | 99 | 0.3 | 4 | 0.3 | 1 | 0.1 | 1 | 0.1 |
| **Urinary Bladder** | 1327 | 4.1 | 1268 | 4.3 | 32 | 2.2 | 10 | 1.5 | 16 | 1.9 |
| **Other Sites** | 3945 | 12.2 | 3595 | 12.2 | 176 | 12.1 | 67 | 10.0 | 99 | 11.7 |

**Table 19.**

**NUMBER AND PERCENTAGE OF DEATHS FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[67]](#footnote-28)**

**Massachusetts, 2009-2013**

**FEMALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races[[68]](#footnote-29)** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| **Cancer Site / Type** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** |
| **All Sites** | 32123 | 100.0 | 29299 | 100.0 | 1452 | 100.0 | 540 | 100.0 | 766 | 100.0 |
| **Brain & Other Nervous System** | 723 | 2.3 | 655 | 2.3 | 18 | 1.2 | 15 | 2.8 | 24 | 3.1 |
| **Breast** | 4307 | 13.4 | 3879 | 13.2 | 239 | 16.5 | 66 | 12.2 | 115 | 15.0 |
| **Bronchus & Lung** | 8529 | 27.0 | 8038 | 27.4 | 275 | 18.9 | 101 | 18.7 | 100 | 13.0 |
| **Cervix Uteri** | 274 | 0.9 | 227 | 0.8 | 25 | 1.7 | 8 | 1.5 | 14 | 1.8 |
| **Colon / Rectum** | 2734 | 8.5 | 2437 | 8.3 | 143 | 9.8 | 64 | 11.8 | 82 | 10.7 |
| **Corpus Uteri & Uterus, NOS** | 1007 | 3.1 | 880 | 3.0 | 75 | 5.2 | 17 | 3.1 | 30 | 3.9 |
| **Esophagus** | 372 | 1.2 | 336 | 1.1 | 14 | 1.0 | 7 | 1.3 | 13 | 1.7 |
| **Hodgkin Lymphoma** | 54 | 0.2 | 51 | 0.2 | 0 | 0.0 | 0 | 0.0 | 2 | 0.3 |
| **Kidney & Renal Pelvis** | 515 | 1.6 | 485 | 1.7 | 16 | 1.1 | 5 | 0.9 | 7 | 1.7 |
| **Larynx** | 92 | 0.3 | 87 | 0.3 | 2 | 0.1 | 1 | 0.2 | 2 | 0.3 |
| **Leukemia** | 1144 | 4.4 | 1036 | 3.5 | 52 | 3.6 | 12 | 2.2 | 42 | 5.5 |
| **Liver & Intrahepatic Bile Ducts** | 771 | 2.4 | 649 | 2.2 | 43 | 3.0 | 43 | 8.0 | 35 | 4.6 |
| **Melanoma of Skin** | 422 | 1.3 | 412 | 1.4 | 5 | 0.3 | 2 | 0.4 | 3 | 0.4 |
| **Multiple Myeloma** | 638 | 2.0 | 542 | 1.9 | 68 | 4.7 | 5 | 0.9 | 21 | 2.7 |
| **Non-Hodgkin Lymphoma** | 1027 | 3.2 | 943 | 3.2 | 38 | 2.6 | 16 | 3.0 | 29 | 3.8 |
| **Oral Cavity & Pharynx** | 303 | 0.9 | 272 | 0.9 | 10 | 0.7 | 11 | 2.0 | 10 | 1.3 |
| **Ovary** | 1690 | 5.3 | 1572 | 5.4 | 67 | 4.6 | 25 | 4.6 | 24 | 3.1 |
| **Pancreas** | 2260 | 7.0 | 2048 | 7.0 | 111 | 7.6 | 40 | 7.4 | 55 | 7.2 |
| **Stomach** | 550 | 1.7 | 443 | 1.5 | 43 | 3.0 | 25 | 4.6 | 36 | 4.7 |
| **Thyroid** | 114 | 0.4 | 97 | 0.3 | 6 | 0.4 | 4 | 0.7 | 6 | 0.8 |
| **Urinary Bladder** | 654 | 2.0 | 624 | 2.1 | 19 | 1.3 | 3 | 0.6 | 8 | 1.0 |
| **Other Sites** | 3943 | 12.3 | 3576 | 12.2 | 183 | 12.6 | 70 | 13.0 | 108 | 14.1 |

**Table 20.**

**NUMBER AND PERCENTAGE OF DEATHS FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[69]](#footnote-30)**

**Massachusetts, 2009-2013**

**TOTAL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races[[70]](#footnote-31)** | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| **Cancer Site / Type** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** | **Deaths** | **% of Deaths** |
| **All Sites** | 64543 | 100.0 | 58656 | 100.0 | 2909 | 100.0 | 1212 | 100.0 | 1613 | 100.0 |
| **Brain & Other Nervous System** | 1603 | 2.4 | 1486 | 2.5 | 37 | 1.3 | 24 | 2.0 | 51 | 3.2 |
| **Breast** | 4360 | 6.8 | 3930 | 6.7 | 241 | 8.3 | 66 | 5.4 | 115 | 7.1 |
| **Bronchus & Lung** | 17290 | 26.8 | 16068 | 27.4 | 620 | 21.3 | 297 | 24.5 | 268 | 16.6 |
| **Cervix Uteri** | 274 | 0.4 | 227 | 0.4 | 25 | 0.9 | 8 | 0.7 | 14 | 0.9 |
| **Colon / Rectum** | 5398 | 8.4 | 4838 | 8.2 | 277 | 9.5 | 118 | 9.7 | 151 | 9.4 |
| **Corpus Uteri & Uterus, NOS** | 1007 | 1.6 | 880 | 1.5 | 75 | 2.6 | 17 | 1.4 | 30 | 1.9 |
| **Esophagus** | 1844 | 2.9 | 1718 | 2.9 | 58 | 2.0 | 30 | 2.5 | 34 | 2.1 |
| **Hodgkin Lymphoma** | 126 | 0.2 | 111 | 0.2 | 4 | 0.1 | 2 | 0.2 | 8 | 0.5 |
| **Kidney & Renal Pelvis** | 1287 | 2.0 | 1197 | 2.0 | 43 | 1.5 | 15 | 1.2 | 28 | 1.7 |
| **Larynx** | 370 | 0.6 | 334 | 0.6 | 14 | 0.5 | 5 | 0.4 | 15 | 0.9 |
| **Leukemia** | 2556 | 4.0 | 2342 | 4.0 | 90 | 3.1 | 41 | 3.4 | 78 | 4.8 |
| **Liver & Intrahepatic Bile Ducts** | 2512 | 3.9 | 2021 | 3.4 | 166 | 5.7 | 180 | 14.8 | 137 | 8.5 |
| **Melanoma of Skin** | 1118 | 1.7 | 1092 | 1.9 | 11 | 0.4 | 4 | 0.3 | 7 | 0.4 |
| **Multiple Myeloma** | 1272 | 2.0 | 1091 | 1.9 | 120 | 4.1 | 13 | 1.1 | 44 | 2.7 |
| **Non-Hodgkin Lymphoma** | 2151 | 3.3 | 1971 | 3.4 | 82 | 2.8 | 31 | 2.6 | 60 | 3.7 |
| **Oral Cavity & Pharynx** | 965 | 1.5 | 854 | 1.5 | 46 | 1.6 | 30 | 2.5 | 34 | 2.1 |
| **Ovary** | 1690 | 2.6 | 1572 | 2.7 | 67 | 2.3 | 25 | 2.1 | 24 | 1.5 |
| **Pancreas** | 4346 | 6.7 | 3949 | 6.7 | 206 | 7.1 | 67 | 5.5 | 114 | 7.1 |
| **Prostate** | 3035 | 4.7 | 2706 | 4.6 | 214 | 7.4 | 30 | 2.5 | 75 | 4.6 |
| **Stomach** | 1227 | 1.9 | 989 | 1.7 | 93 | 3.2 | 54 | 4.5 | 87 | 5.4 |
| **Testis** | 24 | 0.04 | 23 | 0.04 | 0 | 0.0 | 0 | 0.0 | 1 | 0.1 |
| **Thyroid** | 219 | 0.3 | 196 | 0.3 | 10 | 0.3 | 5 | 0.4 | 7 | 0.4 |
| **Urinary Bladder** | 1981 | 3.1 | 1892 | 3.2 | 51 | 1.7 | 13 | 1.1 | 24 | 1.5 |
| **Other Sites** | 7888 | 12.2 | 7171 | 12.2 | 359 | 12.3 | 137 | 11.3 | 207 | 12.8 |

**Table 21.**

**AGE-ADJUSTED[[71]](#footnote-32) MORTALITY RATES[[72]](#footnote-33) AND 95% CONFIDENCE LIMITS (95% CL)**

**FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[73]](#footnote-34)**

**Massachusetts, 2009-2013**

**MALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races** | **White, non-Hispanics** | **Black, non-Hispanics** | **Asian, non-Hispanics** | **Hispanics** |
| **Cancer Site / Type** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** |
| **All Sites** | 195.9 | 193.8-198.1 | 199.4 | 197.2-201.7 | 220.6 | 209.3-232.0 | 120.4 | 111.3-129.5 | 128.7 | 120.0-137.4 |
| **Brain & Other Nervous System** | 5.1 | 4.8-5.5 | 5.5 | 5.2-6.0 | \* | \* | \* | \* | 3.2 | 2.0-4.4 |
| **Breast** | 0.3 | 0.2-0.4 | 0.3 | 0.3-0.4 | \* | \* | \* | \* | \* | \* |
| **Bronchus & Lung** | 52.9 | 51.8-54.0 | 54.4 | 53.2-55.6 | 51.6 | 46.2-57.1 | 37.6 | 32.3-42.9 | 26.6 | 22.6-30.6 |
| **Colon / Rectum** | 16.1 | 15.5-16.8 | 16.4 | 15.7-17.0 | 19.0 | 15.8-22.2 | 9.1 | 6.7-11.5 | 12.1 | 9.3-15.0 |
| **Esophagus** | 8.6 | 8.1-9.0 | 9.1 | 8.6-9.5 | 6.1 | 4.3-7.9 | 4.7 | 2.8-6.0 | 3.4 | 1.9-4.9 |
| **Hodgkin Lymphoma** | 0.4 | 0.3-0.5 | 0.4 | 0.3-0.5 | \* | \* | \* | \* | \* | \* |
| **Kidney & Renal Pelvis** | 4.5 | 4.2-4.9 | 4.7 | 4.3-5.0 | 4.4 | 2.7-6.0 | \* | \* | 2.5 | 1.4-3.6 |
| **Larynx** | 1.6 | 1.4-1.8 | 1.6 | 1.4-1.9 | \* | \* | \* | \* | \* | \* |
| **Leukemia** | 8.8 | 8.4-9.3 | 9.2 | 8.7-9.7 | 5.8 | 3.9-7.6 | 5.4 | 3.5-7.4 | 4.9 | 3.3-6.5 |
| **Liver & Intrahepatic Bile Ducts** | 9.9 | 9.4-10.3 | 8.8 | 8.4-9.3 | 15.5 | 12.7-18.2 | 21.6 | 18.0-25.2 | 12.4 | 10.0-14.9 |
| **Melanoma of Skin** | 4.2 | 3.9-4.5 | 4.6 | 4.3-5.0 | \* | \* | \* | \* | \* | \* |
| **Multiple Myeloma** | 3.8 | 3.5-4.1 | 3.7 | 3.4-4.0 | 7.8 | 5.7-9.9 | \* | \* | 3.9 | 2.3-5.5 |
| **Non-Hodgkin Lymphoma** | 6.9 | 6.5-7.3 | 7.1 | 6.7-7.5 | 6.2 | 4.4-8.0 | \* | \* | 4.3 | 2.8-5.8 |
| **Oral Cavity & Pharynx** | 3.8 | 3.5-4.1 | 3.8 | 3.5-4.1 | 4.8 | 3.2-6.4 | \* | \* | 3.5 | 2.1-4.9 |
| **Pancreas** | 12.4 | 11.9-12.9 | 12.7 | 12.1-13.3 | 14.6 | 11.6-17.5 | 5.1 | 3.2-7.1 | 8.9 | 6.6-11.2 |
| **Prostate** | 19.3 | 18.6-20.0 | 19.0 | 18.3-19.7 | 40.3 | 34.9-45.7 | 7.5 | 4.8-10.2 | 14.7 | 11.4-18.0 |
| **Stomach** | 4.1 | 3.8-4.4 | 3.7 | 3.4-4.0 | 7.6 | 5.5-9.7 | 5.0 | 3.2-6.8 | 7.2 | 5.3-9.2 |
| **Testis** | 0.1 | 0.08-0.2 | 0.2 | 0.1-0.2 | \* | \* | \* | \* | \* | \* |
| **Thyroid** | 0.6 | 0.5-0.7 | 0.7 | 0.5-0.8 | \* | \* | \* | \* | \* | \* |
| **Urinary Bladder** | 8.3 | 7.8-8.8 | 8.8 | 8.3-9.3 | 5.8 | 3.8-7.8 | \* | \* | \* | \* |

**Table 22.**

**AGE-ADJUSTED[[74]](#footnote-35) MORTALITY RATES[[75]](#footnote-36) AND 95% CONFIDENCE LIMITS (95% CL)**

**FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[76]](#footnote-37)**

**Massachusetts, 2009-2013**

**FEMALES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **All Races** | **White, non-Hispanics** | **Black, non-Hispanics** | **Asian, non-Hispanics** | **Hispanics** |
| **Cancer Site / Type** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** |
| **All Sites** | 141.1 | 139.6-142.7 | 145.3 | 143.6-146.9 | 145.8 | 138.3-153.3 | 78.7 | 72.1-85.3 | 88.5 | 82.2-94.7 |
| **Brain & Other Nervous System** | 3.4 | 3.2-3.7 | 3.6 | 3.4-3.9 | \* | \* | \* | \* | 2.3 | 1.4-3.2 |
| **Breast** | 19.2 | 18.6-19.8 | 19.7 | 19.1-20.3 | 23.5 | 20.5-26.4 | 8.4 | 6.4-10.5 | 10.8 | 8.9-12.8 |
| **Bronchus & Lung** | 38.4 | 37.6-39.2 | 41.0 | 40.1-41.9 | 27.7 | 24.5-31.0 | 15.7 | 12.7-18.8 | 12.6 | 10.1-15.1 |
| **Cervix Uteri** | 1.3 | 1.2-1.5 | 1.3 | 1.1-1.5 | 2.2 | 1.4-3.1 | \* | \* | \* | \* |
| **Colon / Rectum** | 11.4 | 11.0-11.9 | 11.3 | 10.9-11.8 | 14.2 | 11.9-16.5 | 9.8 | 7.4-12.2 | 9.9 | 7.8-12.1 |
| **Corpus Uteri & Uterus, NOS** | 4.4 | 4.2-4.7 | 4.4 | 4.1-4.7 | 7.6 | 5.9-9.4 | \* | \* | 3.6 | 2.3-4.9 |
| **Esophagus** | 1.6 | 1.4-1.8 | 1.6 | 1.5-1.8 | \* | \* | \* | \* | \* | \* |
| **Hodgkin Lymphoma** | 0.3 | 0.2-0.3 | 0.3 | 0.2-0.4 | \* | \* | \* | \* | \* | \* |
| **Kidney & Renal Pelvis** | 2.2 | 2.0-2.4 | 2.3 | 2.1-2.5 | \* | \* | \* | \* | \* | \* |
| **Larynx** | 0.4 | 0.3-0.5 | 0.4 | 0.3-0.5 | \* | \* | \* | \* | \* | \* |
| **Leukemia** | 5.0 | 4.7-5.3 | 5.1 | 4.8-5.4 | 5.5 | 4.0-6.9 | \* | \* | 4.8 | 3.3-6.2 |
| **Liver & Intrahepatic Bile Ducts** | 3.4 | 3.2-3.7 | 3.2 | 3.0-3.5 | 4.2 | 3.0-5.5 | 6.2 | 4.3-8.0 | 4.3 | 2.9-5.8 |
| **Melanoma of Skin** | 1.9 | 1.7-2.1 | 2.2 | 1.9-2.4 | \* | \* | \* | \* | \* | \* |
| **Multiple Myeloma** | 2.7 | 2.5-2.9 | 2.5 | 2.3-2.7 | 6.9 | 5.3-8.6 | \* | \* | 2.7 | 1.6-3.9 |
| **Non-Hodgkin Lymphoma** | 4.3 | 4.0-4.5 | 4.3 | 4.1-4.6 | 4.0 | 2.7-5.2 | \* | \* | 3.9 | 2.5-5.3 |
| **Oral Cavity & Pharynx** | 1.3 | 1.1-1.4 | 1.3 | 1.2-1.5 | \* | \* | \* | \* | \* | \* |
| **Ovary** | 7.5 | 7.2-7.9 | 8.0 | 7.6-8.4 | 6.6 | 5.0-8.1 | 3.2 | 2.0-4.5 | 2.8 | 1.7-3.9 |
| **Pancreas** | 9.7 | 9.3-10.1 | 9.8 | 9.4-10.3 | 11.2 | 9.1-13.2 | 6.3 | 4.4-8.3 | 6.5 | 4.8-8.3 |
| **Stomach** | 2.3 | 2.1-2.5 | 2.0 | 1.9-2.2 | 4.5 | 3.1-5.8 | 3.5 | 2.1-4.9 | 3.6 | 2.4-4.8 |
| **Thyroid** | 0.5 | 0.4-0.6 | 0.5 | 0.4-0.6 | \* | \* | \* | \* | \* | \* |
| **Urinary Bladder** | 2.6 | 2.4-2.8 | 2.8 | 2.6-3.0 | \* | \* | \* | \* | \* | \* |

**Table 23.**

**AGE-ADJUSTED[[77]](#footnote-38) MORTALITY RATES[[78]](#footnote-39) AND 95% CONFIDENCE LIMITS (95% CL)**

**FOR SELECTED CANCER SITES BY RACE/ETHNICITY[[79]](#footnote-40)**

**Massachusetts, 2009-2013**

**TOTAL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **All Races** | **White, non-Hispanics** | **Black, non-Hispanics** | **Asian, non-Hispanics** | **Hispanics** |
| **Cancer Site / Type** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** | **Rates** | **95% CL** |
| **All Sites** | 162.9 | 161.7-164.2 | 166.7 | 165.4-168.1 | 173.4 | 167.1-179.7 | 97.3 | 91.9-102.8 | 105.1 | 100.0-110.3 |
| **Brain & Other Nervous System** | 4.2 | 4.0-4.4 | 4.5 | 4.3-4.8 | 2.0 | 1.3-2.6 | 1.6 | 1.0-2.3 | 2.6 | 1.9-3.4 |
| **Breast** | - | - | - | - | - | - | - | - | - | - |
| **Bronchus & Lung** | 44.3 | 43.6-45.0 | 46.4 | 45.7-47.1 | 37.1 | 34.1-40.0 | 25.5 | 22.6-28.4 | 18.5 | 16.3-20.7 |
| **Cervix Uteri** | - | - | - | - | - | - | - | - | - | - |
| **Colon / Rectum** | 13.4 | 13.1-13.8 | 13.5 | 13.1-13.8 | 16.2 | 14.3-18.1 | 9.6 | 7.8-11.3 | 10.7 | 9.0-12.5 |
| **Corpus Uteri & Uterus, NOS** | - | - | - | - | - | - | - | - | - | - |
| **Esophagus** | 4.6 | 4.4-4.8 | 4.9 | 4.7-5.1 | 3.2 | 2.4-4.1 | 2.6 | 1.7-3.5 | 2.4 | 1.6-3.3 |
| **Hodgkin Lymphoma** | 0.3 | 0.3-0.4 | 0.4 | 0.3-0.4 | \* | \* | \* | \* | \* | \* |
| **Kidney & Renal Pelvis** | 3.2 | 3.0-3.4 | 3.3 | 3.2-3.5 | 2.6 | 1.8-3.4 | \* | \* | 1.5 | 0.9-2.0 |
| **Larynx** | 0.9 | 0.8-1.0 | 1.0 | 0.8-1.1 | \* | \* | \* | \* | \* | \* |
| **Leukemia** | 6.6 | 6.3-6.8 | 6.8 | 6.5-7.0 | 5.4 | 4.3-6.5 | 3.2 | 2.2-4.2 | 4.9 | 3.8-6.0 |
| **Liver & Intrahepatic Bile Ducts** | 6.3 | 6.1-6.6 | 5.7 | 5.5-6.0 | 9.0 | 7.6-10.4 | 13.3 | 11.4-15.2 | 8.0 | 6.6-9.3 |
| **Melanoma of Skin** | 2.9 | 2.7-3.0 | 3.2 | 3.0-3.4 | \* | \* | \* | \* | \* | \* |
| **Multiple Myeloma** | 3.2 | 3.0-3.3 | 3.0 | 2.8-3.2 | 7.2 | 5.9-8.5 | \* | \* | 3.2 | 2.3-4.1 |
| **Non-Hodgkin Lymphoma** | 5.4 | 5.1-5.6 | 5.5 | 5.2-5.7 | 4.9 | 3.8-6.0 | 2.4 | 1.6-3.3 | 4.1 | 3.1-5.1 |
| **Oral Cavity & Pharynx** | 2.4 | 2.3-2.6 | 2.4 | 2.3-2.6 | 2.6 | 1.8-3.3 | 2.0 | 1.3-2.8 | 2.3 | 1.5-3.0 |
| **Ovary** | - | - | - | - | - | - | - | - | - | - |
| **Pancreas** | 10.9 | 10.6-11.2 | 11.1 | 10.8-11.5 | 12.7 | 10.9-14.4 | 5.8 | 4.4-7.2 | 7.6 | 6.2-9.0 |
| **Prostate** | - | - | - | - | - | - | - | - | - | - |
| **Stomach** | 3.1 | 2.9-3.3 | 2.8 | 2.6-2.9 | 5.8 | 4.6-6.9 | 4.2 | 3.1-5.3 | 5.1 | 4.0-6.2 |
| **Testis** | - | - | - | - | - | - | - | - | - | - |
| **Thyroid** | 0.6 | 0.5-0.6 | 0.6 | 0.5-0.6 | \* | \* | \* | \* | \* | \* |
| **Urinary Bladder** | 4.9 | 4.7-5.1 | 5.2 | 4.9-5.4 | 3.4 | 2.5-4.3 | \* | \* | 2.0 | 1.2-2.8 |

**Table 24.**

 **INCIDENCE RATES1 FOR SELECTED CANCER SITES BY SEX**

**Massachusetts and U.S. (2009-2013)**

|  |  |  |
| --- | --- | --- |
|  | **MALES** | **FEMALES** |
| **Cancer Site / Type** | **Massachusetts** | **United States** | **Massachusetts** | **United States** |
|  | **Rate** | **95% CL**  | **Rate** | **95% CL** | **Rate** | **95% CL** | **Rate** | **95% CL** |
| **All Sites** | 523.0 | 519.5-526.5 | 522.6 | 522.0-523.1 | 453.8\* | 450.9-456.8 | 419.0 | 418.6-419.5 |
| **Brain & Other Nervous System** | 8.1 | 7.6-8.5 | 7.8 | 7.8-7.9 | 5.9 | 5.5-6.2 | 5.6 | 5.6-5.7 |
| **Breast** | 1.4 | 1.2-1.6 | 1.4 | 1.3-1.4 | 135.8\* | 134.2-137.4 | 123.1 | 122.9-123.4 |
| **Breast *in situ2*** | 0.1 | 0.1-0.2 | N/A | N/A | 43.9\* | 42.9-44.8 | 31.1 | 31.0-31.2 |
| **Bronchus & Lung** | 72.8\* | 71.5-74.1 | 76.7 | 76.4-76.9 | 61.8\* | 60.7-62.9 | 54.1 | 53.9-54.2 |
| **Cervix Uteri** | -- | -- |  |  | 5.2\* | 4.9-5.5 | 7.7 | 7.7-7.8 |
| **Colon / Rectum** | 43.9\* | 42.9-44.9 | 48.4 | 48.2-48.5 | 34.9\* | 34.1-35.7 | 36.6 | 36.5-36.8 |
| **Corpus Uteri & Uterus, NOS** | -- | -- |  |  | 29.5\* | 28.8-30.3 | 25.3 | 25.2-25.4 |
| **Esophagus** | 10.4\* | 9.9-10.9 | 8.3 | 8.2-8.4 | 2.2\* | 2.0-2.4 | 1.8 | 1.8-1.8 |
| **Hodgkin Lymphoma** | 3.4 | 3.1-3.6 | 3.1 | 3.1-3.2 | 2.6 | 2.4-2.9 | 2.4 | 2.4-2.5 |
| **Kidney & Renal Pelvis** | 21.6 | 20.9-22.3 | 21.5 | 21.4-21.6 | 10.7 | 10.2-11.2 | 11.3 | 11.2-11.4 |
| **Larynx** | 5.9 | 5.6-6.3 | 6.3 | 6.2-6.4 | 1.6 | 1.4-1.7 | 1.4 | 1.4-1.4 |
| **Leukemia** | 16.9 | 16.2-17.5 | 16.9 | 16.8-17.0 | 10.1 | 9.7-10.6 | 10.4 | 10.3-10.4 |
| **Liver & Intrahepatic Bile Ducts** | 13.1\* | 12.5-13.6 | 11.5 | 11.4-11.6 | 3.7 | 3.4-3.9 | 3.9 | 3.9-3.9 |
| **Melanoma of Skin** | 26.3 | 25.5-27.1 | 25.4 | 25.3-25.6 | 17.9\* | 17.3-18.5 | 15.8 | 15.8-15.9 |
| **Multiple Myeloma** | 8.2 | 7.7-8.6 | 7.7 | 7.7-7.8 | 5.2 | 4.8-5.5 | 5.1 | 5.0-5.1 |
| **Non-Hodgkin Lymphoma** | 23.6 | 22.8-24.3 | 23.1 | 23.0-23.2 | 16.5 | 16.0-17.1 | 16.0 | 15.9-16.1 |
| **Oral Cavity & Pharynx** | 17.6 | 17.0-18.3 | 16.9 | 16.8-17.0 | 7.0\* | 6.6-7.3 | 6.3 | 6.2-6.4 |
| **Ovary** | -- | -- |  |  | 11.9 | 11.4-12.3 | 11.9 | 11.8-12.0 |
| **Pancreas** | 14.2 | 13.6-14.8 | 14.0 | 13.9-14.1 | 11.3 | 10.8-11.7 | 10.9 | 10.8-11.0 |
| **Prostate** | 125.1\* | 123.4-126.8 | 131.6 | 131.3-131.8 | -- | -- |  |  |
| **Stomach** | 9.6 | 9.1-10.1 | 9.2 | 9.2-9.3 | 4.5 | 4.2-4.7 | 4.6 | 4.6-4.7 |
| **Testis** | 6.4\* | 6.0-6.8 | 5.5 | 5.4-5.5 | -- |  |  |  |
| **Thyroid** | 10.0\* | 9.6-10.5 | 6.8 | 6.8-6.9 | 29.0\* | 28.2-29.8 | 20.3 | 20.2-20.4 |
| **Urinary Bladder** | 41.6\* | 40.6-42.6 | 36.4 | 36.3-36.6 | 11.4\* | 10.9-11.9 | 9.0 | 9.0-9.1 |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Rates are age-adjusted to the 2000 U.S. Standard Population.

2Breast *in situ* cases are excluded from “All Sites” and from breast cancer counts.

N/A – not available

\* indicates that the Massachusetts incidence rate differed significantly from the national rate (p < 0.05).

 Data Sources: Massachusetts: Massachusetts Cancer Registry and United States: NAACCR Fast Stats: An interactive tool for quick access to key NAACCR cancer statistics. North American Association of Central Cancer Registries. <http://www.naaccr.org/>. (Accessed on 1-28-2016)

**Table 25.**

**MORTALITY RATES1 FOR SELECTED CANCER SITES BY SEX**

**Massachusetts and U.S. (2009-2013)**

|  |  |  |
| --- | --- | --- |
|  | **MALES** | **FEMALES** |
| **Cancer Site / Type** | **Massachusetts** | **United States** | **Massachusetts** | **United States** |
|  | **Rate** | **95% CL** | **Rate** | **95% CL** | **Rate** | **95% CL** | **Rate** | **95% CL** |
| **All Sites** | 195.9\* | 193.8-198.1 | 204.0 | 203.6-204.3 | 141.1\* | 139.6-142.7 | 143.9 | 143.6-144.1 |
| **Brain & Other Nervous System** | 5.1 | 4.8-5.5 | 5.3 | 5.2-5.3 | 3.4 | 3.2-3.7 | 3.5 | 3.5-3.6 |
| **Breast** | 0.3 | 0.2-0.4 | 0.3 | 0.3-0.3 | 19.2\* | 18.6-19.8 | 21.6 | 21.5-21.7 |
| **Bronchus & Lung** | 52.9\*  | 51.8-54.0 | 57.8 | 57.6-57.9 | 38.4\* | 37.6-39.2 | 37.1 | 37.0-37.2 |
| **Cervix Uteri** | - | - | - | - | 1.3\* | 1.2-1.5 | 2.3 | 2.3-2.4 |
| **Colon / Rectum** | 16.1\* | 15.5-16.8 | 18.2 | 18.1-18.3 | 11.4\* | 11.0-11.9 | 13.0 | 12.9-13.0 |
| **Corpus Uteri & Uterus, NOS** | - | - | - | - | 4.4 | 4.2-4.7 | 4.5 | 4.4-4.5 |
| **Esophagus** | 8.6\* | 8.1-9.0 | 7.4 | 7.3-7.4 | 1.6 | 1.4-1.8 | 1.5 | 1.5-1.6 |
| **Hodgkin Lymphoma** | 0.4 | 0.3-0.5 | 0.4 | 0.4-0.5 | 0.3 | 0.2-0.3 | 0.3 | 0.3-0.3 |
| **Kidney & Renal Pelvis** | 4.5\* | 4.2-4.9 | 5.7 | 5.6-5.7 | 2.2\* | 2.0-2.4 | 2.5 | 2.5-2.5 |
| **Larynx** | 1.6\* | 1.4-1.8 | 1.9 | 1.9-1.9 | 0.4 | 0.3-0.5 | 0.4 | 0.4-0.4 |
| **Leukemia** | 8.8 | 8.4-9.3 | 9.2 | 9.1-9.3 | 5.0 | 4.7-5.3 | 5.1 | 5.1-5.2 |
| **Liver & Intrahepatic Bile Ducts** | 9.9\* | 9.4-10.3 | 9.1 | 9.0-9.2 | 3.4 | 3.2-3.7 | 3.7 | 3.6-3.7 |
| **Melanoma of Skin** | 4.2 | 3.9-4.5 | 4.1 | 4.0-4.1 | 1.9 | 1.7-2.1 | 1.7 | 1.7-1.7 |
| **Multiple Myeloma** | 3.8\* | 3.5-4.1 | 4.4 | 4.3-4.4 | 2.7 | 2.5-2.9 | 2.8 | 2.7-2.8 |
| **Non-Hodgkin Lymphoma** | 6.9\* | 6.5-7.3 | 7.7 | 7.7-7.8 | 4.3\* | 4.0-4.5 | 4.7 | 4.7-4.8 |
| **Oral Cavity & Pharynx** | 3.8 | 3.5-4.1 | 3.8 | 3.7-3.8 | 1.3 | 1.1-1.4 | 1.3 | 1.3-1.4 |
| **Ovary** | - | - | - | - | 7.5 | 7.2-7.9 | 7.6 | 7.5-7.6 |
| **Pancreas** | 12.4 | 11.9-12.9 | 12.6 | 12.5-12.6 | 9.7 | 9.3-10.1 | 9.6 | 9.5-9.6 |
| **Prostate** | 19.3\* | 18.6-20.0 | 20.6 | 20.5-20.8 | - | - | - | - |
| **Stomach** | 4.1 | 3.8-4.4 | 4.5 | 4.4-4.5 | 2.3 | 2.1-2.5 | 2.4 | 2.4-2.4 |
| **Testis** | 0.1 | 0.08-0.2 | 0.3 | 0.2-0.3 | - | - | - | - |
| **Thyroid** | 0.6 | 0.5-0.7 | 0.4 | 0.5-0.5 | 0.5 | 0.4-0.6 | 0.6 | 0.5-0.5 |
| **Urinary Bladder** | 8.3\* | 7.8-8.8 | 7.7 | 7.6-7.7 | 2.6\* | 2.4-2.8 | 2.2 | 2.2-2.2 |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Rates are age-adjusted to the 2000 U.S. Standard Population.

2Breast *in situ* cases are excluded from “All Sites” and from breast cancer counts.

N/A – not applicable

\* indicates that the Massachusetts mortality rate differed significantly from the national rate (p < 0.05).

 Data Sources: Massachusetts: Massachusetts Vital Statistics and United States: National Center for Health Statistics.

**Appendices**

**Appendix I**

**ICD CODES USED FOR THIS REPORT**

|  |  |
| --- | --- |
| **Cancer Site/Type** | ***.……….C o d e s………..*** |
|  | **ICD-O-3\*** | **ICD-10\*\*** |
| **Brain & Other** **Nervous System** | C70.0-C72.9except 9590-9989 | C70-C72 |
| **Breast** **(includes *in situ*)** | C50.0 – C50.9except 9590 -9989 | C50 |
| **Bronchus & Lung** | C34.0 – C34.9 except 9590-9989 | C34 |
| **Cervix Uteri** | C53.0 – C53.9except 9590-9989 | C53 |
| **Colon/ Rectum** | C18.0-C18.9,C19.9, C20.9,C26.0except 9590-9989 | C18 – C20, C26.0 |
| **Corpus Uteri** **& Uterus, NOS** | C54.0 – C54.9,C55.9except 9590 – 9989 | C54 – C55 |
| **Esophagus** | C15.0-C15.9except 9590 – 9989 | C15 |
| **Hodgkin Lymphoma** | C00.00 – C80.9 (includes 9650-9667) | C81 |
| **Kidney &** **Renal Pelvis** | C64.9, C65.9except 9590-9989 | C64- C65 |
| **Larynx** | C32.0 – C32.9except 9590- 9989 | C32 |
| **Leukemia** | C00.0 – C80.9(includes 9733, 9742,9800 – 9820, 9826,9831 – 9948, 9963 – 9964)C42.0, C42.1, C42.4(includes 9823, 9827) | C90.1, C91 – C95 |
| **Liver and Intrahepatic****Bile Ducts** | C22.0, C22.1except 9590 – 9989 | C22 |

|  |  |
| --- | --- |
| **Cancer Site/ Type** | ***……….C o d e s………..*** |
|  | **ICD-O-3\*** | **ICD-10\*\*** |
| **Melanoma of Skin** | C44.0 – C44.9(includes 8720-8790) | C43 |
| **Multiple Myeloma** | C00.0-C80.9(includes 9731, 9732,9734) | C90.0, C90.2 |
| **Non – Hodgkin** **Lymphoma** | C00.0 – C80.9(includes 9590 – 9596,9670 – 9729)All sites except C42.0,C42.1, C42.4(includes 9823, 9827) | C82 – C85, C96.3 |
| **Oral Cavity** **& Pharynx** | C00.0 – C14.8except 9590 – 9989 | C00 – C14 |
| **Ovary** | C56.9except 9590- 9989 | C56 |
| **Pancreas** | C25.0 – C25.9except 9590 – 9989 |  |
| **Prostate** | C61.9except 9590 – 9989 | C61 |
| **Stomach** | C16.0 – C16.9except 9590- 9989 | C16 |
| **Testis** | C62.0 – C62.9except 9590 – 9989 | C62 |
| **Thyroid** | C73.9 except 9590 – 9989 | C73 |
| **Urinary Bladder****(includes *in situ*)** | C67.0 – C67.9except 9590 – 9989 | C67 |

**\*** *International Classification**of Diseases for Oncology, 3d Ed.* (includes codes added since publication) for incidence data

**\*\*** *International Classification of Diseases, Tenth Revision* (includes codes added since publication) for mortality data

**APPENDIX II:**

**Population and Rate Changes**

The population estimates for 2009-2013 used in this report were produced by the National Center for Health Statistics (NCHS) in collaboration with the U.S. Census Bureau’s Population Estimation Program. The NCHS takes the Census Bureau population estimates file and reallocates the multiple race categories required by the 1997 Office of Management and Budget (OMB) specifications back into the four race categories specified in the 1977 OMB specifications so that the estimates will be compatible with previous years’ populations. (3) The estimates are divided into mutually exclusive racial/ethnic categories similar to those of the MCR.

Please note that the statewide age-adjusted rates published in this report cannot be compared with those published in reports prior to July 2007, because the overall population count and the age distribution of the population, which were based on the Census 2000 count, differ.

The difference in the new population estimates is pronounced for Hispanics and black, non-Hispanics. The Hispanic and black, non-Hispanic populations have increased 15% since 2000, while the overall state population has increased by 1%. It is important to remember that both age-adjusted cancer incidence and cancer death rates are not a measure of the actual risk of cancer or of death from it. Rather, age-adjusted rates are summary measures used to compare cancer incidence and mortality trends over time or among different populations whose age distributions differ. For specific examples of the effect of new population estimates on age-adjusted rates, see Appendix II in the report *Cancer Incidence and Mortality in Massachusetts 2000-2004: Statewide Report,* available at [www.mass.gov/dph/mcr](http://www.mass.gov/dph/mcr).

.

**Appendix III**

**POPULATION ESTIMATES BY AGE, RACE/ETHNICTIY, AND SEX**

**Massachusetts, 2009-2013**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **White, non-Hispanic** | **Black, non-Hispanic** | **Asian, non-Hispanic** | **Hispanic** |
| **Age Group** | **Males**  | **Females** | **Total** | **Males** | **Females** | **Total** | **Males** | **Females** | **Total** | **Males** | **Females** | **Total** |
| **00-04** | 623630 | 594870 | 1218500 | 87396 | 83438 | 170834 | 68061 | 66517 | 134578 | 163964 | 157042 | 321006 |
| **05-09** | 677387 | 647736 | 1325123 | 85892 | 81700 | 167592 | 64988 | 65735 | 130723 | 149706 | 144070 | 293776 |
| **10-14** | 737012 | 701325 | 1438337 | 85336 | 82083 | 167419 | 56721 | 58400 | 115121 | 142152 | 136498 | 278650 |
| **15-19** | 840650 | 818023 | 1658673 | 100394 | 97427 | 197821 | 64892 | 70894 | 135786 | 157448 | 149897 | 307345 |
| **20-24** | 839434 | 843045 | 1682479 | 101862 | 100449 | 202311 | 81160 | 89193 | 170353 | 159642 | 150951 | 310593 |
| **25-29** | 805696 | 810487 | 1616183 | 86524 | 87478 | 174002 | 89862 | 100417 | 190279 | 147978 | 139564 | 287542 |
| **30-34** | 730408 | 742274 | 1472682 | 78422 | 83096 | 161518 | 86775 | 97178 | 183953 | 139650 | 137052 | 276702 |
| **35-39** | 730733 | 753803 | 1484536 | 73102 | 80015 | 153117 | 84998 | 89932 | 174930 | 117826 | 123175 | 241001 |
| **40-44** | 877947 | 911466 | 1789413 | 75348 | 82105 | 157453 | 73161 | 78504 | 151665 | 106309 | 113270 | 219579 |
| **45-49** | 1005262 | 1040594 | 2045856 | 78048 | 81657 | 159705 | 62315 | 66318 | 128633 | 93060 | 102565 | 195625 |
| **50-54** | 1027343 | 1073423 | 2100766 | 70718 | 75807 | 146525 | 51090 | 55151 | 106241 | 73208 | 82185 | 155393 |
| **55-59** | 924800 | 982585 | 1907385 | 55144 | 61621 | 116765 | 41519 | 46634 | 88153 | 53306 | 62945 | 116251 |
| **60-64** | 794710 | 865270 | 1659980 | 40974 | 49304 | 90278 | 31904 | 36318 | 68222 | 37982 | 47040 | 85022 |
| **65-69** | 585861 | 661774 | 1247635 | 27050 | 35833 | 62883 | 21736 | 24334 | 46070 | 24703 | 32171 | 56874 |
| **70-74** | 402201 | 488137 | 890338 | 18287 | 26317 | 44604 | 16640 | 18894 | 35534 | 15669 | 22438 | 38107 |
| **75-79** | 311691 | 416006 | 727697 | 12584 | 20328 | 32912 | 11562 | 13496 | 25058 | 9970 | 15410 | 25380 |
| **80-84** | 244935 | 382049 | 626984 | 7788 | 14791 | 22579 | 6760 | 9060 | 15820 | 5981 | 9909 | 15890 |
| **85+** | 215613 | 482348 | 697961 | 5983 | 14286 | 20269 | 4869 | 7822 | 12691 | 4904 | 9268 | 14172 |

Population Data Source: United States Census Data (2009-2013)

**Appendix IV**

**Racial/Ethnic Breakdown of the Massachusetts and United States Populations\***

 **Massachusetts (2009-2013)**

 **United States (2009-2013)**

Data Source: United States Census Data, 2009-2013

.

**REFERENCES**

This page intentionally left blank.

**REFERENCES FOR GENERAL REPORT**

1. Massachusetts Cancer Registry, Cancer Incidence and Mortality in Massachusetts, 2006-2010: Statewide Report, Available at: [www.mass.gov/dph/mcr](http://www.mass.gov/dph/mcr)
2. Ryerson, A. B. et al. (2016), Annual Report to the Nation on the Status of Cancer, 1975-2012, featuring the increasing incidence of liver cancer. Cancer. doi: 10.1002/cncr.29936
3. National Center for Health Statistics, U.S. Department of Health and Human Services. Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Vintage 2009 Bridged Race postcensal population estimates for July 1, 2000 to July 1, 2009 by year, county, single year of age (0-85+ years), bridged race, Hispanic origin, and sex and Vintage 2013 Bridged Race postcensal population estimates for July 1, 2010 to July 1, 2013 by year, county, single year of age (0-85+ years), bridged race, Hispanic origin, and sex Available at: <http://www.cdc.gov/nchs/nvss/bridged_race.htm>

**REFERENCES FOR SPECIAL OVERVIEW: OBESITY-RELATED CANCERS**

1. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q1> [↑](#endnote-ref-1)
2. Massachusetts Department of Public Health. 2013. A Profile of Health Among Massachusetts Adults, 2011: Results from the Behavioral Risk Factor Surveillance System [↑](#endnote-ref-2)
3. Health and Risk Behaviors of Massachusetts Youth, 2011. Available at: <http://www.doe.mass.edu/cnp/hprograms/yrbs/2011Report.pdf> [↑](#endnote-ref-3)
4. Centers for Disease Control and Prevention. Pediatric Nutrition Surveillance System 2010 Report: Available at: <http://www.cdc.gov/pednss/pdfs/PedNSS_2010_Summary.pdf> [↑](#endnote-ref-4)
5. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/cancertopics/factsheet/Risk/obesity> [↑](#endnote-ref-5)
6. Centers for Disease Control and Prevention. Obesity is common, serious, and costly. Available at:<http://www.cdc.gov/media/matte/2012/05_weight_of_nation.pdf> [↑](#endnote-ref-6)
7. Centers for Disease Control and Prevention. Obesity is common, serious, and costly. Available at:<http://www.cdc.gov/media/matte/2012/05_weight_of_nation.pdf> [↑](#endnote-ref-7)
8. Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of

Chronic Diseases (2002: Geneva, Switzerland) Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation, Geneva, 28 January -- 1 February 2002. [↑](#endnote-ref-8)
9. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q3> [↑](#endnote-ref-9)
10. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q1> [↑](#endnote-ref-10)
11. World Health Organization and International Union Against Cancer. 2005. Global Action Against Cancer. Geneva [↑](#endnote-ref-11)
12. National Cancer Institute, Uncovering the Mechanisms Linking Obesity and Cancer Risk. Available at <http://www.cancer.gov/about-cancer/causes-prevention/research/obesity-and-cancer-risk> [↑](#endnote-ref-12)
13. National Cancer Institute, Uncovering the Mechanisms Linking Obesity and Cancer Risk. Available at <http://www.cancer.gov/about-cancer/causes-prevention/research/obesity-and-cancer-risk> [↑](#endnote-ref-13)
14. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q3> [↑](#endnote-ref-14)
15. Calle Eugenia E and Thun Michael J. Obesity and cancer. Oncogene 2004; 23: 6365-6378. [↑](#endnote-ref-15)
16. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q1> [↑](#endnote-ref-16)
17. Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of

Chronic Diseases (2002: Geneva, Switzerland) Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation, Geneva, 28 January -- 1 February 2002 [↑](#endnote-ref-17)
18. Ballard-Barbash, R. Friedenreich, C. (2006). Obesity and Body Composition. In D. Schottenfeld & J.F. Fraumeni, Jr. (Eds.), *Cancer Epidemiology and Prevention,* Third Edition, (pp. 442-448). New York, NY: Oxford University Press, Inc. [↑](#endnote-ref-18)
19. Overweight and lack of exercise linked to increased cancer risk in: Weight control and physical activity. Lyon, International Agency for Research on Cancer, 2002 (IARC handbooks of Cancer Prevention, Vol 6). [↑](#endnote-ref-19)
20. Calle Eugenia E and Thun Michael J. Obesity and cancer. Oncogene 2004; 23: 6365-6378. [↑](#endnote-ref-20)
21. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/cancertopics/factsheet/Risk/obesity> [↑](#endnote-ref-21)
22. Calle Eugenia E and Thun Michael J. Obesity and cancer. Oncogene 2004; 23: 6365-6378. [↑](#endnote-ref-22)
23. Maruthur NM , Bolen S, Brancati FL, Clark JM. Obesity and mammography: a systematic review and meta-analysis. J Gen Intern Med. 2009 May;24(5):665-77. [↑](#endnote-ref-23)
24. [Petrelli JM](http://www.ncbi.nlm.nih.gov/pubmed?term=Petrelli%20JM%5BAuthor%5D&cauthor=true&cauthor_uid=12074502), [Calle EE](http://www.ncbi.nlm.nih.gov/pubmed?term=Calle%20EE%5BAuthor%5D&cauthor=true&cauthor_uid=12074502), [Rodriguez C](http://www.ncbi.nlm.nih.gov/pubmed?term=Rodriguez%20C%5BAuthor%5D&cauthor=true&cauthor_uid=12074502), [Thun MJ](http://www.ncbi.nlm.nih.gov/pubmed?term=Thun%20MJ%5BAuthor%5D&cauthor=true&cauthor_uid=12074502). Body mass index, height, and postmenopausal breast cancer mortality in a prospective cohort of US women. [Cancer Causes Control.](http://www.ncbi.nlm.nih.gov/pubmed/12074502) 2002 May;13(4):325-32 [↑](#endnote-ref-24)
25. Calle Eugenia E and Thun Michael J. Obesity and cancer. Oncogene 2004; 23: 6365-6378. [↑](#endnote-ref-25)
26. Calle Eugenia E and Thun Michael J. Obesity and cancer. Oncogene 2004; 23: 6365-6378. [↑](#endnote-ref-26)
27. Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of

Chronic Diseases (2002: Geneva, Switzerland) Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation, Geneva, 28 January -- 1 February 2002. [↑](#endnote-ref-27)
28. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/cancertopics/factsheet/Risk/obesity> [↑](#endnote-ref-28)
29. Overweight and lack of exercise linked to increased cancer risk in: Weight control and physical activity. Lyon, International Agency for Research on Cancer, 2002 (IARC handbooks of Cancer Prevention, Vol 6). [↑](#endnote-ref-29)
30. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/cancertopics/factsheet/Risk/obesity> [↑](#endnote-ref-30)
31. Calle Eugenia E and Thun Michael J. Obesity and cancer. Oncogene 2004; 23: 6365-6378 [↑](#endnote-ref-31)
32. Bergström A., CC Hsieh. P Lindblad, CM Lu, NR Cook, and A Wolk, Obesity and renal cell cancer – a quantitative review. British Journal of Cancer (2001) 85(7), 984–990 [↑](#endnote-ref-32)
33. Calle Eugenia E and Thun Michael J. Obesity and cancer. Oncogene 2004; 23: 6365-6378 [↑](#endnote-ref-33)
34. National Cancer Institute . Cancer Topics. Esophageal Cancer. Available at: <http://www.cancer.gov/cancertopics/types/esophageal> [↑](#endnote-ref-34)
35. Ballard-Barbash, R. Friedenreich, C. (2006). Obesity and Body Composition. In D. Schottenfeld & J.F. Fraumeni, Jr. (Eds.), *Cancer Epidemiology and Prevention,* Third Edition, (pp. 442-448). New York, NY: Oxford University Press, Inc. [↑](#endnote-ref-35)
36. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q3> [↑](#endnote-ref-36)
37. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q3> [↑](#endnote-ref-37)
38. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q3> [↑](#endnote-ref-38)
39. National Cancer Institute. Obesity and Cancer Risk. Available at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q3> [↑](#endnote-ref-39)
40. 1Rates are age-adjusted to the 2000 U.S. Standard Population. \*NOS – Not Otherwise Specified.

 Source: Massachusetts Vital Statistics [↑](#footnote-ref-1)
41. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-2)
42. per 100,000 males

Source: Massachusetts Vital Statistics [↑](#footnote-ref-3)
43. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-4)
44. per 100,000 females

Source: Massachusetts Vital Statistics [↑](#footnote-ref-5)
45. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-6)
46. per 100,000 total population

3Dashes indicate cancers found in only one sex or predominantly in one sex (breast cancer). [↑](#footnote-ref-7)
47. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-8)
48. per 100,000

3Breast cancer rates do not include *in situ* cases.

Source: Massachusetts Cancer Registry [↑](#footnote-ref-9)
49. Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category. [↑](#footnote-ref-10)
50. The number of cases for all races is not the sum of cases by race/ethnicity. 3Breast *in situ* cases are excluded from ‘All Sites’ and breast cancer counts.

Source: Massachusetts Cancer Registry [↑](#footnote-ref-11)
51. Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category. [↑](#footnote-ref-12)
52. The number of cases for all races is not the sum of cases by race/ethnicity. 3Breast *in situ* cases are excluded from ‘All Sites’ and from breast cancer counts.

 Source: Massachusetts Cancer Registry [↑](#footnote-ref-13)
53. Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category.

2Total includes persons classified as a transsexual and persons of unknown sex. 3The number of cases for all races is not the sum of cases by race/ethnicity. 4 Breast in situ cases are excluded from ‘All Sites’ and from breast cancer counts. Source: Massachusetts Cancer Registry [↑](#footnote-ref-14)
54. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-15)
55. per 100,000 [↑](#footnote-ref-16)
56. Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category. 4 Breast *in situ* is excluded from ‘All Sites’.

\*An age-adjusted incidence rate was not calculated when there were fewer than 20 cases.

Source: Massachusetts Cancer Registry [↑](#footnote-ref-17)
57. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-18)
58. per 100,000 [↑](#footnote-ref-19)
59. Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category. 4 Breast *in situ* cases are excluded from ‘All Sites’.

\* An age-adjusted incidence rate was not calculated when there were fewer than 20 cases.

Source: Massachusetts Cancer Registry [↑](#footnote-ref-20)
60. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-21)
61. per 100,000 [↑](#footnote-ref-22)
62. Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category. 4 Breast *in situ* cases are excluded from ‘All Sites’. 5 Dashes indicate cancers found in only one sex or predominantly in one sex (breast cancer). \* An age-adjusted incidence rate was not calculated when there were fewer than 20 cases. Source: Massachusetts Cancer Registry [↑](#footnote-ref-23)
63. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-24)
64. per 100,000

Source: Massachusetts Vital Statistics [↑](#footnote-ref-25)
65. Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category. [↑](#footnote-ref-26)
66. The number of deaths for all races is not the sum of deaths by race/ethnicity.

Source: Massachusetts Vital Statistics [↑](#footnote-ref-27)
67. Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category. [↑](#footnote-ref-28)
68. The number of deaths for all races is not the sum of deaths by race/ethnicity.

 Source: Massachusetts Vital Statistics [↑](#footnote-ref-29)
69. Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category. [↑](#footnote-ref-30)
70. The number of deaths for all races is not the sum of deaths by race/ethnicity.

Source: Massachusetts Vital Statistics [↑](#footnote-ref-31)
71. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-32)
72. per 100,000 [↑](#footnote-ref-33)
73. Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category.

\*An age-adjusted mortality rate was not calculated when there were fewer than 20 deaths.

Source: Massachusetts Vital Statistics [↑](#footnote-ref-34)
74. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-35)
75. per 100,000 [↑](#footnote-ref-36)
76. Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category.

\* An age-adjusted mortality rate was not calculated when there were fewer than 20 deaths.

Source: Massachusetts Vital Statistics [↑](#footnote-ref-37)
77. Rates are age-adjusted to the 2000 U.S. Standard Population. [↑](#footnote-ref-38)
78. per 100,000 [↑](#footnote-ref-39)
79. Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category.

4Dashes indicate cancers found in only one sex or predominantly in one sex (breast cancer). [↑](#footnote-ref-40)