

CANCER INCIDENCE AND MORTALITY IN DELAWARE, 2011-2015

DELAWARE DEPARTMENT OF HEALTH AND SOCIAL SERVICES
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This report was prepared by the Delaware Department of Health and Social Services, Division of Public Health, Comprehensive Cancer Control Program.

For more information, please contact:
Delaware Comprehensive Cancer Program
Division of Public Health
Thomas Collins Building, Suite 11
540 S. DuPont Highway
Dover, DE 19901
Phone: 302-744-1020
Fax: 302-739-2545

<http://www.dhss.delaware.gov/dhss/dph/dpc/cancer.html>

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CHAPTER 1: EXECUTIVE SUMMARY

This report presents the 2011-2015 cancer incidence and mortality data and statistics for Delaware. The Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH), publishes this report in conjunction with the Delaware Cancer Consortium (DCC) as a source of information for Delawareans on cancer incidence and mortality in the state. DPH and other stakeholders also use this report to inform decisions on outreach and program strategies to combat cancer incidence and mortality in Delaware.

Cancer incidence (the number of new cases of cancer in a population over a time period)¹ and mortality (the number of deaths from cancer in a population over a time period)² rates and other analysis are performed by the Delaware Comprehensive Cancer Control Program staff. Incidence data are obtained from the Delaware Cancer Registry (DCR) and mortality data are obtained from the Delaware Health Statistics Center.

This report includes cancer statistics for all cancer sites combined (all-site cancer), as well as eight site-specific cancer types. These cancer statistics reflect incidence and mortality data for 2011-2015. DPH compares Delaware's cancer incidence and mortality trends for 2011-2015 to those of the U.S. over the same period. DPH also summarizes how Delaware and U.S. cancer rates have changed from the five-year periods of 2001-2005 to 2011-2015.

From 2001-2005 to 2011-2015, Delaware's all-site cancer incidence rate decreased 3%. During the same time period, the comparable U.S. all-site cancer incidence rate fell 8%. While progress continues to be made, Delaware's 2011-2015 all-site cancer incidence rate (495.3 per 100,000) remains 13% higher than the comparable U.S. rate (439.2 per 100,000).

From 2001-2005 to 2011-2015, the all-site cancer incidence rate decreased by 9% among Delaware males but rose 3% among Delaware females. During the same time period, the all-site cancer incidence rate decreased by 7% in non-Hispanic Caucasian males, decreased by 15% in non-Hispanic African American males, and decreased 9% in Hispanic males in Delaware. **While there was a decrease in all male race groups, the all-site cancer incidence rate increased 5% in non-Hispanic Caucasian females, did not change in non-Hispanic African American females, and increased 2% in Hispanic females in Delaware.**

Delaware's 2011-2015 all-site cancer mortality rate of 175.1 per 100,000 was 7% higher than the U.S. rate of 163.5 per 100,000. This difference in all-site cancer mortality rates was statistically significant.

Although Delaware's all-site cancer mortality rate has historically been higher than the U.S. rate, the gap has narrowed over the last decade as the state continues to make strides in reducing the cancer mortality rate through cancer screening and early detection. **Delaware's ranking of 18th among the states for highest all-site cancer mortality is lower than the ranking of 16th in the 2018 report, which looked at the 2010-2014 time period, and represents considerable continued progress since the 1990s, when the state ranked second. From 2001-2005 to 2011-2015, Delaware's cancer death rate decreased 14%, the same decline seen nationally (14%).**

The all-site cancer mortality rate among non-Hispanic African American male Delawareans declined 30%, compared to a 19% decline among non-Hispanic Caucasian male Delawareans and a 7% decline among Hispanic male Delawareans. Among female Delawareans, the all-site cancer mortality rate declined 14% in non-Hispanic African Americans, declined 13% in non-Hispanic Caucasians, and declined 4% in Hispanics. There were larger declines in rates among males compared to females.

Many factors contribute to Delaware's progress in reducing its cancer burden. Below is a brief summary of key factors, broken down by cancer type, that impact cancer in Delaware.

¹ <https://seer.cancer.gov/statistics/types/incidence.html>

² <https://seer.cancer.gov/statistics/types/mortality.html>

BREAST CANCER

- The 2011-2015 breast cancer incidence rate for Delaware (134.2 per 100,000) was statistically significantly higher than the U.S. rate (126.0 per 100,000). **Delaware was ranked ninth nationally in 2011-2015 compared to seventh nationally in 2010-2014.**
- From 2001-2005 to 2011-2015, Delaware's breast cancer incidence rate increased by 6% while the comparable U.S. rate fell 4%. During this time period, the breast cancer incidence rate increased by 4% among non-Hispanic African American females, by 7% among non-Hispanic Caucasian females, and by 7% among Hispanic females.
- The proportion of breast cancer cases diagnosed in the earliest, most treatable stage has greatly improved in Delaware over the past three decades. The proportion of Delaware breast cancers diagnosed at the local stage increased from 42% in 1980-1984, to 67% in 2011-2015.
- The difference between Delaware's 2011-2015 breast cancer mortality rate (22.2 per 100,000) and the U.S. rate (20.9 per 100,000) was not statistically significant. Similarly, the difference between non-Hispanic African American females in Delaware (25.7 per 100,000) and non-Hispanic African American females in the U.S. (29.5 per 100,000), as well as between non-Hispanic Caucasian females in Delaware (21.1 per 100,000) and non-Hispanic Caucasian females in the U.S. (20.8 per 100,000) was not statistically significant.
- From 2001-2005 to 2011-2015, Delaware's decline in breast cancer mortality (12%) was less than the decline seen nationally (17%). Delaware's breast cancer mortality rate was ranked 21st nationally in 2011-2015 compared to 20th nationally in 2010-2014.
- From 2001-2005 to 2011-2015, Delaware's female breast cancer mortality rate decreased 11% among non-Hispanic African Americans and 15% among non-Hispanic Caucasians.
- It is highly likely that improvements in the early detection of breast cancer contributed to Delaware's progress in reduced breast cancer mortality. Data from the 2016 Behavioral Risk Factor Survey (BRFS) showed that Delaware females ranked fourth highest nationally in the prevalence of females 40 years of age and older who have had a mammogram within the past two years (72%).

COLORECTAL CANCER

- **From 2001-2005 to 2011-2015, Delaware's colorectal cancer incidence rate decreased 30% while the comparable U.S. rate fell 22%.** For both males and females, Delaware's colorectal cancer incidence rates declined more than the U.S. rates. Among males, Delaware's incidence rate declined 32% while the U.S. incidence rate declined 24%. Among females, Delaware's incidence rate declined 28% while the U.S. incidence rate declined 22%.
- From 2001-2005 to 2011-2015, Delaware's greatest improvements in colorectal cancer incidence rates were observed among non-Hispanic Caucasians; incidence rates for non-Hispanic Caucasian males and females declined by 32% and 29%, respectively.
- **For 2011-2015, the colorectal cancer incidence rate among non-Hispanic African Americans in Delaware (43.0 per 100,000) was statistically significantly lower than the U.S. (48.7 per 100,000).**
- For the 2011-2015 time period, 55% of all colorectal cancer cases diagnosed in Delaware were detected in the regional or distant stages (i.e. after the cancer had spread from its original location). This reflects a 3% decline since 2001-2005 in the percentage of regional and distant stage colorectal cancer diagnoses (58%).

- **Historically, Delaware’s colorectal cancer mortality rate has been higher than the U.S. rate. However, for 2011-2015, Delaware’s colorectal cancer mortality rate (13.7 per 100,000) was lower than that of the U.S. (14.5 per 100,000) but this difference was not statistically significant.**
- From 2001-2005 to 2011-2015, Delaware’s colorectal cancer mortality rate decreased 31% while the national rate decreased 23%. Delaware ranked 41st nationally in both 2011-2015 and in 2010-2014.
- **The reduction in colorectal cancer mortality rates is especially noteworthy among non-Hispanic African American Delawareans.** From 2001-2005 to 2011-2015, Delaware’s colorectal cancer mortality rates declined 50% among non-Hispanic African American males, compared to 30% among non-Hispanic Caucasian males. During the same time period, colorectal cancer mortality declined 32% among non-Hispanic African American females, compared to 35% among non-Hispanic Caucasian females.
- Improvements in the number of colorectal cancer cases diagnosed in the earliest, most treatable stages contributed to Delaware’s reduction in colorectal cancer mortality rates. Data from the 2016 BRFS showed that **Delaware ranked 12th highest in prevalence in the U.S. for meeting the U.S. Preventive Services Task Force (USPSTF) recommendations for colorectal screening.** Nearly 72% of Delawareans age 50-74 years reported meeting the USPSTF recommendations for colorectal screening. The U.S. national median for meeting these recommendations was 68%.

LUNG CANCER

- **Lung cancer continues to account for an enormous share of Delaware’s overall cancer burden.** From 2011-2015, lung cancer accounted for 19% of all newly diagnosed cancer cases and 29% of all cancer deaths in Delaware.
- **According to the U.S. Department of Health and Human Services, tobacco use causes an estimated 85% to 90% of all lung cancer cases.** Delaware has reaped the benefits of statewide reductions in tobacco use that began decades ago. According to the 2017 Delaware BRFS, there is no statistically significant difference in current smoking prevalence between males and females.
- Prior to January 2013, there were no early lung cancer screening recommendations endorsed by the American Cancer Society. Unfortunately, the majority of lung cancer cases continue to be diagnosed in the distant stage (i.e., when the cancer has spread from the primary site to distant tissues or organs or to distant lymph nodes). From 2011-2015, Delaware and the U.S. had a similar proportion of lung cancers diagnosed at the distant stage (52% in Delaware and 53% in the U.S.). Additionally, treatment options that are effective for some other forms of cancer are not as effective for lung cancer.
- DPH’s Screening for Life Program began covering lung cancer screenings for qualified Delawareans in 2015. The screening – known as a low-dose CT scan – aims to catch lung cancer early, when it is most treatable. The screening is available to current and former smokers deemed at high risk for lung cancer.
- Delaware ranked ninth in the nation for lung cancer incidence, an increase from 10th as seen in 2010-2014. From 2001-2005 to 2011-2015, lung cancer incidence rates declined 15% for Delaware males, compared to 19% for U.S. males. The lung cancer incidence rate for Delaware females decreased 5% during the same time period, compared to a 9% decline in the U.S. female rate.
- Historically, Delaware’s lung cancer mortality rates have been higher than U.S. rates; however, the gap in rates has narrowed among males. Delaware’s male lung cancer mortality rate for 1980-1984 was 19% greater than the U.S. rate, compared to 2011-2015, when the rate was 15% higher than the U.S. rate.
- **For 2011-2015, Delaware females ranked 11th highest in the nation in lung cancer mortality while Delaware males ranked 16th.**
- Between 2001-2005 and 2011-2015, Delaware’s lung cancer mortality rate fell 19% while the U.S. rate dropped 20%.

- **Delaware’s lung cancer mortality rates have declined noticeably among non-Hispanic African Americans.** From 2001-2005 to 2011-2015, Delaware’s lung cancer mortality rates declined 36% among non-Hispanic African American males and 25% among non-Hispanic African American females.
- Among non-Hispanic Caucasian Delawareans, males experienced greater reductions in lung cancer mortality compared to females. From 2001-2005 to 2011-2015, Delaware’s lung cancer mortality rate decreased 23% among non-Hispanic Caucasian males and decreased 13% among non-Hispanic Caucasian females.

PROSTATE CANCER

- From 2001-2005 to 2011-2015, Delaware’s prostate cancer incidence rate decreased 22% while the U.S. rate fell 34%. Delaware’s 2011-2015 prostate cancer incidence rate (136.3 per 100,000) was statistically significantly higher than the U.S. (112.6 per 100,000). These trends most likely reflect a greater prevalence of prostate cancer screening in Delaware compared to the U.S.
- **Results from the 2016 BRFSS show that Delaware ranked sixth in the nation in the prevalence of males 40 years of age and older who have had a PSA (protein-specific antigen) test within the past two years.**
- In 2011-2015, Delawareans ranked third in the nation for prostate cancer incidence, unchanged from its ranking in 2010-2014.
- The proportion of prostate cancer cases detected in the local stage has increased dramatically during the past 30 years in Delaware. From 1980-1984 through 2011-2015, Delaware’s percentage of prostate cancer cases diagnosed in the local stage increased substantially, from 50% to 78%.
- **The prostate cancer incidence rate among non-Hispanic African American Delawareans continues to be statistically significantly higher than the comparable prostate cancer incidence rate for non-Hispanic Caucasians and Hispanics. Delaware’s 2011-2015 prostate cancer incidence rate was 215.7 per 100,000 for non-Hispanic African Americans, compared to 122.0 per 100,000 for non-Hispanic Caucasians, and 128.4 per 100,000 for Hispanics. This same trend is observed in the U.S.**
- Delaware’s mortality rate for prostate cancer was ranked 43nd in 2011-2015, compared to 42nd in 2010-2014.
- The prostate cancer mortality rate for non-Hispanic African American Delawareans remains nearly double the comparable rate for non-Hispanic Caucasians. There was a decline in prostate cancer mortality by 40% among non-Hispanic African American Delawareans between 2001-2005 and 2011-2015, similar to the decline seen among non-Hispanic Caucasian Delawareans at 41%.
- **As of 2011-2015, the non-Hispanic African American (2001-2005: 55.0 per 100,000; 2011-2015: 33.0 per 100,000) and non-Hispanic Caucasian (2001-2005: 27.2 per 100,000; 2011-2015: 16.1 per 100,000) prostate cancer mortality rates were the most similar since cancer data surveillance efforts began in 1980.**

TRENDS IN CANCER INCIDENCE

For 2011-2015, Delaware’s all-site cancer incidence was statistically significantly higher than the U.S. Delaware’s incidence rates were also statistically significantly higher than the U.S. for female breast, lung, pancreas, prostate, and urinary bladder among sites included in this report.

Delaware’s all-site cancer incidence rate decreased from 2001-2005 to 2011-2015. During the same time period, incidence rates for several cancer sites also experienced fluctuations.

Table 1-1 summarizes 2011-2015 age-adjusted incidence rates and 95% confidence intervals for Delaware and the U.S. for all-site cancer and the eight individual cancer sites included in this report. Included in the table is the percentage change in rates (both for Delaware and the U.S.) from 2001-2005 to 2011-2015.

TABLE 1-1: AVERAGE ANNUAL AGE-ADJUSTED CANCER INCIDENCE RATES WITH 95% CONFIDENCE INTERVALS; DELAWARE VS. U.S., 2011-2015

Cancer Site	DE Incidence Rate 2011-2015	U.S. Incidence Rate 2011-2015	DE % Change: 01-05 to 11-15	U.S. % Change: 01-05 to 11-15
All-Site*	495.3 (489.4, 501.2)	439.2 (438.6, 439.8)	-3	-8
Female breast*	134.2 (130, 138.6)	126 (125.5, 126.4)	+6	-4
Colorectal#	37.3 (35.7, 39)	39.4 (39.2, 39.6)	-30	-22
Liver	8.4 (7.7, 9.2)	8.8 (8.8, 8.9)	+75	+57
Lung/bronchus*	71.3 (69.1, 73.6)	54.6 (54.4, 54.8)	-10	-14
Pancreas*	14.4 (13.4, 15.5)	12.6 (12.5, 12.7)	+17	+8
Prostate*	136.3 (131.9, 140.8)	112.6 (112.2, 113.1)	-22	-34
Stomach	6.7 (6.1, 7.5)	7.2 (7.2, 7.3)	-1	-8
Urinary Bladder*	24.6 (23.3, 25.9)	19.5 (19.4, 19.7)	0	-9

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

* = Delaware incidence rate is statistically significantly higher than the U.S. rate at the 95% confidence level.

= Delaware incidence rate is statistically significantly lower than the U.S. rate at the 95% confidence level.

Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

TRENDS IN CANCER MORTALITY

Although Delaware's 2011-2015 all-site cancer mortality rate was significantly greater than the U.S., Delaware's rate for the 2001-2005 to 2011-2015 time period declined 14%, the same amount as for the U.S. From 2001-2005 to 2011-2015, Delaware made great strides in reducing its cancer mortality burden for several cancer types (especially female breast, colorectal, lung, prostate, stomach, and urinary bladder cancer).

TABLE 1-2: AVERAGE ANNUAL AGE-ADJUSTED CANCER MORTALITY RATES WITH 95% CONFIDENCE INTERVALS; DELAWARE VS. U.S., 2011-2015

Cancer Site	DE Mortality Rate 2011-2015	U.S. Mortality Rate 2011-2015	DE % Change: 01-05 to 11-15	U.S. % Change: 01-05 to 11-15
All-Site*	175.1 (171.6, 178.7)	163.5 (163.3, 163.7)	-14	-14
Female breast	22.2 (20.5, 24)	20.9 (20.8, 21)	-12	-17
Colorectal	13.7 (12.7, 14.7)	14.5 (14.4, 14.5)	-31	-23
Liver	6.5 (5.9, 7.2)	6.4 (6.4, 6.4)	+44	+28
Lung/bronchus*	50.0 (48.2, 52)	43.4 (43.3, 43.5)	-19	-20
Pancreas*	12.1 (11.2, 13.1)	10.9 (10.9, 11)	+15	+3
Prostate	18.4 (16.6, 20.3)	19.5 (19.4, 19.6)	-37	-28
Stomach	3.1 (2.6, 3.6)	3.2 (3.1, 3.2)	-16	-22
Urinary Bladder	4.7 (4.2, 5.4)	4.4 (4.4, 4.4)	-15	0

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.

Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

* = Delaware mortality rate is statistically significantly higher than the U.S. rate at the 95% confidence level.

Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

CENSUS TRACT ANALYSES

This report also includes cancer incidence rates for each of Delaware's census tracts as required by Title 16, Chapter 292 of the Delaware Code (Appendix E). Census tract analyses were conducted for 2011-2015. Census tracts were determined by the U.S. Census 2010 designations since they were in effect at the time of analysis.

The Census 2010 subdivided Delaware into 214 census tracts rather than the 197 census tracts in the Census 2000.

Results for 2011-2015 show that:

- In 16 of Delaware's 214 census tracts, the all-site cancer incidence rate was statistically significantly higher than Delaware's average 2011-2015 incidence rate (495.3 per 100,000).
- In 10 of Delaware's 214 census tracts, the all-site cancer incidence rate was statistically significantly lower than Delaware's average 2011-2015 incidence rate (495.3 per 100,000).
- All-site cancer incidence rates for the remaining 188 census tracts were not significantly different from the state's average rate for the 2011-2015 period.
- Age-adjusted five-year cancer incidence rates for 2011-2015 by census tract with 95% confidence intervals are presented in Appendix H. Census tract maps color-coded by rate quintiles are located in Appendix I. Census tract maps that indicate tracts with significantly high or significantly low incidence rates are located in Appendix J.

There is an inherent instability in calculating cancer incidence rates at the census tract level. In a small group, such as a census tract, the snapshot changes considerably from year to year. If one case of cancer is diagnosed in a census tract one year, and three cases of cancer are diagnosed in the same census tract the next year, the cancer rate for that census tract will change dramatically from one year to the next. These large fluctuations do not typically occur in larger populations. If the cancer rate for a census tract is compared to the cancer rate for the whole state of Delaware for a given time period, it would not be unusual to find the comparison different (perhaps even reversed) in the following time period.

When assessing cancer incidence data by census tract, the occurrence of cancer may differ across census tracts for a variety of reasons. For example, lifestyle behaviors may cluster in a homogeneous community. In addition, the presence or absence of exposure to environmental or occupational carcinogen(s) is often limited to a defined geographic area. In addition, residents in certain geographic areas may be more impoverished than other residents, which will affect their availability of health insurance coverage as well as their level of access to health care, particularly cancer screening services. Finally, chance or random variation can play a role, since approximately 5% of all comparisons would be significantly different due to chance alone.

CHAPTER 2: INTRODUCTION

DELAWARE CANCER REGISTRY

The Delaware Cancer Registry (DCR) is managed by the Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH) and serves as the state's central cancer information center. The DCR was founded in 1972 and was legally established in 1980 under the Delaware Cancer Control Act³. The Act stipulated that all hospitals, clinical laboratories, and cancer treatment centers in the state report all new cancer cases to the DCR. In 1996, the Delaware Cancer Control Act was amended to require any health care practitioner who diagnoses or provides treatment to report cancer cases to the DCR. Further enhancements of the Delaware Cancer Control Act took effect in 2002 with the passage of Senate Bill 372 that requires physicians to provide additional information to the DCR, including patients' duration of residence in Delaware and their occupational history. Senate Bill 372 also extended the reporting deadline to 180 days from initial diagnosis or treatment.

Today, Delaware is one of 46 states whose central cancer registry is supported by the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC).⁴ The DCR ensures accurate, timely, and routine surveillance of cancer trends among Delawareans.

REPORTING FACILITIES

There are eight Delaware hospitals currently reporting cancer cases to the DCR. Non-hospital offices that submit data to the DCR include 14 diagnostic laboratories, 14 freestanding ambulatory surgery centers, and a number of physicians. Additionally, the DCR has reciprocal data exchange agreements with Alaska, Arkansas, California, Colorado, Florida, Idaho, Louisiana, Maryland, Massachusetts, Michigan, Montana, Nebraska, Nevada, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, Tennessee, Texas, Virginia, Washington, Wisconsin, Wyoming, and the District of Columbia. Interstate data exchange agreements assist in identifying Delaware residents whose cancer was diagnosed and/or treated in another state.

DATA CONFIDENTIALITY

The DCR maintains patient confidentiality using a combination of techniques. Reporting facilities submit cancer data using computerized data encryption techniques. Published reports and data releases are limited to aggregate data. DCR datasets are released only after all personal identifiers are removed. Researchers who use DCR data must comply with regulations stated in DPH data use agreements and obtain clearance from Delaware's Human Subjects Review Board.

DATA QUALITY

Internal quality control procedures were implemented at the DCR to verify the consistency of cancer data. Data consistency standards are set by the North American Association of Central Cancer Registries (NAACCR). The DCR also conducts record consolidation using a computerized matching program to identify multiple reports on the same individual. This scenario often arises when a patient is diagnosed and treated in two or more facilities and each facility submits a cancer case reporting form to the DCR.

NAACCR CERTIFICATION AND NPCR STANDARD STATUS

In 1997, the NAACCR instituted a program to independently and annually review data from member registries for their completeness, accuracy, and timeliness. The registry certification metrics are pre-determined and

³ <http://delcode.delaware.gov/title16/c032/index.shtml>

⁴ https://nccd.cdc.gov/dpcp_Programs/index.aspx#/3

established by NAACCR⁵. Gold or Silver Standard certifications are awarded following an evaluation of data quality, completeness, and timeliness of reporting. The DCR received Gold Standard certification for diagnosis years 1999, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, and 2015 (the most recent year for which complete data are currently available). The DCR received Silver Standard certification in 1998 and 2002.

Additionally, the NPCR provides an annual Standard Status Report to state cancer registries supported by the CDC. Delaware's data submissions for diagnosis years 2000 through 2016 surpassed all standard levels for quality, completeness, and timeliness.

USES OF DATA

DPH uses DCR data to support various programs and initiatives, including the Screening for Life (SFL) program and the Delaware Cancer Treatment Program. DPH also uses DCR data to investigate citizen inquiries and provide up-to-date cancer statistics to Delaware residents, hospitals, health care providers, community organizations, federal agencies, research institutions, and academic institutions. Committees associated with the Delaware Cancer Consortium (DCC) rely heavily on DCR data to monitor cancer trends across the state, promote research, and guide policy planning.

ORGANIZATION OF THIS REPORT

This report includes cancer statistics for all cancer sites combined (all-site cancer), as well as eight site-specific cancer types. These cancer statistics reflect incidence and mortality data for 2011-2015. We compare Delaware's cancer incidence and mortality trends for 2011-2015 to those of the U.S. over the same time period. We also summarize how Delaware and U.S. cancer rates have changed from 2001-2005 to 2011-2015. In addition to incidence and mortality, stage at diagnosis and age-specific statistics are evaluated for each cancer type. In many cases, these statistics are also calculated separately by sex, race, county of residence, and age group.

Additional behavioral risk factor data relevant to adult Delawareans are presented throughout the report and in Appendix D.

Delaware's 2011-2015 cancer incidence and mortality rankings among all 50 U.S. states are provided for each cancer site included in the report. State rankings for cancer incidence and mortality were obtained from the U.S. Cancer Statistics Working Group⁶.

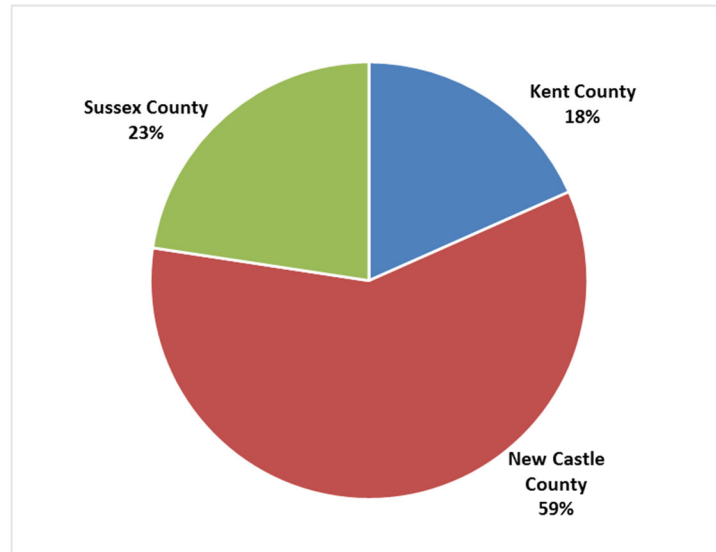
DELAWARE'S POPULATION

In 2017, census data estimated Delaware's total population at 961,939. The majority of Delawareans – 59% – reside in New Castle County. Kent and Sussex Counties are home to 18% and 23% of Delawareans, respectively (Figure 2-1).

⁵ <https://www.naaccr.org/certification-criteria/>

⁶ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

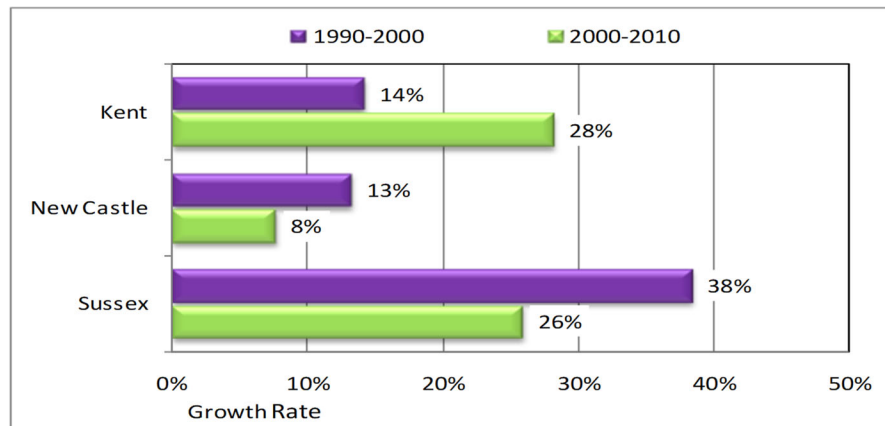
FIGURE 2-1: PERCENTAGE OF POPULATION BY COUNTY, DELAWARE, 2010



Source: U.S. Census Bureau, American FactFinder, <http://factfinder2.census.gov/>.

Since 1990, population growth rates have varied across Delaware counties (Figure 2-2). New Castle County – the most populated of Delaware’s three counties – demonstrated the smallest population growth, increasing its total population by 13% from 1990-2000 and just 8% from 2000-2010. Kent County grew in total population by 14% from 1990-2000, and by 28% from 2000-2010. Sussex County – Delaware’s southernmost county – experienced the largest population growth from 1990-2000 with an increase in total population of nearly 40%. Population growth slowed slightly in Sussex County from 2000-2010, as total population increased by 26%.

FIGURE 2-2: PERCENTAGE OF POPULATION GROWTH BY COUNTY AND DECADE, DELAWARE, 1990-2000 AND 2000-2010



Source: U.S. Census Bureau 2010, American FactFinder, <http://factfinder2.census.gov/>.

Census data from 2011-2015 show that 64% of all Delawareans are non-Hispanic Caucasian. Non-Hispanic Caucasians are a majority of the population in all three Delaware counties: 64% in Kent County, 60% in New Castle County, and 75% in Sussex County. Non-Hispanic African Americans comprise 21% of Delaware’s population. The distribution varies by county: 23% in Kent County, 24% in New Castle County, and 12% in Sussex County. Four percent of Delawareans are Asians. Another 2% of Delawareans are considered “other” race, which is defined as: (a) any other race group that was too small to enumerate separately; (b) unknown race; or (c) mixed race (i.e., two or more races). Regardless of race, persons of Hispanic ethnicity make up just over 9% of Delaware’s population.

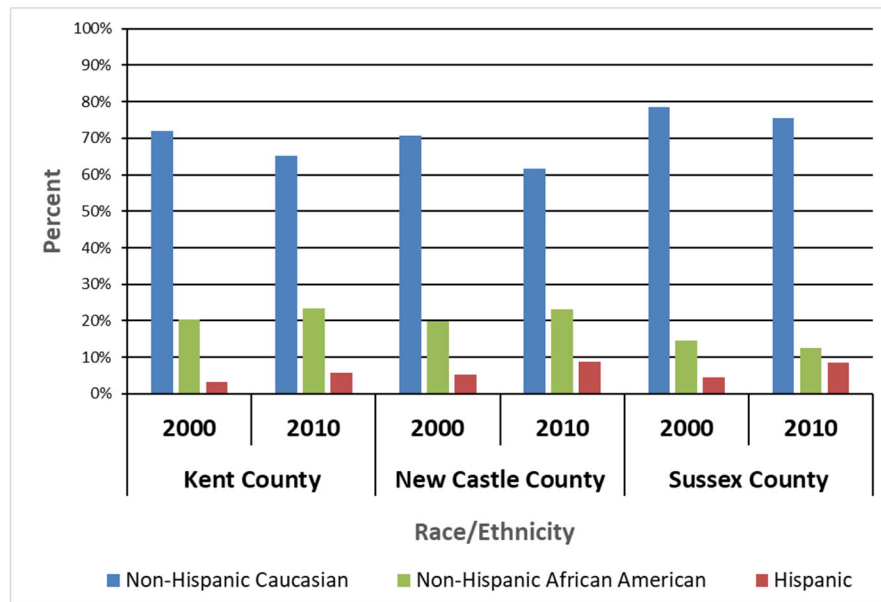
TABLE 2-1: PERCENTAGE OF POPULATION BY RACE/ETHNICITY AND COUNTY, DELAWARE, 2011-2015

Race/Ethnicity	Delaware	Kent	New Castle	Sussex
Not Hispanic or Latino				
Caucasian	64	64	60	75
African American	21	23	24	12
American Indian and Alaska Native	0	1	0	0
Asian	4	2	5	1
Native Hawaiian and Other Pacific Islander	0	0	0	0
Other race	0	0	0	0
Two or more races	2	3	2	2
Hispanic or Latino	9	7	9	9

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates, American FactFinder, <http://factfinder2.census.gov/>.

Since 2000, racial diversity has expanded at different rates across Delaware’s counties. Both Kent and New Castle Counties experienced substantial increases in the proportion of non-Hispanic African American and Hispanic residents (and concurrent decreases in the proportion of non-Hispanic Caucasian residents) from 2000 to 2010 (Figure 2-3). In Kent County, the non-Hispanic African American population increased from 20% in 2000 to 23% in 2010; the non-Hispanic Caucasian population declined from 72% to 65%; and the Hispanic population increased from 3% to 6%. In New Castle County, the non-Hispanic African American population increased from 20% in 2000 to 23% in 2010; the non-Hispanic Caucasian population declined from 71% to 62%; and the Hispanic population increased from 5% to 9%. A different trend was observed in Sussex County, where the non-Hispanic African American population decreased from 15% in 2000 to 12% in 2010; however, similar to the trends in the other counties, the non-Hispanic Caucasian population declined from 78% to 76%, and the Hispanic population increased from 4% to 9%.

FIGURE 2-3: PERCENTAGE OF RESIDENTS BY RACE/ETHNICITY, DELAWARE AND COUNTIES, 2000 AND 2010



Source: U.S. Census Bureau 2010, American FactFinder, <http://factfinder2.census.gov/>.

GUIDELINES FOR INTERPRETATION OF INCIDENCE AND MORTALITY RATES

Incidence and mortality rates for Delaware are expressed per 100,000 Delawareans and rates for the U.S. are expressed per 100,000 U.S. residents. Due to Delaware's small population base, cancer rates were calculated using five-year calendar year groupings for both cancer incidence and mortality.

Cancer incidence and mortality rates were adjusted by age to enable comparisons between populations that may have different age distributions (e.g., Delaware vs. the U.S.). Thus, age-adjusted cancer rates can be compared without any concern about how differences in age distribution of the populations would affect cancer rates. The standard population used to adjust for age is the 2000 U.S. population.

Ninety-five percent confidence intervals were computed for each cancer rate. Confidence intervals represent the range of values in which the cancer rate could reasonably fall 95% of the time. They are used to determine whether the amount by which two cancer rates differ is statistically significant. If the confidence interval for one rate does not overlap with the confidence interval for another rate, the two rates are significantly different. When one rate is significantly different from another rate, we assume that the difference between the rates is larger than would be expected by chance alone, meaning it is statistically significant. If the confidence interval for one rate overlaps with the confidence interval for another rate, the two rates are not statistically significantly different and this is commonly referred to as "no meaningful difference" between rates.

For this report, cancer frequencies and rates were suppressed according to the DPH's Policy Memorandum 49 (Data and Data Release Standards):

- Incidence and mortality frequencies of fewer than six were not shown to protect patient privacy and confidentiality. In some instances, additional cells were suppressed so that one cannot deduce the actual count in the initially suppressed cell. Suppressing incidence and mortality statistics based on a small number of cancer cases or deaths helps protect patient privacy and confidentiality.^{7,8}
- Age-adjusted incidence and mortality rates based on fewer than 25 cases or deaths were suppressed as they are inherently unstable and cannot be reliably interpreted.

⁷ Coughlin SS, Clutter GG, Hutton M. Ethics in Cancer Registries. *Journal of Cancer Registry Management*, 2: 5-10, 1999.

⁸ McLaughlin CC. Confidentiality protection in publicly released central registry data. *Journal of Cancer Registry Management*, 2: 84-88, 2002.

CHAPTER 3: ALL-SITE CANCER

INCIDENCE

For 2011-2015, Delaware ranked 2nd in the U.S. for all-site cancer incidence (2nd in 2010-2014); males ranked 3rd (3rd in 2010-2014) and females ranked 5th (6th in 2010-2014)⁹.

2011-2015 DATA

TABLE 3-1: NUMBER OF ALL-SITE CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	28,027	14,456	13,571	22,047	11,429	10,618	4,660	2,388	2,272	766	381	385
Kent	5,133	2,650	2,483	3,895	1,985	1,910	1,007	552	455	142	75	67
New Castle	14,821	7,467	7,354	10,959	5,567	5,392	3,007	1,488	1,519	495	246	249
Sussex	8,070	4,338	3,732	7,190	3,876	3,314	646	348	298	129	60	69

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- In 2011-2015, 28,027 new all-site cancer cases were diagnosed in Delaware, an average of 5,605 per year.
- Males accounted for 52% of all-site cancer cases.
- Non-Hispanic Caucasians accounted for 79% of all-site cancer cases.

TABLE 3-2: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	439.2	483.0	409.9
Delaware	495.3	554.4	453.3
Kent	525.2	588.9	477.4
New Castle	486.3	544.4	448.2
Sussex	492.4	552.6	445.4

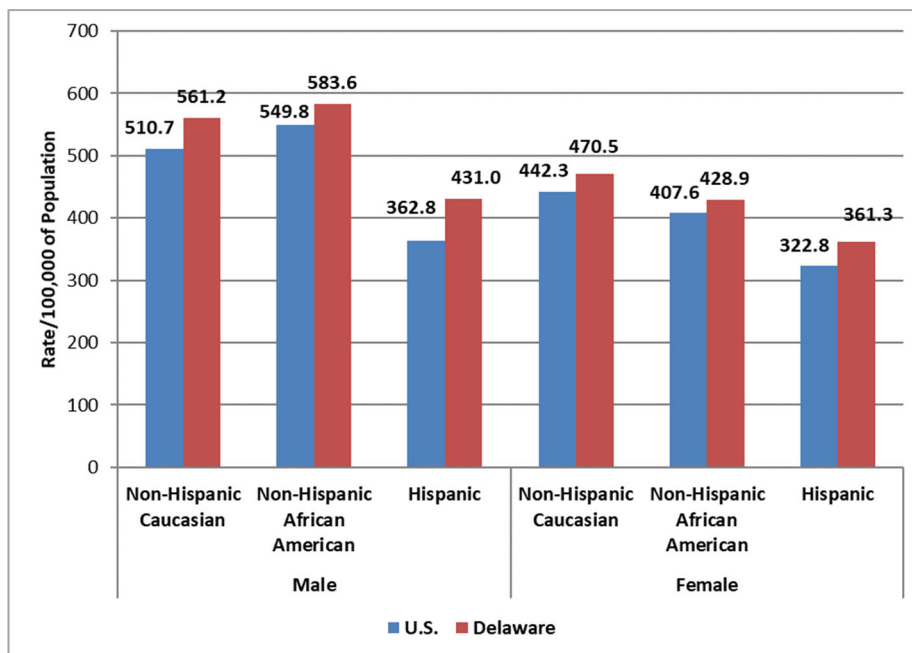
Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

FIGURE 3-1: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015

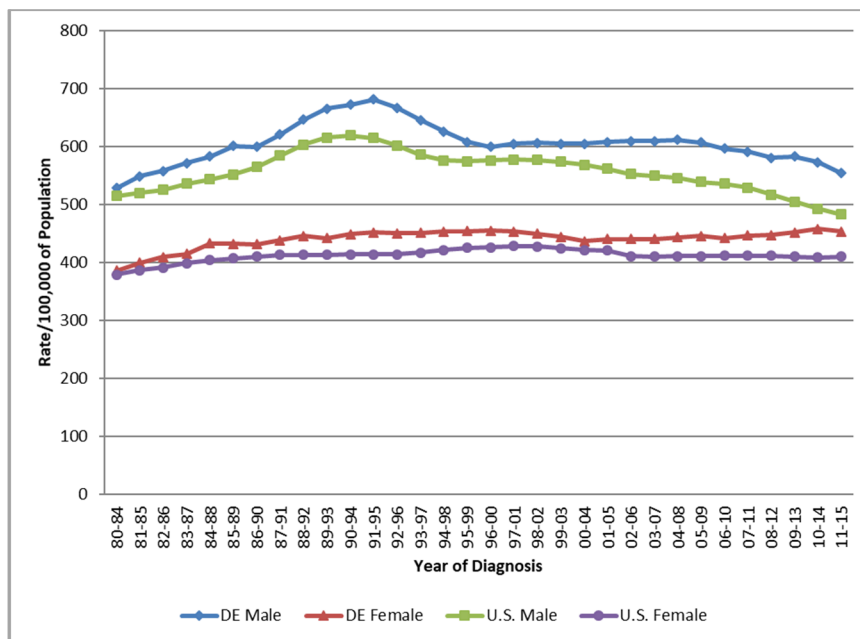


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 Sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (554.4 per 100,000) had a statistically significantly higher all-site cancer incidence rate compared to females (453.3 per 100,000).
 - The difference in all-site cancer incidence rates between non-Hispanic Caucasians (507.8 per 100,000) and non-Hispanic African Americans (492.2 per 100,000) was not statistically significant.
 - Hispanics (390.7 per 100,000) had a statistically significantly lower all-site cancer incidence rate compared to both non-Hispanic Caucasians (507.8 per 100,000) and non-Hispanic African Americans (492.2 per 100,000).
- Comparing Delaware and the U.S.
 - Delaware (495.3 per 100,000) had a statistically significantly higher all-site cancer incidence rate compared to the U.S. (439.2 per 100,000).
 - Delaware males (554.4 per 100,000) had a statistically significantly higher all-site cancer incidence rate compared to U.S. males (483.0 per 100,000).
 - Delaware females (453.3 per 100,000) had a statistically significantly higher all-site cancer incidence rate compared to U.S. females (409.9 per 100,000).
 - Non-Hispanic Caucasians in Delaware (507.8 per 100,000) had a statistically significantly higher all-site cancer incidence rate compared to non-Hispanic Caucasians in the U.S. (469.6 per 100,000).
 - Non-Hispanic African Americans in Delaware (492.2 per 100,000) had a statistically significantly higher all-site cancer incidence rate compared to non-Hispanic African Americans in the U.S. (465.2 per 100,000).
 - Hispanics in Delaware (390.7 per 100,000) had a statistically significantly higher all-site cancer incidence rate compared to Hispanics in the U.S. (336.3 per 100,000).

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 3-2: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY SEX; U.S. AND DELAWARE, 1980-2015

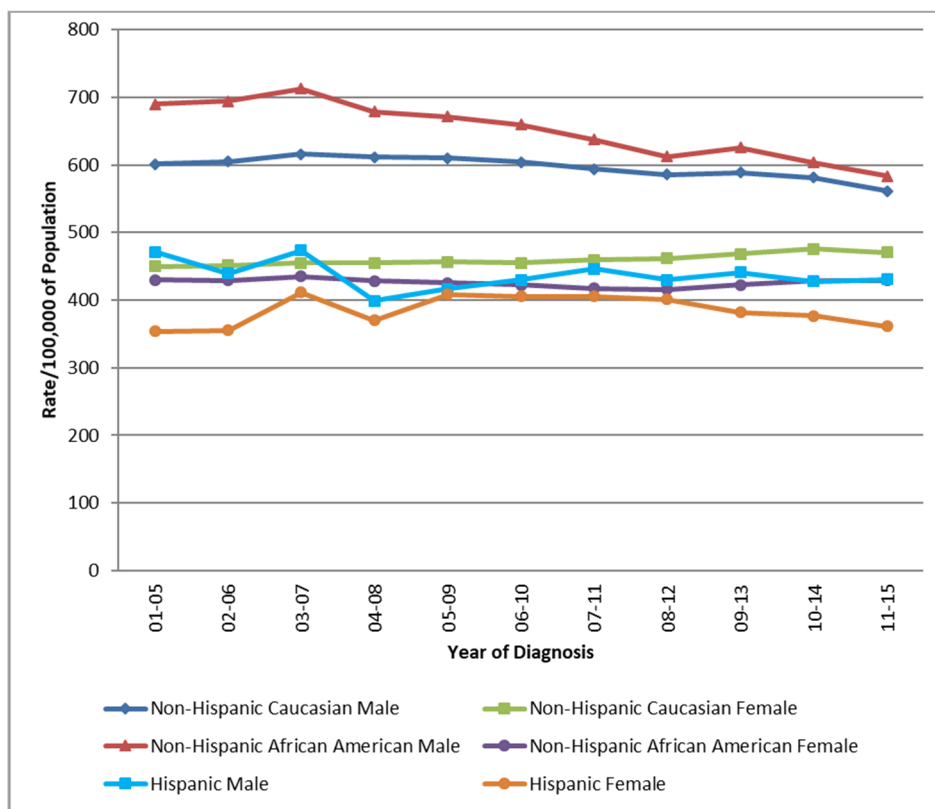


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 Sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for all-site cancer decreased 3% in Delaware and decreased 8% in the U.S.
 - Incidence rates for all-site cancer decreased 9% in Delaware males and decreased 14% in U.S. males.
 - Incidence rates for all-site cancer increased 3% in Delaware females and decreased 3% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 3-3: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

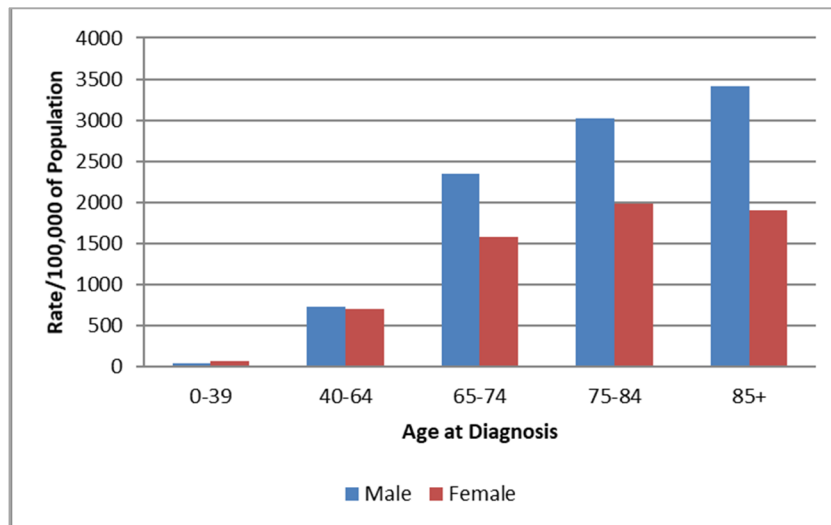


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for all-site cancer decreased 7% in non-Hispanic Caucasian males and increased 5% in non-Hispanic Caucasian females.
 - Incidence rates for all-site cancer decreased 15% in non-Hispanic African American males and did not change in non-Hispanic African American females.
 - Incidence rates for all-site cancer decreased 9% in Hispanic males and increased 2% in Hispanic females.

AGE-SPECIFIC INCIDENCE RATES – DELAWARE

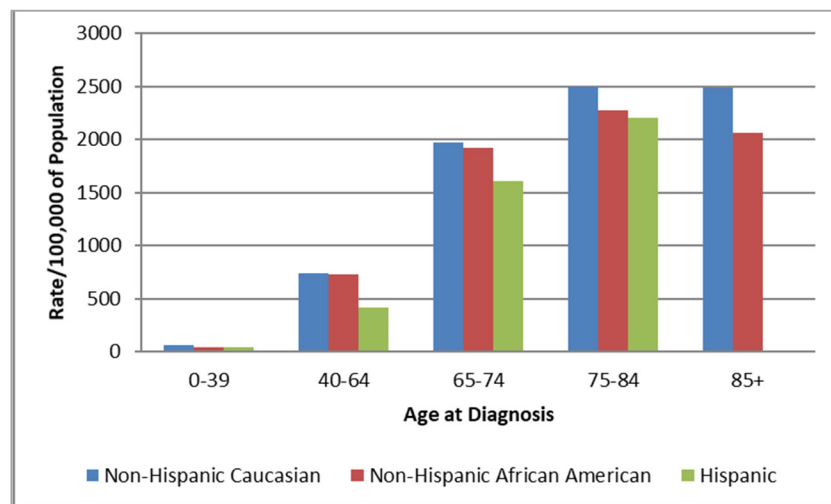
FIGURE 3-4: AGE-SPECIFIC ALL-SITE CANCER INCIDENCE RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The all-site cancer incidence rate was highest for males 85 years of age and older and for females between 75 and 84 years of age.

FIGURE 3-5: AGE-SPECIFIC ALL-SITE CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The all-site cancer incidence rate was highest for non-Hispanic Caucasians, non-Hispanic African Americans, and Hispanics between 75 and 84 years of age.

TABLE 3-3: AGE-SPECIFIC ALL-SITE CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	61.0	46.7	75.4	44.2	25.4	62.6	41.0	39.3	42.9
40-64	743.2	748.4	738.4	725.7	829.3	640.8	418.8	364.8	476.1
65-74	1,972.5	2,338.5	1,647.9	1,921.6	2,587.9	1,406.7	1,603.8	1,958.7	1,308.2
75-84	2,497.1	3,091.4	2,018.5	2,272.6	2,807.3	1,922.3	2,203.9	2,752.8	1,738.8
85+	2,491.2	3,543.2	1,937.3	2,063.5	2,764.1	1,748.1	-	-	-

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

Rates based on less than 25 cases are not shown.

- The all-site cancer incidence rate was highest for non-Hispanic Caucasian males 85 years of age and older and for non-Hispanic African American and Hispanic males between 75 and 84 years of age.
- The all-site cancer incidence rate was highest for non-Hispanic Caucasian, non-Hispanic African American, and Hispanic females between 75 and 84 years of age.

MORTALITY

For 2011-2015, Delaware ranked 18th in the U.S. for all-site cancer mortality (16th in 2010-2014); males ranked 22nd (21st in 2010-2014) and females ranked 14th (13th in 2010-2014)⁹.

2011-2015 DATA

TABLE 3-4: NUMBER OF ALL-SITE CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	9,718	5,001	4,717	7,757	4,052	3,705	1,616	768	848	194	107	87
Kent	1,816	928	888	1,422	729	693	315	162	153	43	23	20
New Castle	5,138	2,573	2,565	3,878	1,986	1,892	1,050	474	576	128	67	61
Sussex	2,764	1,500	1,264	2,457	1,337	1,120	251	132	119	23	17	6

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.

- In 2011-2015, there were 9,718 deaths from cancer in Delaware, an average of 1,944 per year.
- Males accounted for 51% of all-site cancer deaths.
- Non-Hispanic Caucasians accounted for 80% of all-site cancer deaths.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

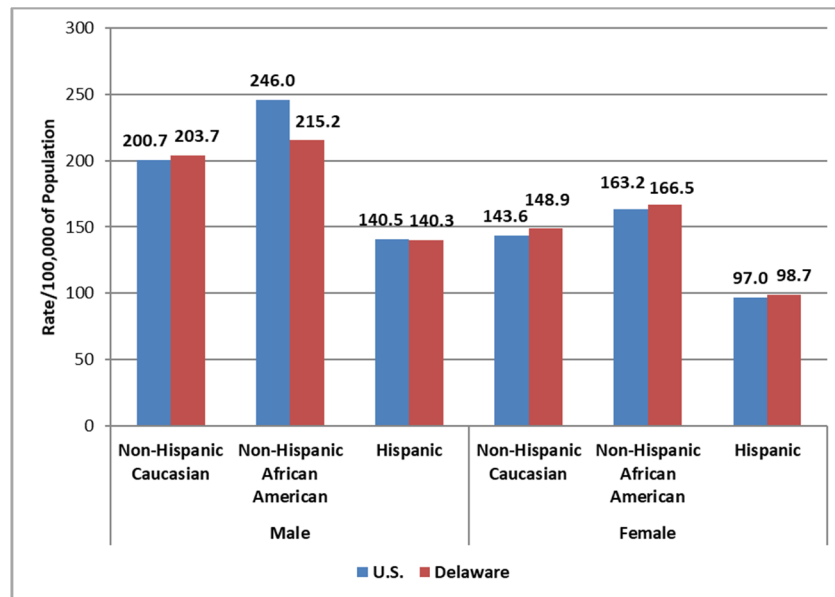
TABLE 3-5: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	163.5	196.8	139.6
Delaware	175.1	206.1	153.0
Kent	190.6	221.0	168.9
New Castle	175.5	207.0	154.3
Sussex	166.2	197.8	141.8

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.

Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 Sub. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 3-6: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.

Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 Sub.

Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (206.1 per 100,000) had a statistically significantly higher all-site cancer mortality rate compared to females (153.0 per 100,000).
 - Non-Hispanic African Americans (185.2 per 100,000) had a statistically significantly higher all-site cancer mortality rate compared to Hispanics (118.0 per 100,000), but they did not significantly differ compared to non-Hispanic Caucasians (172.0 per 100,000).
 - Non-Hispanic Caucasians (172.0 per 100,000) had a statistically significantly higher all-site cancer mortality rate compared to Hispanics (118.0 per 100,000).
- Comparing Delaware and the U.S.
 - Delaware (175.1 per 100,000) had a statistically significantly higher all-site cancer mortality rate compared to the U.S. (163.5 per 100,000).
 - Delaware males (206.1 per 100,000) had a statistically significantly higher all-site cancer mortality rate compared to U.S. males (196.8 per 100,000).

- Delaware females (153.0 per 100,000) had a statistically significantly higher all-site cancer mortality rate compared to U.S. females (139.6 per 100,000).
- Non-Hispanic Caucasians in Delaware (172.0 per 100,000) had a slightly statistically significantly higher all-site cancer mortality rate compared to non-Hispanic Caucasians in the U.S (167.8 per 100,000).
- The difference in all-site cancer mortality rates between non-Hispanic African Americans in Delaware (185.2 per 100,000) and the U.S. (194.6 per 100,000) was not statistically significant.
- The difference in all-site cancer mortality rates between Hispanics in Delaware (118.0 per 100,000) and the U.S. (115.0 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 3-7: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATES BY SEX; U.S. AND DELAWARE, 1980-2015

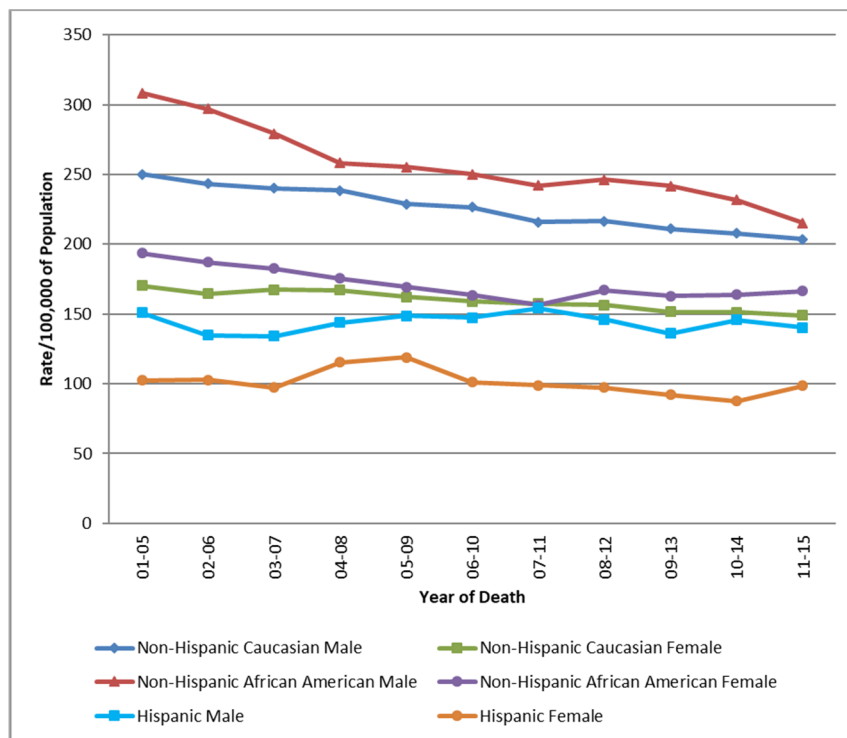


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 Sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for all-site cancer decreased 14% in Delaware and in the U.S.
 - Mortality rates for all-site cancer decreased 18% in Delaware males and decreased 17% in U.S. males.
 - Mortality rates for all-site cancer decreased 10% in Delaware females and decreased 13% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 3-8: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

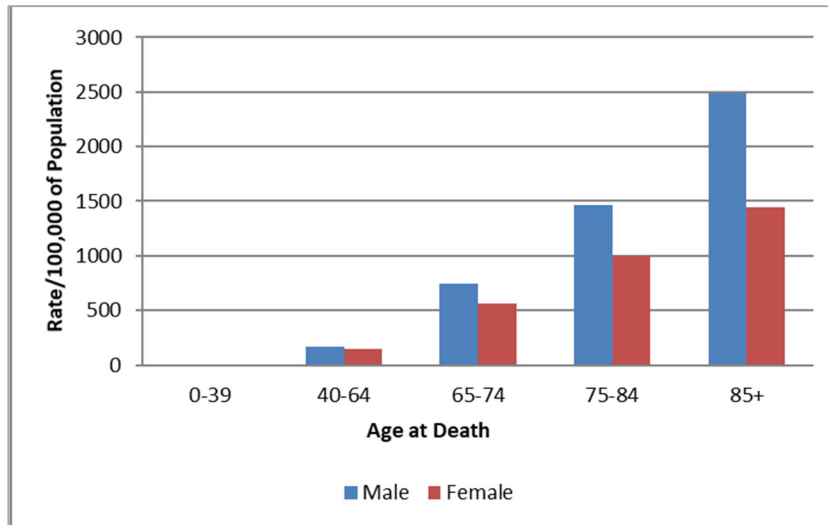


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Mortality rates for all-site cancer decreased 19% in non-Hispanic Caucasian males and decreased 13% in non-Hispanic Caucasian females.
 - Mortality rates for all-site cancer decreased 30% in non-Hispanic African American males and decreased 14% in non-Hispanic African American females.
 - Mortality rates for all-site cancer decreased 7% in Hispanic males and decreased 4% in Hispanic females.

AGE-SPECIFIC MORTALITY RATES – DELAWARE

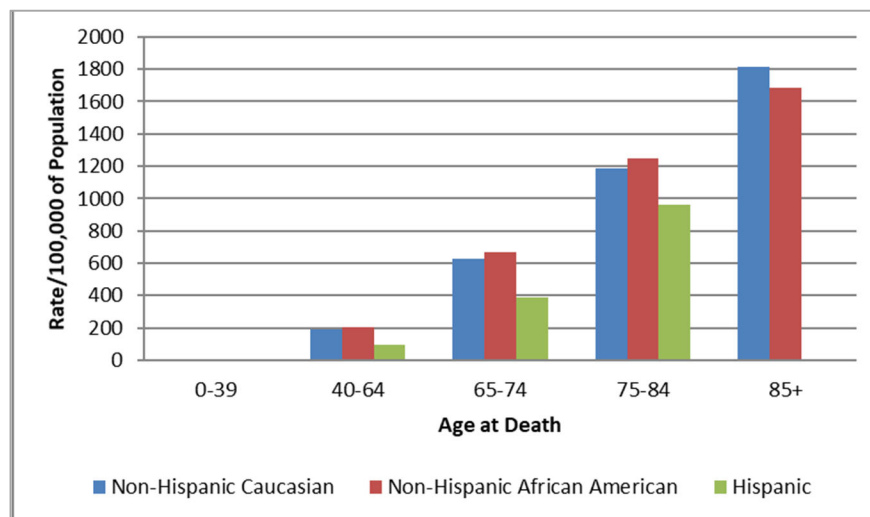
FIGURE 3-9: AGE-SPECIFIC ALL-SITE CANCER MORTALITY RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The all-site mortality rate was highest for both males and females 85 years of age and older.

FIGURE 3-10: AGE-SPECIFIC ALL-SITE CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The all-site mortality rate was highest for non-Hispanic Caucasians and non-Hispanic African Americans 85 years of age and older. Due to small numbers, mortality rates could not be calculated for Hispanics in certain age groups.

**TABLE 3-6: AGE-SPECIFIC ALL-SITE CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY;
DELAWARE, 2011-2015**

Age at Death	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	4.4	---	---	5.9	---	---
40-64	201.66	210.1	105.8	174.6	194.7	88.5
65-74	707.7	800.2	---	551.5	576.2	---
75-84	1,445.4	1,502.6	---	975.6	1,079.1	---
85+	2,535.4	2,138.9	---	1,433.4	1,481.5	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The all-site mortality rate was highest for non-Hispanic Caucasians and non-Hispanic African American males 85 years of age and older.
- The all-site mortality rate was highest for non-Hispanic Caucasians and non-Hispanic African American females 85 years of age and older.

CHAPTER 4: BREAST CANCER (FEMALE)

RISK FACTORS

Most females who have one or more breast cancer risk factors never develop the disease. Some females who develop breast cancer have no apparent risk factors other than being a female and growing older. Even when a woman with one or more risk factors develops breast cancer, it is difficult to know how much these factors might have contributed to the development of the disease.

The following are **lifestyle risk factors** that a person can modify to reduce their risk of getting female breast cancer:

- Alcohol use (two to five drinks daily)
- Obesity or overweight status, especially after menopause
- Reproductive history (breast cancer risk increases among females who have never had children or who had their first child after 30 years of age)
- High-fat diet with low intake of fruits and vegetables
- Smoking and exposure to secondhand smoke

The following are **environmental and medically-related** causes of female breast cancer:

- Birth control use in the past 10 years
- Combined hormone therapy (estrogen and progesterone) for two or more years after menopause – risk returns to normal five years following discontinued use
- History of high-dose radiation therapy to the chest area as a child or young adult
- Exposure to chemical compounds in the environment which may have estrogen-like properties (pesticides like Dichlorodiphenyldichloroethylene (DDE), polychlorinated biphenyls (PCBs), and substances found in some plastics, cosmetics, and personal care products)

The following are **non-modifiable** risk factors (these cannot be changed) for getting female breast cancer:

- Gender – Breast cancer is 100 times more common in females than in males.
- Increasing age – Only one out of eight invasive breast cancers are diagnosed in females under 45 years of age; two-thirds of invasive cancers are in females 55 years of age and older.
- Family history – Having one first-degree relative (mother, sister, or daughter) with breast cancer doubles a woman's risk of developing breast cancer; having two first-degree relatives triples the risk.
- Gene defects or mutations – Five to 10 percent of breast cancer cases may result from gene defects or mutations inherited from a parent; the most common inherited mutation is the BRCA1 or BRCA2 gene found mostly in Jewish females of Eastern European origin.
- Personal history of breast cancer – This triples the risk of developing a new cancer in another part of the body, another part of the previously affected breast, or the other breast.
- Race – Non-Hispanic Caucasian females 45 years of age and older are more likely to develop breast cancer when compared to non-Hispanic African American females. Non-Hispanic African American females are more likely to be diagnosed at a younger age and more likely to die from breast cancer when compared to non-Hispanic Caucasian females.
- Dense breast tissue is thought to increase risk because it is more difficult to detect potential problems on mammograms.
- Personal history of benign breast conditions
- Early age at menarche (before 12 years of age) and/or later age at menopause (55 years of age and older)

To protect against breast cancer, individuals should maintain a healthy weight; consume a diet high in fruits, vegetables, and whole grains; limit calcium intake; and engage in regular physical activity.

EARLY DETECTION

A screening mammogram (x-ray of the breast) is used to detect breast disease in females who appear to have no breast problems. For early breast cancer detection in females without breast symptoms, the DCC recommends that:¹⁰

- Females 40 years of age and older should get a mammogram and clinical breast exam annually.
- Females 18-39 years of age should get a clinical breast exam annually.

Also, females should know how their breasts normally look and feel, and report any breast change promptly to their health care provider. Breast self-exam is encouraged for females starting in their 20s¹⁰. Females at increased risk for breast cancer should discuss with their health care provider the benefits and limitations of beginning mammograms when they are younger, having additional tests, and/or having more frequent exams.

FEMALE BREAST CANCER SCREENING IN DELAWARE

The Behavioral Risk Factor Survey (BRFS) has collected yearly mammogram use data through 2000; after 2000, mammogram use data are collected biennially. The BRFS asks a female respondent's mammogram use during the previous two years (as opposed to the annual mammogram screening schedule recommended by the DCC) to account for minor variations in scheduling that may cause a woman to miss the one-year threshold (e.g., two mammogram screening appointments 14 months apart).

Data from the 2016 BRFS provides information on breast cancer screening among Delaware females:

- Of Delaware females 40 years of age and older, 78% reported having a mammogram within the previous two years, compared to a national median of 72%. Delaware females ranked third highest nationally for this response.
- In Delaware, the percentage of non-Hispanic Caucasian females 40 years of age and older who reported having a mammogram in the past two years was lower compared to non-Hispanic African American females. The difference was significantly different (77% vs. 87%, respectively).
- Females 40 years of age and older in the three highest income categories had the highest percentages of mammography use (79% for females with an annual income of \$50,000-\$74,999 and 86% for females with an annual income of \$75,000 and over).
- Delaware females (40 years of age and older) who were college graduates (81.9%) had a higher prevalence of having had a mammogram in the past two years, compared to Delaware females who had less than a high school diploma (65.5%); this difference was statistically significant.

¹⁰ American Cancer Society recommendations for early breast cancer detection in women without breast symptoms. Accessed March 15, 2016. <http://www.cancer.org/Cancer/BreastCancer/MoreInformation/BreastCancerEarlyDetection/breast-cancer-early-detection-ac-recs>

INCIDENCE

For 2011-2015, Delaware ranked 9th in the U.S. for female breast cancer incidence (7th in 2010-2014)⁹.

2011-2015 DATA

**TABLE 4-1: NUMBER OF FEMALE BREAST CANCER CASES, BY RACE/ETHNICITY;
DELAWARE AND COUNTIES, 2011-2015**

	All Females	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
Delaware	4,008	3,082	728	99
Kent	681	514	136	20
New Castle	2,233	1,607	493	58
Sussex	1,094	961	99	21

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- Female breast cancer is the most commonly diagnosed cancer among females in the U.S. and Delaware.
- There were a total of 36 breast cancers diagnosed in males; 75% were in non-Hispanic Caucasian males. While these data are collected, only breast cancer in females will be addressed in this section.
- In 2011-2015, 4,008 female breast cancer cases (30% of all female cancers) were diagnosed in Delaware.
- Non-Hispanic Caucasians accounted for 77% of female breast cancer cases.

**TABLE 4-2: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER INCIDENCE RATES BY
RACE/ETHNICITY; U.S., DELAWARE AND COUNTIES, 2011-2015**

	All Females	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
U.S.	126.0	135.2	130.2	93.7
Delaware	134.2	136.8	133.3	94.3
Kent	130.9	134.7	125.8	---
New Castle	136.2	140.7	134.6	82.5
Sussex	130.1	128.9	140.9	---

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

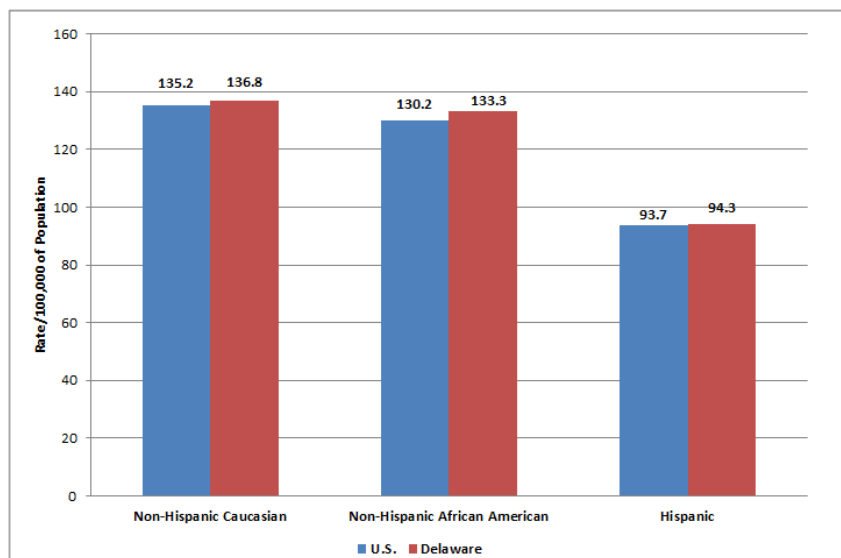
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

Rates based on less than 25 cases are not shown.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

FIGURE 4-1: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER INCIDENCE RATES BY RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015

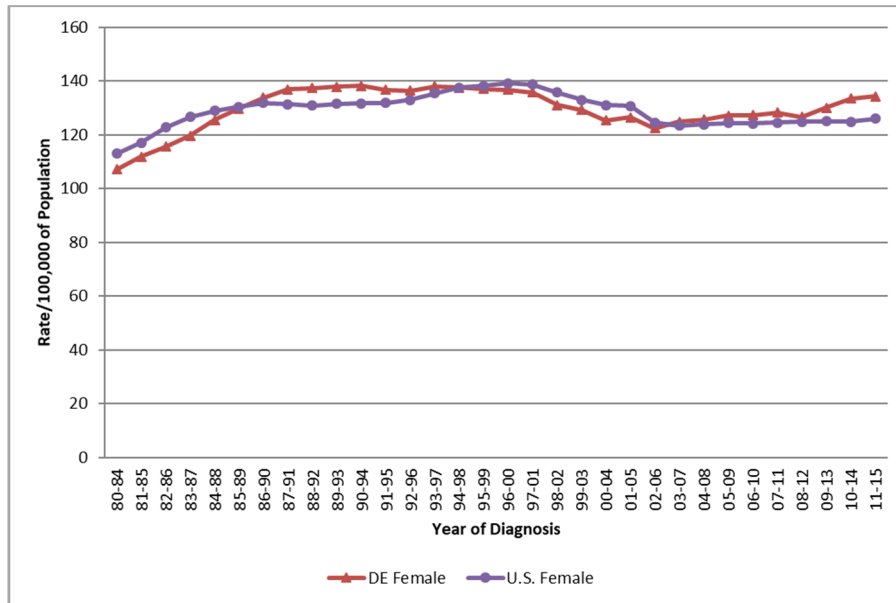


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - The difference in female breast cancer incidence rates between non-Hispanic Caucasians (136.8 per 100,000) and non-Hispanic African Americans (133.3 per 100,000) was not statistically significant.
 - Hispanics (94.3 per 100,000) had a statistically significantly lower female breast cancer incidence rate compared to both non-Hispanic Caucasians and non-Hispanic African Americans.
- Comparing Delaware and the U.S.
 - Delaware (134.2 per 100,000) had a statistically significantly higher female breast cancer incidence rate compared to the U.S. (126.0 per 100,000).
 - The difference in female breast cancer incidence rates between non-Hispanic Caucasians in Delaware (136.8 per 100,000) and the U.S. (135.2 per 100,000) was not statistically significant.
 - The difference in female breast cancer incidence rates between non-Hispanic African Americans in Delaware (133.3 per 100,000) and the U.S. (130.2 per 100,000) was not statistically significant.
 - The difference in female breast cancer incidence rates between Hispanics in Delaware (94.3 per 100,000) and the U.S. (93.7 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 4-2: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER INCIDENCE RATES; U.S. AND DELAWARE, 1980-2015

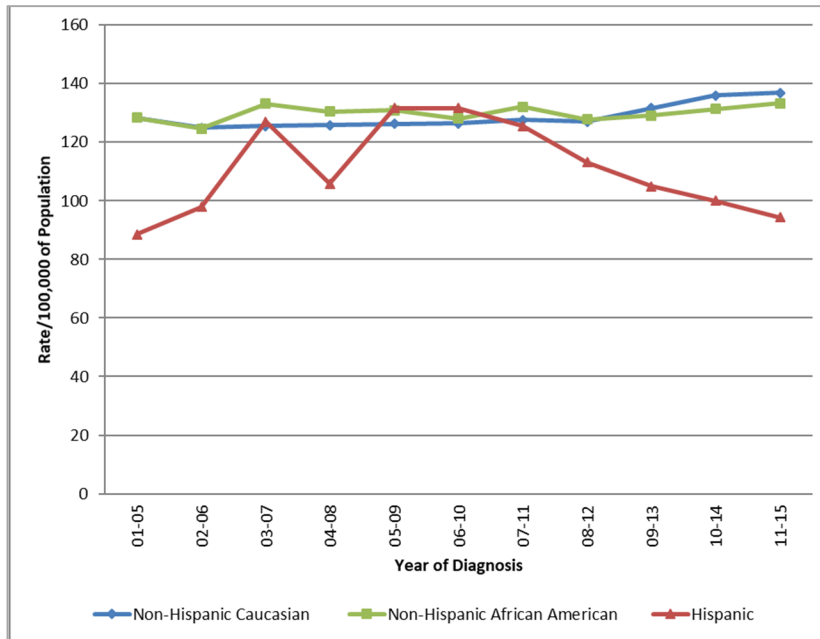


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for female breast cancer increased 6% in Delaware and decreased 4% in the U.S.

TRENDS OVER TIME - DELAWARE

FIGURE 4-3: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2001-2015

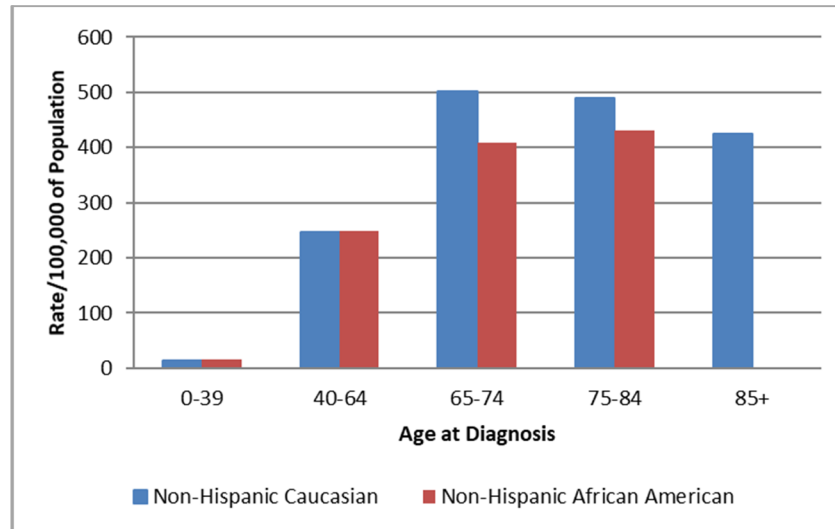


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for female breast cancer increased 7% in non-Hispanic Caucasians.
 - Incidence rates for female breast cancer increased 4% in non-Hispanic African Americans.
 - Incidence rates for female breast cancer increased 7% in Hispanics.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

FIGURE 4-4: AGE-SPECIFIC FEMALE BREAST CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population

- The incidence rate for female breast cancer is highest for non-Hispanic Caucasians 65 to 74 years of age and for non-Hispanic African Americans 75 to 84 years of age (based on the rates that could be calculated). Due to small numbers, incidence rates could not be calculated for Hispanics or for non-Hispanic African Americans aged 85+.

TABLE 4-3: AGE-SPECIFIC FEMALE BREAST CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	All Females	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	13.0	13.2	14.8	---
40-64	239.4	245.9	248	143.5
65-74	477.4	502.2	408.4	---
75-84	473.8	489.8	430.4	---
85+	409.1	425.7	---	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

STAGE OF DIAGNOSIS - DELAWARE

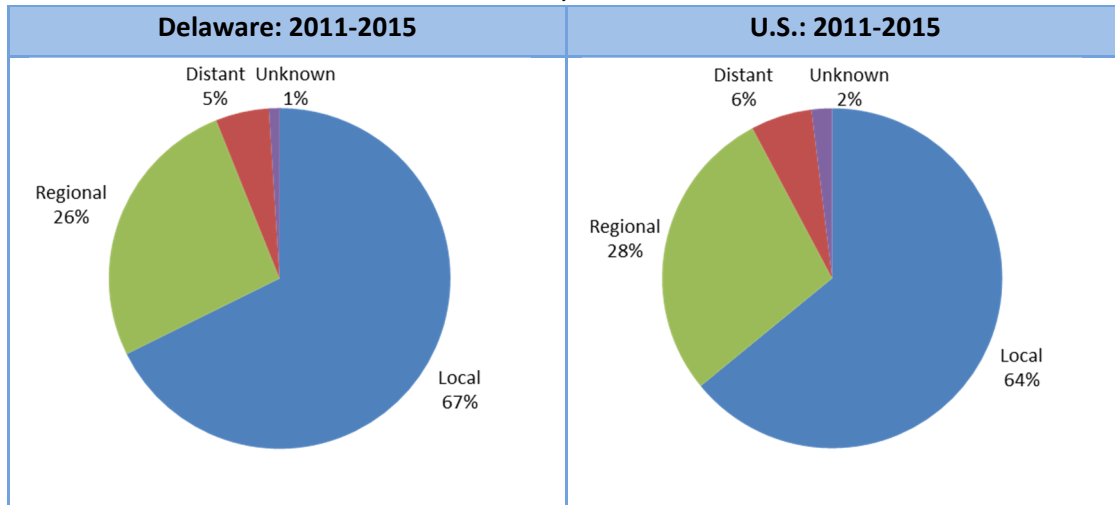
TABLE 4-4: NUMBER AND PERCENTAGE OF FEMALE BREAST CANCER CASES BY STAGE AT DIAGNOSIS BY RACE/ETHNICITY; DELAWARE, 2011-2015

Stage at Diagnosis	All Females	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
Local	2,682 (67)	2,124 (69)	431 (59)	61 (62)
Regional	1,059 (26)	758 (25)	244 (34)	31 (31)
Distant	213 (5)	161 (5)	42 (6)	---
Unknown	54 (1)	39 (1)	11 (2)	---
Total	4,008	3,082	728	99

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 2,682 (67%) female breast cancers diagnosed at the local stage; 1,059 (26%) at the regional stage; 213 (5%) at the distant stage; and 54 (1%) had an unknown stage.
- Non-Hispanic Caucasians (69%) had a higher proportion of female breast cancer diagnosed at local stage compared to both non-Hispanic African Americans (59%) and Hispanics (62%).

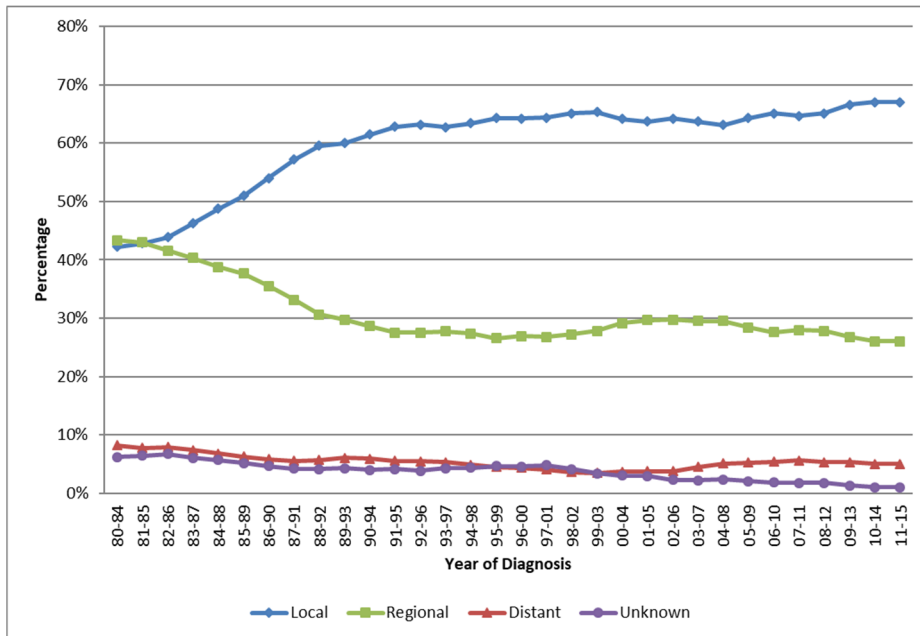
FIGURE 4-5: PERCENTAGE OF FEMALE BREAST CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

- In comparing U.S. and Delaware breast cancer data, the proportion of female breast cancer cases diagnosed at each of the stages is similar.

FIGURE 4-6: FIVE-YEAR PERCENTAGE OF STAGE OF DIAGNOSIS FOR FEMALE BREAST CANCER CASES, DELAWARE, 1980-2015



Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percent of female breast cancer cases diagnosed at the local stage increased from 42% to 67%.
 - Cases diagnosed at the distant stage decreased from 8% to 5%.

MORTALITY

For 2011-2015, Delaware ranked 21st in the U.S. for female breast cancer mortality (20th in 2010-2014)⁹.

2011-2015 DATA

TABLE 4-5: NUMBER OF FEMALE BREAST CANCER DEATHS, BY RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Females	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
Delaware	670	506	139	16
Kent	130	86	33	8
New Castle	359	258	90	---
Sussex	181	162	16	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Counts less than 6 are not shown to protect patient privacy

- Female breast cancer is the second most common cause of cancer death among females in the U.S. and Delaware.
- Seven males died from breast cancer from 2011 through 2015. Male deaths due to breast cancer are not included in this section.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

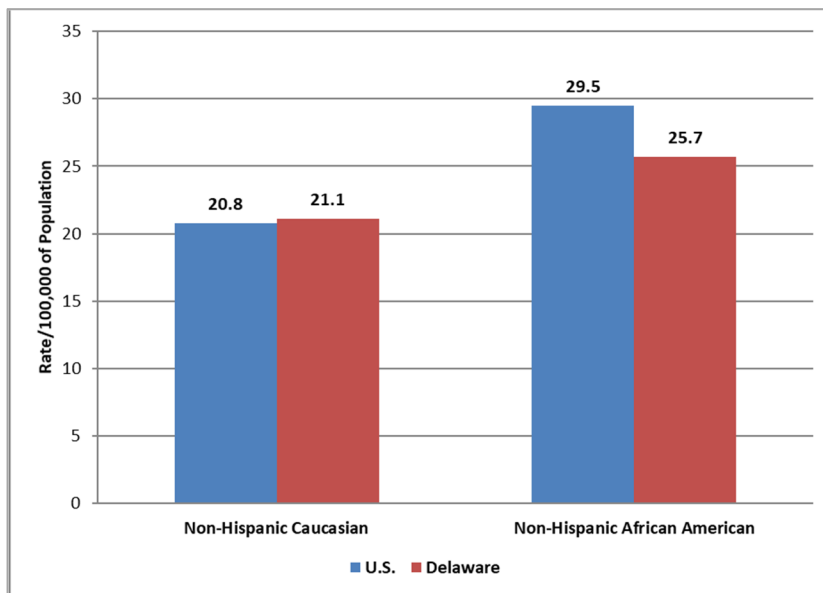
- In 2011-2015, there were 670 female deaths (14% of all female cancer deaths) from breast cancer in Delaware.
- Non-Hispanic Caucasian females accounted for 76% of breast cancer deaths.

TABLE 4-6: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER MORTALITY RATES BY RACE/ETHNICITY; U.S., DELAWARE AND COUNTIES, 2011-2015

	All Females	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
U.S.	20.9	20.8	29.5	14.3
Delaware	22.2	21.1	25.7	---
Kent	25.8	22.1	31.4	---
New Castle	21.3	20.3	25.3	---
Sussex	22.0	22.3	---	---

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
 Rates based on less than 25 cases are not shown.

FIGURE 4-7: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER MORTALITY RATES BY RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



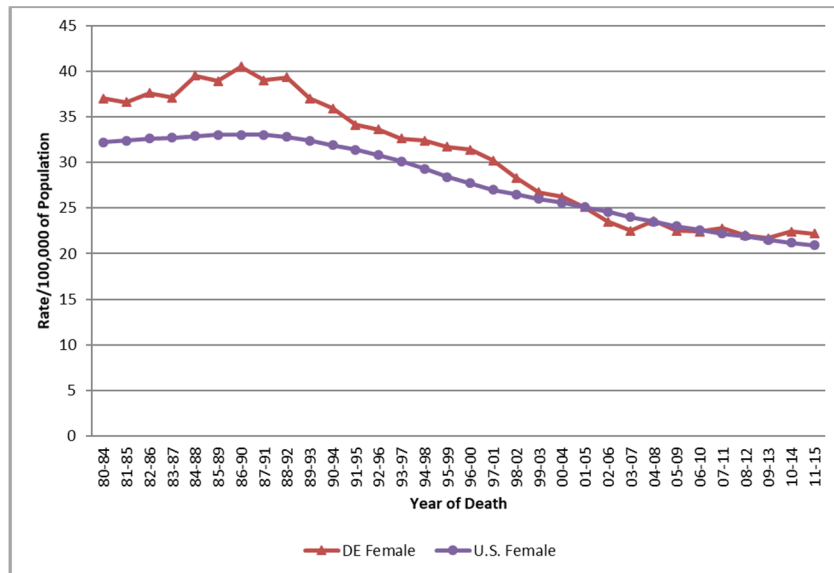
Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - The difference in female breast cancer mortality rates between non-Hispanic Caucasians (21.1 per 100,000) and non-Hispanic African Americans (25.7 per 100,000) was not statistically significant.
 - Female breast cancer mortality rates for Hispanics could not be calculated due to the low number of deaths.

- Comparing Delaware and the U.S.
 - The difference in female breast cancer mortality rates between Delaware (22.2 per 100,000) and the U.S. (20.9 per 100,000) was not statistically significant.
 - The difference in female breast cancer mortality rates between non-Hispanic Caucasians in Delaware (21.1 per 100,000) and the U.S (20.8 per 100,000) was not statistically significant.
 - The difference in female breast cancer mortality rates between non-Hispanic African Americans in Delaware (25.7 per 100,000) and the U.S. (29.5 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 4-8: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER MORTALITY RATES; U.S. AND DELAWARE, 1980-2015

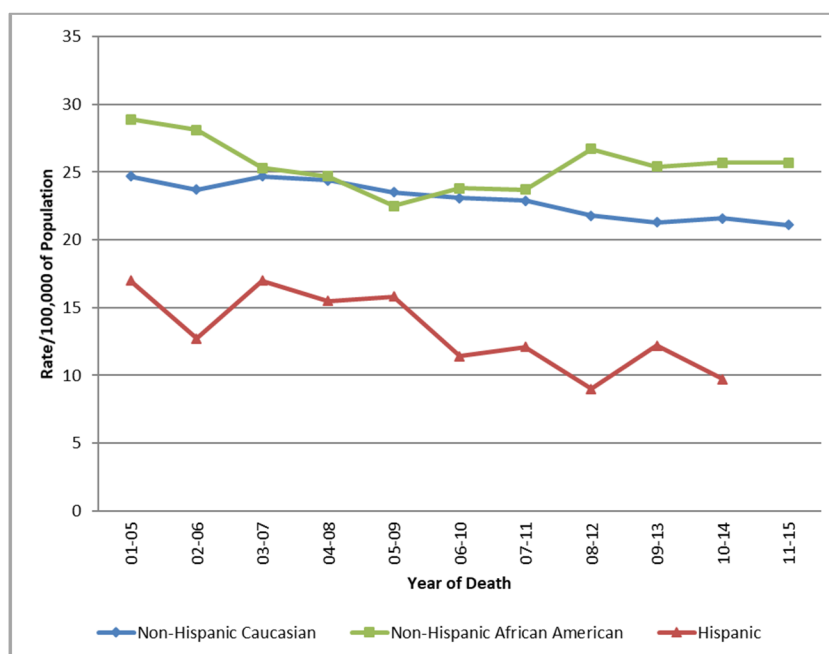


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for female breast cancer decreased 12% in Delaware and decreased 17% in the U.S.

TRENDS OVER TIME - DELAWARE

FIGURE 4-9: FIVE-YEAR AVERAGE AGE-ADJUSTED FEMALE BREAST CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2001-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Mortality rates for female breast cancer decreased 15% in non-Hispanic Caucasians.
 - Mortality rates for female breast cancer decreased 11% in non-Hispanic African Americans.
 - Mortality rates for female breast cancer in Hispanics could not be calculated due to the small number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

TABLE 4-7: AGE-SPECIFIC FEMALE BREAST CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	All Females	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---
40-64	34.9	31.8	45.4	---
65-74	65.6	67.9	---	---
75-84	111.9	109.1	---	---
85+	182.1	176.9	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

- The incidence rate for female breast cancer was highest for non-Hispanic Caucasian females 85 years of age and older. Due to small numbers, mortality rates could not be calculated for Hispanics or for some non-Hispanic Caucasian or non-Hispanic African American age groups.

CHAPTER 5: COLORECTAL CANCER

RISK FACTORS

The following are ***lifestyle risk factors*** that a person can modify to reduce their risk of getting colorectal cancer:

- A diet high in red and processed meats
- Heavy alcohol consumption
- Lack of physical activity/obesity
- Long-term tobacco use
- Type 2 diabetes

The following are ***environmental and medically-related causes*** of colorectal cancer:

- Personal history of testicular cancer (possibly due to testicular cancer treatment strategies)
- History of radiation treatment for prostate cancer
- Night-shift work may increase risk among females (limited data on this factor)

The following are ***non-modifiable risk factors*** (these cannot be changed) for getting colorectal cancer:

- Age (risk increases after 50 years of age)
- Race (non-Hispanic African Americans are at greater risk compared to non-Hispanic Caucasians)
- Ethnicity (Jewish males and females of Eastern European descent are at greater risk)
- Personal history of colorectal adenomatous polyps or previous history of colorectal cancer
- History of Inflammatory Bowel Disease, Ulcerative Colitis, or Crohn's disease
- Familial adenomatous polyposis (FAP) is responsible for 1% of colorectal cancers.
- Family history of colorectal cancer or adenomatous polyps in one or more first-degree relatives

To protect against colorectal cancer, individuals should get regular screenings because the early removal of colorectal polyps can prevent colorectal cancer from developing. People should also manage lifestyle risk factors: eat a healthy diet, limit alcohol use (two drinks a day for males and one drink a day for females), increase physical activity, and take a daily multivitamin (studies have shown that a multivitamin containing folic acid, vitamin D and/or magnesium could decrease colorectal cancer risk).

People who use aspirin and other anti-inflammatory drugs (i.e. ibuprofen) show a lower risk of colorectal cancer but long-term use may lead to other side effects. Combined hormone replacement therapy (including both estrogen and progesterone) may reduce a woman's postmenopausal risk of colorectal cancer.

EARLY DETECTION

The American Cancer Society (ACS) and DCC colorectal cancer screening guidelines recommend that at 50 years of age, males and females at ***average risk*** of developing colorectal cancer should use one of the following screening options¹¹:

- a. Fecal occult blood tests (FOBT) every year
- b. Fecal immunochemical test (FIT) every year
- c. Flexible sigmoidoscopy every five years
- d. Double-contrast barium enema every five years
- e. Computed tomography (CT) colonography (virtual colonoscopy) every five years
- f. Colonoscopy every 10 years

¹¹ Detailed screening guidelines for colorectal cancer:

<http://www.cancer.org/Cancer/ColonandRectumCancer/MoreInformation/ColonandRectumCancerEarlyDetection/colorectal-cancer-early-detection-acs-recommendations>

For options a-e, a follow-up colonoscopy should be performed if results from an initial screening test are positive. ACS and DCC screening guidelines offer suggested screening schedules for individuals with an elevated risk of developing colorectal cancer.

COLORECTAL CANCER SCREENING IN DELAWARE

Data from the 2016 BRFS provides information on colorectal cancer screening patterns among Delawareans:

- Delaware ranked 12th highest in the prevalence (77%) of adults 50-74 years of age who reported meeting the U.S. Preventive Services Task Force (USPSTF) recommendations for colorectal screening. The U.S. national median for meeting the USPSTF recommendation for colorectal cancer screening was 68%.
- The percentage of Delawareans who met the USPSTF recommendation for colorectal cancer screening increased by age group. Significantly more Delawareans 60-64 years of age and 65 years of age and older (75% and 82%, respectively) reported meeting the recommendation, compared to those 50-59 years of age (62%).
- The prevalence of non-Hispanic Caucasians 50-74 years of age in Delaware who met the USPSTF recommendation for colorectal cancer screening (74%) was higher compared to the prevalence for non-Hispanic African Americans in Delaware (65%). However, this difference was not statistically significant.
- In Delaware, the prevalence of adults 50-74 years of age who met the USPSTF colorectal cancer screening increased by education level.
- As income increases, so does the prevalence of meeting the USPSTF recommendation for colorectal cancer screening. Delawareans who reported having the recommended colorectal cancer screenings differed significantly between income levels: 57% were in the lowest income category (less than \$15,000 annual household income) and 78% were in the highest income category (\$50,000 or more).

INCIDENCE

For 2011-2015, Delaware ranked 38th in the U.S. for colorectal cancer incidence (35th in 2010-2014); males ranked 32rd (33rd in 2010-2014) and females ranked 38th (40th in 2010-2014)⁹.

2011-2015 DATA

TABLE 5-1: NUMBER OF COLORECTAL CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	2,080	1,084	996	1,596	837	759	389	194	195	65	34	31
Kent	393	203	190	291	148	143	84	45	39	12	---	---
New Castle	1,096	556	540	779	400	379	250	118	132	46	24	22
Sussex	591	325	266	526	289	237	55	31	24	7	---	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Counts less than 6 are not shown to protect patient privacy.

- Colorectal cancer is the third most commonly diagnosed cancer in the U.S. and Delaware.
- In 2011-2015, 2,080 colorectal cancer cases (7% of all cancer cases) were diagnosed in Delaware.
- Males accounted for 52% of colorectal cancer cases.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

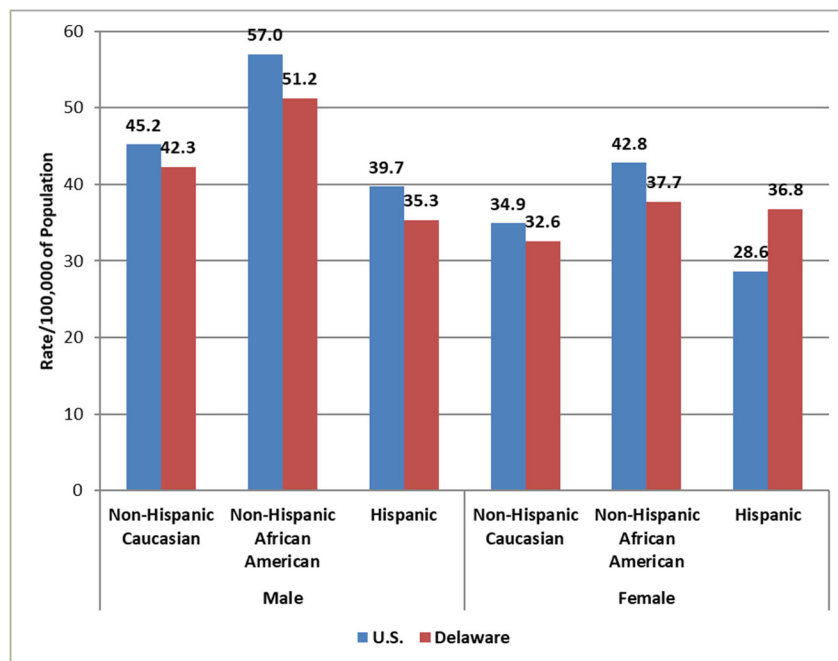
- Non-Hispanic Caucasians accounted for 77% of colorectal cancer cases.

TABLE 5-2: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	39.4	45.2	34.5
Delaware	37.3	42.9	32.9
Kent	41.4	47.3	36.7
New Castle	36.3	41.1	32.8
Sussex	37.0	44.5	30.1

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 5-1: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



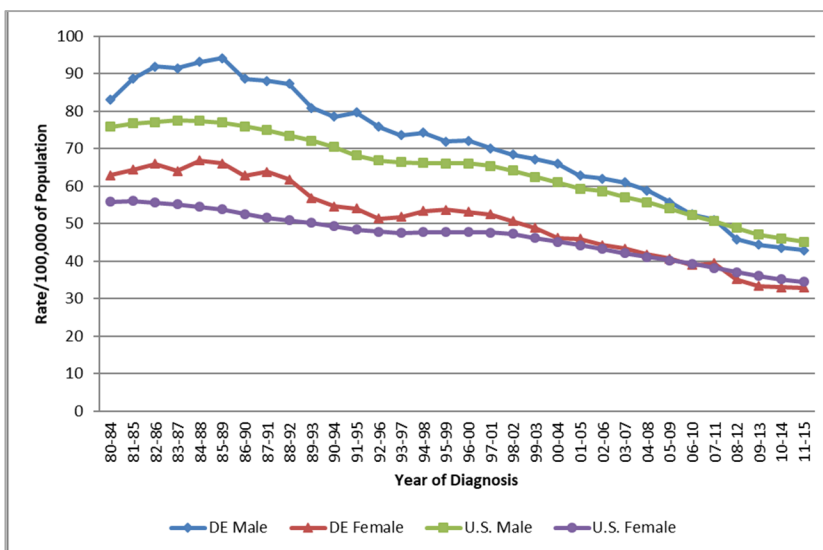
Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (42.9 per 100,000) had a statistically significantly higher colorectal cancer incidence rate compared to females (32.9 per 100,000).
 - The difference in colorectal cancer incidence rates between non-Hispanic Caucasians (36.9 per 100,000), non-Hispanic African Americans (43.0 per 100,000), and Hispanics (36.6 per 100,000) was not statistically significant.
- Comparing Delaware and the U.S.
 - Delaware (37.3 per 100,000) had a statistically significantly lower colorectal cancer incidence rate compared to the U.S. (39.4 per 100,000).
 - The difference in colorectal cancer incidence rates between males in Delaware (42.9 per 100,000) and the U.S. (45.2 per 100,000) was not statistically significant.

- The difference in colorectal cancer incidence rates between females in Delaware (32.9 per 100,000) and the U.S. (34.5 per 100,000) was not statistically significant.
- Non-Hispanic Caucasians in Delaware (36.9 per 100,000) had a statistically significantly lower colorectal cancer incidence rate compared to the U.S. (39.7 per 100,000).
- Non-Hispanic African Americans in Delaware (43.0 per 100,000) had a statistically significantly lower colorectal cancer incidence rate compared to non-Hispanic African Americans in the U.S. (48.7 per 100,000).
- The difference in colorectal cancer incidence rates between Hispanics in Delaware (36.8 per 100,000) and the U.S. (33.5 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 5-2: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER INCIDENCE RATES BY SEX; U.S. AND DELAWARE, 1980-2015

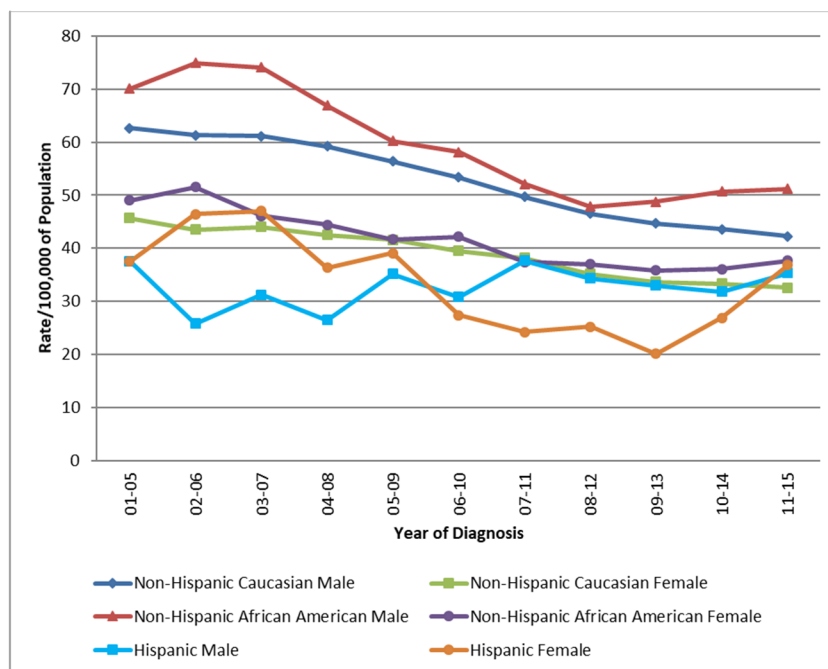


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for colorectal cancer decreased 30% in Delaware and decreased 22% in the U.S.
 - Incidence rates for colorectal cancer decreased 32% in Delaware males and decreased 24% in U.S. males.
 - Incidence rates for colorectal cancer decreased 28% in Delaware females and decreased 22% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 5-3: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

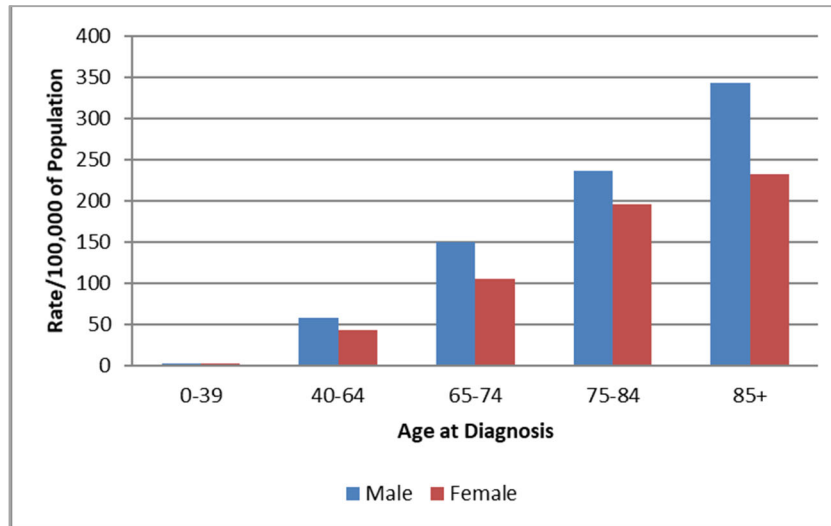


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for colorectal cancer decreased 32% in non-Hispanic Caucasian males and decreased 29% in non-Hispanic Caucasian females.
 - Incidence rates for colorectal cancer decreased 27% in non-Hispanic African American males and decreased 23% in non-Hispanic African American females.
 - Incidence rates for colorectal cancer decreased 6% in Hispanic males and decreased 2% in Hispanic females.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

**FIGURE 5-4: AGE-SPECIFIC COLORECTAL CANCER INCIDENCE RATES BY SEX;
DELAWARE, 2011-2015**



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The incidence rate for colorectal cancer was highest for both males and females 85 years of age and older.

**TABLE 5-3: AGE-SPECIFIC COLORECTAL CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY;
DELAWARE, 2011-2015**

Age at Diagnosis	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	58.3	63.6	---	43.7	51.1	---
65-74	148.2	176.2	---	100.2	124.8	---
75-84	233.9	296.9	---	194.3	212.3	---
85+	347.7	---	---	238.6	---	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The incidence rate for colorectal cancer was highest for both non-Hispanic Caucasian males and females 85 years of age and older. Due to small numbers, incidence rates could not be calculated for Hispanics or for some combinations of sex and age group for non-Hispanic Caucasians and non-Hispanic African Americans.

STAGE OF DIAGNOSIS - DELAWARE

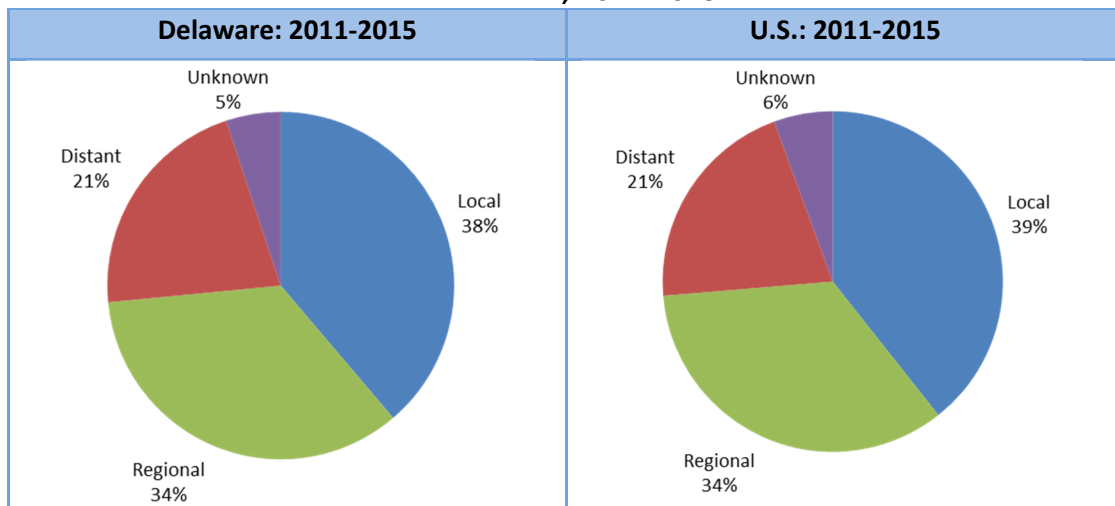
TABLE 5-4: NUMBER AND PERCENTAGE OF COLORECTAL CANCER CASES BY STAGE AT DIAGNOSIS BY SEX AND RACE/ETHNICITY, DELAWARE, 2011-2015

Stage at Diagnosis	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Local	830 (40)	422 (39)	408 (41)	637 (40)	322 (39)	315 (41)	152 (39)	77 (40)	75 (39)	27 (42)	14 (41)	13 (42)
Regional	716 (34)	386 (36)	330 (33)	559 (35)	305 (36)	254 (33)	125 (32)	66 (34)	59 (30)	24 (37)	12 (35)	12 (39)
Distant	438 (21)	238 (22)	200 (20)	327 (21)	179 (21)	148 (20)	92 (24)	45 (23)	47 (24)	---	---	---
Unknown	97 (5)	38 (4)	59 (6)	74 (5)	31 (4)	43 (6)	20 (5)	6 (3)	14 (7)	---	---	---
Total	2,081	1,084	997	1,597	837	760	389	194	195	65	34	31

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 830 (40%) colorectal cancers diagnosed at the local stage; 716 (34%) at the regional stage; 438 (21%) at the distant stage; and 97 (5%) had an unknown stage.
- Hispanics (42%) had a higher proportion of colorectal cancers diagnosed at the local stage compared to both non-Hispanic Caucasians (40%) and non-Hispanic African Americans (39%).
- Males (39%) had a lower proportion of colorectal cancers diagnosed at the local stage compared to females (41%).

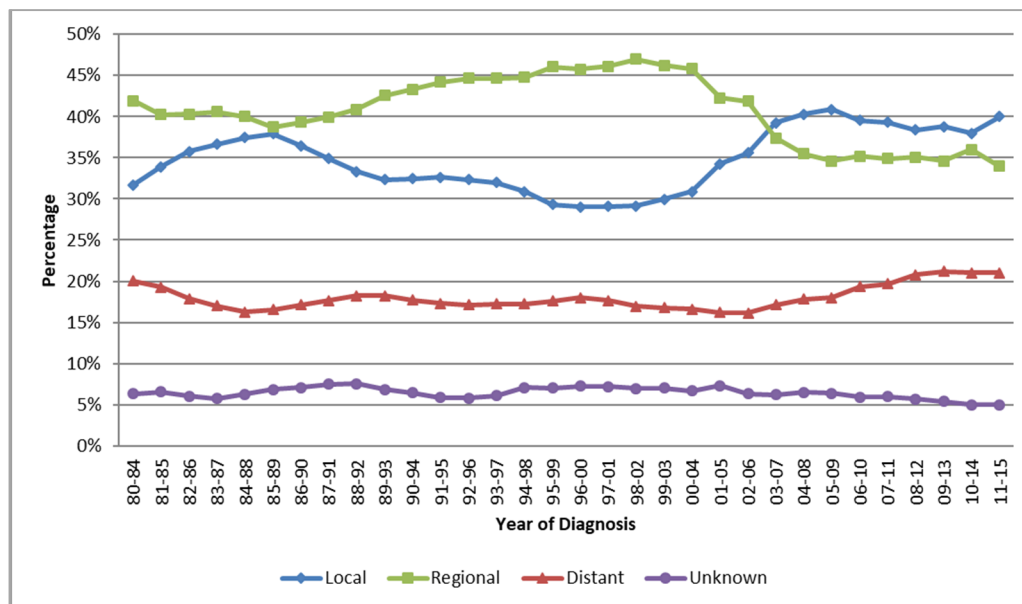
FIGURE 5-5: PERCENTAGE OF COLORECTAL CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

- In comparing U.S. and Delaware colorectal cancer data, percentages showing the stage of colorectal cancer at diagnosis are similar.

FIGURE 5-6: FIVE-YEAR PERCENTAGE OF STAGE OF DIAGNOSIS FOR COLORECTAL CANCER CASES, DELAWARE, 1980-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percentage of colorectal cancer cases diagnosed at the local stage increased from 32% to 40%.
 - Colorectal cancer cases diagnosed at the distant stage increased slightly, from 20% to 21%.

MORTALITY

For 2011-2015, Delaware ranked 41st in the U.S. for colorectal cancer mortality (41st in 2010-2014); males ranked 36th (32nd in 2010-2014) and females ranked 41st (47th in 2010-2014)⁹.

2011-2015 DATA

TABLE 5-5: NUMBER OF COLORECTAL CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	747	397	350	582	314	268	133	61	72	22	15	7
Kent	145	79	66	104	57	47	30	17	13	---	---	---
New Castle	404	205	199	300	156	144	86	35	51	10	---	---
Sussex	198	113	85	178	101	77	17	9	8	---	---	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Counts less than 6 are not shown to protect patient privacy.

- Colorectal cancer is the third most common cause of cancer death in the U.S. and Delaware.
- In 2011-2015, there were 747 deaths (8% of all cancer deaths) from colorectal cancer in Delaware.
- Males accounted for 53% of colorectal cancer deaths.
- Non-Hispanic Caucasians accounted for 78% of colorectal cancer deaths.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

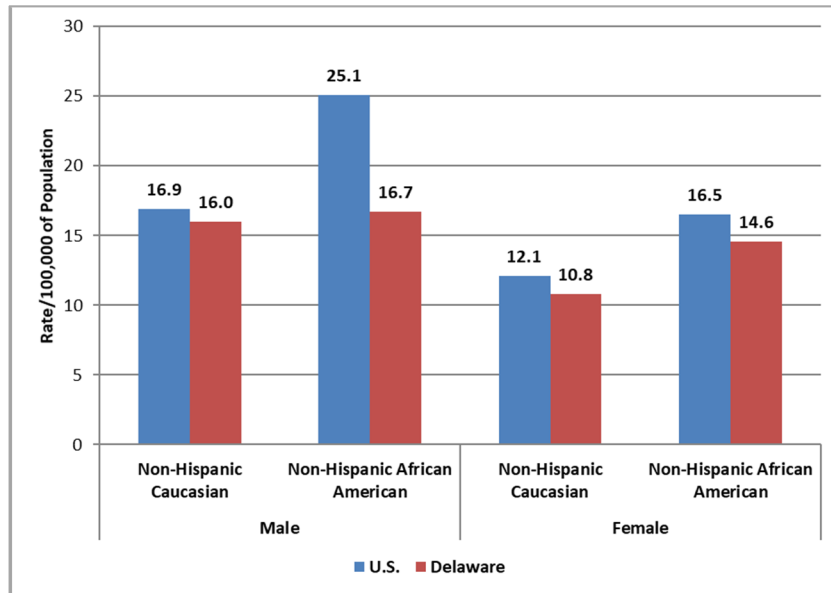
TABLE 5-6: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	14.5	17.3	12.2
Delaware	13.7	16.5	11.4
Kent	15.4	18.9	12.6
New Castle	13.8	16.3	11.9
Sussex	12.3	15.5	9.3

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.

Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 5-7: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.

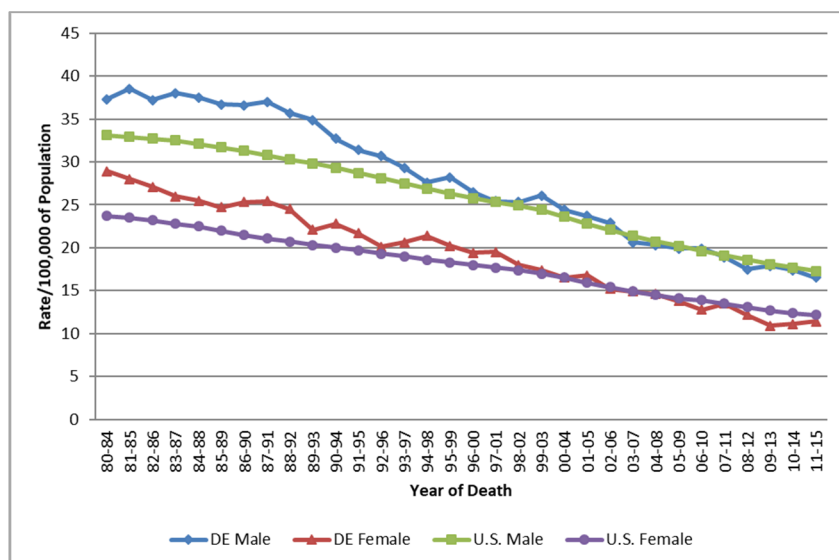
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (16.5 per 100,000) had a statistically significantly higher colorectal cancer mortality rate compared to females (11.4 per 100,000).
 - The difference in colorectal cancer mortality rates between non-Hispanic Caucasians (13.2 per 100,000) and non-Hispanic African Americans (15.5 per 100,000) was not statistically significant.
 - Colorectal cancer mortality rates for Hispanics could not be calculated due to the small number of deaths.
- Comparing Delaware and the U.S.
 - The difference in colorectal cancer mortality rates between Delaware (13.7 per 100,000) and the U.S. (14.5 per 100,000) was not statistically significant.
 - The difference in colorectal cancer mortality rates between males in Delaware (16.5 per 100,000) and the U.S. (17.3 per 100,000) was not statistically significant.
 - The difference in colorectal cancer mortality rates between females in Delaware (11.4 per 100,000) and the U.S. (12.2 per 100,000) was not statistically significant.

- The difference in colorectal cancer mortality rates between non-Hispanic Caucasians in Delaware (13.2 per 100,000) and the U.S (14.3 per 100,000) was not statistically significant.
- Non-Hispanic African Americans in Delaware (15.5 per 100,000) had a statistically significantly lower colorectal cancer mortality rate compared to non-Hispanic African Americans in the U.S. (20.0 per 100,000).

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 5-8: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER MORTALITY RATES BY SEX; U.S. AND DELAWARE, 1980-2015

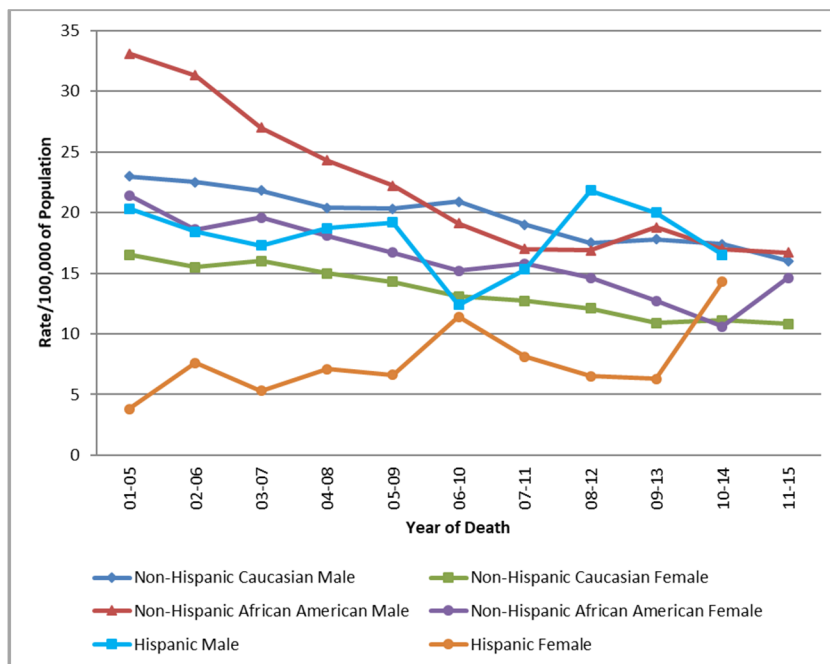


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for colorectal cancer decreased 31% in Delaware and decreased 23% in the U.S.
 - Mortality rates for colorectal cancer decreased 30% in Delaware males and decreased 24% in U.S. males.
 - Mortality rates for colorectal cancer decreased 32% in Delaware females and decreased 23% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 5-9: FIVE-YEAR AVERAGE AGE-ADJUSTED COLORECTAL CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

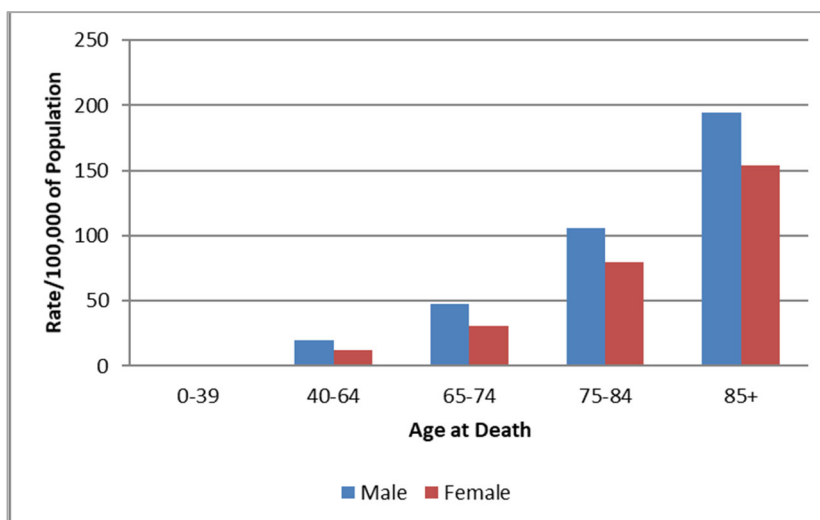


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Mortality rates for colorectal cancer decreased 30% in non-Hispanic Caucasian males and decreased 35% in non-Hispanic Caucasian females.
 - Mortality rates for colorectal cancer decreased 50% in non-Hispanic African American males and decreased 32% in non-Hispanic African American females.
 - Mortality rates for colorectal cancer in Hispanics could not be calculated due to the small number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

FIGURE 5-10: AGE-SPECIFIC COLORECTAL CANCER MORTALITY RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The mortality rate for colorectal cancer is highest for both males and females 85 years of age and older. Due to small numbers, mortality rates could not be calculated by sex for the 0-39 age group.

TABLE 5-7: AGE-SPECIFIC COLORECTAL CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Death	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	20.3	18.5	---	12.1	---	---
65-74	45.7	---	---	26.3	---	---
75-84	103.4	---	---	73.4	---	---
85+	191.4	---	---	154.2	---	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, Division of Public Health, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

- The mortality rate for colorectal cancer was highest for non-Hispanic Caucasian males and females in Delaware 85 years of age and older. Due to small numbers, mortality rates could not be calculated for Hispanics or for most sex and age combinations for non-Hispanic African Americans.

CHAPTER 6: LIVER AND INTRAHEPATIC BILE DUCT CANCER¹²

RISK FACTORS

The following are ***lifestyle risk factors*** that a person can modify to reduce their risk of getting liver cancer:

- Alcohol abuse leads to cirrhosis of the liver, which increases the risk of liver cancer.
- Overweight and obesity
- Tobacco use

The following are ***environmental and medically-related*** causes of liver cancer:

- Long-term exposure to aflatoxins (fungus that contaminates peanuts, wheat, soybeans, ground nuts, corn, and rice)
- Exposure to vinyl chloride and thorium dioxide
- Long-term anabolic steroid use
- Exposure to naturally occurring arsenic
- Infection with the parasite that causes schistosomiasis can cause liver damage leading to liver cancer.

The following are ***non-modifiable*** risk factors (these cannot be changed) for getting liver cancer:

- The risk of liver cancer is higher in males compared to females
- Asian Americans and Pacific Islanders are at increased risk compared to other racial/ethnic groups
- Chronic viral hepatitis (hepatitis B or hepatitis C)
- Cirrhosis of the liver
- Type 2 diabetes is linked with increased liver cancer risk, particularly in individuals with other risk factors (heavy alcohol use, chronic viral hepatitis)
- Certain rare diseases (Tyrosinemia, Wilson disease, Alpha-1 Antitrypsin Deficiency, porphyria cutanea tarda, glycogen storage diseases)

To protect against liver cancer, individuals should eat a healthy diet (high in fruits, vegetables and whole grains), avoid tobacco, limit alcohol use (two drinks a day for males and one drink a day for females), be physically active, practice proper storage of grains (especially in warm climates), receive vaccinations for hepatitis B, and receive drug treatment for hepatitis B and hepatitis C.

EARLY DETECTION

Individuals at increased risk (those with cirrhosis and chronic hepatitis infections) should be screened by their health care providers.

¹² "Liver cancer" is used instead of "liver and intrahepatic bile duct cancer" throughout this chapter.

INCIDENCE

For 2011-2015, Delaware ranked 10th in the U.S. for liver cancer incidence (6th in 2010-2014); males ranked 8th (6th in 2010-2014) and females ranked 15th (19th in 2010-2014)⁹.

2011-2015 DATA

TABLE 6-1: NUMBER OF LIVER CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	506	376	130	347	258	89	121	87	34	22	---	---
Kent	98	74	24	68	51	17	20	---	---	---	---	---
New Castle	271	197	74	162	118	44	87	61	26	12	---	---
Sussex	137	105	32	117	89	28	14	---	--	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, 506 liver cancer cases (2% of all cancer cases) were diagnosed in Delaware.
- Males accounted for 74% of liver cancer cases.
- Non-Hispanic Caucasians accounted for 69% of liver cancer cases.

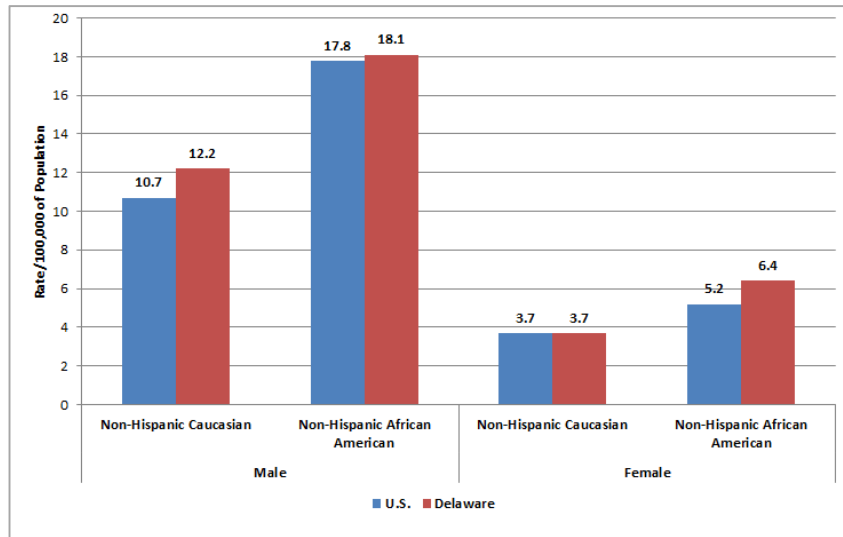
TABLE 6-2: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	8.8	13.6	4.7
Delaware	8.4	13.5	4.1
Kent	9.7	15.6	---
New Castle	8.2	12.9	4.2
Sussex	8.2	13.2	3.8

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

FIGURE 6-1: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015

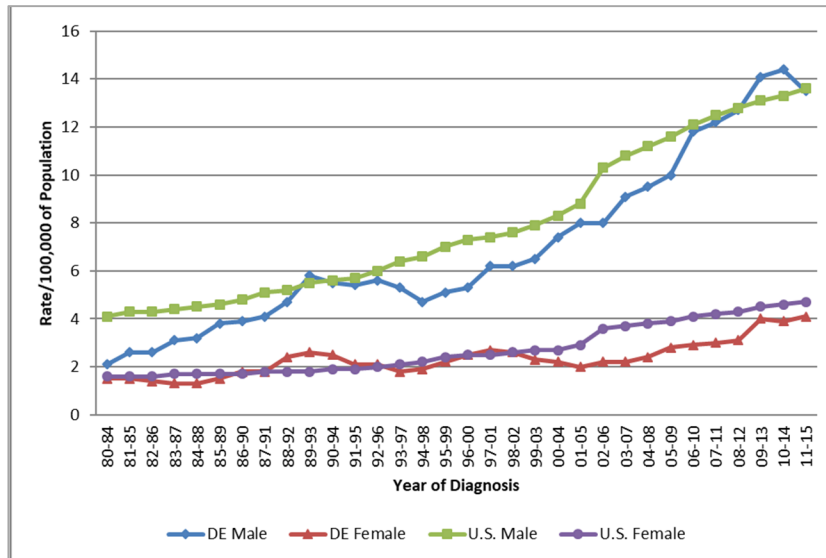


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (13.5 per 100,000) had a statistically significantly higher liver cancer incidence rate compared to females (4.1 per 100,000).
 - Non-Hispanic Caucasians (7.6 per 100,000) had a statistically significantly lower liver cancer incidence rate compared to non-Hispanic African Americans (11.5 per 100,000).
 - Liver cancer incidence rates for Hispanics could not be calculated due to a small of cases.
- Comparing Delaware and the U.S.
 - The difference in liver cancer incidence rates between Delaware (8.4 per 100,000) and the U.S. (8.8 per 100,000) was not statistically significant.
 - The difference in liver cancer incidence rates between males in Delaware (13.5 per 100,000) and the U.S. (13.6 per 100,000) was not statistically significant.
 - The difference in liver cancer incidence rates between females in Delaware (4.1 per 100,000) and the U.S. (4.7 per 100,000) was not statistically significant.
 - The difference in the liver cancer incidence rates between non-Hispanic Caucasians in Delaware (7.6 per 100,000) and the U.S. (7.0 per 100,000) was not statistically significant.
 - The difference in the liver cancer incidence rates between non-Hispanic African Americans in Delaware (11.5 per 100,000) and the U.S. (10.8 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 6-2: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER INCIDENCE RATES BY SEX; U.S. AND DELAWARE, 1980-2015

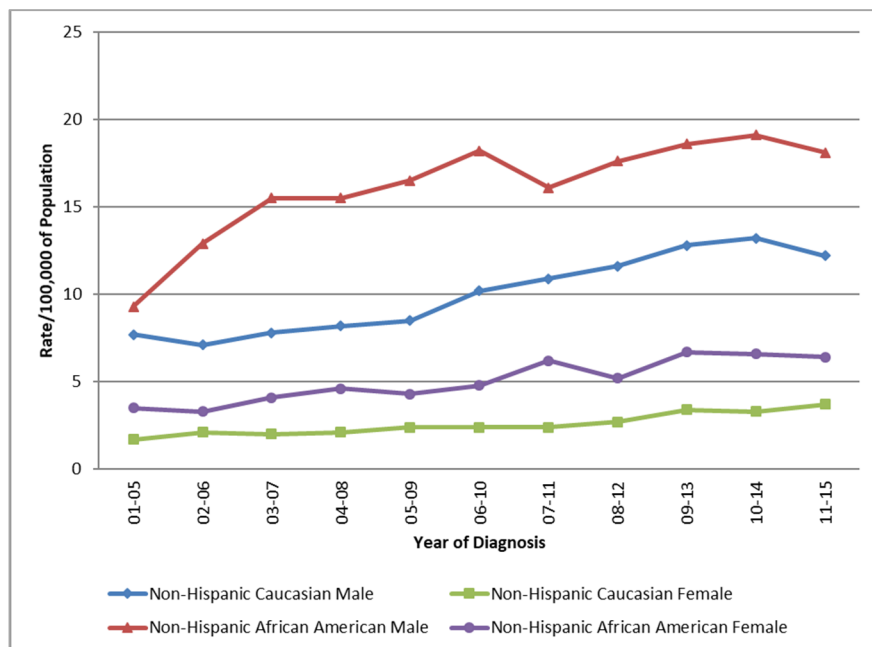


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for liver cancer increased 75% in Delaware and increased 57% in the U.S.
 - Incidence rates for liver cancer increased 69% in Delaware males and increased 55% in U.S. males.
 - Incidence rates for liver cancer increased 105% in Delaware females and increased 62% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 6-3: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

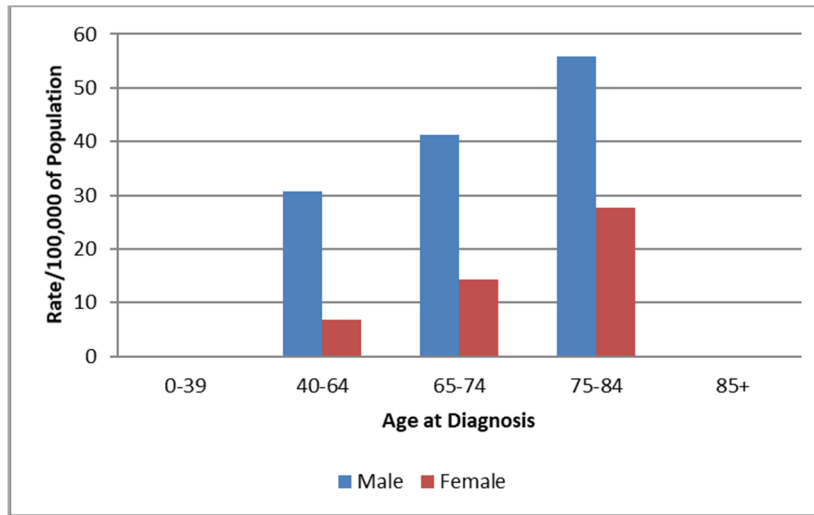


Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for liver cancer increased 58% in non-Hispanic Caucasian males and increased 118% in non-Hispanic Caucasian females.
 - Incidence rates for liver cancer increased 95% in non-Hispanic African American males and increased 83% in non-Hispanic African American females.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

FIGURE 6-4: AGE-SPECIFIC LIVER CANCER INCIDENCE RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The incidence rate for liver cancer was highest for males and females 75-84 years of age, based on the rates that could be calculated. Due to small numbers, incidence rates could not be calculated by sex for the age groups 0-39 and 85+.

TABLE 6-3: AGE-SPECIFIC LIVER CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	28.9	43.8	---	6.2	---	---
65-74	33.3	---	---	---	---	---
75-84	55.4	---	---	---	---	---
85+	---	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The incidence rate for liver cancer was highest for non-Hispanic Caucasians 75-84 years of age, based on the rates that could be calculated.

STAGE OF DIAGNOSIS - DELAWARE

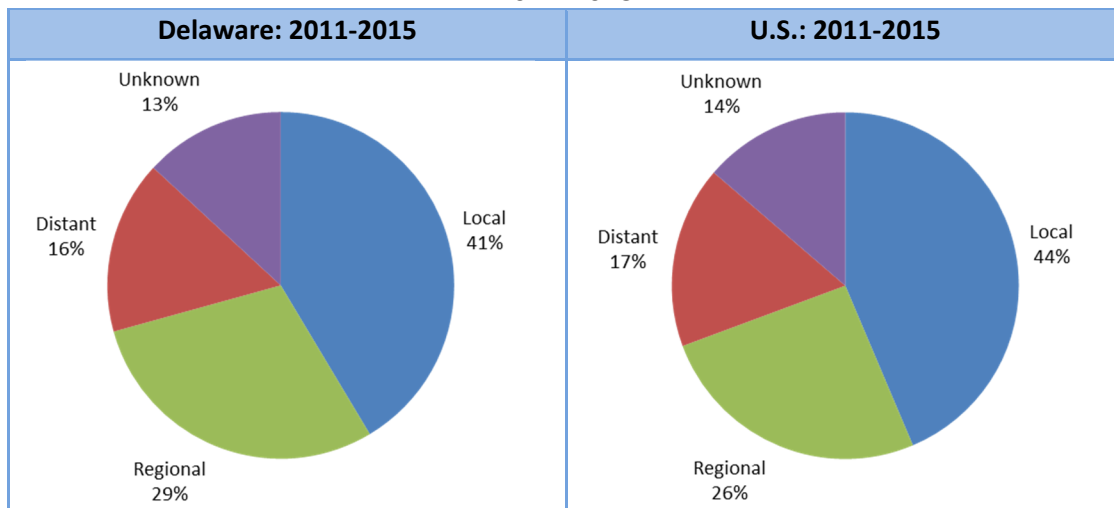
TABLE 6-4: NUMBER AND PERCENTAGE OF LIVER CANCER CASES BY STAGE AT DIAGNOSIS BY SEX AND RACE/ETHNICITY, DELAWARE, 2011-2015

Stage at Diagnosis	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Local	209 (41)	153 (41)	56 (43)	148 (43)	110 (43)	38 (42)	40 (33)	26 (30)	14 (41)	14 (64)	---	---
Regional	149 (29)	115 (31)	34 (26)	103 (30)	79 (31)	24 (27)	37 (31)	28 (32)	9 (27)	---	---	---
Distant	83 (16)	59 (16)	24 (18)	58 (17)	39 (15)	19 (21)	20 (17)	---	---	---	---	---
Unknown	66 (13)	49 (13)	17 (13)	39 (11)	30 (12)	9 (10)	24 (20)	---	---	---	---	---
Total	507	376	131	348	258	90	121	87	34	22	19	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- In 2011-2015, there were 209 (41%) liver cancers diagnosed at the local stage; 149 (29%) at the regional stage; 83 (16%) at the distant stage; and 66 (13%) had an unknown stage.
- Hispanics (64%) had a higher proportion of liver cancers diagnosed at the local stage compared to both non-Hispanic Caucasians (43%) and non-Hispanic African Americans (33%).
- Females (43%) had a higher proportion of liver cancers diagnosed at the local stage compared to males (41%).

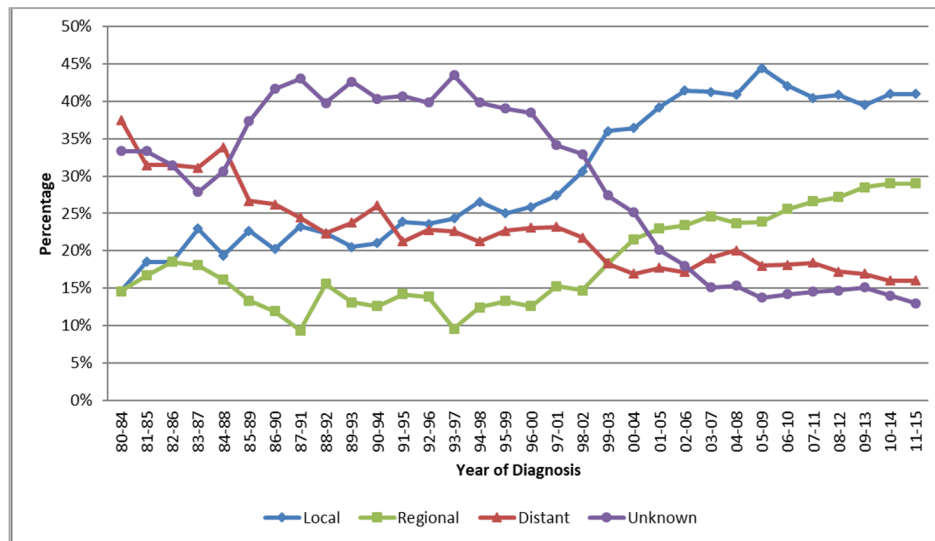
FIGURE 6-5: PERCENTAGE OF LIVER CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

- In comparing U.S. and Delaware liver cancer data, Delaware (29%) had a higher proportion of liver cancer diagnosed at the regional stage compared to the U.S. (26%).

FIGURE 6-6: FIVE-YEAR PERCENTAGE OF STAGE OF DIAGNOSIS FOR LIVER CANCER CASES, DELAWARE, 1980-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percentage of liver cancer cases diagnosed at the local stage increased from 15% to 41%.
 - Liver cancer cases diagnosed at the distant stage decreased from 38% to 16%.

MORTALITY

For 2011-2015, Delaware ranked 19th in the U.S. for liver cancer mortality (11th in 2010-2014); males ranked 14th (10th in 2010-2014) and females ranked 26th (17th in 2010-2014)⁹

2011-2015 DATA

TABLE 6-5: NUMBER OF LIVER CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	374	262	112	260	183	77	92	61	31	13	---	---
Kent	65	41	24	44	28	16	15	10	---	---	---	---
New Castle	216	152	64	134	95	39	68	44	24	9	---	---
Sussex	93	69	24	82	60	22	9	7	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 374 deaths (4% of all cancer deaths) from liver cancer in Delaware.
- Males accounted for 70% of liver cancer deaths.
- Non-Hispanic Caucasians accounted for 70% of liver cancer deaths.

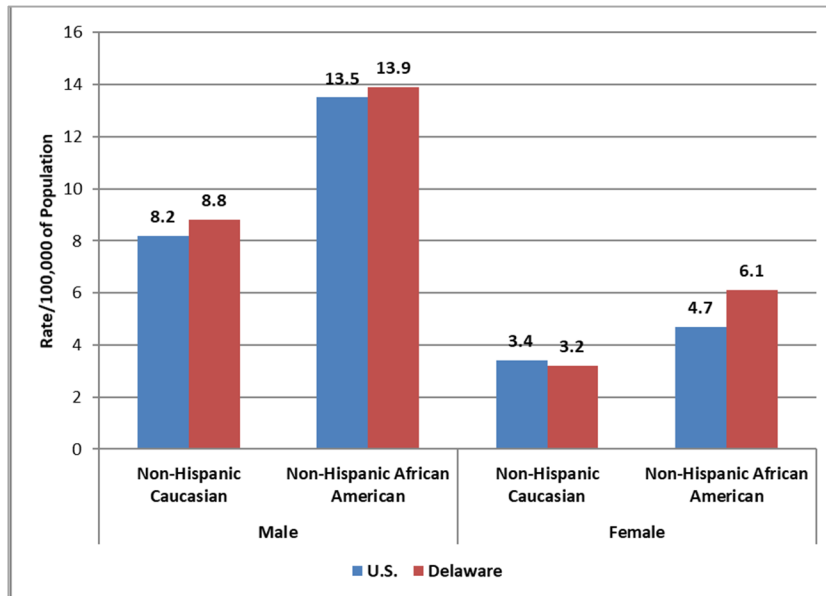
⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

TABLE 6-6: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	6.4	9.4	3.8
Delaware	6.5	10.0	3.6
Kent	6.7	9.2	---
New Castle	7.1	11.2	3.8
Sussex	5.4	8.5	---

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 6-7: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



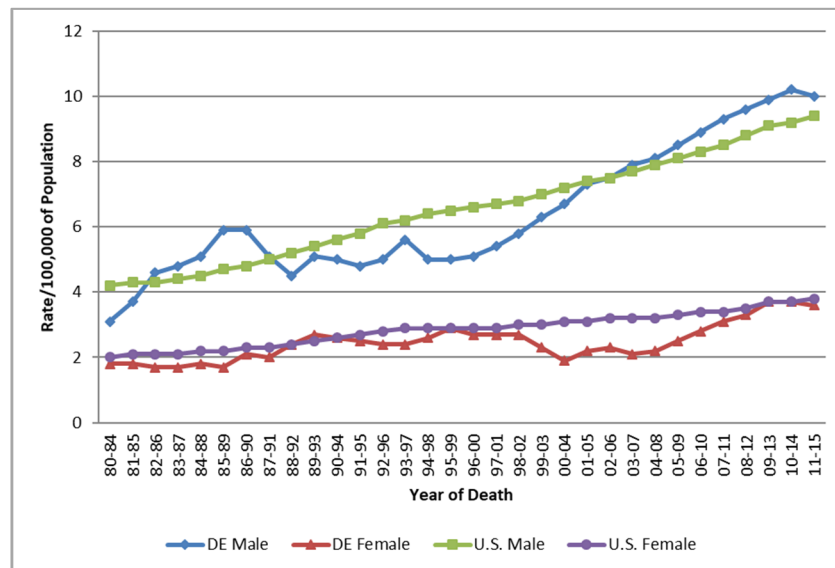
Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, 2017.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (10.0 per 100,000) had a statistically significantly higher liver cancer mortality rate compared to females (3.6 per 100,000).
 - Non-Hispanic Caucasian males (8.8 per 100,000) had a statistically significantly lower liver cancer mortality rate compared to non-Hispanic African American males (13.9 per 100,000).
 - Liver cancer mortality rates for Hispanics could not be calculated due to the small number of deaths.
- Comparing Delaware and the U.S.
 - The difference in liver cancer mortality rates between Delaware (6.5 per 100,000) and the U.S. (6.4 per 100,000) was not statistically significant.
 - The difference in liver cancer mortality rates between males in Delaware (10.0 per 100,000) and the U.S. (9.4 per 100,000) was not statistically significant.
 - There was no meaningful difference in liver cancer mortality rates between females in Delaware (3.6 per 100,000) and females in the U.S. (3.8 per 100,000).

- The difference in liver cancer mortality rates between non-Hispanic Caucasians in Delaware (5.7 per 100,000) and the U.S (5.6 per 100,000) was not statistically significant.
- The difference in liver cancer mortality rates between non-Hispanic African Americans in Delaware (9.5 per 100,000) and the U.S (8.5 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 6-8: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER MORTALITY RATES BY SEX; U.S. AND DELAWARE, 1980-2015

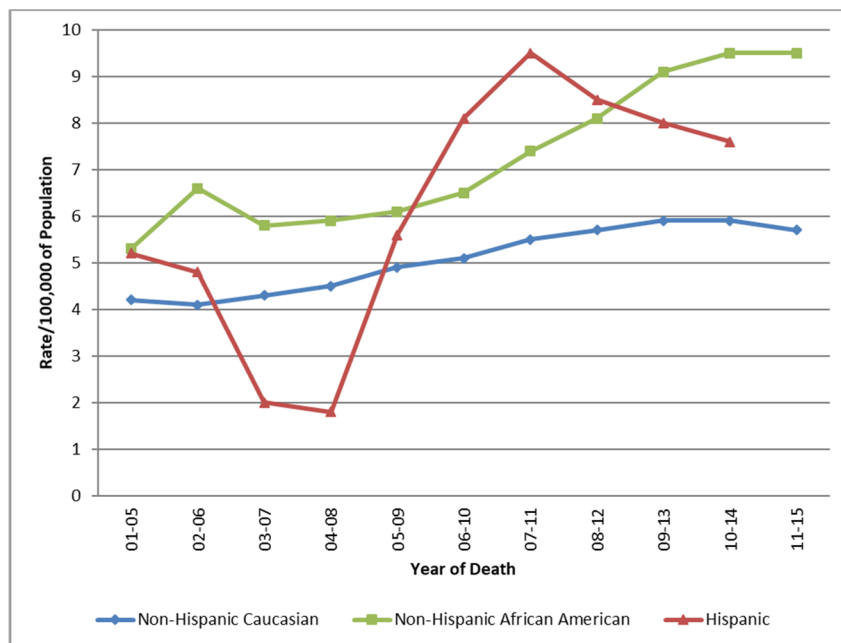


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for liver cancer increased 44% in Delaware and increased 28% in the U.S.
 - Mortality rates for liver cancer increased 37% in Delaware males and increased 27% in U.S. males.
 - Mortality rates for liver cancer increased 64% in Delaware females and increased 23% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 6-9: FIVE-YEAR AVERAGE AGE-ADJUSTED LIVER CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2001-2015

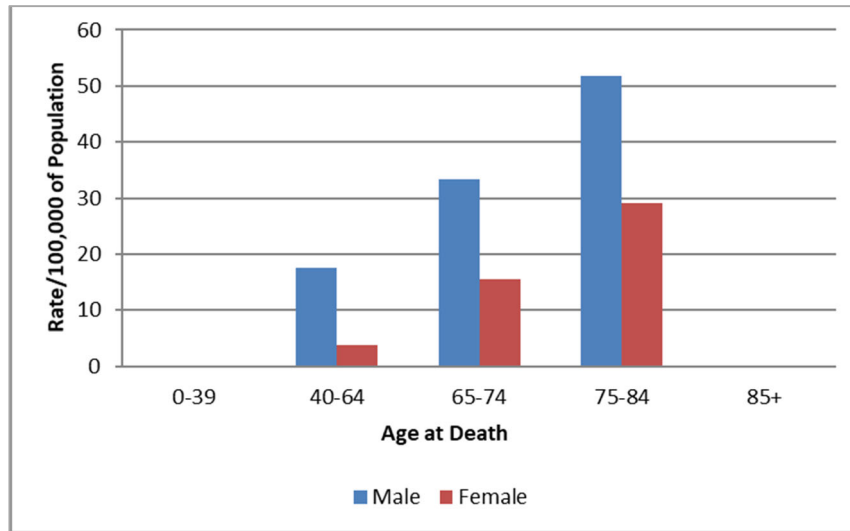


Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Mortality rates for liver cancer increased 36% in non-Hispanic Caucasians.
 - Mortality rates for liver cancer increased 79% in non-Hispanic African Americans.
 - Mortality rates for liver cancer in Hispanics could not be calculated due to the small number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

**FIGURE 6-10: AGE-SPECIFIC LIVER CANCER MORTALITY RATES BY SEX;
DELAWARE, 2011-2015**



Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The mortality rate for liver cancer is highest for both males and females 75-84 years of age, based on the rates that could be calculated. Due to small numbers, mortality rates could not be calculated by sex for the 0-39 and 85+ age groups.

**TABLE 6-7: AGE-SPECIFIC LIVER CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY;
DELAWARE, 2011-2015**

Age at Death	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	15.3	25.3	---	---	---	---
65-74	27.8	---	---	---	---	---
75-84	49.2	---	---	---	---	---
85+	---	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The mortality rate for liver cancer was highest for non-Hispanic Caucasian males 75-84 years of age. Due to small numbers, mortality rates could not be calculated for females, Hispanics, or for most sex and age combinations for non-Hispanic African Americans.

CHAPTER 7: LUNG AND BRONCHUS CANCER¹³

RISK FACTORS

The following are ***lifestyle risk factors*** that a person can modify to reduce their risk of getting lung cancer:

- The use of tobacco products. An estimated 85 to 90 percent of all lung cancer cases are caused by tobacco use, according to the U.S. Department of Health and Human Services.
- Exposure to secondhand smoke. When a person breathes in secondhand smoke, it is like he or she is smoking.
- Other suspected lifestyle risk factors include a diet low in fruits and vegetables, a diet high in cholesterol, heavy alcohol use, and smoking marijuana.

The following are ***environmental and medically-related causes*** of lung cancer:

- Occupational exposures: asbestos, mustard gas, radioactive ores, metals (chromium, cadmium, arsenic), certain organic chemicals, paint
- Environmental exposures: radon gas released from soil or building materials, asbestos (among smokers), air pollution, high levels of arsenic in drinking water
- Radiation therapy to the chest (especially for people who smoke)

The following are ***non-modifiable risk factors*** (these cannot be changed) for getting lung cancer:

- Family history of lung cancer
- Personal history of tuberculosis

To protect against lung cancer, individuals should avoid tobacco and secondhand smoke, consume a diet rich in fruits and vegetables, engage in recommended levels of physical activity, and maintain a healthy weight.

EARLY DETECTION

In January 2013, the American Cancer Society (ACS) published new lung cancer screening guidelines¹⁴ recommending that doctors discuss screening options with patients who meet certain criteria for high risk of developing the disease. High-risk patients are defined as those who:

- Are 55 -74 years of age and in fairly good health
- Have a smoking history equivalent to a pack a day for 30 years or longer
- Currently smoke or have quit within the past 15 years

If a high-risk individual decides to be screened for lung cancer, the ACS recommends that the testing be performed using a low-dose computed tomography (CT) scan and takes place at a facility with experience in lung cancer screening. The guidelines emphasize that screening is not a substitute for quitting smoking.

CURRENT TRENDS IN SMOKING IN DELAWARE

The BRFSS collects data annually on tobacco use among the Delaware population. Current smoking trends may be predictive of cancer rates in the 2030s. In the 1980s (i.e., the time period relevant to current lung cancer rates in terms of tobacco use behaviors), Delaware's smoking prevalence rates were among the highest in the country. Historical BRFSS data show that in 1982, 30% of adult Delawareans smoked cigarettes. By the 1990s, Delaware's smoking rate among adults had declined to approximately 25%.

¹³ "Lung cancer" is used instead of "lung and bronchus cancer" throughout this section.

¹⁴ Wender, R., Fontham, E. T., Barrera, E., Jr, Colditz, G. A., Church, T. R., Ettinger, D. S., ... Smith, R. A. (2013). American Cancer Society lung cancer screening guidelines. *CA: a cancer journal for clinicians*, 63(2), 107–117. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3632634/>

In recent years, tobacco use prevalence has leveled off among adult Delawareans, while continuing to decline among high school students. In 2017, 17% of adult Delawareans smoked cigarettes regularly. The following are some highlights of smoking trends in Delaware:

- The prevalence rate for current smokers in Delaware (17%) is the same as the 2017 U.S. median prevalence of 17%.
- There is no statistically significant difference in current smoking prevalence between males and females.
- There were no differences in current smoking prevalence between non-Hispanic Caucasians and non-Hispanic African Americans.
- When smoking prevalence rates were stratified by age group, Delawareans 25-34 years of age reported the highest prevalence of current smoking (26%). This prevalence was statistically significantly higher compared to that for Delawareans 65 years of age and older.
- Current smoking prevalence changed with education level. In Delaware, 28% of residents who did not complete their high school education said they were current smokers. As education level increased, smoking prevalence decreased. Of adults who reported currently smoking, 21% had a high school diploma or equivalent, 19% had some post-high school education, and 6% had completed college.
- Current smoking prevalence also decreased with higher income levels. In Delaware, 32% of those earning less than \$15,000 were current smokers. The lowest smoking prevalence was among those who earned \$75,000 or more per year (11%).

INCIDENCE

For 2011-2015, Delaware ranked 9th in the U.S. for lung cancer incidence (10th in 2010-2014); males ranked 15th (16th in 2010-2014) and females ranked 7th (7th in 2010-2014)⁹.

2011-2015 DATA

TABLE 7-1: NUMBER OF LUNG CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	4,117	2,135	1,982	3,394	1,764	1,630	602	307	295	60	30	30
Kent	798	402	396	646	329	317	125	60	65	12	---	---
New Castle	2000	1015	985	1562	797	765	376	185	191	37	17	20
Sussex	1319	718	601	1186	638	548	101	62	39	11	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Counts less than 6 are not shown to protect patient privacy.

- Lung cancer is the most frequently diagnosed cancer in the U.S. and Delaware of cancers that affect both men and women.
- In 2011-2015, 4,117 lung cancer cases (15% of all cancer cases) were diagnosed in Delaware.
- Males accounted for 52% of lung cancer cases.
- Non-Hispanic Caucasians accounted for 82% of lung cancer cases.

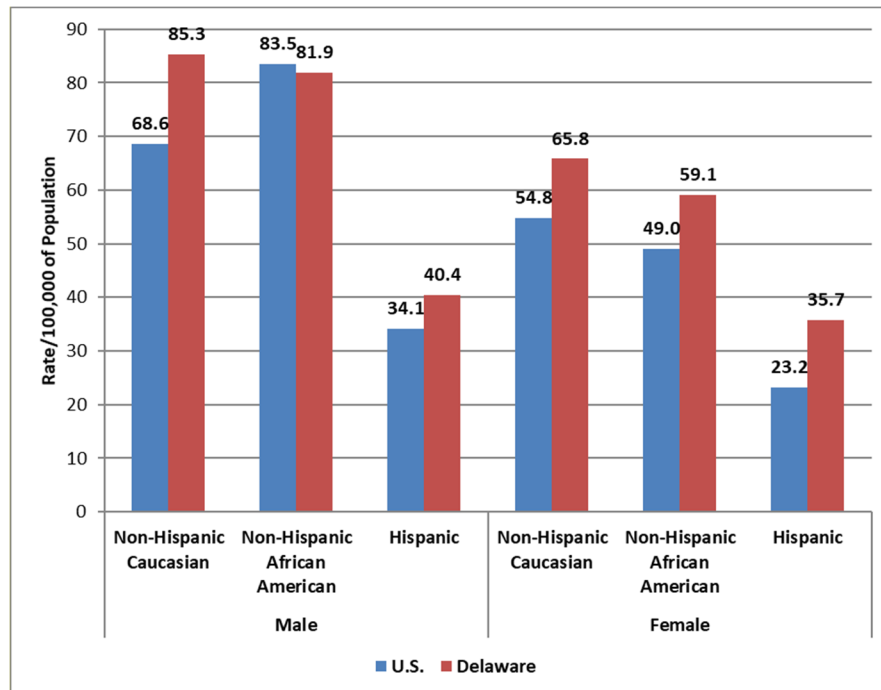
⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

TABLE 7-2: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	54.6	63.8	47.8
Delaware	71.3	82.9	62.8
Kent	80.1	91.4	72.6
New Castle	66.3	76.7	58.9
Sussex	75.7	88.9	65.0

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 7-1: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



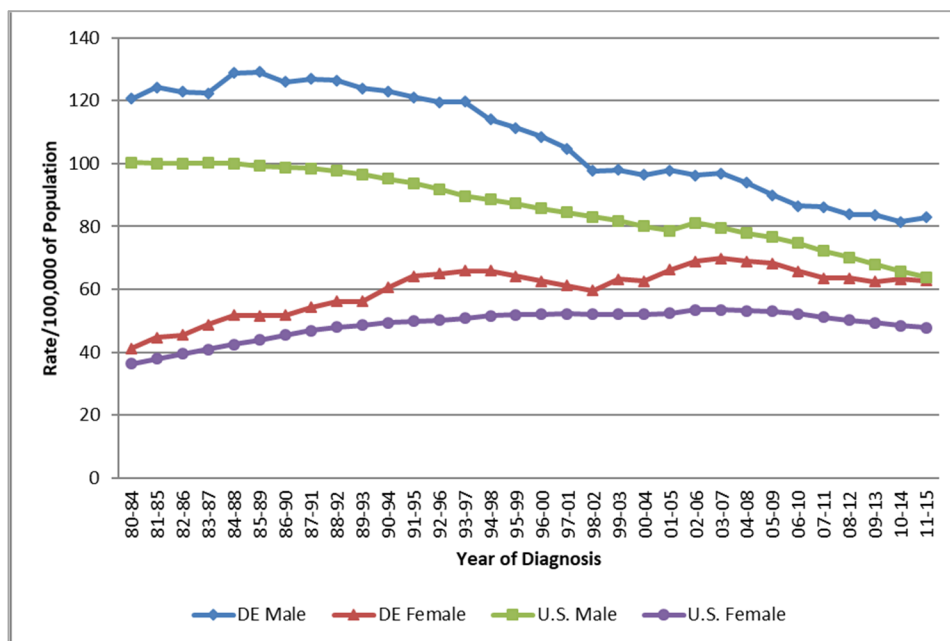
Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (82.9 per 100,000) had a statistically significantly higher lung cancer incidence rate compared to females (62.8 per 100,000).
 - Hispanics (37.7 per 100,000) had a statistically significantly lower lung cancer incidence rate compared to both non-Hispanic Caucasians (74.1 per 100,000) and non-Hispanic African Americans (68.5 per 100,000).
 - The difference in lung cancer incidence rates between non-Hispanic Caucasians (74.1 per 100,000) and non-Hispanic African Americans (68.5 per 100,000) was not statistically significant.

- Comparing Delaware and the U.S.
 - Delaware (71.3 per 100,000) had a statistically significantly higher lung cancer incidence rate compared to the U.S. (54.6 per 100,000).
 - Delaware males (82.9 per 100,000) had a statistically significantly higher lung cancer incidence rate compared to U.S. males (63.8 per 100,000).
 - Delaware females (62.8 per 100,000) had a statistically significantly higher lung cancer incidence rate compared to U.S. females (47.8 per 100,000).
 - Non-Hispanic Caucasians in Delaware (74.1 per 100,000) had a statistically significantly higher lung cancer incidence rate compared to non-Hispanic Caucasians in the U.S. (60.7 per 100,000).
 - The difference in lung cancer incidence rates between non-Hispanic African Americans in Delaware (68.5 per 100,000) and the U.S. (63.0 per 100,000) was not statistically significant.
 - The difference in lung cancer incidence rates between Hispanics in Delaware (37.7 per 100,000) and the U.S. (27.8 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 7-2: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER INCIDENCE RATES BY SEX; U.S. AND DELAWARE, 1980-2015

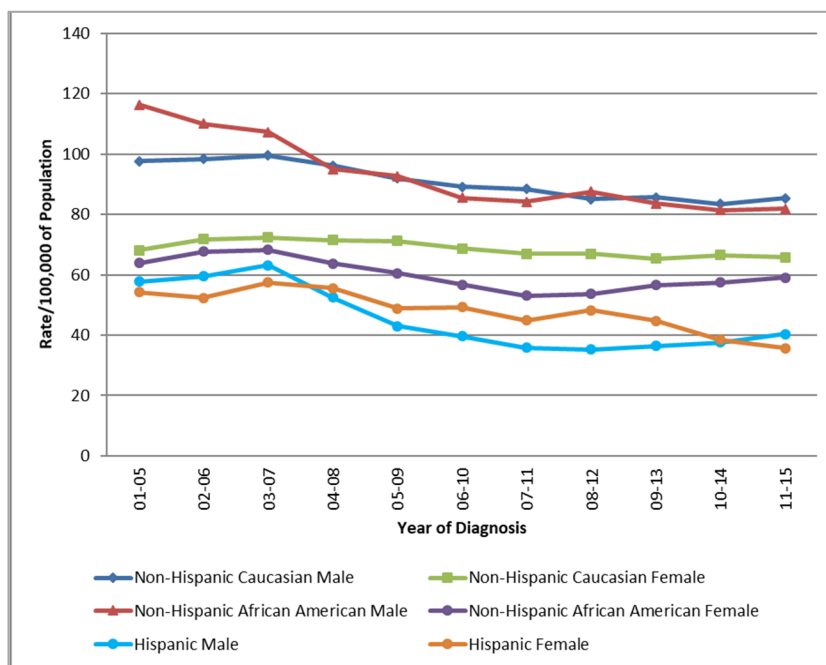


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for lung cancer decreased 10% in Delaware and decreased 14% in the U.S.
 - Incidence rates for lung cancer decreased 15% in Delaware males and decreased 19% in U.S. males.
 - Incidence rates for lung cancer increased 5% in Delaware females and decreased 9% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 7-3: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

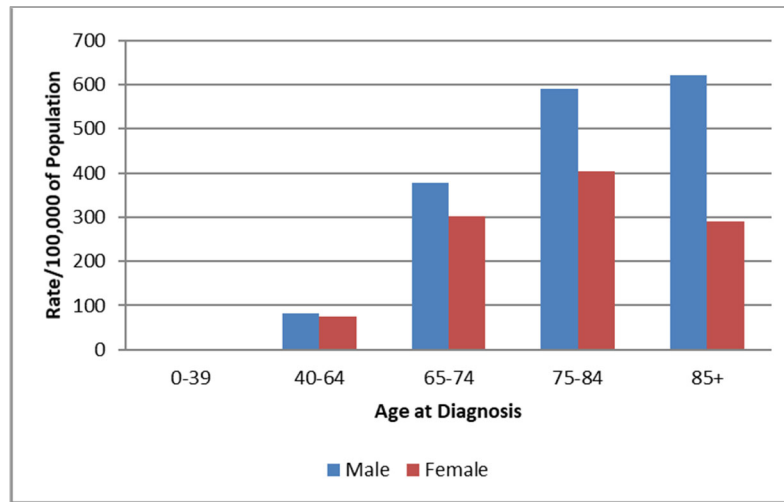


Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for lung cancer decreased 13% in non-Hispanic Caucasian males and decreased 3% in non-Hispanic Caucasian females.
 - Incidence rates for lung cancer decreased 30% in non-Hispanic African American males and decreased 8% in non-Hispanic African American females.
 - Incidence rates for lung cancer decreased 30% in Hispanic males and decreased 34% in Hispanic females.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

FIGURE 7-4: AGE-SPECIFIC LUNG CANCER INCIDENCE RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The incidence rate for lung cancer was highest for males 85 years of age and older and for females 75-84 years of age. Due to small numbers, incidence rates could not be calculated by sex for the 0-39 age group.

TABLE 7-3: AGE-SPECIFIC LUNG CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	89.3	84.8	---	85.0	63.4	---
65-74	392.7	370.8	---	326.9	226.9	---
75-84	605.7	575.9	---	410.4	430.4	---
85+	636.8	---	---	285.9	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

- The incidence rate for lung cancer was highest for non-Hispanic African American males 75-84 years of age (based on the rates that could be calculated) and for non-Hispanic Caucasian males 85 years of age and older.
- The incidence rate for lung cancer was highest for non-Hispanic Caucasian and non-Hispanic African American females 75-84 years of age (based on the rates that could be calculated).

STAGE OF DIAGNOSIS - DELAWARE

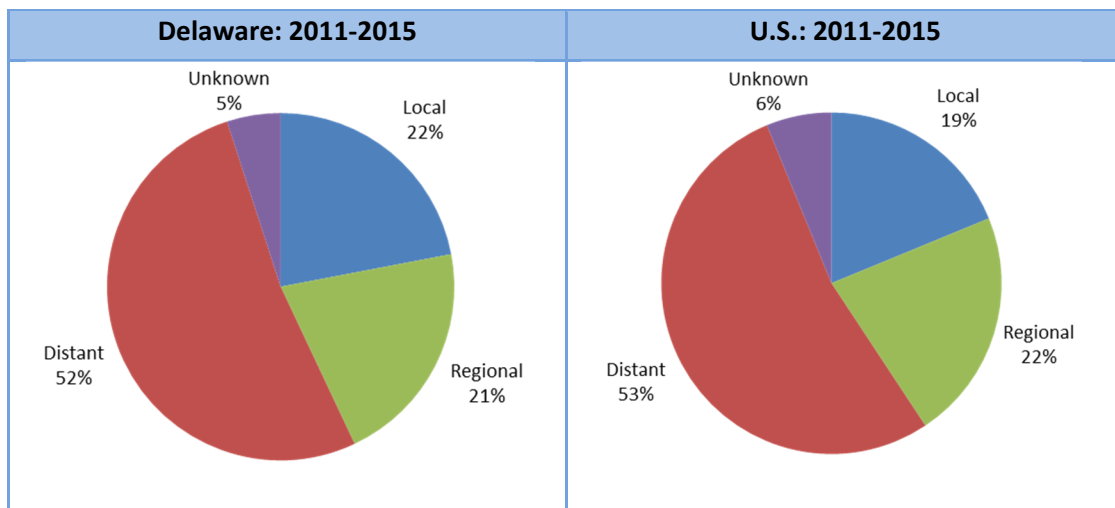
TABLE 7-4: NUMBER AND PERCENTAGE OF LUNG CANCER CASES BY STAGE AT DIAGNOSIS BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Stage at Diagnosis	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Local	921 (22)	435 (20)	486 (25)	752 (22)	347 (20)	405 (25)	135 (22)	66 (22)	69 (23)	15 (25)	8 (27)	7 (23)
Regional	866 (21)	441 (21)	425 (21)	710 (21)	365 (21)	345 (21)	130 (22)	64 (21)	66 (22)	---	---	---
Distant	2,119 (52)	1,141 (53)	978 (49)	1,761 (52)	956 (54)	805 (49)	309 (51)	160 (52)	149 (51)	27 (45)	16 (53)	11 (37)
Unknown	211 (5)	118 (6)	93 (5)	171 (5)	96 (5)	75 (5)	28 (5)	17 (6)	11 (4)	---	---	---
Total	4,117	2,135	1,982	3,394	1,764	1,630	602	307	295	60	30	30

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 921 (22%) lung cancers diagnosed at the local stage; 866 (21%) at the regional stage; 2,119 (52%) at the distant stage; and 211 (5%) with an unknown stage.
- Non-Hispanic Caucasians (52%) had a slightly higher proportion of lung cancers diagnosed at the distant stage compared to both non-Hispanic African Americans (51%) and Hispanics (45%).
- Males (53%) had a higher proportion of lung cancers diagnosed at the distant stage compared to females (49%).

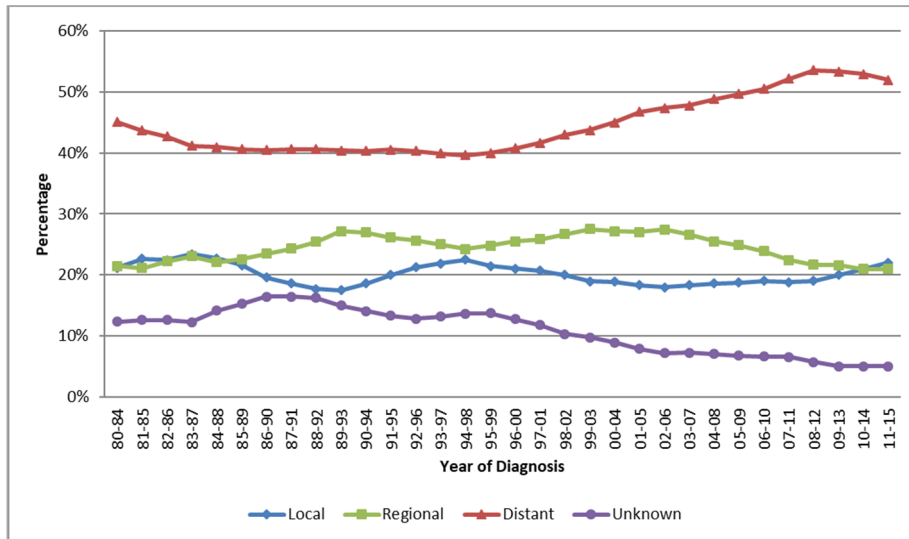
Figure 7-5: PERCENTAGE OF LUNG CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

- In comparing U.S. and Delaware lung cancer data, percentages of the stage at diagnosis for lung cancer are similar, with Delaware having slightly more lung cancers diagnosed at the local stage.

FIGURE 7-6: FIVE-YEAR PERCENTAGE OF LUNG CANCER CASES BY STAGE AT DIAGNOSIS, DELAWARE, 1980-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percent of lung cancer cases diagnosed at the local stage slightly increased from 21% to 22%.
 - Lung cancer cases diagnosed at the distant stage increased from 45% to 52%.

MORTALITY

For 2011-2015, Delaware ranked 14th in the U.S. for lung cancer mortality (13th in 2010-2014); males ranked 16th (16th in 2010-2014) and females ranked 11th (10th in 2010-2014)⁹.

2011-2015 DATA

TABLE 7-5: NUMBER OF LUNG CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	2,802	1,498	1,304	2,324	1,249	1,075	406	216	190	35	19	16
Kent	514	276	238	422	232	190	75	35	40	---	---	---
New Castle	1,402	723	679	1,112	578	534	252	130	122	25	11	14
Sussex	886	499	387	790	439	351	79	51	28	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Counts less than 6 are not shown to protect patient privacy.

- Lung cancer is the most common cause of cancer death in the U.S. and Delaware.
- In 2011-2015, there were 2,802 deaths (29% of all cancer deaths) from lung cancer in Delaware.
- Males accounted for 53% of lung cancer deaths.
- Non-Hispanic Caucasians accounted for 83% of lung cancer deaths.

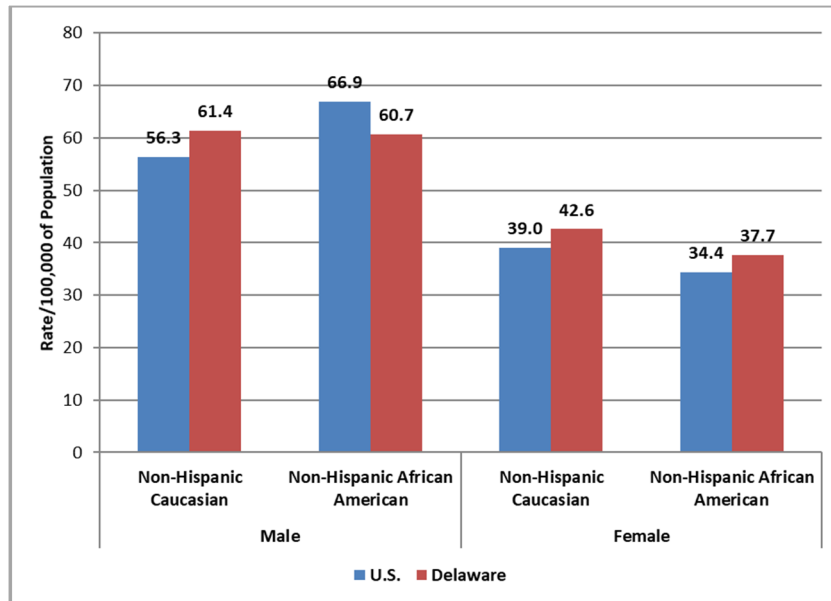
9 U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

TABLE 7-6: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	43.4	53.8	35.4
Delaware	50.0	60.8	42.0
Kent	53.0	64.7	44.3
New Castle	48.3	57.8	41.5
Sussex	51.3	63.0	41.7

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 7-7: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



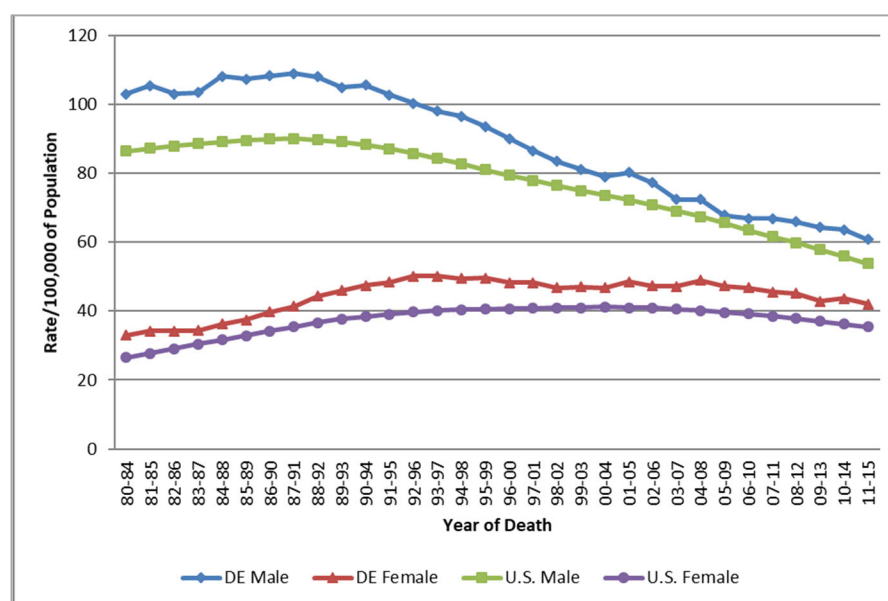
Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (60.8 per 100,000) had a statistically significantly higher lung cancer mortality rate compared to females (42.0 per 100,000).
 - Hispanics (21.6 per 100,000) had a statistically significantly lower lung cancer mortality rate compared to both non-Hispanic Caucasians (50.7 per 100,000) and non-Hispanic African Americans (46.8 per 100,000).
 - The difference in lung cancer mortality rates between non-Hispanic Caucasians and non-Hispanic African Americans was not statistically significant.
- Comparing Delaware and the U.S.
 - Delaware (50.0 per 100,000) had a statistically significantly higher lung cancer mortality rate compared to the U.S. (43.4 per 100,000).
 - Delaware males (60.8 per 100,000) had a statistically significantly higher lung cancer mortality rate compared to U.S. males (53.8 per 100,000).

- Delaware females (42.0 per 100,000) had a statistically significantly higher lung cancer mortality rate compared to U.S. females (35.4 per 100,000).
- Non-Hispanic Caucasians in Delaware (50.7 per 100,000) had a statistically significantly higher lung cancer mortality rate compared to non-Hispanic Caucasians in the U.S (46.5 per 100,000).
- The difference in lung cancer mortality rates between non-Hispanic African Americans in Delaware (46.8 per 100,000) and the U.S. (47.5 per 100,000) was not statistically significant.
- The difference in lung cancer mortality rates between Hispanics in Delaware (21.6 per 100,000) and the U.S. (18.9 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 7-8: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER MORTALITY RATES BY SEX; U.S. AND DELAWARE, 1980-2015

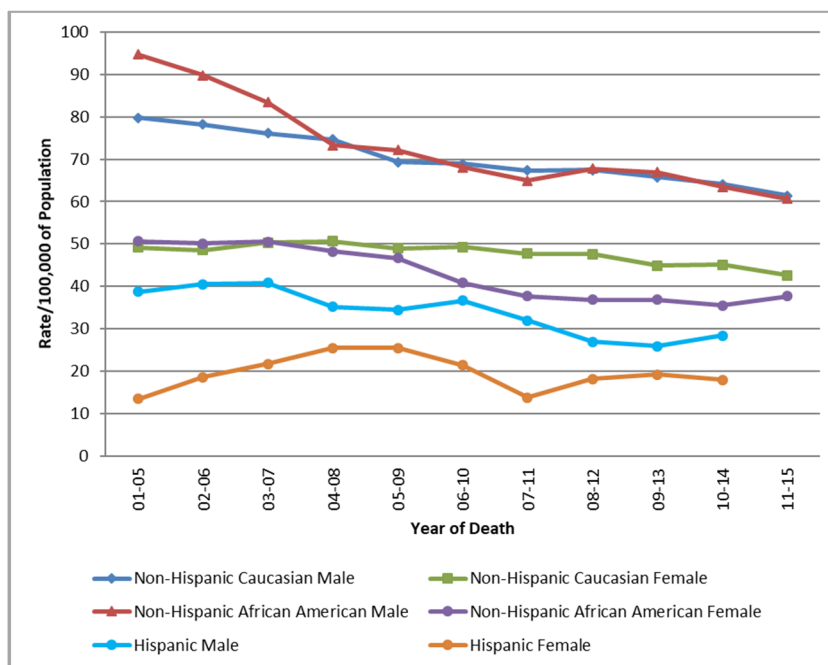


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for lung cancer decreased 19% in Delaware and decreased 20% in the U.S.
 - Mortality rates for lung cancer decreased 24% in Delaware males and decreased 25% in U.S. males.
 - Mortality rates for lung cancer decreased 13% in Delaware females and decreased 14% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 7-9: FIVE-YEAR AVERAGE AGE-ADJUSTED LUNG CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

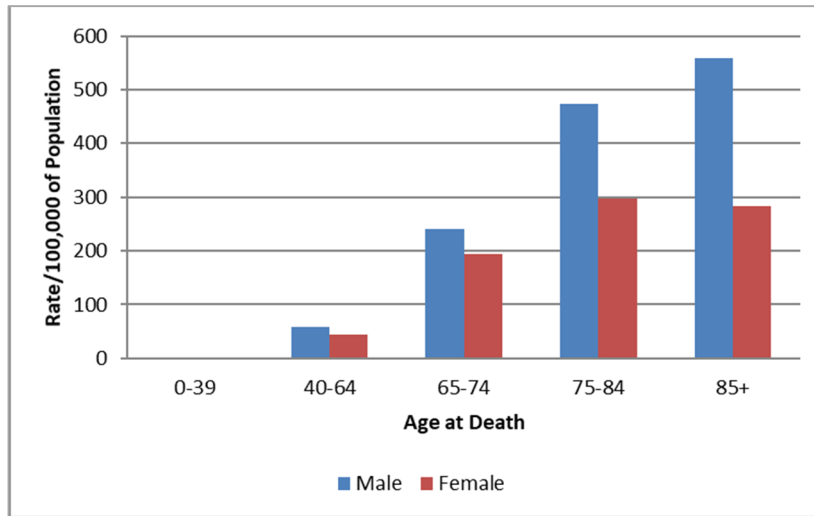


Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Mortality rates for lung cancer decreased 23% in non-Hispanic Caucasian males and decreased 13% in non-Hispanic Caucasian females.
 - Mortality rates for lung cancer decreased 36% in non-Hispanic African American males and decreased 25% in non-Hispanic African American females.
 - Mortality rates for lung cancer in Hispanics could not be calculated due to the low number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

**FIGURE 7-10: AGE-SPECIFIC LUNG CANCER MORTALITY RATES BY SEX;
DELAWARE, 2011-2015**



Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The mortality rate for lung cancer was highest in males 85 years of age and older and females 75-84 years of age. Due to low numbers, mortality rates could not be calculated for some groups.

**TABLE 7-7: AGE-SPECIFIC LUNG CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY;
DELAWARE, 2011-2015**

Age at Death	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	60.6	60.2	---	46.4	41.5	---
65-74	246.4	227.6	---	204.3	144.6	---
75-84	477.7	458.9	---	300.4	271.2	---
85+	562.5	---	---	283.8	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The mortality rate for lung cancer was highest for non-Hispanic Caucasian males 85 years of age and for non-Hispanic African American males 75-84 years of age (based on the rates that could be calculated).
- The mortality rate for lung cancer was highest for non-Hispanic Caucasian and non-Hispanic African American females 75-84 years of age (based on rates that could be calculated).

CHAPTER 8: PANCREATIC CANCER

RISK FACTORS

The following are ***lifestyle risk factors*** that a person can modify to reduce their risk of getting pancreatic cancer:

- Smoking increases risk two to three times more than not smoking.
- Overweight or obesity

The following are ***environmental and medically-related causes of pancreatic cancer***:

- Workplace exposures to chemicals used in the dry cleaning and metalworking industries

The following are ***non-modifiable risk factors (these cannot be changed)*** for getting pancreatic cancer:

- Risk of developing pancreatic cancer increases with age (two-thirds are at least 65 years of age).
- Males are more likely to develop pancreatic cancer.
- Non-Hispanic African Americans are more likely to develop pancreatic cancer than non-Hispanic Caucasians.
- Certain hereditary conditions (familial pancreatitis, Lynch syndrome, hereditary breast, and ovarian cancer syndrome)
- Type 2 diabetes

To protect against pancreatic cancer individuals should manage lifestyle risk factors such as eating a healthy diet (high in fruits, vegetables, and whole grains), avoid tobacco, limit alcohol use (two drinks a day for males and one drink a day for females), and increase physical activity.

EARLY DETECTION

There are currently no screening tests recommended for pancreatic cancer. Individuals with a strong family history may want to consider genetic counseling.

INCIDENCE

For 2011-2015, Delaware ranked 2nd in the U.S. for pancreatic cancer incidence (6th in 2010-2014); males ranked 3rd (4th in 2010-2014) and females ranked 4th (8th in 2010-2014)⁹.

2011-2015 DATA

TABLE 8-1: NUMBER OF PANCREATIC CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	835	437	398	642	357	285	152	60	92	24	12	12
Kent	128	70	58	102	61	41	21	7	14	---	---	---
New Castle	460	221	239	331	168	163	104	42	62	13	7	6
Sussex	247	146	101	209	128	81	27	11	16	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, 835 pancreatic cancer cases (3% of all cancer cases) were diagnosed in Delaware.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

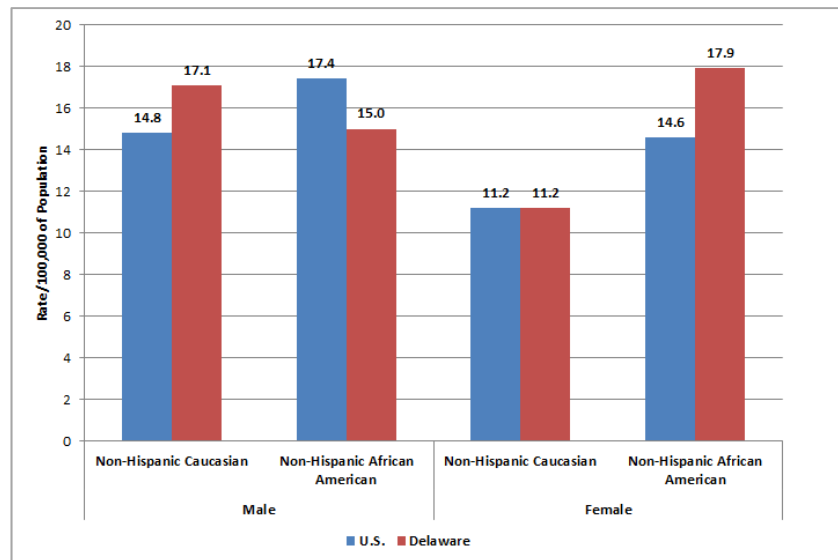
- Males accounted for 52% of pancreatic cancer cases.
- Non-Hispanic Caucasians accounted for 77% of pancreatic cancer cases.

TABLE 8-2: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	12.6	14.4	11.2
Delaware	14.4	16.7	12.5
Kent	13.0	15.4	10.9
New Castle	14.9	16.2	14.0
Sussex	14.4	18.4	10.7

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 8-1: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



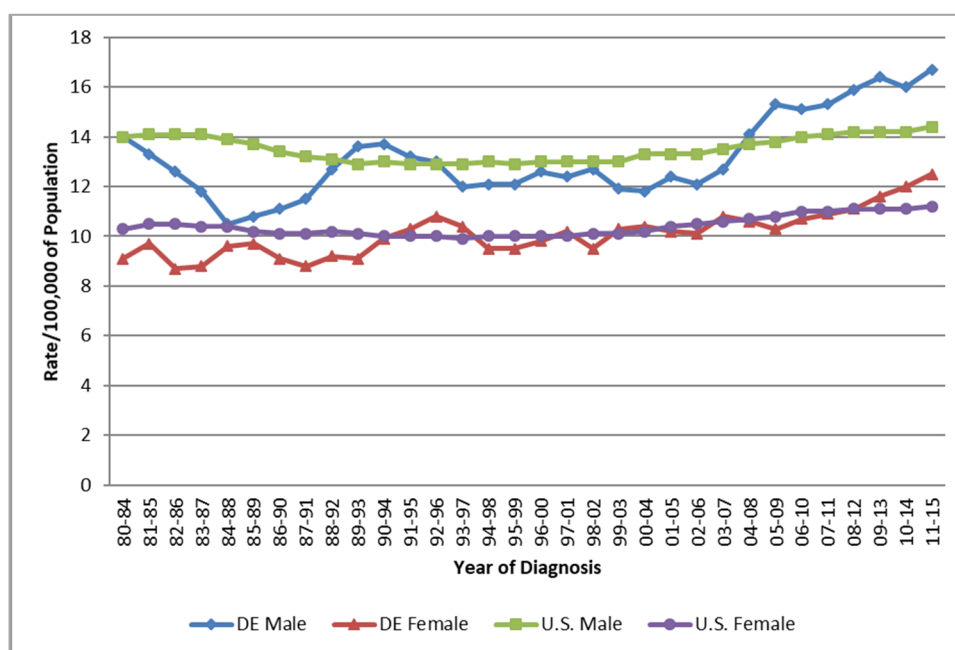
Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (16.7 per 100,000) had a statistically significantly higher pancreatic cancer incidence rate compared to females (12.5 per 100,000).
 - The difference in pancreatic cancer incidence rates between non-Hispanic Caucasians (13.9 per 100,000) and non-Hispanic African Americans (16.8 per 100,000) was not statistically significant.
- Comparing Delaware and the U.S.
 - Delaware (14.4 per 100,000) had a statistically significantly higher pancreatic cancer incidence rate compared to the U.S. (12.6 per 100,000).
 - Delaware males (16.7 per 100,000) had a statistically significantly higher pancreatic cancer incidence rate compared to U.S. males (14.4 per 100,000).

- The difference in pancreatic cancer incidence rates between females in Delaware (12.5 per 100,000) and the U.S. (11.2 per 100,000) was not statistically significant.
- The difference in pancreatic cancer incidence rates between non-Hispanic Caucasians in Delaware (13.9 per 100,000) and the U.S. (12.8 per 100,000) was not statistically significant.
- The difference in the pancreatic cancer incidence rates between non-Hispanic African Americans in Delaware (16.8 per 100,000) and the U.S. (15.8 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 8-2: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER INCIDENCE RATES BY SEX; U.S. AND DELAWARE, 1980-2015

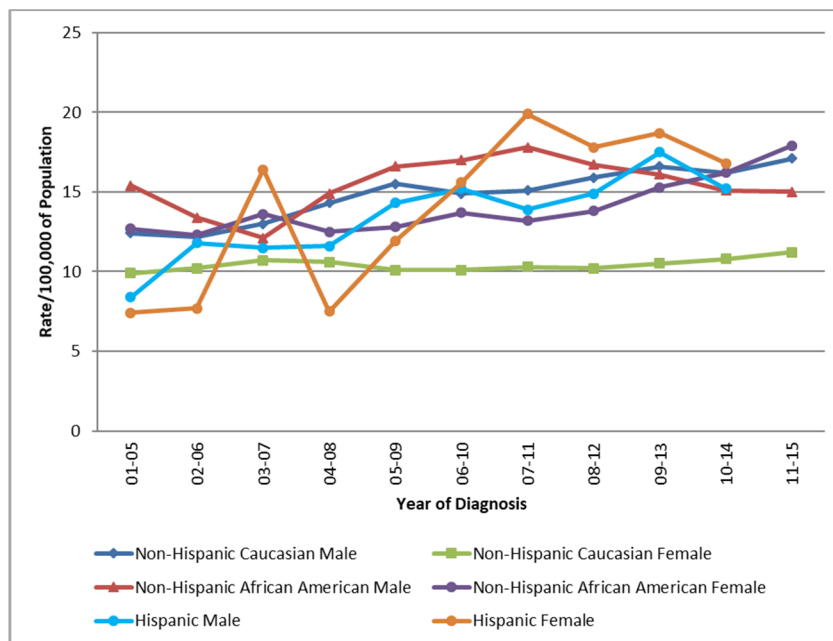


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for pancreatic cancer increased 17% in Delaware and increased 8% in the U.S.
 - Incidence rates for pancreatic cancer increased 35% in Delaware males and increased 8% in U.S. males.
 - Incidence rates for pancreatic cancer increased 23% in Delaware females and increased 8% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 8-3: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

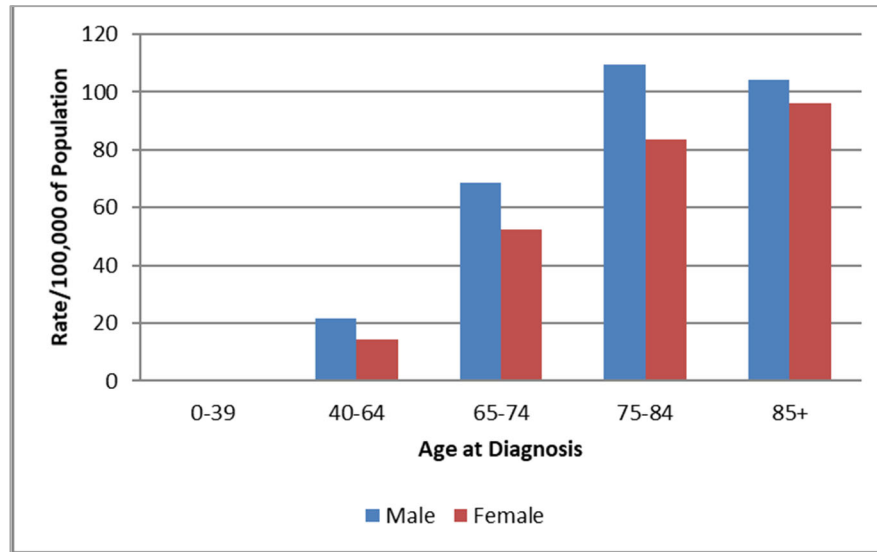


Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for pancreatic cancer increased 38% in non-Hispanic Caucasian males and increased 13% in non-Hispanic Caucasian females.
 - Incidence rates for pancreatic cancer decreased 3% in non-Hispanic African American males and increased 41% in non-Hispanic African American females.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

FIGURE 8-4: AGE-SPECIFIC PANCREATIC CANCER INCIDENCE RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The incidence rate for pancreatic cancer was highest for males 75-84 years of age and for females 85 years of age and older. Due to small numbers, incidence rates could not be calculated by sex for the 0-39 age group.

TABLE 8-3: AGE-SPECIFIC PANCREATIC CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	23.0	21.9	---	12.1	21.9	---
65-74	71.0	---	---	53.1	---	---
75-84	114.5	---	---	75.3	---	---
85+	101.6	---	---	90.5	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The incidence rate for pancreatic cancer was highest for non-Hispanic Caucasian males 75-84 years of age; and for non-Hispanic Caucasian females 85 years of age and older. Due to small numbers, incidence rates could not be calculated by sex for Hispanics and for non-Hispanic African Americans with the exception of the 40-64 age group.

STAGE OF DIAGNOSIS - DELAWARE

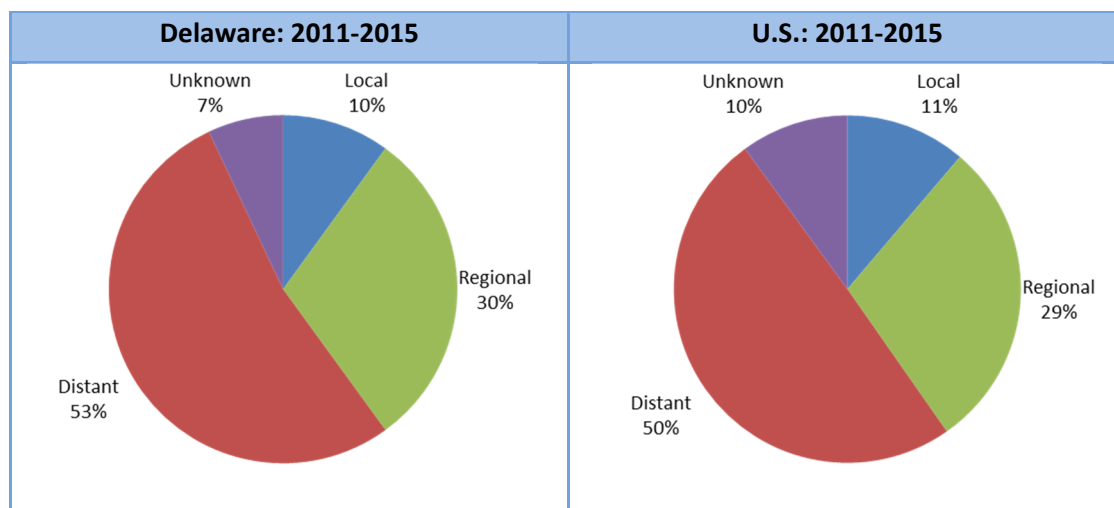
TABLE 8-4: NUMBER AND PERCENTAGE OF PANCREATIC CANCER CASES BY STAGE AT DIAGNOSIS, BY SEX AND RACE/ETHNICITY, DELAWARE, 2011-2015

Stage at Diagnosis	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Local	83 (10)	49 (11)	34 (9)	64 (10)	40 (11)	24 (8)	13 (9)	---	---	---	---	---
Regional	253 (30)	125 (29)	128 (32)	192 (30)	99 (28)	93 (33)	49 (32)	21 (35)	28 (30)	6 (25)	---	---
Distant	438 (53)	233 (53)	205 (52)	340 (53)	190 (53)	150 (53)	81 (53)	32 (53)	49 (53)	12 (50)	8 (67)	---
Unknown	61 (7)	30 (7)	31 (8)	46 (7)	28 (8)	18 (6)	9 (6)	---	---	---	---	---
Total	835	437	398	642	357	285	152	60	92	24	12	12

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 83 (10%) pancreatic cancers diagnosed at the local stage; 253 (30%) at the regional stage; 438 (53%) at the distant stage; and 61 (7%) had an unknown stage.
- Non-Hispanic African Americans (53%) had the same proportion of pancreatic cancers diagnosed at the distant stage as non-Hispanic Caucasians (53%), but a higher proportion compared to Hispanics (50%).
- Males (53%) had a slightly higher proportion of pancreatic cancers diagnosed at the distant stage compared to females (52%).

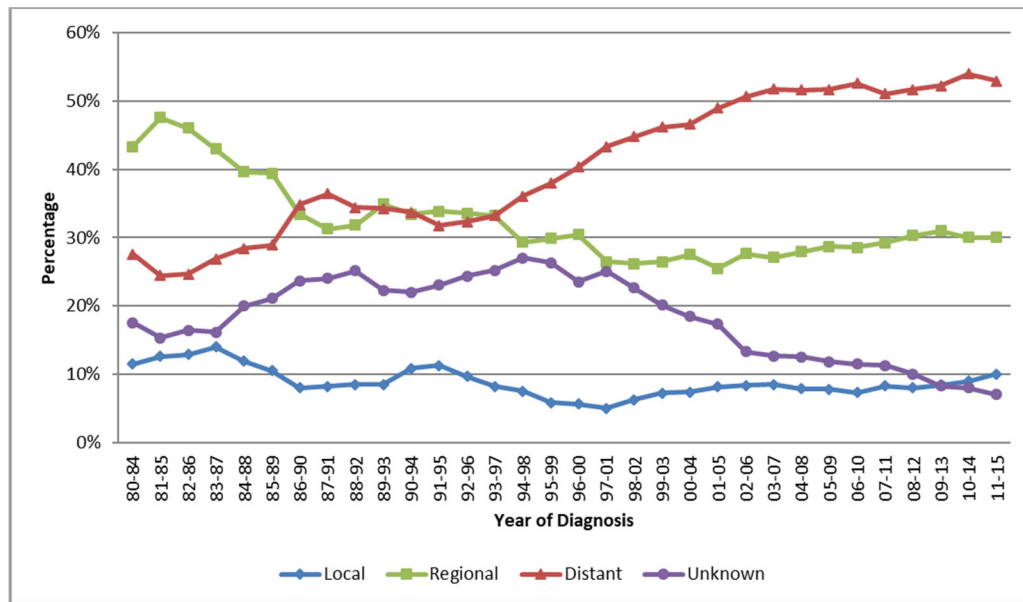
FIGURE 8-5: PERCENTAGE OF PANCREATIC CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

- In comparing U.S. and Delaware pancreatic cancer data, Delaware (53%) had a higher proportion of pancreatic cancer diagnosed at the distant stage compared to the U.S. (50%).

FIGURE 8-6: FIVE-YEAR PERCENTAGE OF STAGE OF DIAGNOSIS FOR PANCREATIC CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percent of pancreatic cancer cases diagnosed at the local stage decreased from 11% to 10%.
 - Pancreatic cancer cases diagnosed at the distant stage increased from 28% to 53%.

MORTALITY

For 2011-2015, Delaware ranked 4th in the U.S. for pancreatic cancer mortality (6th in 2010-2014); males ranked 5th (4th in 2010-2014) and females ranked 6th (26th in 2010-2014)⁹.

2011-2015 DATA

TABLE 8-5: NUMBER OF PANCREATIC CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	682	352	330	549	297	252	105	40	65	19	11	8
Kent	125	70	55	101	58	43	19	9	10	---	---	---
New Castle	363	170	193	277	136	141	69	25	44	9	---	---
Sussex	194	112	82	171	103	68	17	6	11	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 682 deaths (7% of all cancer deaths) from pancreatic cancer in Delaware.
- Males accounted for 52% of pancreatic cancer deaths.
- Non-Hispanic Caucasians accounted for 81% of pancreatic cancer deaths.

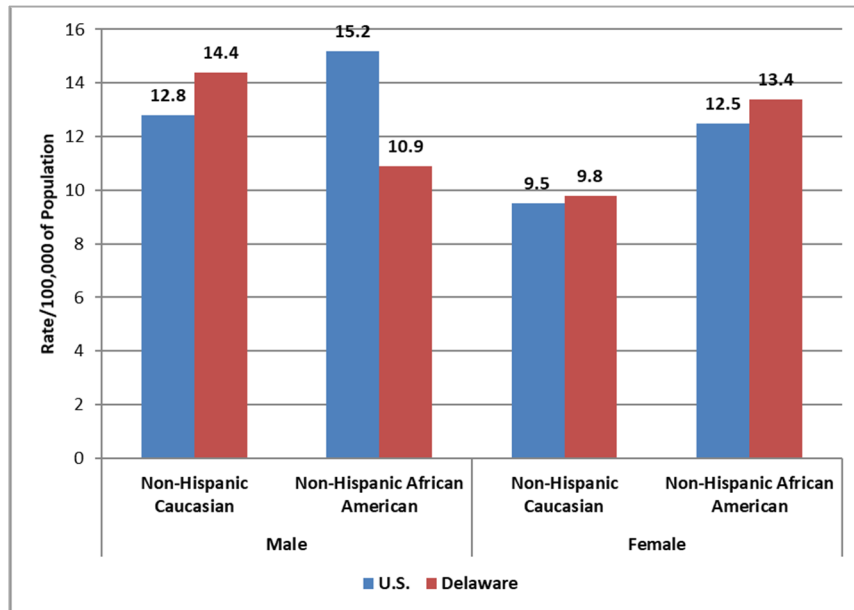
⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

TABLE 8-6: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	10.9	12.6	9.5
Delaware	12.1	14.1	10.5
Kent	13.2	16.4	10.3
New Castle	12.3	13.4	11.6
Sussex	11.4	14.4	8.8

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

FIGURE 8-7: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



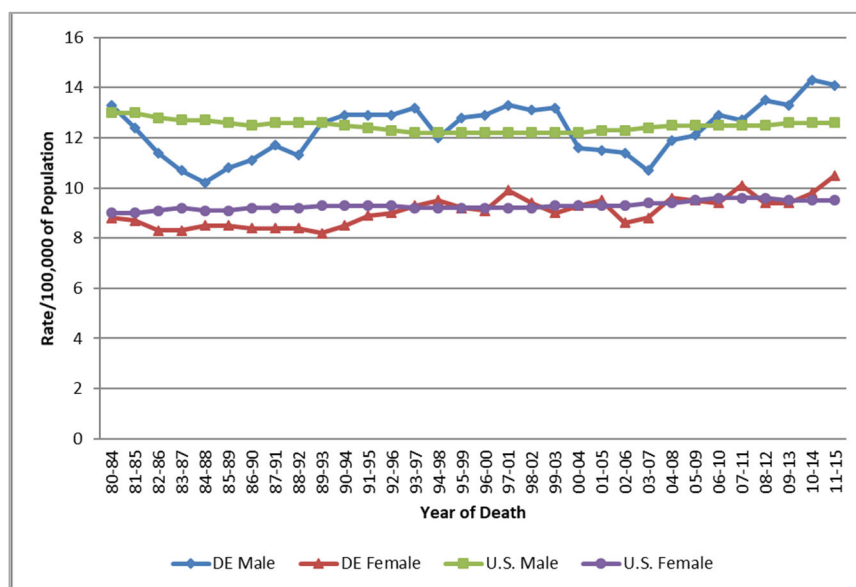
Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (14.1 per 100,000) had a statistically significantly higher pancreatic cancer mortality rate compared to females (10.5 per 100,000).
 - The difference in pancreatic cancer mortality rates between non-Hispanic Caucasians (11.9 per 100,000) and non-Hispanic African Americans (12.3 per 100,000) was not statistically significant.
 - Pancreatic cancer mortality rates for Hispanics could not be calculated due to the small number of deaths.
- Comparing Delaware and the U.S.
 - Delaware (12.1 per 100,000) had a statistically significantly higher pancreatic cancer mortality rate compared to the U.S. (10.9 per 100,000).
 - The difference in pancreatic cancer mortality rates between males in Delaware (14.1 per 100,000) and the U.S. (12.6 per 100,000) was not statistically significant.
 - The difference in pancreatic cancer mortality rates between females in Delaware (10.5 per 100,000) and the U.S. (9.5 per 100,000) was not statistically significant.

- The difference in pancreatic cancer mortality rates between non-Hispanic Caucasians in Delaware (11.9 per 100,000) and the U.S (11.0 per 100,000) was not statistically significant.
- The difference in pancreatic cancer mortality rates between non-Hispanic African Americans in Delaware (12.3 per 100,000) and the U.S (13.7 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 8-8: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER MORTALITY RATES BY SEX; U.S. AND DELAWARE, 1980-2015

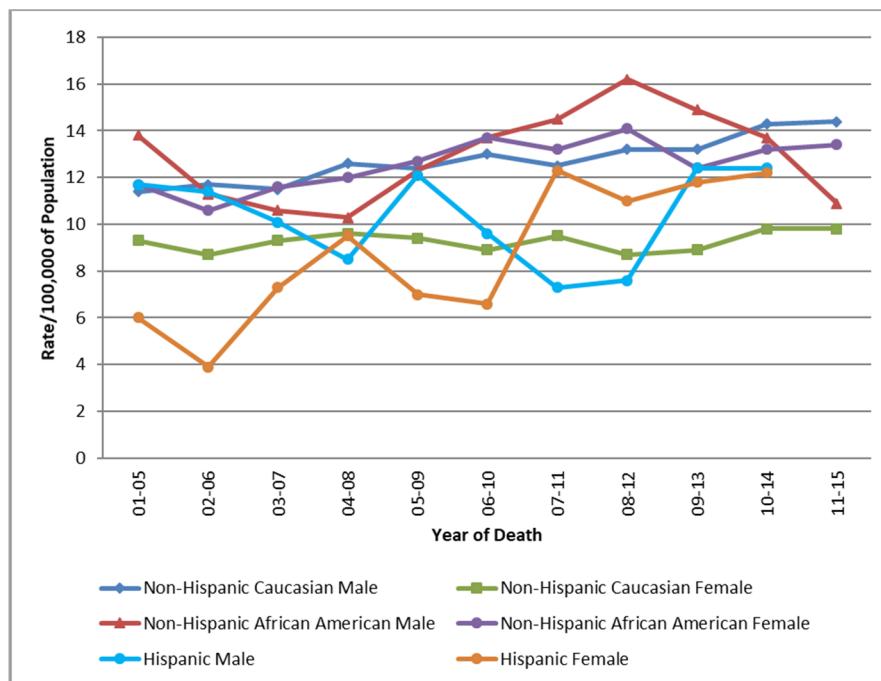


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for pancreatic cancer increased 15% in Delaware and increased 3% in the U.S.
 - Mortality rates for pancreatic cancer increased 23% in Delaware males and increased 2% in U.S. males.
 - Mortality rates for pancreatic cancer increased 11% in Delaware females and increased 2% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 8-9: FIVE-YEAR AVERAGE AGE-ADJUSTED PANCREATIC CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

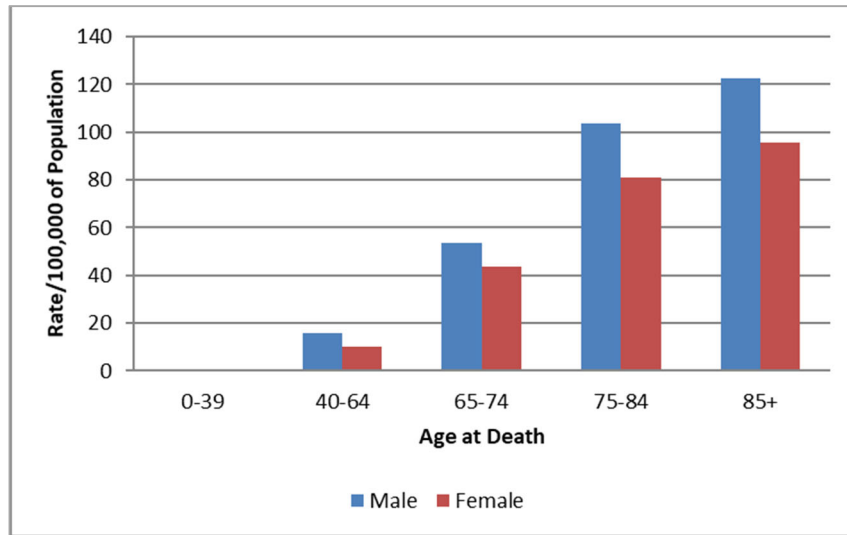


Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for pancreatic cancer increased 26% in non-Hispanic Caucasian males and increased 5% in non-Hispanic Caucasian females.
 - Mortality rates for pancreatic cancer decreased 21% in non-Hispanic African American males and increased 15% in non-Hispanic African American females.
 - Mortality rates for pancreatic cancer in Hispanics could not be calculated due to the small number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

FIGURE 8-10: AGE-SPECIFIC PANCREATIC CANCER MORTALITY RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The mortality rate for pancreatic cancer mortality was highest for both males and females 85 years of age and older.

TABLE 8-7: AGE-SPECIFIC PANCREATIC CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Death	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	16.8	---	---	9.6	---	---
65-74	56.2	---	---	42.7	---	---
75-84	108.3	---	---	73.4	---	---
85+	117.2	---	---	94.6	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

- The mortality rate for pancreatic cancer was highest for non-Hispanic Caucasian males and females 85 years of age and older. Due to small numbers, mortality rates could not be calculated for some groups.

CHAPTER 9: PROSTATE CANCER

RISK FACTORS

The following are ***lifestyle risk factors*** that a person can modify to reduce their risk of getting prostate cancer:

- A diet high in red meat and/or high-fat dairy products
- A diet low in fruits and vegetables
- Obesity
- Tobacco and heavy alcohol use

The following are ***environmental and medically-related*** causes of prostate cancer:

- Employment involving following industries: welding, battery manufacturers, rubber (being a worker), and workers exposed to cadmium

The following are ***non-modifiable*** risk factors (these cannot be changed) for getting prostate cancer:

- Age (risk increases after 50 years of age)
- Race (non-Hispanic African Americans are at higher risk) and ethnicity (Hispanics are at lower risk)
- Nationality (higher risk in males from North America and northwestern Europe)
- Family history of prostate cancer or inherited DNA changes (heredity prostate cancer gene 1)
- Gene mutations that occur during a man's life
- Higher levels of certain male hormones, e.g. testosterone
- Infection and inflammation of the prostate gland (prostatitis)
- Certain genes like the BRCA1 and BRCA2 genes

To protect against prostate cancer, individuals should maintain a healthy weight, consume a diet high in fruits, vegetables, and whole grains; limit calcium intake, and engage in regular physical activity.

EARLY DETECTION

The ACS recommends that males make an informed decision with their health care provider about whether to be screened for prostate cancer. Males should receive information from their doctors about the risks and possible benefits of prostate cancer screening. Males should not be screened unless they receive this information¹⁵.

The DCC recommends the following prostate cancer screening guidelines for Delaware males:

- 'No mass' prostate cancer screening efforts
- Promote education for informed prostate cancer screening decision-making.
- Screening in males older than 75 years of age is less desirable; however, screening decisions should be made on an individual basis.
- Screening is not recommended for males with a life expectancy of less than 10 years.
- Offer screening for individuals considered to be at average risk for the disease beginning at 50 years of age, using an informed decision-making process.
- High-risk individuals should be encouraged to be screened starting at 40 years of age if they:
 - Have first-degree relatives with prostate cancer
 - Are non-Hispanic African American males
 - Have family or personal history of BRCA1 or BRCA2 gene.

¹⁵ American Cancer Society; Prostate Cancer: Early Detection.

<http://www.cancer.org/cancer/prostatecancer/moreinformation/prostatecancerearlydetection/prostate-cancer-early-detection-acs-recommendations>

- Screening at one-to-two year intervals via prostate specific antigen (PSA) test, with or without digital rectal exam (DRE)

PROSTATE CANCER SCREENING IN DELAWARE

Data from the 2016 BRFs provides information on the prevalence of prostate cancer screening among Delaware males:

- Forty-five percent of Delaware males 40 years of age and older reported having had a PSA blood test in the past two years, compared to the national median prevalence of 39%.
- The prevalence of Delaware males who received a PSA test within the past two years increased with age: 44% of males 50-59 years of age were tested, compared to 65% of males 65 years of age and older. This difference was statistically significant.
- In Delaware, there was no statistically significant difference in the prevalence of having a PSA test within the past two years between non-Hispanic Caucasian males (47%) and non-Hispanic African American males (46%).
- As the level of education increased, the prevalence of Delaware males who had a PSA test within the past two years increased. Only 28% of Delaware males with less than high school education reported having a PSA test within the past two years, compared to 53% of Delaware males who graduated from college. This difference was statistically significant.
- According to the 2015 BRFs report, 28% of Delaware males reported making the decision together with their health care provider to have the PSA test done.

INCIDENCE

For 2011-2015, Delaware ranked 3rd in the U.S. for prostate cancer incidence (3rd in 2010-2014)⁹.

2011-2015 DATA

TABLE 9-1: NUMBER OF PROSTATE CANCER CASES, BY RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Males	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
Delaware	3,817	2,699	943	104
Kent	769	473	262	20
New Castle	1,997	1,321	566	72
Sussex	1,051	905	115	12

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- Prostate cancer is the most commonly diagnosed cancer among males in the U.S. and Delaware.
- In 2011-2015, 3,817 prostate cancer cases (26% of all male cancer cases) were diagnosed in Delaware.
- Non-Hispanic Caucasians accounted for 71% of prostate cancer cases.

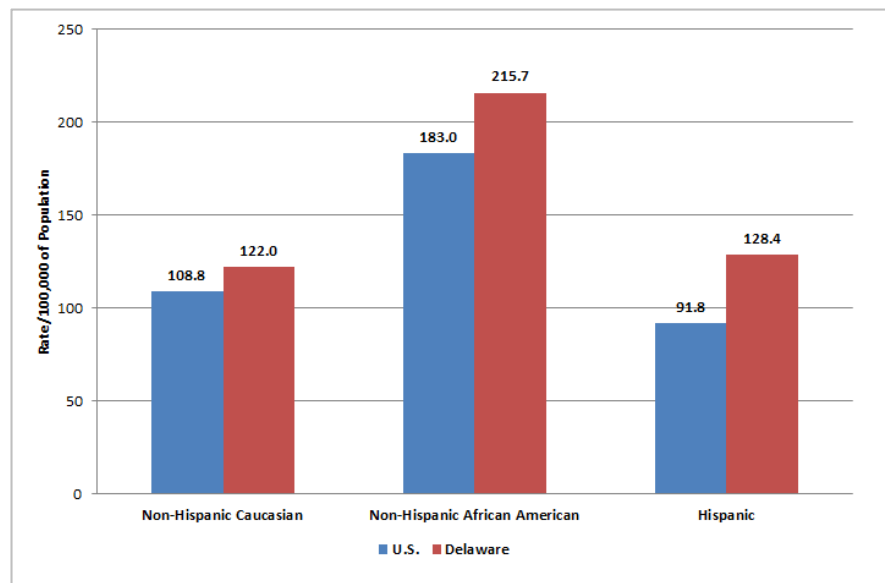
⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

TABLE 9-2: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER INCIDENCE RATES BY RACE/ETHNICITY; U.S., DELAWARE AND COUNTIES, 2011-2015

	All Males	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
U.S.	112.6	108.8	183.0	91.8
Delaware	136.3	122.0	215.7	128.4
Kent	160.4	129.8	279.8	---
New Castle	136.3	122.6	203.2	138.9
Sussex	122.8	117.1	177.1	---

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
 Rates based on less than 25 cases are not shown.

FIGURE 9-1: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER INCIDENCE RATES BY RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



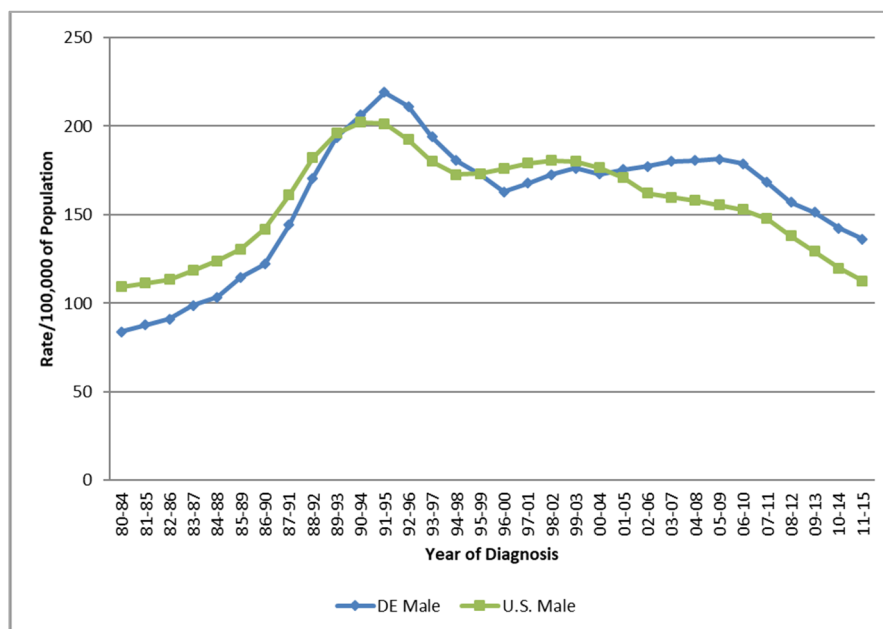
Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Non-Hispanic African Americans (215.7 per 100,000) had a statistically significantly higher prostate cancer incidence rate compared to both non-Hispanic Caucasians (122.0 per 100,000) and Hispanics (128.4 per 100,000).
 - The difference in prostate cancer incidence rates between non-Hispanic Caucasians and Hispanics was not statistically significant.
- Comparing Delaware and the U.S.
 - Delaware (136.3 per 100,000) had a statistically significantly higher prostate cancer incidence rate compared to the U.S. (112.6 per 100,000).
 - Non-Hispanic Caucasians in Delaware (122.0 per 100,000) had a statistically significantly higher prostate cancer incidence rate compared to non-Hispanic Caucasians in the U.S. (108.8 per 100,000).

- Non-Hispanic African Americans in Delaware (215.7 per 100,000) had a statistically significantly higher prostate cancer incidence rate compared to non-Hispanic African Americans in the U.S. (183.0 per 100,000).
- Hispanics in Delaware (128.4 per 100,000) had a statistically significantly higher prostate cancer incidence rate compared to Hispanics in the U.S. (91.8 per 100,000).

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 9-2: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER INCIDENCE RATES; U.S. AND DELAWARE, 1980-2015

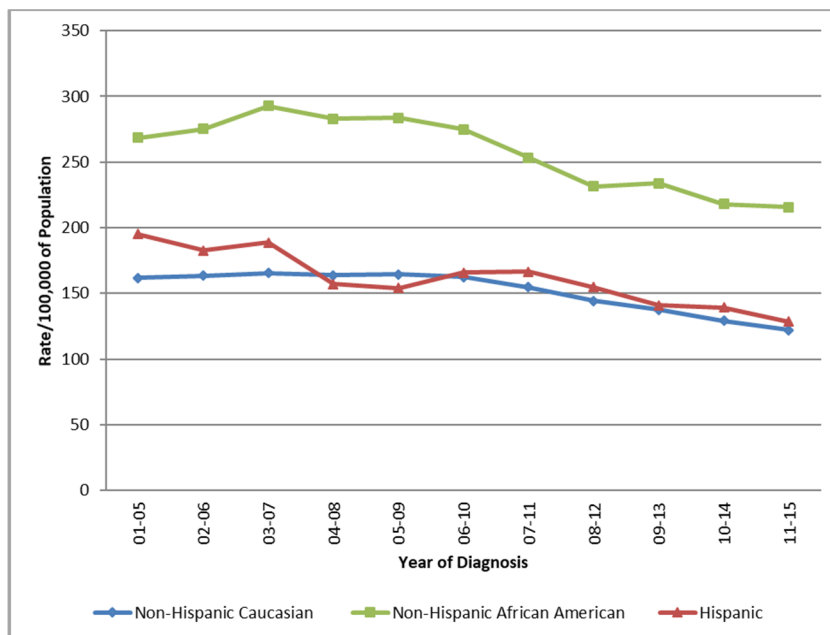


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for prostate cancer decreased 22% in Delaware and decreased 34% in the U.S.

TRENDS OVER TIME - DELAWARE

FIGURE 9-3: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2001-2015

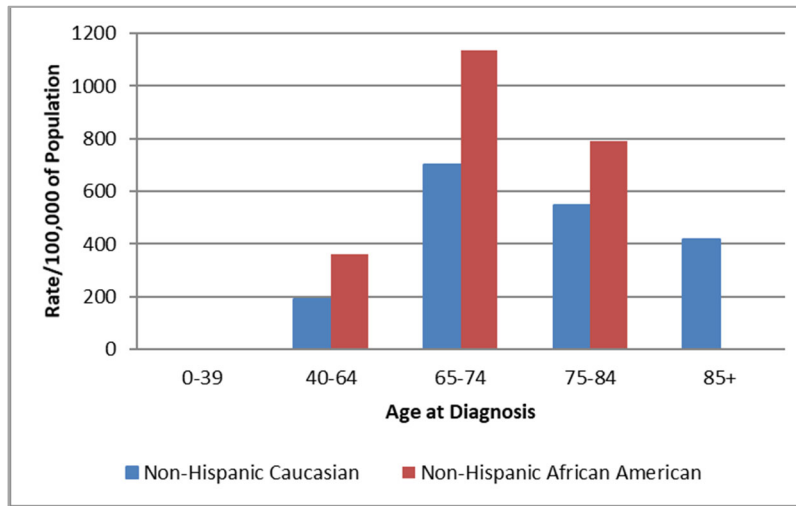


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for prostate cancer decreased 25% in non-Hispanic Caucasians.
 - Incidence rates for prostate cancer decreased 20% in non-Hispanic African Americans.
 - Incidence rates for prostate cancer decreased 34% in Hispanics.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

FIGURE 9-4: AGE-SPECIFIC PROSTATE CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The incidence rate for prostate cancer was highest for both non-Hispanic Caucasians and non-Hispanic African Americans 65-74 years of age. Due to small numbers, incidence rates could not be calculated by race for the 0-39 age group, for non-Hispanic African Americans in the 85+ age group, or for Hispanics by age group.

TABLE 9-3: AGE-SPECIFIC PROSTATE CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	All Males	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---
40-64	218.2	192.6	362.7	121.6
65-74	758.8	702.7	1134.3	731.8
75-84	579.8	547.9	791.8	---
85+	423.2	418.0	---	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

STAGE OF DIAGNOSIS - DELAWARE

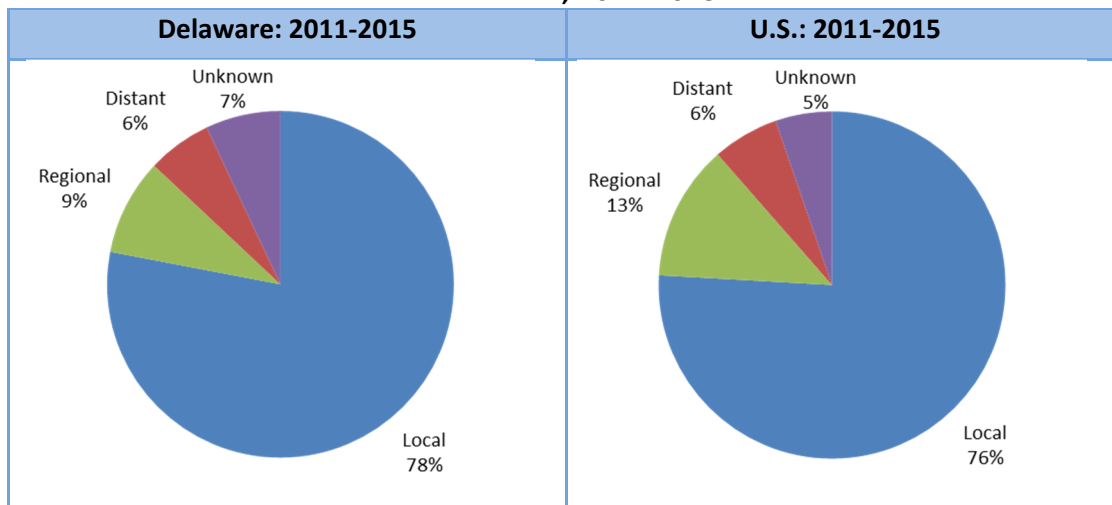
TABLE 9-4: NUMBER AND PERCENTAGE OF PROSTATE CANCER CASES BY STAGE AT DIAGNOSIS BY RACE/ETHNICITY, DELAWARE, 2011-2015

Stage at Diagnosis	All Males	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
Local	2,974 (78)	2,108 (78)	737 (78)	77 (74)
Regional	351 (9)	250 (9)	81 (9)	12 (12)
Distant	220 (6)	152 (6)	58 (6)	7 (7)
Unknown	272 (7)	189 (7)	67 (7)	8 (8)
Total	3817	2699	943	104

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- In 2011-2015, there were 2,974 (78%) prostate cancers diagnosed at the local stage; 351 (9%) at the regional stage; 220 (6%) at the distant stage; and 272 (7%) with an unknown stage.
- Non-Hispanic African Americans (78%) had the same proportion of prostate cancers diagnosed at the local stage compared to non-Hispanic Caucasians (79%), which was a higher proportion compared to Hispanics (74%).

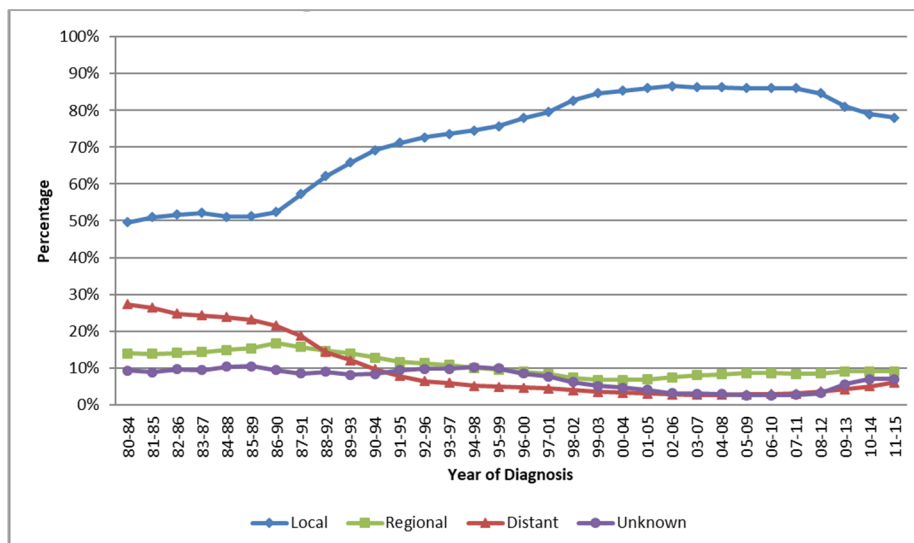
FIGURE 9-5: PERCENTAGE OF PROSTATE CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



*Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.*

- In comparing U.S. and Delaware prostate cancer data, the proportion of prostate cancer diagnosed at the local stage is higher in Delaware (78%) compared to the U.S. (76%).

FIGURE 9-6: FIVE-YEAR PERCENTAGE OF STAGE OF DIAGNOSIS FOR PROSTATE CANCER CASES, DELAWARE, 1980-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percentage of prostate cancer cases diagnosed at the local stage increased from 50% to 78%.
 - Cases diagnosed at the distant stage decreased from 27% to 6%.

MORTALITY

For 2011-2015, Delaware ranked 43rd in the U.S. for prostate cancer mortality (42nd in 2010-2014)⁹.

2011-2015 DATA

TABLE 9-5: NUMBER OF PROSTATE CANCER DEATHS, BY RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Males	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
Delaware	414	303	98	9
Kent	76	45	27	---
New Castle	226	156	61	---
Sussex	112	102	10	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Counts less than 6 are not shown to protect patient privacy.

- Prostate cancer is the second most common cause of cancer deaths among males in the U.S. and Delaware.
- In 2011-2015, there were 414 male deaths (8% of all male cancer deaths) from prostate cancer in Delaware.
- Non-Hispanic Caucasian males accounted for 73% of prostate cancer deaths.

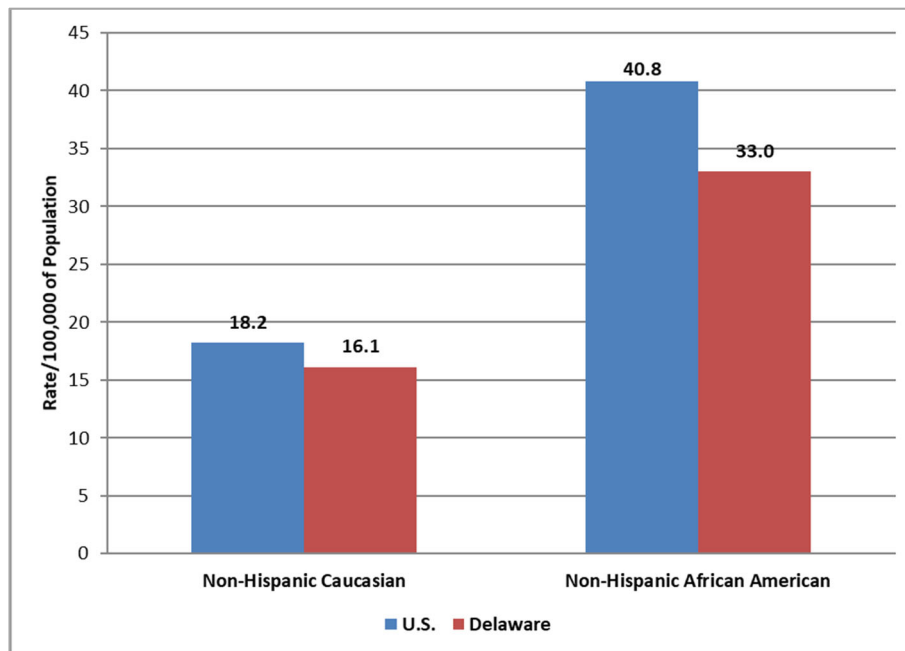
⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

TABLE 9-6: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER MORTALITY RATES BY RACE/ETHNICITY; U.S., DELAWARE AND COUNTIES, 2011-2015

	All Males	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
U.S.	19.5	18.2	40.8	16.2
Delaware	18.4	16.1	33.0	---
Kent	19.7	14.8	41.3	---
New Castle	19.5	16.6	31.8	---
Sussex	16.2	16.0	---	---

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
 Rates based on less than 25 cases are not shown.

FIGURE 9-7: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER MORTALITY RATES BY RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



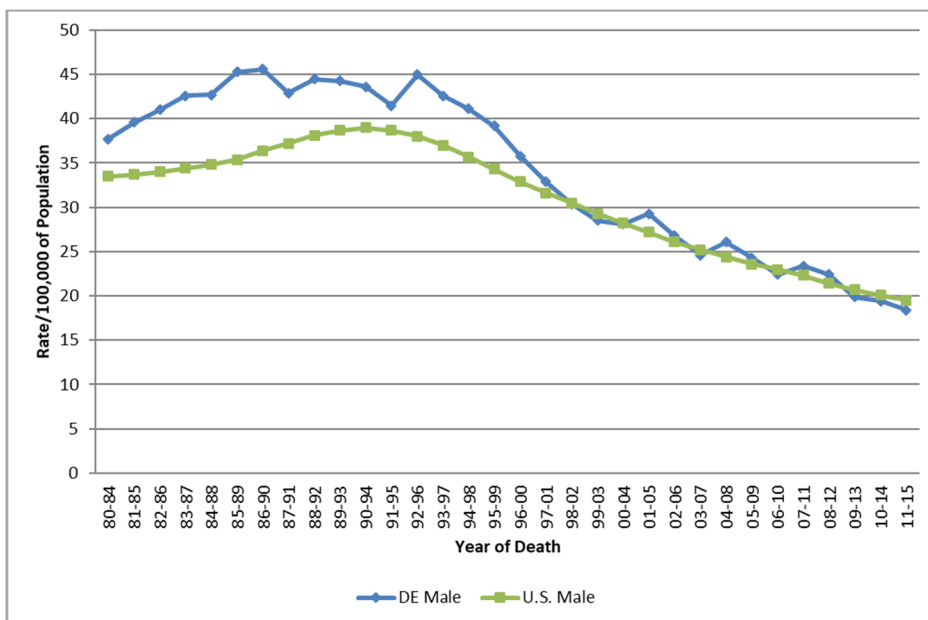
Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Non-Hispanic African Americans (33.0 per 100,000) had a statistically significantly higher prostate cancer mortality rate compared to non-Hispanic Caucasians (16.1 per 100,000).
 - Prostate cancer mortality rates for Hispanics could not be calculated due to the small number of deaths.
- Comparing Delaware and the U.S.
 - The difference in the prostate cancer mortality rates between Delaware (18.4 per 100,000) and the U.S. (19.5 per 100,000) was not statistically significant.
 - The difference in prostate cancer mortality rates between non-Hispanic Caucasians in Delaware (16.1 per 100,000) and the U.S. (18.2 per 100,000) was not statistically significant.

- The difference in prostate cancer mortality rates between non-Hispanic African Americans in Delaware (33.0 per 100,000) and the U.S (40.8 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 9-8: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER MORTALITY RATES; U.S. AND DELAWARE, 1980-2015

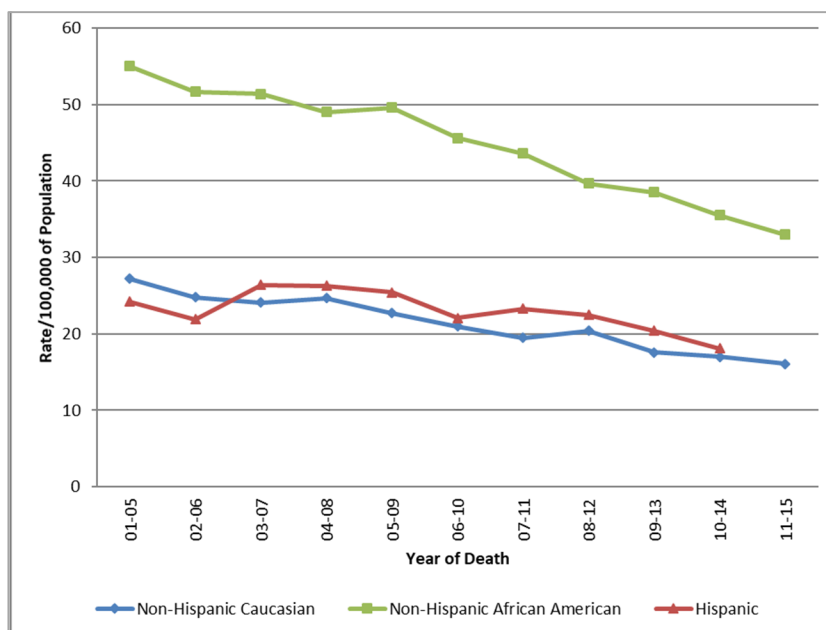


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for prostate cancer decreased 37% in Delaware and decreased 28% in the U.S.

TRENDS OVER TIME - DELAWARE

FIGURE 9-9: FIVE-YEAR AVERAGE AGE-ADJUSTED PROSTATE CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2001-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for prostate cancer decreased 41% in non-Hispanic Caucasians.
 - Mortality rates for prostate cancer decreased 40% in non-Hispanic African Americans.
 - Mortality rates for prostate cancer in Hispanics could not be calculated due to the low number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

TABLE 9-7: AGE-SPECIFIC PROSTATE CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Death	All Males	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---
40-64	7.4	5.5	---	---
65-74	47.8	42.0	---	---
75-84	152.1	119.4	359.9	---
85+	418.7	421.9	---	---

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

- The mortality rate for prostate cancer was highest in males 85 years of age and older. Due to small numbers, prostate cancer mortality rates were not calculated by age group for Hispanics and for non-Hispanic African Americans with the exception of the 75-84 age group.

CHAPTER 10: STOMACH CANCER

RISK FACTORS

The following are ***lifestyle risk factors*** that a person can modify to reduce their risk of getting stomach cancer:

- Diet high in smoked foods, pickled vegetables, and salted fish and meats
- Low intake of fresh fruits and vegetables
- Tobacco use (This doubles the risk of stomach cancer.)
- Obesity
- Heterocyclic amines and polycyclic aromatic hydrocarbons in grilled, charred, or fried meats and fish

The following are ***environmental and medically-related*** causes of getting stomach cancer:

- Living in Japan, China, Southern and Eastern Europe, and South and Central America
- Epstein-Barr virus
- Workplace exposures in the coal, metal, and rubber industry

The following are ***non-modifiable*** risk factors (these cannot be changed) for getting stomach cancer of getting stomach cancer:

- Infection with certain bacteria (e.g. *Helicobacter pylori*)
- Males are at higher risk compared to females
- Increasing age especially after 50 years of age
- People of Hispanic ethnicity are at increased risk; people of non-Hispanic African American or Asian/Pacific Islander race are at increased risk
- Family history of stomach cancer; personal history of stomach lymphoma
- Pernicious anemia (leads to a shortage of red blood cells)
- Type A blood

To protect against stomach cancer, individuals should avoid tobacco, consume a diet rich in fruits and vegetables, engage in recommended levels of physical activity, and maintain a healthy weight.

EARLY DETECTION

There are currently no tests recommended for the screening of stomach cancer in the general population. Some tests can be used to diagnose stomach cancer in individuals with known risks.

INCIDENCE

For 2011-2015, Delaware ranked 14th in the U.S. for stomach cancer incidence (21st in 2010-2014); males ranked 11th (22nd in 2010-2014) and females ranked 21st (20th in 2010-2014)⁹.

2011-2015 DATA

TABLE 10-1: NUMBER OF STOMACH CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	385	248	137	267	176	91	84	52	32	16	8	8
Kent	54	28	26	39	21	18	12	---	---	---	---	---
New Castle	226	142	84	139	88	51	62	39	23	13	6	7
Sussex	105	78	27	89	67	22	10	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, 385 stomach cancer cases (1% of all cancer cases) were diagnosed in Delaware.
- Delaware males accounted for 64% of stomach cancer cases.
- Non-Hispanic Caucasians accounted for 69% of stomach cancer cases.

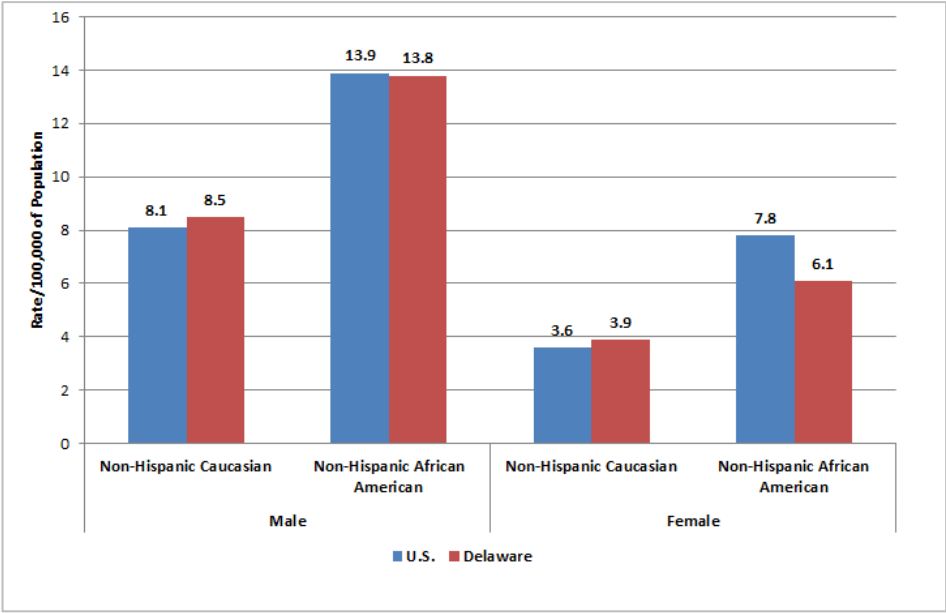
TABLE 10-2: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	7.2	9.8	5.2
Delaware	6.7	9.5	4.5
Kent	5.5	6.3	4.8
New Castle	7.5	10.8	5.0
Sussex	6.1	9.3	3.4

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

FIGURE 10-1: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER INCIDENCE RATES FOR BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015

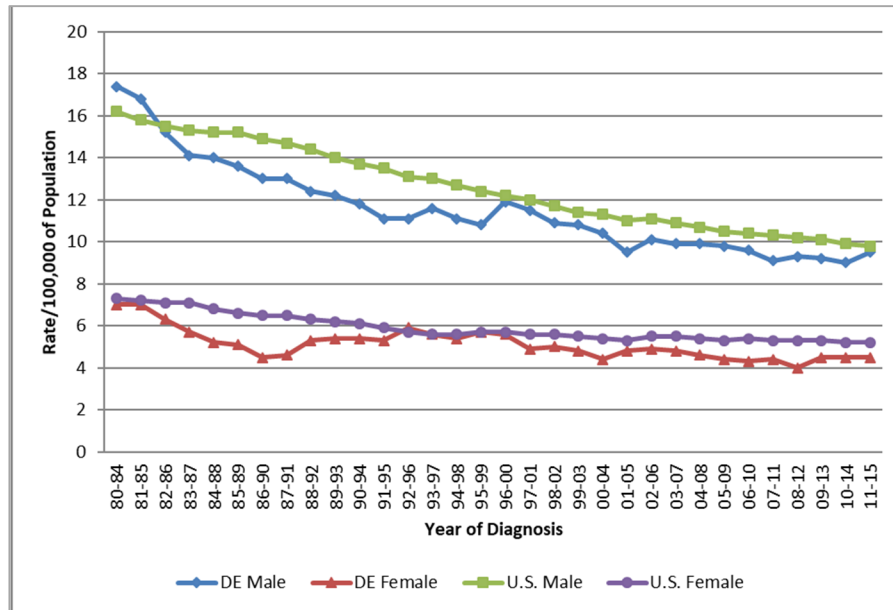


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (9.5 per 100,000) had a statistically significantly higher stomach cancer incidence compared to females (4.5 per 100,000).
 - Non-Hispanic Caucasians (6.0 per 100,000) had a statistically significantly lower stomach cancer incidence compared to non-Hispanic African Americans (9.4 per 100,000).
 - Stomach cancer incidence rates for Hispanics could not be calculated due to an insufficient number of cases.
- Comparing Delaware and the U.S.
 - The difference in stomach cancer incidence rates between Delaware (6.7 per 100,000) and the U.S. (7.2 per 100,000) was not statistically significant.
 - The difference in stomach cancer incidence rates between males in Delaware (9.5 per 100,000) and the U.S. (9.8 per 100,000) was not statistically significant.
 - The difference in stomach cancer incidence rates between females in Delaware (4.5 per 100,000) and the U.S. (5.2 per 100,000) was not statistically significant.
 - The difference in stomach cancer incidence rates between non-Hispanic Caucasians in Delaware (6.0 per 100,000) and the U.S. (5.6 per 100,000) was not statistically significant.
 - The difference in stomach cancer incidence rates between non-Hispanic African Americans in Delaware (9.4 per 100,000) and the U.S. (10.3 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 10-2: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER INCIDENCE RATES BY SEX; U.S. AND DELAWARE, 1980-2015

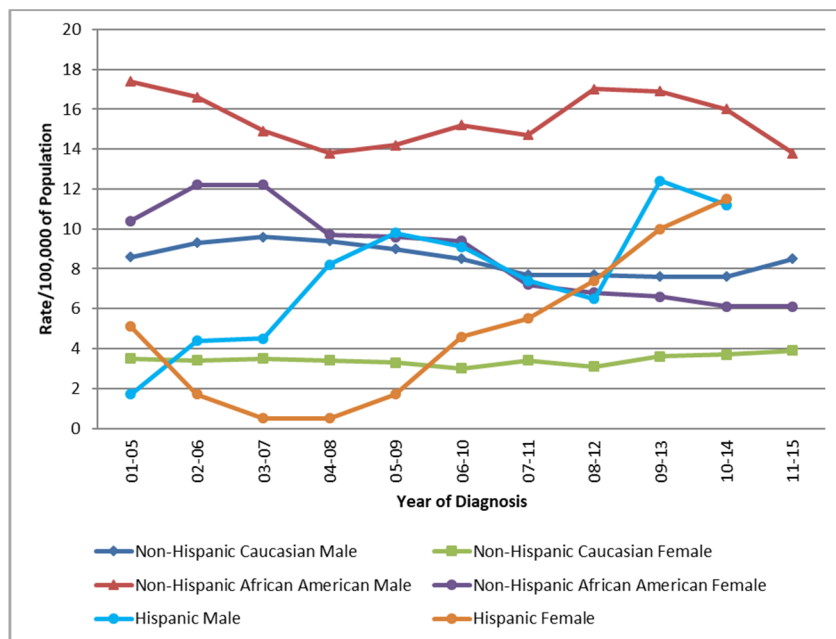


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for stomach cancer decreased 1% in Delaware and decreased 8% in the U.S.
 - Incidence rates for stomach cancer did not change in Delaware males and decreased 11% in U.S. males.
 - Incidence rates for stomach cancer decreased 6% in Delaware females and decreased 2% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 10-3: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

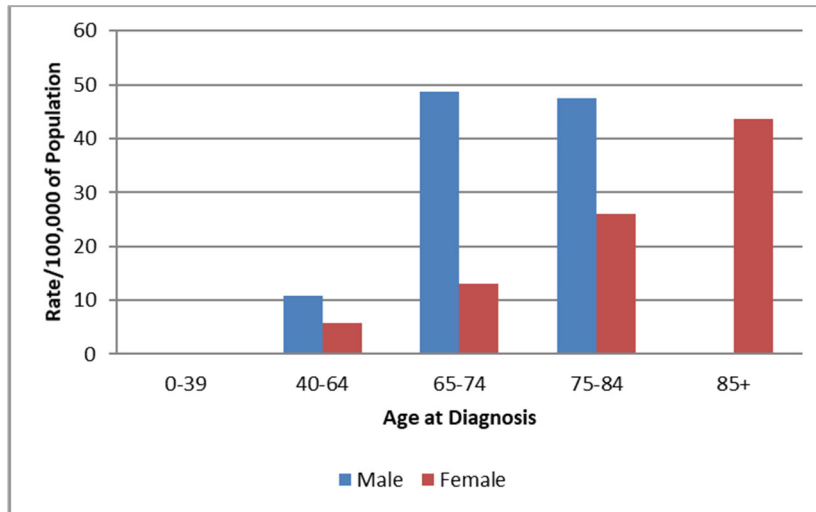


Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for stomach cancer decreased 1% in non-Hispanic Caucasian males and increased 11% in non-Hispanic Caucasian females.
 - Incidence rates for stomach cancer decreased 21% in non-Hispanic African American males and decreased 41% in non-Hispanic African American females.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

**FIGURE 10-4: AGE-SPECIFIC STOMACH CANCER INCIDENCE RATES BY SEX;
DELAWARE, 2011-2015**



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The incidence rate for stomach cancer was highest for males 65-74 years of age and for females 85 years of age and older, based on the rates that could be calculated. Due to small numbers, incidence rates were not calculated by sex for the 0-39 age group or for males in the 85+ age group.

**TABLE 10-3: AGE-SPECIFIC STOMACH CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY;
DELAWARE, 2011-2015**

Age at Diagnosis	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	10.3	---	---	4.5	---	---
65-74	43.8	---	---	---	---	---
75-84	43.1	---	---	25.8	---	---
85+	---	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The incidence rate for stomach cancer was highest for non-Hispanic Caucasian males 65-74 years of age, based on the rates that could be calculated. Due to small numbers, incidence rates were not calculated by sex and age group for non-Hispanic African Americans or Hispanics.

STAGE OF DIAGNOSIS - DELAWARE

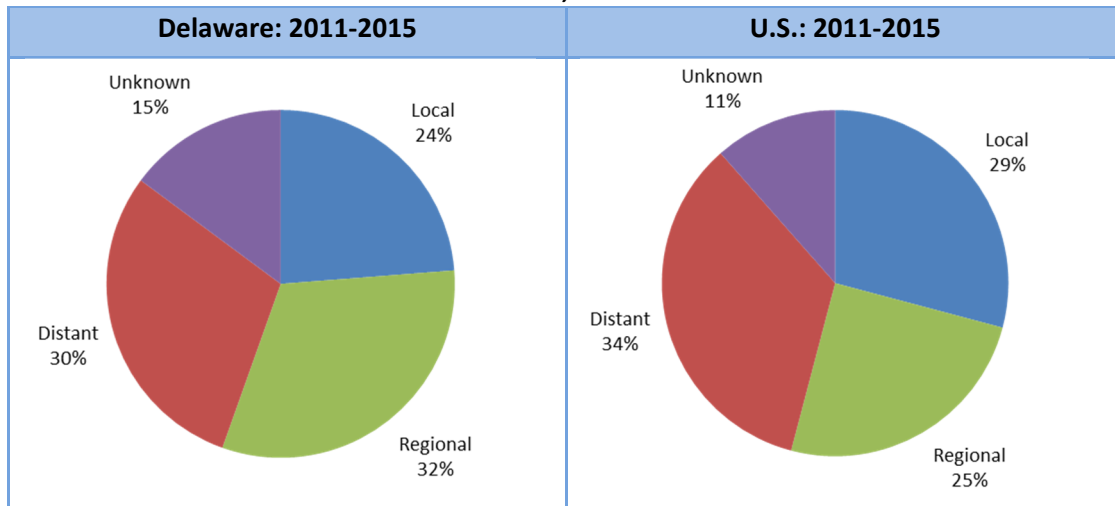
TABLE 10-4: NUMBER AND PERCENTAGE OF STOMACH CANCER CASES BY STAGE AT DIAGNOSIS, BY SEX, AND RACE/ETHNICITY, DELAWARE, 2011-2015

Stage at Diagnosis	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Local	93 (24)	61 (25)	32 (23)	72 (27)	47 (27)	25 (28)	18 (21)	11 (21)	7 (22)	---	---	---
Regional	122 (32)	79 (32)	43 (31)	84 (32)	58 (33)	26 (29)	28 (33)	15 (29)	13 (41)	---	---	---
Distant	114 (30)	73 (29)	41 (30)	78 (29)	50 (28)	28 (31)	25 (30)	---	---	7 (44)	---	---
Unknown	56 (15)	35 (14)	21 (15)	33 (12)	21 (12)	12 (13)	13 (16)	---	---	---	---	---
Total	385	248	137	267	176	91	84	52	32	16	8	8

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 93 (24%) stomach cancers diagnosed at the local stage; 122 (32%) at the regional stage; 114 (30%) at the distant stage; and 56 (15%) with an unknown stage.
- Hispanics (44%) had a higher proportion of stomach cancers diagnosed at the distant stage compared to both non-Hispanic Caucasians (29%) and non-Hispanic African Americans (30%).
- Males (29%) and females (30%) had a similar proportion of stomach cancers diagnosed at distant stage.

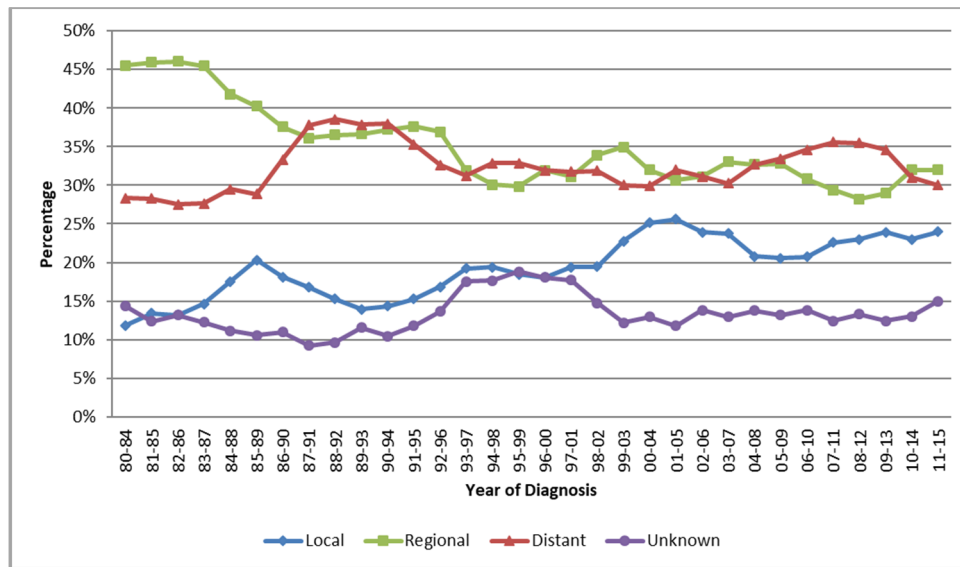
FIGURE 10-5: PERCENTAGE OF STOMACH CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

- In comparing U.S. and Delaware stomach cancer data, the U.S. (29%) had a higher proportion diagnosed at the local stage compared to Delaware (24%).

FIGURE 10-6: FIVE-YEAR PERCENTAGE OF DIAGNOSIS FOR STOMACH CANCER CASES, DELAWARE, 1980-2015



Source: Delaware Cancer Registry, Delaware Department of Health and Social Services, Division of Public Health, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percentage of stomach cancer cases diagnosed at the local stage increased from 12% to 24%.
 - Cases of stomach cancer diagnosed at the distant stage increased from 28% to 30%.

MORTALITY

For 2011-2015, Delaware ranked 20th in the U.S. for stomach cancer mortality (14th in 2010-2014); males ranked 31st (16th in 2010-2014) and females ranked 15th (13th in 2010-2014)⁹.

2011-2015 DATA

TABLE 10-5: NUMBER OF STOMACH CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	169	92	77	109	57	52	42	26	16	9	---	---
Kent	35	19	16	22	12	10	---	---	---	---	---	---
New Castle	106	55	51	65	31	34	30	18	12	6	---	---
Sussex	28	18	10	22	14	8	---	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 169 deaths (2% of all cancer deaths) from stomach cancer in Delaware.
- Males accounted for 54% of stomach cancer deaths.
- Non-Hispanic Caucasians accounted for 65% of stomach cancer deaths.

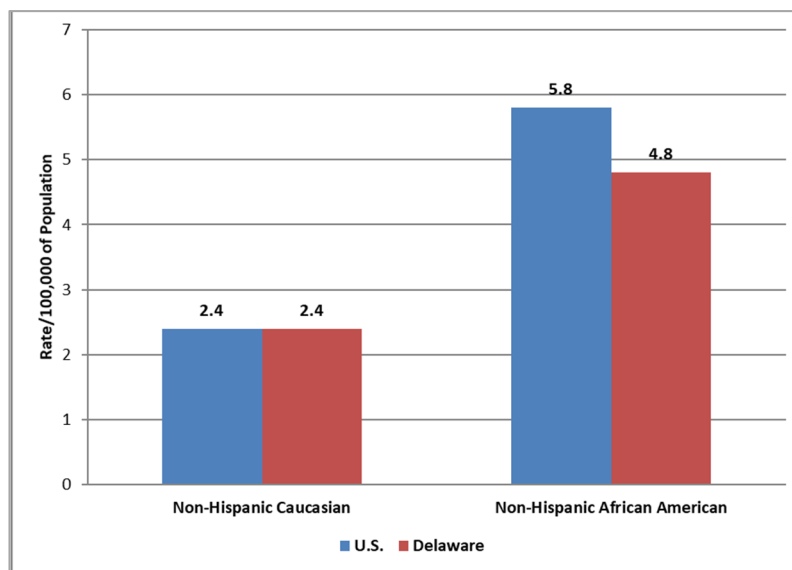
⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

TABLE 10-6: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	3.2	4.3	2.3
Delaware	3.1	3.8	2.5
Kent	3.7	---	---
New Castle	3.6	4.5	3.0
Sussex	1.7	---	---

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
 Rates based on less than 25 cases are not shown.

FIGURE 10-7: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER INCIDENCE RATES BY RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015



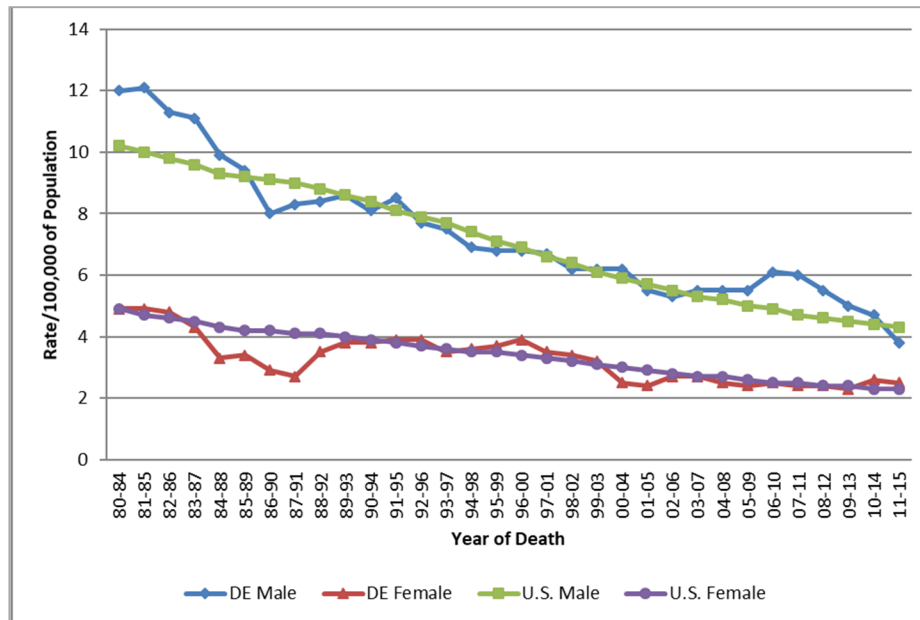
Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - The difference in stomach cancer mortality rates between males (3.8 per 100,000) and females (2.5 per 100,000) was not statistically significant.
 - Non-Hispanic Caucasians (2.4 per 100,000) had a statistically significantly lower stomach cancer mortality rate compared to non-Hispanic African Americans (4.8 per 100,000).
 - Stomach cancer incidence rates for Hispanics could not be calculated due to the low number of deaths.
- Comparing Delaware and the U.S.
 - The difference in stomach cancer mortality rates between Delaware (3.1 per 100,000) and the U.S. (3.2 per 100,000) was not statistically significant.
 - The difference in stomach cancer mortality rates between males in Delaware (3.8 per 100,000) and the U.S. (4.3 per 100,000) was not statistically significant.
 - The difference in stomach cancer mortality rates between females in Delaware (2.5 per 100,000) and the U.S. (2.3 per 100,000) was not statistically significant.

- The difference in stomach cancer mortality rates between non-Hispanic Caucasians in Delaware (2.4 per 100,000) and the U.S. (2.4 per 100,000) was not statistically significant.
- The difference in stomach cancer mortality rates between non-Hispanic African Americans in Delaware (4.8 per 100,000) and the U.S. (5.8 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 10-8: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER MORTALITY RATES BY SEX; U.S. AND DELAWARE, 1980-2015

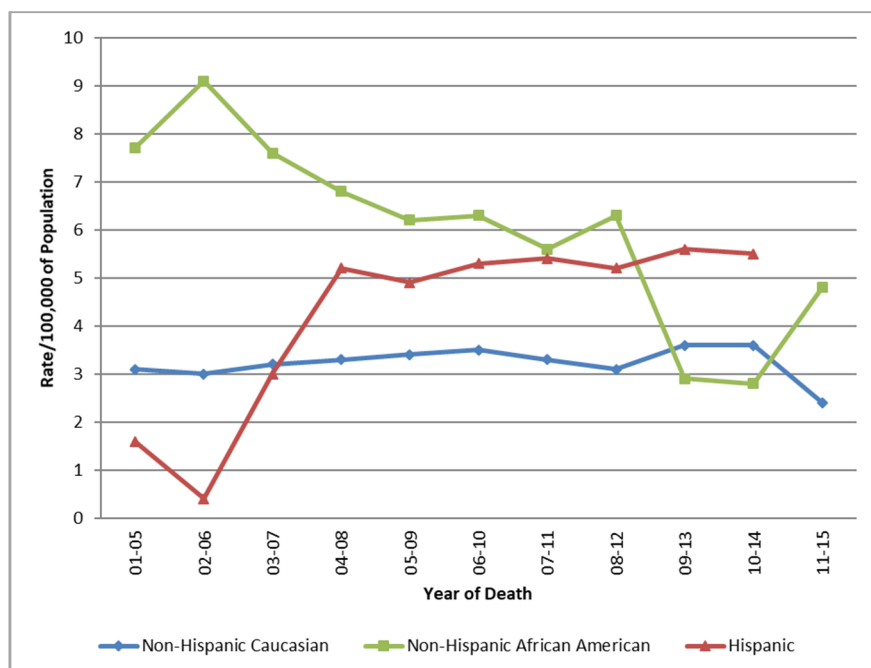


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for stomach cancer decreased 16% in Delaware and decreased 22% in the U.S.
 - Mortality rates for stomach cancer decreased 31% in Delaware males and decreased 25% in U.S. males.
 - Mortality rates for stomach cancer increased 4% in Delaware females and decreased 21% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 10-9: FIVE-YEAR AVERAGE AGE-ADJUSTED STOMACH CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2001-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Mortality rates for stomach cancer decreased 23% in non-Hispanic Caucasians.
 - Mortality rates for stomach cancer decreased 38% in non-Hispanic African Americans.
 - Mortality rates for stomach cancer in Hispanics could not be calculated due to the small number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

- Due to low numbers, age-specific stomach cancer mortality rates were not calculated.

CHAPTER 11: URINARY BLADDER CANCER

RISK FACTORS

The following are ***lifestyle risk factors*** that a person can modify to reduce their risk of getting urinary bladder cancer:

- Smoking cigarettes
- Low fluid consumption
- Excessive use of certain pain medications (e.g. phenacetin)

The following are ***environmental and medically-related*** causes of urinary bladder cancer:

- Workplace exposures to aromatic amines used in the dye industry (e.g. benzidine, beta-naphthylamine)
- Employment in rubber or leather industries
- Arsenic in drinking water
- Treatment with alkylating agent chemotherapy drugs like Cytosin
- Radiation therapy to the bladder
- Exposure to combustion gases and soot from coal

The following are ***non-modifiable*** risk factors (these cannot be changed) for getting urinary bladder cancer:

- Non-Hispanic Caucasians are twice as likely as non-Hispanic African Americans to have urinary bladder cancer; Asians and American Indians are also at higher risk.
- Hispanics are at higher risk.
- Most cases are present in those 55 years of age and older (90% of cases).
- More common in males than females
- Personal and family history of bladder cancer
- Certain gene syndromes

To protect against urinary bladder cancer, individuals should avoid tobacco.

EARLY DETECTION

There are currently no tests recommended for the screening of urinary bladder cancer in the general population. Screening is recommended for people at very high risk (history of work-related exposures).

INCIDENCE

For 2011-2015, Delaware ranked 6th in the U.S. for urinary bladder cancer incidence (6th in 2010-2014); males ranked 5th (6th in 2010-2014) and females ranked 11th (7th in 2010-2014)⁹.

2011-2015 DATA

TABLE 11-1: NUMBER OF URINARY BLADDER CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	1,407	1,082	325	1,243	963	280	127	91	36	26	20	6
Kent	252	185	67	213	154	59	30	---	---	---	---	---
New Castle	736	570	166	633	501	132	81	53	28	15	10	---
Sussex	419	327	92	397	308	89	16	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, 1,407 urinary bladder cancer cases (5% of all cancer cases) were diagnosed in Delaware.
- Males accounted for 77% of urinary bladder cancer cases.
- Non-Hispanic Caucasians accounted for 88% of urinary bladder cancer cases.

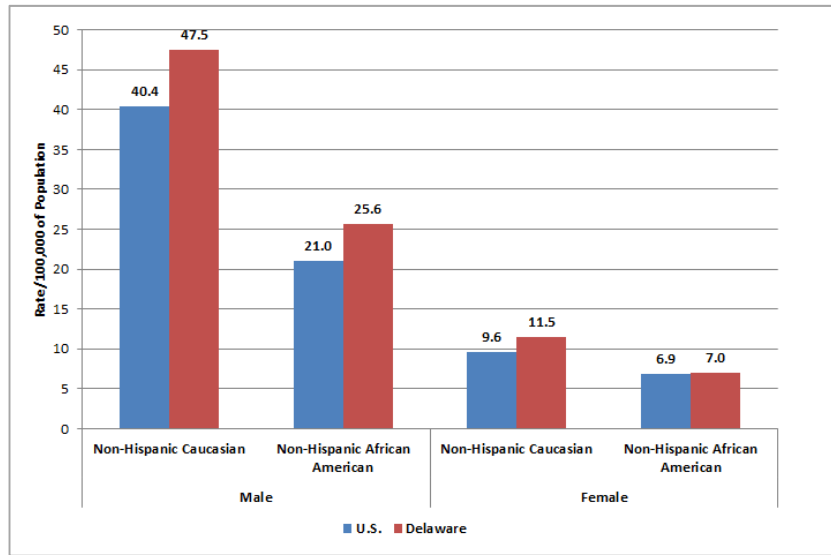
TABLE 11-2: FIVE-YEAR AVERAGE AGE-ADJUSTED URINARY BLADDER CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	19.5	34.3	8.3
Delaware	24.6	43.4	10.4
Kent	25.9	43.4	12.7
New Castle	24.5	44.9	9.8
Sussex	23.9	40.5	10.7

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

FIGURE 11-1: FIVE-YEAR AVERAGE AGE-ADJUSTED URINARY BLADDER CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2011-2015

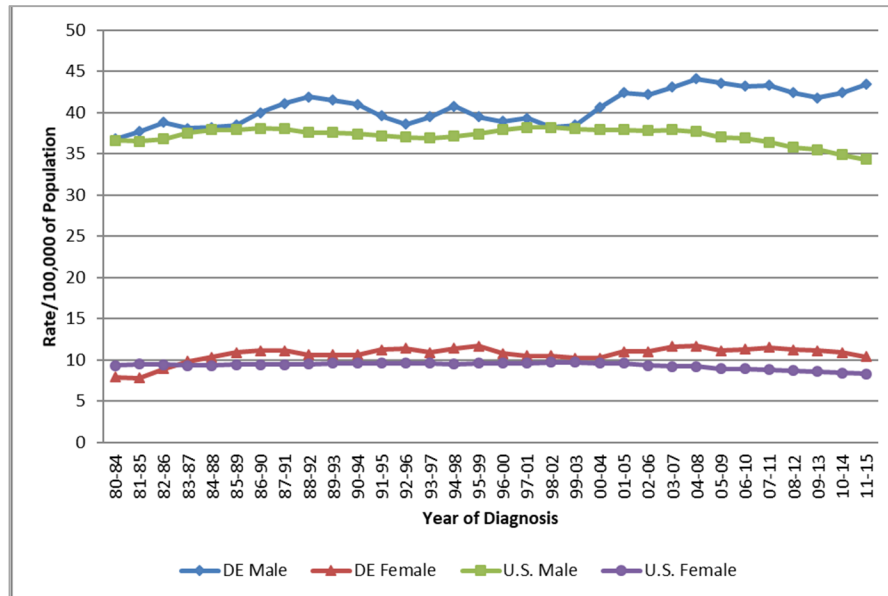


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- In Delaware
 - Males (43.4 per 100,000) had a statistically significantly higher urinary bladder cancer incidence rate compared to females (10.4 per 100,000).
 - Non-Hispanic Caucasians (27.2 per 100,000) had a statistically significantly higher urinary bladder cancer incidence rate compared to non-Hispanic African Americans (14.3 per 100,000).
 - The difference in urinary bladder cancer incidence rates between Hispanics (18.1 per 100,000) and both non-Hispanic Caucasians and non-Hispanic African Americans was not statistically significant.
- Comparing Delaware and the U.S.
 - Delaware (24.6 per 100,000) had a statistically significantly higher urinary bladder cancer incidence rate compared to the U.S. (19.5 per 100,000).
 - Delaware males (43.4 per 100,000) had a statistically significantly higher urinary bladder cancer incidence rate compared to U.S. males (34.3 per 100,000).
 - Delaware females (10.4 per 100,000) had a statistically significantly higher urinary bladder cancer incidence rate compared to U.S. females (8.3 per 100,000).
 - Non-Hispanic Caucasians in Delaware (27.2 per 100,000) had a statistically significantly higher urinary bladder cancer incidence rate compared to non-Hispanic Caucasians in the U.S. (23.1 per 100,000).
 - The difference in urinary bladder cancer incidence rates between non-Hispanic African Americans in Delaware (14.3 per 100,000) and the U.S. (12.5 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 11-2: FIVE-YEAR AVERAGE AGE-ADJUSTED URINARY BLADDER CANCER INCIDENCE RATES BY SEX; U.S. AND DELAWARE, 1980-2015

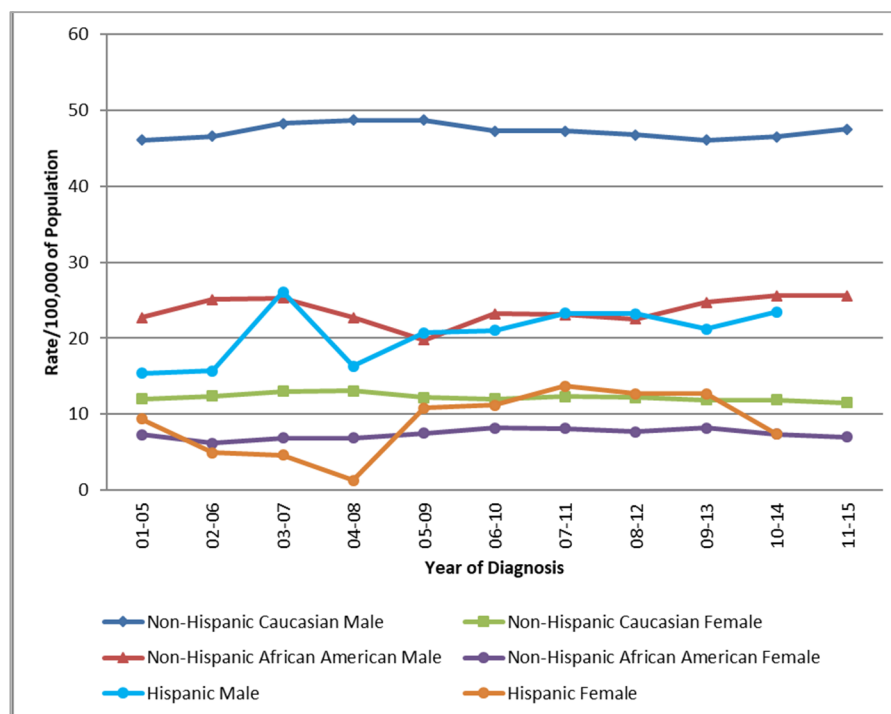


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Incidence rates for urinary bladder cancer did not change in Delaware and decreased 9% in the U.S.
 - Incidence rates for urinary bladder cancer increased 2% in Delaware males and decreased 9% in U.S. males.
 - Incidence rates for urinary bladder cancer decreased 5% in Delaware females and decreased 14% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 11-3: FIVE-YEAR AVERAGE AGE-ADJUSTED URINARY BLADDER CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2001-2015

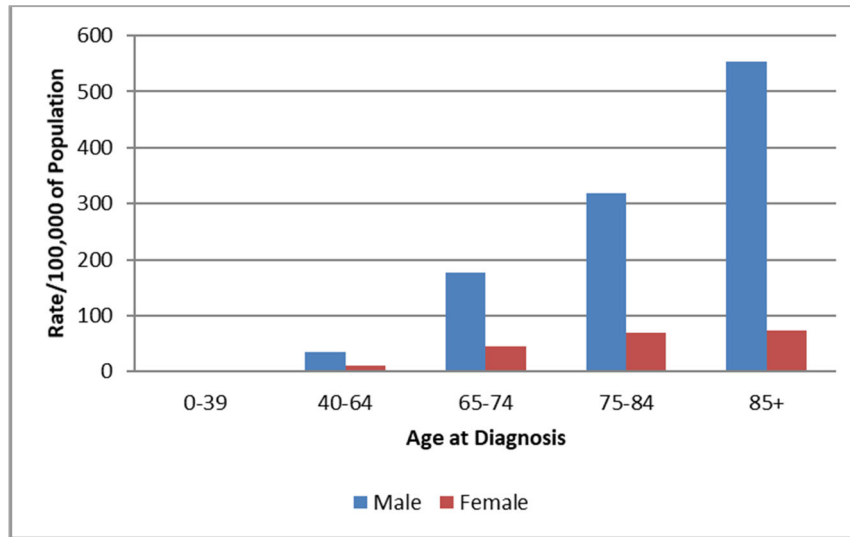


Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Incidence rates for urinary bladder cancer increased 3% in non-Hispanic Caucasian males and decreased 4% in non-Hispanic Caucasian females.
 - Incidence rates for urinary bladder cancer increased 13% in non-Hispanic African American males and decreased 4% in non-Hispanic African American females.

AGE-SPECIFIC INCIDENCE RATES - DELAWARE

FIGURE 11-4: AGE-SPECIFIC URINARY BLADDER CANCER INCIDENCE RATES BY SEX; DELAWARE, 2011-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- The incidence rate for urinary bladder was highest for both males and females 85 years of age and older. Due to small numbers, urinary bladder cancer incidence rates were not calculated by sex for the 0-39 age group.

TABLE 11-3: AGE-SPECIFIC URINARY BLADDER CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Diagnosis	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	41.1	21.9	---	12.0	---	---
65-74	190.8	117.5	---	50.9	---	---
75-84	350.9	---	---	74.4	---	---
85+	597.7	---	---	84.3	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

- The incidence rate for urinary bladder cancer was highest for non-Hispanic Caucasian males and non-Hispanic Caucasian females 85 years of age and older.

STAGE OF DIAGNOSIS - DELAWARE

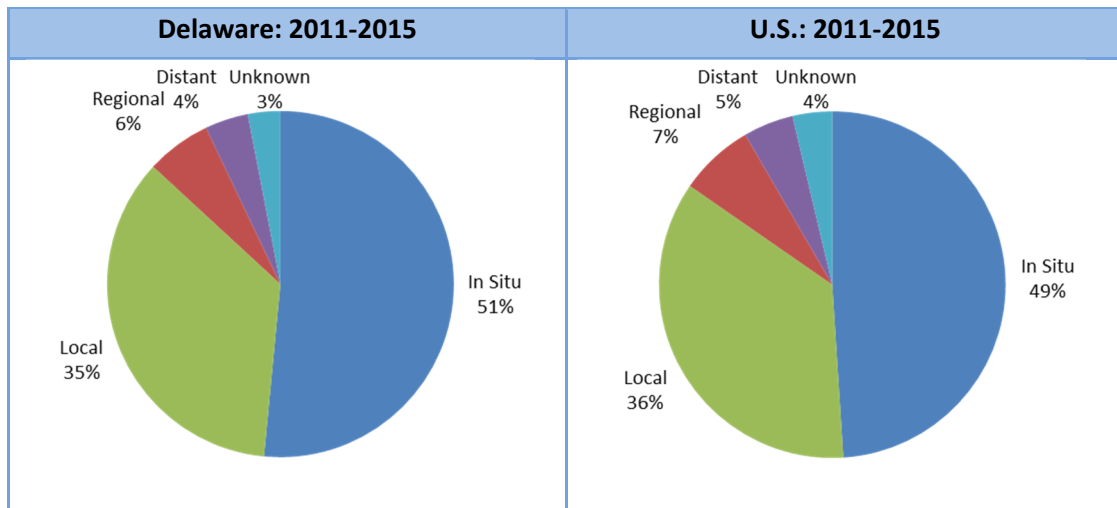
TABLE 11-4: NUMBER AND PERCENTAGE OF URINARY BLADDER CANCER CASES BY STAGE AT DIAGNOSIS, BY SEX, AND RACE/ETHNICITY, DELAWARE, 2011-2015

Stage at Diagnosis	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
In Situ	720 (51)	562 (52)	158 (49)	644 (52)	502 (52)	142 (51)	51 (40)	39 (43)	12 (33)	17 (65)	---	---
Local	496 (35)	383 (35)	113 (35)	435 (35)	343 (36)	92 (33)	52 (41)	36 (40)	16 (44)	7 (27)	---	---
Regional	90 (6)	61 (6)	29 (9)	82 (7)	56 (6)	26 (9)	7 (6)	---	---	---	---	---
Distant	56 (4)	41 (4)	15 (5)	45 (4)	33 (3)	12 (4)	10 (8)	---	---	---	---	---
Unknown	45 (3)	35 (3)	10 (3)	37 (3)	29 (3)	8 (3)	7 (6)	---	---	---	---	---
Total	1,407	1,082	325	1,243	963	280	127	91	36	26	20	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Counts less than 6 are not shown to protect patient privacy.

- *In situ* urinary bladder cancer cases are included because, based on language used by pathologists, it is difficult to distinguish them from malignant cancers.
- In 2011-2015, there were 720 (51%) urinary bladder cancers diagnosed *in situ*; 496 (35%) at the local stage; 90 (6%) at the regional stage; 56 (4%) at the distant stage; and 45 (3%) with an unknown stage.
- Non-Hispanic African Americans (40%) had a lower proportion of urinary bladder cancers diagnosed *in situ* compared to both non-Hispanic Caucasians (52%) and Hispanics (65%).
- Males (52%) had a higher proportion of urinary bladder cancers diagnosed *in situ* compared to females (49%).

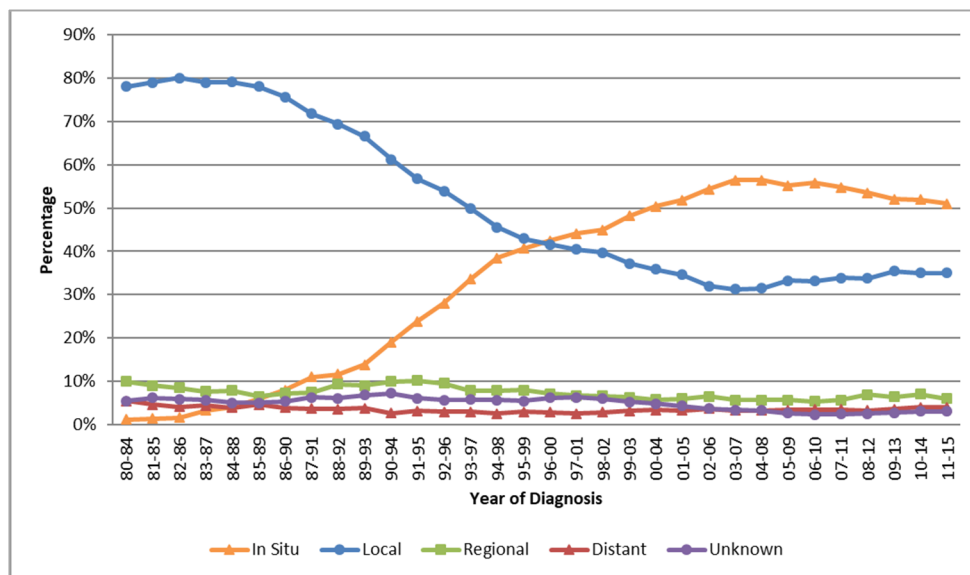
FIGURE 11-5: PERCENTAGE OF URINARY BLADDER CANCER CASES BY STAGE AT DIAGNOSIS, U.S. AND DELAWARE, 2011-2015



Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.

- In comparing U.S. and Delaware urinary bladder cancer data, Delaware (51%) has a higher proportion of urinary bladder cancer diagnosed *in situ* compared to the U.S. (49%).

FIGURE 11-6: FIVE-YEAR PERCENTAGE OF STAGE OF DIAGNOSIS FOR URINARY BLADDER CANCER CASES, DELAWARE, 1980-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

- From 1980-1984 to 2011-2015 in Delaware
 - The percent of urinary bladder cancer cases diagnosed *in situ* increased from 1% to 51%.

MORTALITY

For 2011-2015, Delaware ranked 16th in the U.S. for urinary bladder cancer mortality (20th in 2010-2014); males ranked 21st (32nd in 2010-2014) and females ranked 7th (3rd in 2010-2014)⁹.

2011-2015 DATA

TABLE 11-5: NUMBER OF URINARY BLADDER CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2011-2015

	All Races			Non-Hispanic Caucasian			Non-Hispanic African American			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	259	180	79	226	159	67	30	18	12	---	---	---
Kent	40	21	19	38	19	19	---	---	---	---	---	---
New Castle	149	110	39	123	95	28	23	12	11	---	---	---
Sussex	70	49	21	65	45	20	---	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Counts less than 6 are not shown to protect patient privacy.

- In 2011-2015, there were 259 deaths (3% of all cancer deaths) from urinary bladder cancer in Delaware.
- Males accounted for 69% of urinary bladder cancer deaths.
- Non-Hispanic Caucasians accounted for 87% of urinary bladder cancer deaths.

TABLE 11-6: FIVE-YEAR AVERAGE AGE-ADJUSTED URINARY BLADDER CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE AND COUNTIES, 2011-2015

	Overall	Male	Female
U.S.	4.4	7.6	2.2
Delaware	4.7	8.0	2.5
Kent	4.3	---	---
New Castle	5.2	9.7	2.3
Sussex	4.2	6.8	---

Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.
Rates based on less than 25 cases are not shown.

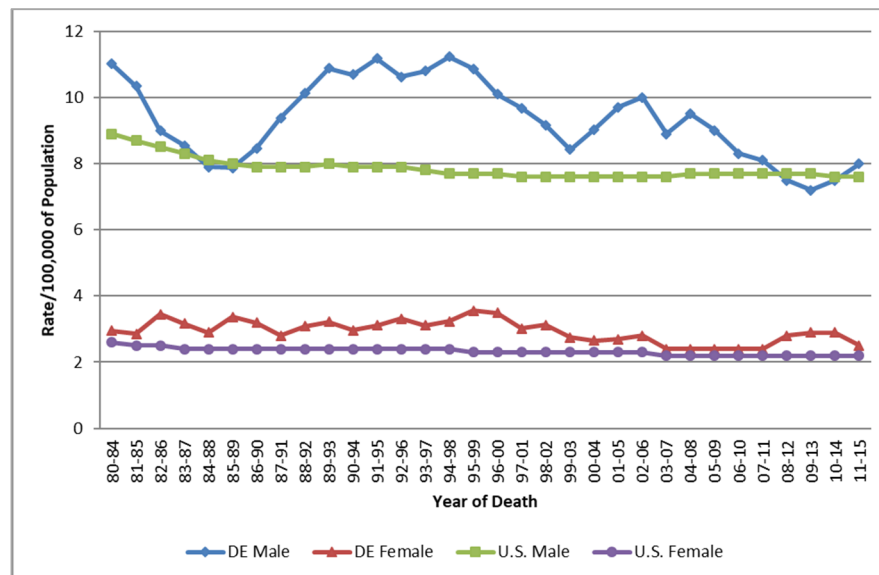
- In Delaware
 - Males (8.0 per 100,000) had a statistically significantly higher urinary bladder cancer mortality rate compared to females (2.5 per 100,000).
 - The difference in urinary bladder cancer mortality rates between non-Hispanic Caucasians (5.0 per 100,000) and non-Hispanic African Americans (3.8 per 100,000) was not statistically significant.
 - Urinary bladder cancer mortality rates for Hispanics could not be calculated due to the low number of deaths.

⁹ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

- Comparing Delaware and the U.S.
 - The difference in urinary bladder cancer mortality rates between Delaware (4.7 per 100,000) and the U.S. (4.4 per 100,000) was not statistically significant.
 - The difference in urinary bladder cancer mortality rates between males in Delaware (8.0 per 100,000) and the U.S. (7.6 per 100,000) was not statistically significant.
 - Delaware females (2.5 per 100,000) did not have a statistically significantly higher urinary bladder cancer mortality rate compared to U.S. females (2.2 per 100,000).
 - The difference in urinary bladder cancer mortality rates between non-Hispanic Caucasians in Delaware (5.0 per 100,000) and the U.S. (4.8 per 100,000) was not statistically significant.
 - The difference in urinary bladder cancer mortality rates between non-Hispanic African Americans in Delaware (3.8 per 100,000) and the U.S. (3.6 per 100,000) was not statistically significant.

TRENDS OVER TIME - DELAWARE AND U.S.

FIGURE 11-7: FIVE-YEAR AVERAGE AGE-ADJUSTED URINARY BLADDER CANCER MORTALITY RATES BY SEX; U.S. AND DELAWARE, 1980-2015

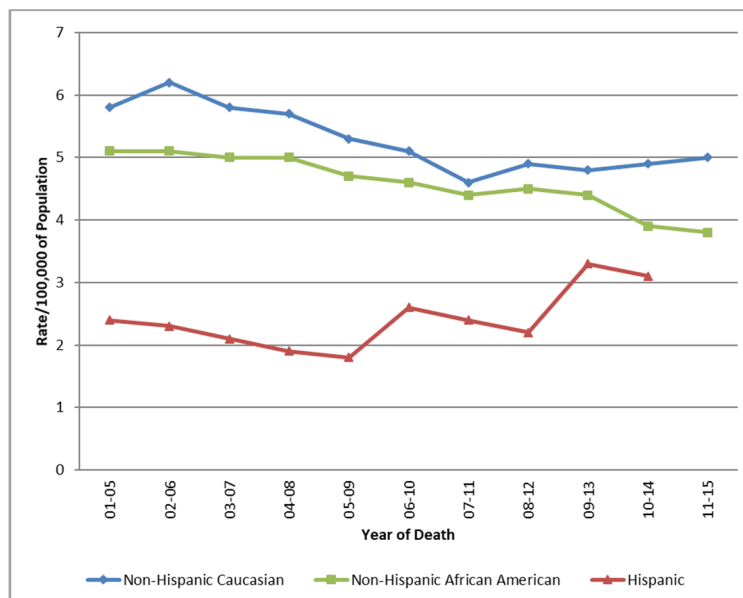


Source (Delaware): Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018.
 Source (U.S.): Surveillance, Epidemiology and End Results Program (SEER 18), National Cancer Institute, Nov 2017 sub.
 Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015
 - Mortality rates for urinary bladder cancer decreased 15% in Delaware and remained the same in the U.S.
 - Mortality rates for urinary bladder cancer decreased 18% in Delaware males and remained the same in the U.S. males.
 - Mortality rates for urinary bladder cancer decreased 7% in Delaware females and decreased 4% in U.S. females.

TRENDS OVER TIME - DELAWARE

FIGURE 11-8: FIVE-YEAR AVERAGE AGE-ADJUSTED URINARY BLADDER CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2001-2015



Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

- From 2001-2005 to 2011-2015 in Delaware
 - Mortality rates for urinary bladder cancer decreased 14% in non-Hispanic Caucasians.
 - Mortality rates for urinary bladder cancer decreased 25% in non-Hispanic African Americans.
 - Mortality rates for urinary bladder cancer in Hispanics could not be calculated due to the small number of deaths.

AGE-SPECIFIC MORTALITY RATES - DELAWARE

TABLE 11-7: AGE-SPECIFIC URINARY BLADDER CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2011-2015

Age at Death	Males			Females		
	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic	Non-Hispanic Caucasian	Non-Hispanic African American	Hispanic
0-39	---	---	---	---	---	---
40-64	4.8	---	---	---	---	---
65-74	19.8	---	---	---	---	---
75-84	57.9	---	---	---	---	---
85+	214.9	---	---	---	---	---

Source: Delaware Department of Social Services, Division of Public Health, Delaware Health Statistics Center, 2018. Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population. Rates based on less than 25 cases are not shown.

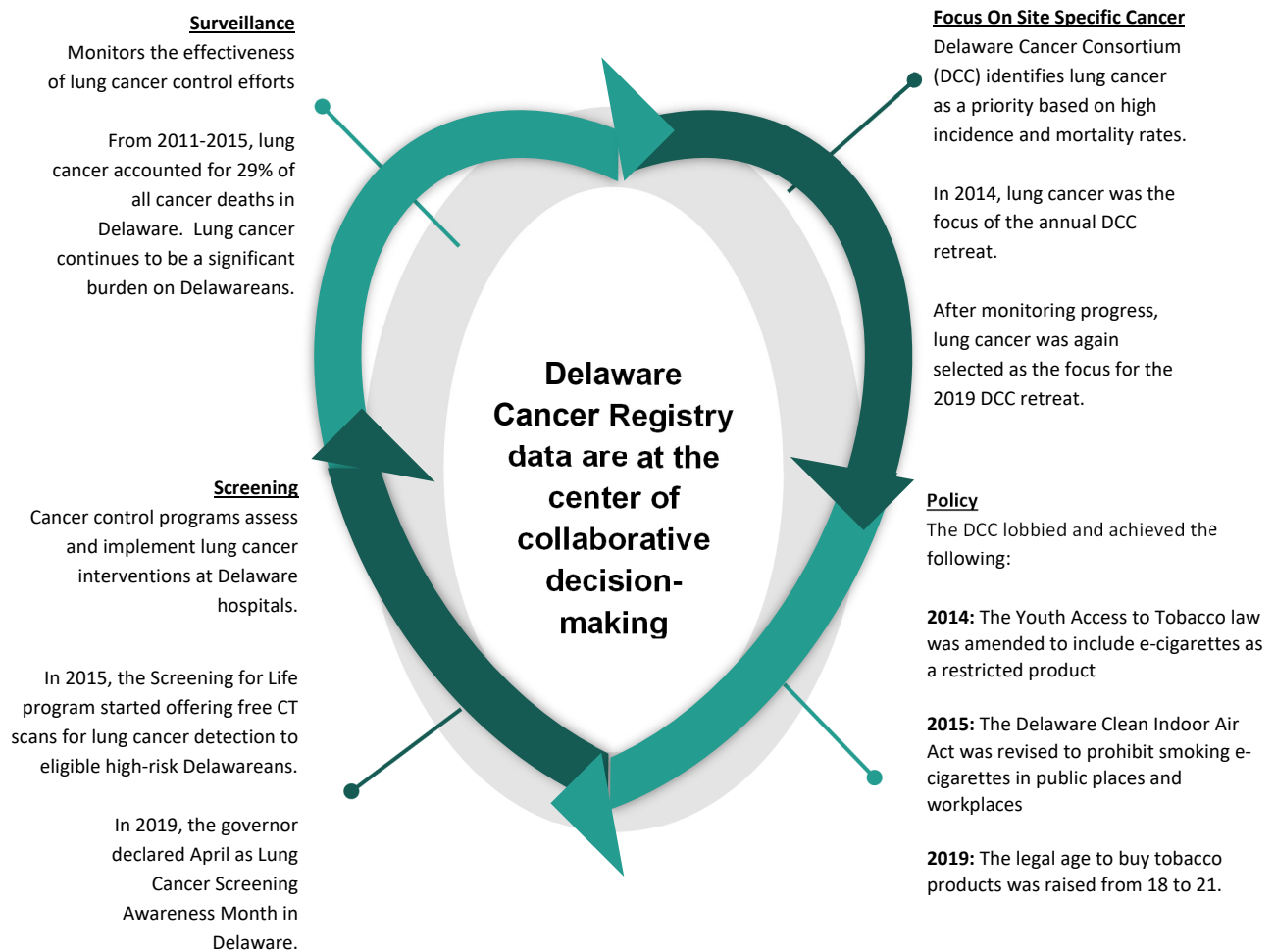
- The mortality rate for urinary bladder cancer was highest for non-Hispanic Caucasians 85 years of age and older. Due to small numbers, mortality rates were not calculated by age group other than for non-Hispanic Caucasian males.

CHAPTER 12: AN OVERVIEW OF LUNG CANCER IN DELAWARE

Lung cancer is a major cause of cancer in Delaware. From 2011-2015, it accounted for 15% of all newly diagnosed cancer cases in the state. Lung cancer is also the most common cause of cancer deaths in both the U.S. and in Delaware, accounting for 29% of all cancer deaths in the state. Delaware's 2011-2015 lung cancer incidence (71.3 per 100,000) and mortality (50.0 per 100,000) rates were significantly higher than the comparable U.S. rates (incidence: 54.6 per 100,000; mortality: 43.4 per 100,000). Fifty-two percent of Delaware lung cancer cases were diagnosed at the distant stage. Yet, between 2001-2005 and 2011-2015, mortality rates for lung cancer decreased by 19% in Delaware (2001-2005: 61.9 per 100,000; 2011-2015: 50.0 per 100,000).

Historically, Delaware's lung cancer mortality rates have been higher than the U.S. average. The state has identified lung cancer as a priority and continues to work towards reducing the burden of lung cancer on Delawareans. As a part of reducing the burden, there is collaboration and a multi-disciplinary approach at different levels in order to enact change and address issues that contribute to the high rate of lung cancer in Delaware (Figure 12-1).

Figure 12-1: Collaborative and Multi-disciplinary Approach to Lung Cancer Control, Delaware, 2011-2019



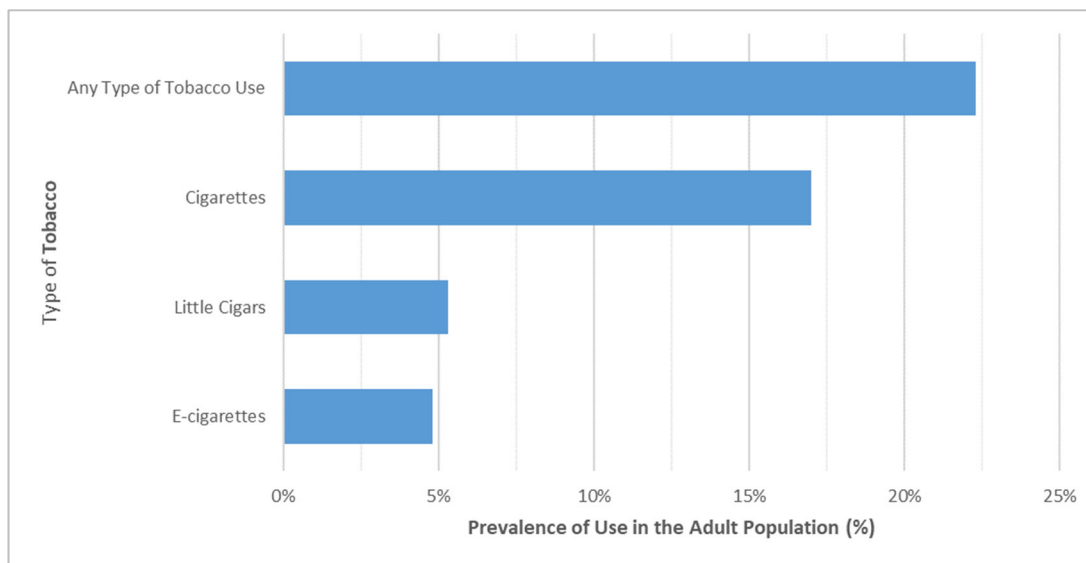
Source: Delaware Department of Health and Social Services, Division of Public Health

SMOKING AND TOBACCO USE

Smoking continues to be the number one risk factor for lung cancer, accounting for an estimated 80 to 90% of all lung cancer cases.¹⁶ Cigarette smoking among U.S. adults has declined considerably after the release of the 1964 report, *Smoking and Health: Report of the Advisory Committee to the Surgeon General*. However, tobacco products have evolved in recent years to include various combustible, non-combustible, and electronic products as noted in the 2016 report, *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*.¹⁷ Notably, the electronic nicotine delivery system (ENDS) is an emerging contender of non-combustible tobacco products and includes electronic cigarettes (e-cigarettes or e-cigs), vaporizers or vapes, hookah, and e-pipes.

According to the Delaware BRFs, cigarette smoking prevalence among adult Delawareans was about 17% in 2016 and 2017. However, when considering all the other forms of tobacco currently in use, total tobacco use prevalence decreased from 2016 to 2017, from 24.2% to 22.3% among adult Delawareans (Figure 12-2). There were no statistically significant differences by sex, race or ethnicity.¹⁸ Smoking status of self-reported “never smokers” was 57.9%. This category comprised the largest group when compared to former smokers (25.1%), current smokers (11.2%), and some-day smokers (5.8%) (Figure 12-3). While Delaware-specific BRFs data are not available on smoking among youth, national trends report 7.2% of tobacco use among middle school students and 27.1% of tobacco use among high school students in 2018.¹⁹

FIGURE 12-2: PERCENTAGE OF PREVALENCE OF TOBACCO USE BY PRODUCT IN ADULTS, DELAWARE, 2017



Source: Delaware Behavioral Risk Factor Survey, 2017.

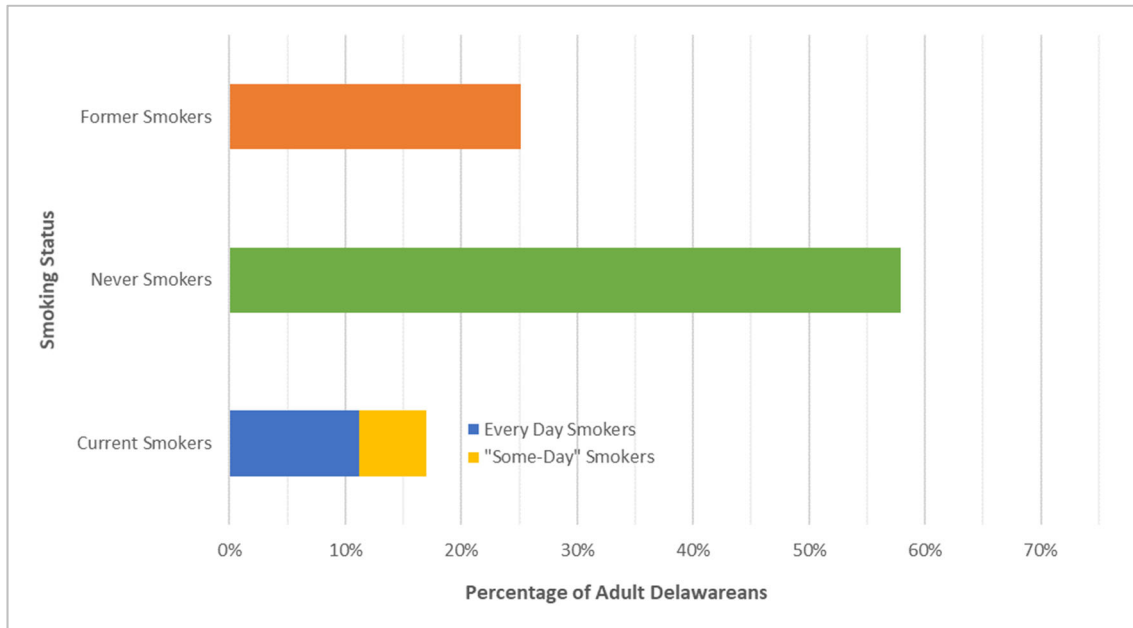
¹⁶ U.S. Department of Health & Human Services. 2018. Accessed on May 8, 2019. https://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm

¹⁷ U.S. Department of Health and Human Services. E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.

¹⁸ Delaware Behavioral Risk Factor Survey (BRFS). Accessed on May 8, 2019. <https://www.dhss.delaware.gov/dhss/dph/dpc/tobacco2017brfs.html>

¹⁹ Centers for Disease Control and Prevention. Vital Signs: Tobacco Product Use Among Middle and High School Students – United States, 2011-2018. Morbidity and Mortality Weekly Report, 2019;68(06) [accessed 2019 Feb 28].

FIGURE 12-3: SMOKING STATUS OF ADULT DELAWAREANS, 2017



Source: Delaware Behavioral Risk Factor Survey, 2017.

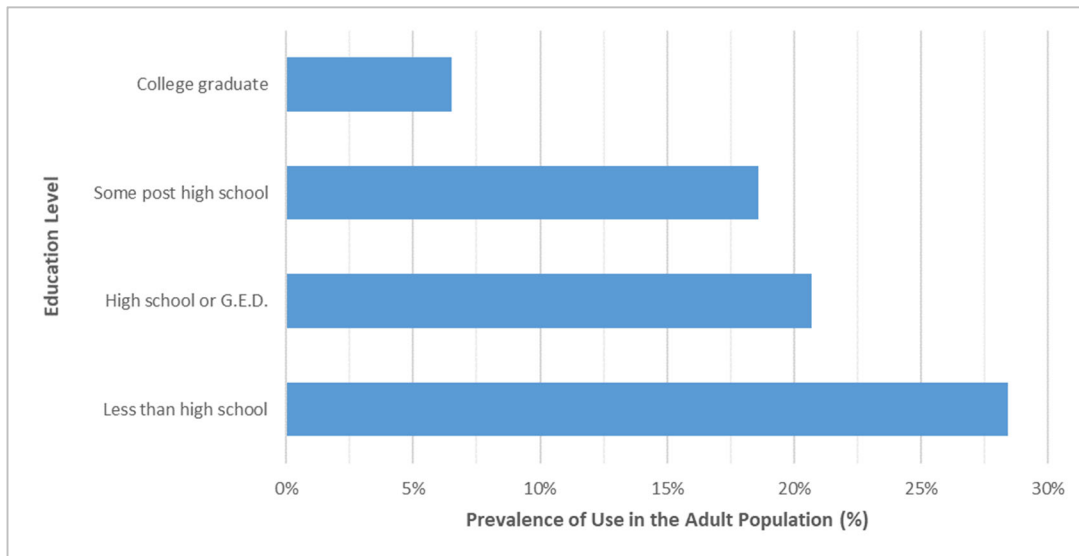
Former smokers were defined as anyone who has smoked at least 100 cigarettes during their lifetime but has not reported smoking every day or some days.

Never smokers were defined as anyone who reports having smoked less than 100 cigarettes in their lifetime.

Current smokers were defined as anyone who has reported smoking at least 100 cigarettes during their lifetime and reports smoking every day or some days during the week.

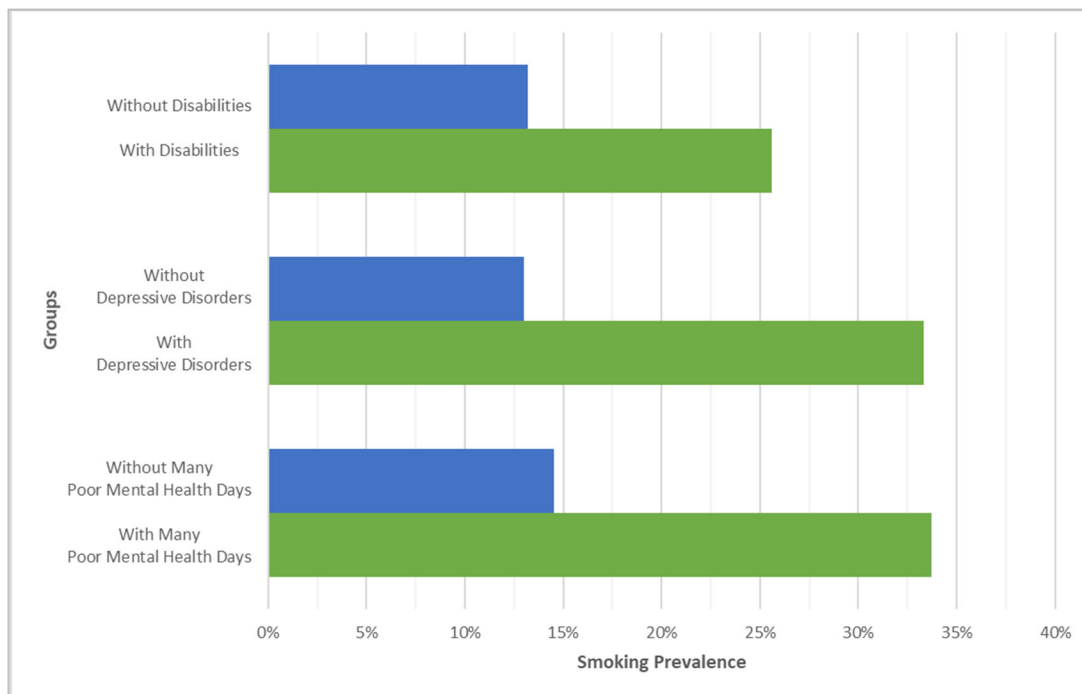
There are differences in the prevalence of smoking among adults by education and health issues. There is a gradient in prevalence of cigarette smoking among adults by educational level. Those who have less than a high school education have the highest prevalence of cigarette smoking, and this decreases with each level of increased education where college graduates have the lowest prevalence of cigarette smoking (Figure 12-4). Those with particular health issues such as disabilities, depressive disorders, and poor mental health have a higher prevalence of smoking than those without these health issues (Figure 12-5). These differences in smoking prevalence provide insight into particular populations that may be at most risk.

FIGURE 12-4: PERCENTAGE OF PREVALENCE OF ADULT CIGARETTE SMOKING BY EDUCATION LEVEL, DELAWARE, 2017



Source: Delaware Behavioral Risk Factor Survey, 2017.

FIGURE 12-5: PERCENTAGE OF ADULTS BY GROUPS WITH HIGHER SMOKING PREVALENCE, DELAWARE, 2017



Source: Delaware Behavioral Risk Factor Survey, 2017.

TOBACCO PREVENTION AND LUNG CANCER SCREENING

Lung cancer screening and tobacco prevention continue to be priorities for the Division of Public Health (DPH). The CDC reports about 9 out of 10 smokers began using cigarettes by age 18 and 98% first try smoking by age 26.²⁰ To prevent early access to tobacco products, on April 11, 2019, the Delaware General Assembly passed new legislation, Senate Bill 25 to raise the legal age for sales of tobacco and tobacco products from 18 to 21. Governor John Carney signed Senate Bill 25 on April 17, 2019. The law goes into effect July 16, 2019.

Additionally, the new legislation eliminates any penalty to those under 21 who are caught with tobacco products, and instead enforces penalties on the sellers if they sell to anyone under the new legal buying age.

Lung cancer is most treatable when diagnosed during the early stage. Low-dose CT scans help detect lung cancer at that early, most treatable, stage. Studies have shown that this form of screening can reduce the risk of dying of lung cancer by 20%. Following the ACS lung cancer screening guidelines from 2013, the DCC and DPH's Comprehensive Cancer Control Program promotes low-dose CT scans via a new lung cancer screening educational campaign. This campaign also educates the public on the availability of screening sites. DPH's SFL program provides financial coverage for the screenings of individuals without insurance coverage otherwise. Nurse navigators are resources to Delawareans to help schedule cancer screening and provide follow-up help. Lung cancer screenings aid in early detections of lung cancer. To support these efforts, Governor John Carney also proclaimed April 2019 as Lung Cancer Screening Awareness Month in Delaware.

Lung cancer screening is recommended for individuals who meet the following criteria:

- Are 55-80 years of age
- Smoked a pack of cigarettes a day for the last 30 years or more, or two packs a day for the last 15 years or more
- Quit smoking within the last 15 years and had smoked a pack of cigarettes a day for 30 or more years, or two packs a day for 15 or more years.

PRIORITIES MOVING FORWARD

DPH and DCC have the following priorities related to lung cancer:

- Lower the state's lung cancer incidence and mortality rates by increasing screening, tobacco prevention efforts, and education/awareness, especially in the youth population.
- Develop and implement evidence-based education campaigns to increase cancer screening rates.
- Decrease the number of late-stage (distant) lung cancer diagnoses by 20 percent.
- Increase screenings and outreach programs of at-risk and underserved populations by identifying barriers to screening and then creating programs that overcome them.

²⁰ U.S. Department of Health and Human Services. The Health Consequences of Smoking – 50 Years of Progress: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014 [accessed 2019 Feb 28]. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK179276/pdf/Bookshelf_NBK179276.pdf

CHAPTER 13: CANCER INCIDENCE BY CENSUS TRACT

BACKGROUND

As required by Title 16, Chapter 292 of the *Delaware Code* (Appendix E), DHSS, DPH publishes cancer rates by census tract annually. Specifically:

“The agency [DPH] shall create a detailed map of each county in Delaware that graphically illustrates the overall incidence of cancer in each census tract. The census tracts will be identified on the maps and shall be color-coded to designate the degree of cancer incidence in each tract. These maps shall be created within 90 days of the agency receiving the cancer incidence data. The agency shall post the maps created ... on their website in a format that can be easily accessed and read by the public.”

METHODS

Census tract analysis methods are described in detail in Appendix F.

As of the 2010 Census, Delaware is divided into 214 census tracts.

- For 2011-2015, the least populated census tract (511.01 in Sussex County) had an annual average of 708 residents. The most populous census tract (402.02 in Kent County) had an annual average population of 13,309 residents. The average annual number of residents per census tract was 4,329.
 - For 2011-2015 census tract analyses, 27,955 Delaware cancer cases diagnosed during the period were included in the analyses.
-

RESULTS OF CENSUS TRACT ANALYSES

Cancer incidence rates by census tract (with confidence intervals) are shown in Appendix H for the 2011-2015 period. Census tracts shaded in yellow have statistically significantly higher incidence rates and those shaded in blue have statistically significantly lower incidence rates (when compared to the overall state incidence rate).

Results for 2011-2015 show that:

- In 16 of Delaware’s 214 census tracts (7%), the all-site cancer incidence rate was statistically significantly higher than Delaware’s average 2011-2015 incidence rate (495.3 per 100,000).
- In 10 of Delaware’s 214 census tracts (5%), the all-site cancer incidence rate was statistically significantly lower than Delaware’s average 2011-2015 incidence rate (495.3 per 100,000).
- All-site cancer incidence rates for the remaining 188 census tracts (88%) were not significantly different from the state’s average rate for the 2011-2015 period.

Appendix I shows maps of Delaware census tracts grouped by 2011-2015 all-site cancer incidence quintile. Appendix J shows maps of Delaware census tracts in which census tracts with 2011-2015 all-site cancer incidence rates are significantly different from the state average. These are shaded for ease of identification.

DISCUSSION OF RESULTS OF CENSUS TRACT ANALYSES

When assessing cancer incidence data by census tract, the occurrence of cancer may differ across census tracts for a variety of reasons. For example, lifestyle behaviors may cluster in a homogeneous community. In addition, the presence of exposure to environmental or occupational carcinogens is often limited to a defined geographic area. Also, residents in certain geographic areas may be more impoverished than other residents, which will affect their availability of health insurance coverage as well as their level of access to health care, particularly cancer screening services. Finally, chance or random variation can play a role, since approximately 5% of all comparisons will be significantly different due to chance alone.

Additional caution is needed when comparing results from the 2011-2015 census tract analysis to results for 2003-2007 and earlier time periods. Because of the change in the configuration of census tracts in Delaware (i.e., shifting from 197 census tracts defined by the 2000 Census to 214 census tracts defined by the 2010 Census), results derived using the two different census tract configurations would be expected to differ due to various reasons. Despite population growth in the intervening decade, the average population size of each census tract decreased when census tracts were redrawn for the 2010 Census. Using the 2000 Census configuration of 197 census tracts, each census tract had an average of 4,257 residents. Using the 2010 Census configuration of 214 census tracts, each census tract had an average of 4,118 residents.

Furthermore, there is an inherent instability in calculating cancer incidence rates at the census tract level. In a small group, such as a census tract, the relative number of cancer diagnoses can change considerably from year to year. If one case of cancer is diagnosed in a census tract one year, and three cases of cancer are diagnosed in the same census tract the next year, the cancer rate for that census tract will change dramatically from one year to the next. These relatively large fluctuations do not typically occur in larger populations. If a census tract has an all-site cancer incidence rate that is significantly different from the state rate for one time period, it is not unusual to find a non-significant difference in rates for the following time period (and vice versa).

The all-site cancer incidence fluctuations in census tract 513.02 illustrate this key point. During 2003-2007, 134 all-site cancer cases were diagnosed in census tract 513.02 and its all-site cancer incidence rate (823.3 per 100,000) was significantly elevated, compared to the all-site cancer incidence rate for Delaware (510.6 per 100,000). In 2004-2008, 123 all-site cancer cases were diagnosed in census tract 513.02 – 11 fewer than in the previous period. However, despite the decrease in the number of cases, the all-site cancer incidence rate (649.2 per 100,000) for 2004-2008 remained significantly elevated, compared to the all-site cancer incidence rate for Delaware (515.1 per 100,000). For the most recent time period, 2011-2015, 110 all-site cancer cases were diagnosed in census tract 513.02, yielding an all-site cancer incidence rate (475.1 per 100,000) which was not statistically significantly different from the all-site cancer incidence rate for Delaware (495.3 per 100,000).

Inaccurate data on the population at risk in small geographic areas continues to complicate epidemiologic studies in community settings. Census data are known to be less accurate for cities or counties than for states. In addition: *“The uncertainty is greatest for demographic subgroups of the population during the 10-year interval between national census counts”*²¹. Because population estimates for census tracts in analyses during the three initial time periods (2001-2005, 2002-2006, and 2003-2007) relied solely on 2000 Census population data, there was the potential for major fluctuations in the rate when comparing that data with data using the 2010 Census population projections. A further complication is that before 2004-2008, geocoding was not yet available, reducing the accuracy of geographic data.

²¹ Thun M., Sinks T. Understanding Cancer Clusters. *Cancer: A Cancer Journal for Clinicians*, 54(5), 273-280 (2004). Retrieved from <https://onlinelibrary.wiley.com/doi/full/10.3322/canjclin.54.5.273>

APPENDIX A: DATA SOURCES AND METHODOLOGY

CANCER INCIDENCE DATA

DELAWARE CANCER REGISTRY

This report covers data on cancer cases diagnosed among Delawareans from January 1, 2011 to December 31, 2015 and that were reported to the DCR by January 2019. Trends in incidence rates are based on cancers diagnosed from January 1, 1980 to December 31, 2015.

During 2011-2015, there were 28,027 cancer cases diagnosed among Delawareans, which includes individuals with cancers diagnosed at more than one site (known as multiple primaries). With the exception of urinary bladder cancer, only malignant tumors are included in the analyses. *In situ* urinary bladder cancer cases are included because, based on language used by pathologists, it is difficult to distinguish them from malignant cancers.

The International Classification of Diseases for Oncology, Second Edition (ICD-O-2), describes the topography (primary anatomic site) and morphology (histology) for cancers reported from 1988 through 2000. Cancers diagnosed from 2001 through the present are coded using the International Classification of Diseases for Oncology, Third Edition (ICD-O-3)²². Relevant codes for this report are in Appendix B. The topography code defines both the site of the tumor and the type of cancer. The first four digits of the morphology code define the histology of the cancer and the fifth digit indicates whether or not the cancer is malignant, benign, *in situ*, or uncertain. Consistent with the CDC's publication of the *U.S. Cancer Statistics*, Kaposi's sarcoma and mesothelioma are considered separate sites based on distinct histology codes.

SEER PROGRAM OF THE NATIONAL CANCER INSTITUTE

U.S. incidence and mortality data obtained from the Surveillance, Epidemiology and End Results (SEER) program of the National Cancer Institute (NCI) were used as the comparison for Delaware's cancer incidence and mortality rates. These data were accessed using SEER*Stat. Since 1973, the SEER program collects, analyzes, and disseminates cancer incidence data for cancer control, diagnosis, treatment, and research from population-based registries throughout the United States. The initial SEER reporting areas (known as SEER-9) were Connecticut, Iowa, New Mexico, Utah, and Hawaii; and the metropolitan areas of Detroit, Michigan; San Francisco-Oakland, California; Atlanta, Georgia; and Seattle-Puget Sound, Washington. Additional geographic areas were selected for inclusion in the SEER Program based on their ability to operate and maintain a high quality population-based cancer reporting system and for their epidemiologically relevant population subgroups.²³ The current analysis used data from SEER-18 that includes available cases diagnosed from 2000 through the current year and is representative of the demographics of the entire U.S. population; the following registry areas were added between SEER-9 and SEER-18: Alaska Native, Rural Georgia, Greater Georgia, San Jose-Monterey, Greater California, Kentucky, Los Angeles, Louisiana and New Jersey.

Historically, Delaware's cancer incidence rates have been compared to cancer incidence rates calculated using data from the SEER-9 registries that provided data to SEER beginning in 1974 and 1975. In 2009, DPH and the DCC elected to begin using cancer incidence rates based on 17 population-based registries as a comparison for Delaware's cancer incidence rates. Currently, SEER incidence rates are based on data from 18 population-based registries (SEER-18) that represent 28% of the U.S. population. The primary benefit of using U.S. comparison rates derived from SEER-18 is that these rates are based on a larger and more representative subsample of the U.S. population. Also, comparing Delaware's incidence rates with rates derived from the SEER-18 registries provides a comparison of cancer surveillance statistics that is consistent with those of other population-based registries throughout the U.S.

²² Fritz A, Jack A, Parkin DM, Percy C, Shanmugarathan, Sobin L, Whelan S (eds). International Classification of Diseases for Oncology, Third Edition (ICD-O-3). World Health Organization, Geneva.

²³ Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute. <http://seer.cancer.gov/about/>

CANCER MORTALITY DATA

DELAWARE HEALTH STATISTICS CENTER

Mortality data are provided by the Delaware Health Statistics Center (DHSC) for all death certificates filed in Delaware from 2011 through 2015. Five-year average annual age-adjusted cancer mortality rates are based on deaths that occurred in the five-year period from January 1, 2011 to December 31, 2015. Trends in cancer mortality are presented for deaths that occurred from 1980 through 2015.

Underlying cause-of-death codes are based on the International Classification of Diseases, Ninth Edition (ICD-9) for deaths that occurred between 1980 and 1998. For deaths that occurred from 1999 to the present, the International Classification of Diseases, Tenth Edition (ICD-10) is used to code cause of death. To determine the underlying cause of death, the sequence of events leading to the individual's death are recorded on the death certificate and run through the Automated Classification of Medical Entities (ACME) software used by the National Center for Health Statistics (NCHS). This program uses a series of rules and hierarchies of events to select the most appropriate underlying cause of death.

NATIONAL CENTER FOR HEALTH STATISTICS

U.S. mortality data were obtained from the NCHS. U.S. mortality data are compiled from all death certificates filed in the 50 states and the District of Columbia from 1980 through 2015. Cause of death was coded by NCHS in accordance with World Health Organization regulations that stipulate that cancer deaths be coded using the most current revision of the International Classification of Diseases. As in Delaware, deaths that occurred prior to 1999 in the U.S. are coded using ICD-9 and beginning with 1999 deaths are coded using ICD-10. These U.S. mortality data were accessed through SEER*Stat²⁴.

POPULATION ESTIMATES, 2011-2015

Cancer incidence and mortality rates for the U.S. are calculated using population totals estimated by the U.S. Census. Delaware rates are based on population estimates released by the U.S. Census Bureau.

RISK FACTORS AND EARLY DETECTION

Data on known and suspected cancer risk factors, prevention options, and screening recommendations are located at the beginning of each site-specific chapter of this report. Primary resources for this information are: (1) ACS (www.cancer.org); and (2) NCI (www.cancer.gov).

The BRFSS provides estimates of the prevalence of risk factors across Delaware and nationally. The most recently available risk factor data from BRFSS are from 2017. Risk factor data are included in appropriate chapters for site-specific cancers. Supplemental data on cervical cancer screening, overweight and obesity, physical inactivity, and nutrition are presented in Appendix D.

STATISTICAL METHODOLOGY AND TECHNICAL TERMS

AGE-ADJUSTMENT OF INCIDENCE AND MORTALITY RATES

The age distribution of a population is an important determinant of the burden of cancer. Because cancer incidence and mortality increase with age, crude rates cannot be used for comparisons of cancer statistics between sexes, racial or ethnic groups, or geographic entities across different time spans.

Age adjustment is useful when comparing two or more populations with different age distributions at one

²⁴ SEER*Stat Software, Surveillance, Epidemiology and End Results (SEER) program, National Cancer Institute, <http://seer.cancer.gov/seerstat/index.html>

point in time or one population at two or more points in time²⁵. To calculate an age-adjusted incidence rate, the crude incidence rate for each of 18 five-year age groups is multiplied by a fixed population weight for that specific age group using the appropriate 2000 U.S. Standard Population (Table A-1)²⁶. Individual age-specific rates are then summed to obtain the overall age-adjusted rate.

TABLE A-1: U.S. STANDARD YEAR 2000 POPULATION WEIGHTS, BY AGE GROUP

Age Group	Population Weight	Age Group	Population Weight
0-4	0.0691	45-49	0.0721
5-9	0.0725	50-54	0.0627
10-14	0.0730	55-59	0.0485
15-19	0.0722	60-64	0.0388
20-24	0.0665	65-69	0.0343
25-29	0.0645	70-74	0.0318
30-34	0.0710	75-79	0.0270
35-39	0.0808	80-84	0.0178
40-44	0.0819	85+	0.0155

Source: U.S. Census 2000, accessed from SEER, <http://seer.cancer.gov/stdpopulations/19ages.proportions.html>.

The formula for an age-adjusted rate can be presented as follows:

$$\text{Age-Adjusted Rate} = \sum (w_i \times ((c_i/n_i) \times 100,000))$$

- c_i is the number of new cases or deaths in the i age group
- n_i is the population estimate for the i age group
- w_i is the proportion of the standard population in the i age group

All rates are expressed per 100,000 of the population.

RACE/ETHNICITY- AND SEX-SPECIFIC INCIDENCE AND MORTALITY RATES

Race/ethnicity- and sex-specific incidence and mortality rates are calculated to assess how cancer patterns differed across subgroups within the state. These rates are calculated by dividing the number of cases or deaths that occurred in each race/ethnic and/or sex group by the total population in the corresponding race/ethnic and/or sex group over the same time period. As with other rates, these rates were adjusted to the 2000 U.S. standard population and expressed per 100,000 of the population.

CONFIDENCE INTERVALS

Age-adjusted incidence and mortality rates are subject to chance variation, particularly when they are based on a small number of cancer cases or deaths occurring over a limited time period or in a limited geographic area. Aggregating several years of data provides more reliable estimates of incidence and mortality in these situations. The level of uncertainty associated with incidence and mortality rates is estimated by the 95% confidence interval.

²⁵ Anderson RN, Rosenberg HM. Report of the second workshop on age adjustment. National Center for Health Statistics. Vital Health Stat 4(30). 1998.

²⁶ Klein RJ, Schoenborn CA. Age Adjustment Using the 2000 Projected U.S. Population. Healthy People statistical notes, no. 20, <http://www.cdc.gov/nchs/data/statnt/statnt20.pdf>

When incidence rates are based on more than 100 cases, lower and upper limits of the 95% confidence intervals for an age-adjusted (AA) incidence or mortality rate are calculated using SEER*Stat²⁷ by methodology shown here:²⁸

$$\text{Lower Confidence Limit} = \text{AA Rate} - 1.96 \left[\frac{\text{AA Rate}}{\sqrt{\# \text{ Cases}}} \right]$$

$$\text{Upper Confidence Limit} = \text{AA Rate} + 1.96 \left[\frac{\text{AA Rate}}{\sqrt{\# \text{ Cases}}} \right]$$

where AA Rate is the age-adjusted incidence or mortality rate.

When an incidence or mortality rate is based on fewer than 100 cases or deaths, the 95% confidence intervals are calculated using the following formulas:

$$\text{Lower Confidence Limit (LCL)} = \text{AA Rate} \times L$$

$$\text{Upper Confidence Limit (UCL)} = \text{AA Rate} \times U$$

where L and U are values published by the National Center for Health Statistics for the specific purpose of calculating 95% confidence intervals for rates based on fewer than 100 cases²⁹.

STAGE AT DIAGNOSIS

Stage at diagnosis describes the extent to which a cancer has spread from the site of origin at the time of diagnosis. SEER summary staging is used to define the stage at diagnosis for all incident cancer cases. Cancer cases diagnosed between 1980 and 2000 are coded according to Summary Stage 1977. Cases diagnosed from 2001 through 2003 are coded according to Summary Stage 2000. Beginning in 2004, SEER Summary Stage 2000, derived using the Collaborative Staging Algorithm, is used.

Three categories define the stage at diagnosis for a particular cancer site:

1. **Local** - Tumor is invasive but confined to the organ of origin.
2. **Regional** - Tumor has extended beyond limits of the organ of origin with no evidence of distant metastasis.
3. **Distant** - Cancer cells have detached from the tumor at the primary site and are growing at a new site in the body.

DATA RELEASE STANDARDS

For this report, cancer frequencies and rates are released according to DPH Policy Memorandum 49 (Data and Data Release Standards). Incidence and mortality frequencies of fewer than six are not presented and age-adjusted incidence and mortality rates based on fewer than 25 cases or deaths are not calculated. This DPH policy helps protect patient privacy and confidentiality^{30,31}. Furthermore, a cancer rate based on a very small number of cases is inherently unstable and cannot be reliably interpreted.

²⁷ Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute. SEER*Stat Software, Version 8.3.5, <http://seer.cancer.gov/seerstat/index.html>

²⁸ Tiwari RC, Clegg LX, Zou Z. Efficient interval estimation for age-adjusted cancer rates. *Stat Methods Med Res* 2006;15(6):547-69.

²⁹ Martin JA, Hamilton BE, Ventura SJ, Menacker F, Park MM, Sutton PD. Births: Final data for 2001. *National vital statistics reports*; vol. 51 no. 2. Hyattsville, Maryland: National Center for Health Statistics, 2002.

³⁰ Coughlin SS, Clutter GG, Hutton M. Ethics in Cancer Registries. *Journal of Cancer Registry Management*, 2: 5-10, 1999.

³¹ McLaughlin CC. Confidentiality protection in publicly released central registry data. *Journal of Cancer Registry Management*, 2: 84-88, 2002.

DEFINITION OF RACE/ETHNICITY

In this report, the race/ethnicity category is defined as follows:

1. **Non-Hispanic Caucasian** – cases who are reported to have Caucasian race and not of Hispanic/Latino ethnicity.
2. **Non-Hispanic African American** – cases who are reported to have African American race and not of Hispanic/Latino ethnicity.
3. **Hispanic** – cases who are reported to be of Hispanic/Latino ethnicity regardless of race.

APPENDIX B: PRIMARY CANCER SITE DEFINITIONS

TABLE B-1: PRIMARY CANCER SITE DEFINITIONS

Cancer Site Group	ICD-O-3 Site (Topography)	ICD-O-3 Histology (Morphology)
All malignant cancers	C000–C809	
Female Breast	C500–C509	excludes 9050–9055, 9140 and 9590–9992
Colon and Rectum	C180–C189, C260, C199, C209	excludes 9050–9055, 9140 and 9590–9992
Liver, intrahepatic bile ducts and other biliary	C220, C221, C239, C240-C249	excludes 9050–9055, 9140 and 9590–9992
Lung and Bronchus	C340–C349	excludes 9050–9055, 9140 and 9590–9992
Pancreas	C250–C259	excludes 9050–9055, 9140 and 9590–9992
Prostate	C619	excludes 9050–9055, 9140 and 9590–9992
Stomach	C160-C169	excludes 9050–9055, 9140 and 9590–9992
Urinary bladder*	C670–C679	excludes 9050–9055, 9140 and 9590–9992

*Includes *in situ* urinary bladder cancers

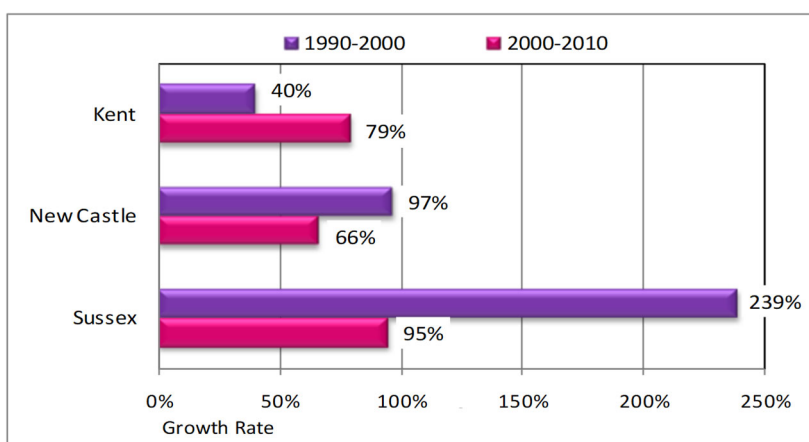
Source: Site Recode ICD-O-3/WHO 2008 Definition http://seer.cancer.gov/siterecode/icdo3_dwho/home/index.html.

APPENDIX C: HISPANIC ETHNICITY

The Census Bureau defines "Hispanic or Latino" as "a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race."³² According to the Census Bureau, in 1990, persons of Hispanic ethnicity comprised 2% of Delaware's population. By 2000, Delaware's Hispanic population increased to 5%. As of the 2010 U.S. Census, persons of Hispanic origin comprise 8% of Delaware's population.

The largest growth in the Hispanic population occurred in Sussex County, where the Hispanic prevalence grew from 1% in 1990 to 4% in 2000, and again to 9% in 2010. Historically, since 1990 when Hispanic prevalence data began to be collected, New Castle County had the largest percentage of persons of Hispanic ethnicity. The Hispanic population in New Castle County grew from 3% in 1990, to 5% in 2000, and to 9% in 2010. Among Kent County residents, the Hispanic population grew from 2% in 1990, to 3% in 2000, and to 6% in 2010.

FIGURE C-1: PERCENTAGE OF CHANGES IN DELAWARE'S HISPANIC POPULATION BY COUNTY AND DECADE, 1990-2000 AND 2000-2010



Source: U.S. Census Bureau 2010, American FactFinder, <http://factfinder2.census.gov/>.

Specific issues that suggest that Hispanic cancer rates would be subject to misinterpretation are discussed below:

- **Uncertain estimate of Delaware's Hispanic population** — Estimates of Delaware's population are derived from the census performed every 10 years by the U.S. Census Bureau and a final adjustment based on projections from the U.S. Census Bureau as to the overall rate of growth for the Hispanic population in both the state and the nation.
- **Inaccurate recording of Hispanic ethnicity on death certificates** — Race and Hispanic origin are treated as distinct categories and reported separately on death certificates and to the DCR, in accordance with guidelines from the federal Office of Management and Budget. However, it is possible that Hispanic race is under-reported both in the cancer registry and on death certificates.
- **Hispanic identification in the Delaware Cancer Registry data** — NAACCR convened an expert panel in 2001 to develop a best practices approach to Hispanic identification. In the resulting approach to enhance Hispanic identification, the NAACCR Hispanic Identification Algorithm (NHIA) was computerized and released for use by central cancer registries in 2003. In this report, NHIA is used to identify Delawareans of Hispanic origin. To minimize misclassification, the expert panel continues to evaluate the NHIA while considering the possibility of the under- or over-estimation of Hispanic cancer incidence.

³² Grieco, EM, Cassidy RC. (2001-03). "Overview of Race and Hispanic Origin: Census 2000 Brief" U.S. Census Bureau. Accessed May 26, 2011.

- **Small number of cases or deaths and small population sizes** — An incidence or mortality rate is an estimate, and the reliability of estimates can be measured by calculating a confidence interval. A narrow confidence interval suggests that the rate is a good estimate; a wide confidence interval suggests that the rate should be interpreted with caution. If the confidence intervals of two rates do not overlap, the rates are considered to be statistically different. Both the size of the numerator (the number of cases or deaths) and the size of the denominator (the population) determine the width of the confidence interval. Typically, researchers report 95% confidence intervals. When constructed properly, a 95% confidence interval includes the true cancer rate 95% of the time.

APPENDIX D: BEHAVIORAL RISK FACTORS

The BRFSS is the world's largest ongoing telephone health survey tracking health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected in all 50 states and four territories. The survey was developed to monitor the statewide prevalence of behavioral risk factors influencing premature morbidity and mortality. The BRFSS includes a core set of questions developed by the CDC and is administered to adults 18 years of age and older. Delaware's BRFSS is a collaborative effort between DPH and the CDC. BRFSS questions target lifestyle behaviors (including tobacco use, fruit and vegetable consumption, exercise, and weight control); cancer screening practices; health status; and health care access and use³³.

Technological and cultural changes are posing challenges to survey research. One of the most significant challenges has been the rapid increase in households where telephone service is provided primarily, or only, via cell phone service. These "cell phone" households are, at least currently, more common among young adults and minority populations.

Originally, the BRFSS survey was administered by a random-digit-dial telephone survey. Starting with reporting 2011 data, the BRFSS became a "multi-mode survey," using several modes of data collection—including landline telephone interviews, cell phone interviews, and online follow-up surveys for some respondents who did not want to respond by phone. Also, the BRFSS uses a new method for weighting data, called "raking," which more accurately reflects the actual population of each state³⁴.

Because cell phones are quickly replacing landline phones, it was difficult to obtain a true representative sample of some population subgroups during the late 2000s. The response rate problems likely resulted in less accurate prevalence estimates for some behaviors or conditions more prevalent in populations who primarily use cell phones. For example, the prevalence of cigarette smoking, known to be more prevalent among young adults, may have been under-estimated for several years.

The data below relate to cancer screening and risk factor prevalence among Delawareans. Data on breast, cervical, colorectal, and prostate cancer screening patterns among Delawareans are provided in relevant cancer site chapters earlier in this document. Data on overweight and obesity, physical activity, and consumption of dietary fruits and vegetables are provided below³⁵.

OVERWEIGHT/OBESITY

Being overweight or obese is a risk factor for numerous cancers, including female breast, colorectal, kidney, and uterine cancers. In addition, being overweight or obese is a major risk factor for other chronic diseases, including coronary heart disease, type 2 diabetes, and stroke.

The CDC defines overweight as a body mass index (BMI) from 25 to less than 30; and obese as a BMI equal to or greater than 30. BMI is calculated using an individual's height and weight³⁶. The following data are specific to the 2016 Delaware BRFSS:

- In Delaware, 69% of adults 18 years of age and older were overweight or obese in 2017, compared to the national median of 65%.
- In 2017, the prevalence of being overweight in Delaware differed significantly by sex: 41% of males and 32% of females were overweight.
- The prevalence of obesity among adult Delawareans did not differ by sex: 33% of males and 32% of females were obese in 2017.

³³ Behavioral Risk Factor Surveillance System, <http://www.cdc.gov/BRFS/>

³⁴ Behavioral Risk Factor Surveillance System (BRFSS) Fact Sheet: Raking— Changing Weighting Methodology, http://www.dhss.delaware.gov/dph/dpc/files/rakingweights_info.pdf

³⁵ Delaware Behavioral Risk Factor Survey – Measuring Behaviors that Affect Health, <http://www.dhss.delaware.gov/dph/dpc/brfsurveys.html>

³⁶ About BMI for Adults, http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html

- The prevalence of being overweight did not differ significantly between non-Hispanic Caucasians (36%) and non-Hispanic African American (39%) Delawareans.
- In Delaware, significantly more non-Hispanic African Americans (41%) than non-Hispanic Caucasians (31%) were obese.
- The prevalence of being overweight was highest among Delaware college graduates (39%).
- The prevalence of obesity was statistically significantly higher among Delaware adults with a high school diploma (36%) than among college graduates (28%).
- Delaware adults with a household annual income of \$75,000 or more had a significantly lower prevalence of obesity (29%) compared to Delaware adults with a household annual income of less than \$15,000.
- Among Delawareans, the prevalence of obesity was highest among those 55-64 years of age (38%).
- Delaware adults 18-24 years of age had the lowest prevalence of obesity (15%), a statistically significant difference compared to all other age groups.

PHYSICAL ACTIVITY

Lack of physical activity is a substantiated risk factor for colorectal cancer and a suspected risk factor for other cancers (e.g., prostate cancer). The benefits of regular, sustained physical activity also include reduction in risk for other chronic diseases, including coronary heart disease, stroke, type 2 diabetes, and improved overall well-being.

Respondents in the 2017 Delaware BRFSS survey answer a series of questions to determine what percentage of respondents met aerobic guidelines, strengthening guidelines, both, or neither³⁷.

- In Delaware, 44% of adults 18 years of age and older did not meet either aerobic or strengthening guidelines, similar to the national median of 39%.
- In Delaware, the prevalence of adults who reported they did not meet aerobic or strengthening guidelines was statistically significantly higher among females (47%) than males (40%).
- African American Delawareans (48%) had a lower prevalence of meeting aerobic or strengthening guidelines than Caucasians (42%). This difference was not statistically significant.
- Delawareans 45-54 years of age (46%) had the lowest prevalence of meeting either aerobic or strengthening guidelines. However, this was not statistically significant compared to any other age group.
- Delawareans in lower income categories reported a statistically significantly lower prevalence of levels of physical activity which meet recommended guidelines (57% of those earning less than \$15,000 did not meet the guidelines; 52% of those earning \$15,000-\$24,999 did not meet the guidelines). This compares to Delawareans in the highest income category, where 36% of those earning \$50,000 or more per year did not meet the guidelines.
- Delawareans in lower education levels reported a statistically significantly lower prevalence of meeting the physical activity guidelines. In Delaware, 54% of adults with less than a high school diploma and 50% of adults with a high school education or GED did not meet the physical activity guidelines, compared to 42% of adults with some post high school education, or 35% of adults who were college graduates.

DIETARY FRUITS AND VEGETABLES

³⁷U.S. Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. Hyattsville, MD: U.S. Department of Health and Human Services; 2008. <https://health.gov/paguidelines/>

A diet high in fruits and vegetables is a protective factor against numerous cancers, including cancers of the breast, cervix, colon/rectum, uterus, esophagus, oral cavity, ovary, pancreas, prostate, and stomach.

The following data are from the 2017 Delaware BRFSS:

- In Delaware, 16% of adults consumed five or more servings of fruits and/or vegetables a day, compared to the national median of 16% of adults.
- Significantly fewer Delaware males (12%) consumed five or more servings of fruits and vegetables daily than females (18%).
- In Delaware, 15% of non-Hispanic Caucasians, 17% of non-Hispanic African Americans, and 14% of Hispanics consumed five or more servings of fruits and vegetables daily. This difference was not statistically significant.

APPENDIX E: TITLE 16, CHAPTER 20 OF THE DELAWARE CODE (76 DEL. LAWS., C 292 §1)³⁸

CHAPTER 292 FORMERLY
SENATE BILL NO. 235
AS AMENDED BY
SENATE AMENDMENT NO. 2
AND
HOUSE AMENDMENT NO. 1

AN ACT TO AMEND TITLE 16 OF THE DELAWARE CODE RELATING TO UNIFORM HEALTH DATA REPORTING.
BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE:

WHEREAS, the State of Delaware traditionally has one of the highest rates of cancer incidence and mortality in the United States;

WHEREAS, identification of clusters of certain types of cancers in specific locations can help public health agencies develop intervention strategies leading to early detection when cancer is more easily cured;

WHEREAS, providing such data to medical researchers outside state government may assist in the process of both identifying cancer clusters and developing intervention strategies;

WHEREAS, the public good is served by allowing citizens to know of potential hazards in their communities so they can take actions to preserve their health;

WHEREAS, it is equally important to preserve the privacy and dignity of people afflicted with cancer, and

WHEREAS, the Department of Health and Social Services, Division of Public Health has opted to err on the side of cancer patient privacy by withholding even generic data on cancer clusters from other researchers and the public;

NOW THEREFORE:

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE:

Section 1. Amend Chapter 20, Title 16 of the Delaware Code by renumbering §2005 through 2008 as §2006 through 2009, respectively.

Section 2. Amend Chapter 20, Title 16 of the Delaware Code by inserting a new §2005 to read as follows:
“§2005(a). Cancer incidence data.

Notwithstanding any provisions in this Title to the contrary, the agency shall make available as public records cancer incidence by census tract and by type of cancer. Such released data shall be assigned consensus tract geography from the most recent decennial census. If release of such information by census tract will explicitly or implicitly identify any individual, the agency may combine data among contiguous census tracts, but only insofar as is necessary to protect patient confidentiality.

(b) The agency shall create a detailed map of each county in Delaware that graphically illustrates the overall incidence of cancer in each census tract. The census tracts will be identified on the maps and shall be color-coded to designate the degree of cancer incidence in each tract. These maps shall be created within 90 days of the agency receiving the cancer incidence data.

(c) The agency shall post the maps created under the subsection above on their website in a format that can be easily accessed and read by the public.”

Section 3. Amend §1232(d) Title 16 of the Delaware Code by deleting the word “or” at the end of paragraph (6) and by inserting the word “or” at the end of paragraph 7 and by adding a new paragraph “(8)” to read as follows:

“(8) Pursuant to Title 16 §2005.”

Section 4. Amend Subchapter III of Chapter 12 of Title 16 of the Delaware Code by inserting a new section §1233 to read as follows:

“§1233. Regulations.

The Department of Health and Social Services shall enforce this subchapter and shall from time to time promulgate any additional forms and regulations that are necessary for this purpose.”

Approved July 3, 2008

³⁸ <https://delcode.delaware.gov/title16/c032/index.shtml>

APPENDIX F: CANCER INCIDENCE BY CENSUS TRACT

GEOCODING VALIDATION PROCESS

Accurate census tract assignment is necessary for valid rate calculation at the census tract level. The accuracy of census tract assignment is entirely dependent on the accuracy and quality of patient address data. To assure accuracy and quality, cancer cases submitted to the DCR undergo quality assurance review of the data fields for each patient's address. The case-level quality review of street address data includes correction of misspellings, incomplete addresses, and address formats. Accurint[®], a Lexis Nexis[®] service, is used to assign a valid physical street address to post office box addresses where possible. DCR staff also use Accurint[®] to assign a valid physical street address to rural addresses where possible.

Geocoding software is then used to assign cases to a census tract based on the patient's address at time of diagnosis. Some cases may not be coded to the street address level in this step, due to recently created streets that are not yet embedded within the geocoding software. For these cases, further manual review and census tract assignment is conducted using the American Factfinder[®] and Google Maps[®] online databases.

PRELIMINARY ANALYSES

Cancer case used for analysis include all eligible³⁹ cancer cases diagnosed among Delawareans from January 1, 2011 through December 31, 2015. Within this time period, 100% of the cases were successfully geocoded (all but one case); i.e. the residential census tract of the individual was identified. Table F-1 shows the percentage level of certainty of the census tract assignments for each individual. More than 99% of cases were assigned a census tract based on a complete and valid address of residence.

TABLE F-1: NUMBER OF CASES AND PERCENTAGE OF CENSUS TRACT CERTAINTY FOR CANCER INCIDENCE DATA, DELAWARE, 2011-2015

Census Tract Based on Level of Certainty	2011-2015
Complete & valid street address of residence	27,839 (99.6%)
Residence ZIP + 4	2 (0.01%)
Residence ZIP + 2	28 (0.10%)
Residence ZIP code only	45 (0.20%)
ZIP code of P.O. Box	40 (0.10%)
Not assigned, geocoding attempted	1 (0.00%)
Total Number of Cases	27,955

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

FIVE-YEAR POPULATION ESTIMATES BY CENSUS TRACT

As of the 2000 U.S. Census, Delaware was comprised of 197 census tracts. Census tract analyses through 2003-2007 used the 2000 Census tract designations. As of the 2010 Census, however, Delaware was realigned into 214 census tracts. These new census tract subdivisions became available beginning with the 2004-2008 analyses. Approximately half of the 2010 Census tracts remained the same as in the 2000 Census and the rest have either combined with others or split into two or more new census tracts.

Note that census tracts do not follow a consecutive numbering scheme. New Castle County contains 129 census tracts numbered 2.00 through 169.04. Kent County is comprised of 32 tracts numbered 401.00 through 434.00. Sussex County includes 53 tracts numbered 501.01 through 519.00.

Census tract populations for 2011-2015 were calculated using estimates from Woods & Poole. Population

³⁹ Excludes benign tumors, non-urinary bladder in situ tumors, and basal and squamous cell cancers per reporting guidelines mandated by the Surveillance, Epidemiology, and End Results Program of the National Cancer Institute.

data specific for each five-year age category and census tract were provided from the SEER Program from the NCI, made available through a database in SEER*Stat.⁴⁰

Five-year population estimates for the 2011-2015 study period range from 3,542 for census tract 511.01 in Sussex County to 66,543 for census tract 402.02 in Kent County.

AGE-ADJUSTED INCIDENCE RATES, BY CENSUS TRACT

For each census tract, age-adjusted incidence rates were calculated at the census tract level.

Age-adjusted incidence rates take into account the different age distributions for the populations at risk. To calculate age-adjusted incidence rates, crude incidence rates for each age group are multiplied by the appropriate 2000 U.S. Standard Population weight for that age group (Appendix A). Age-adjusted incidence rates for each of the 18 age groups are then summed to yield the age-adjusted incidence rate for an entire census tract. All age-adjusted incidence rates were calculated for each census tract using SEER*Stat.

95% CONFIDENCE INTERVALS

Confidence intervals represent the range of values in which the cancer rate could reasonably fall. Our best estimate of the cancer rate in a particular census tract is the incidence rate itself. However, the rate could reasonably lie anywhere between the lower confidence limit (LCL) and the upper confidence limit (UCL). Because of this, a confidence interval is sometimes called the “margin of error.”

When incidence rates are based on more than 100 cases, 95% confidence intervals are calculated using equation F-2.

EQUATION F-1: CONFIDENCE LIMIT EQUATIONS FOR 100 OR MORE CASES

$$\text{Lower Confidence Limit} = \text{AA Rate} - 1.96 \left[\frac{\text{AA Rate}}{\sqrt{\# \text{ Cases}}} \right]$$

$$\text{Upper Confidence Limit} = \text{AA Rate} + 1.96 \left[\frac{\text{AA Rate}}{\sqrt{\# \text{ Cases}}} \right]$$

where AA Rate is the age-adjusted incidence rate for a particular census tract.

When incidence rates are based on fewer than 100 cases, 95% confidence intervals are calculated using equation F-3.

EQUATION F-2: CONFIDENCE LIMIT EQUATIONS FOR FEWER THAN 100 CASES

$$\text{Lower Confidence Limit (LCL)} = \text{AA Rate} \times L$$

$$\text{Upper Confidence Limit (LCL)} = \text{AA Rate} \times U$$

Where:

- AA Rate is the age-adjusted incidence rate for a particular census tract, and
- L and U are values published by the National Center for Health Statistics for the specific purpose of calculating 95% confidence intervals for rates based on fewer than 100 cases⁴¹.

COMPARING CENSUS TRACT RATES TO THE STATE RATE

⁴⁰ Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Populations - Total U.S. (2000-2015), Woods & Poole Census Tract Estimates Controlling to Vintage 2015 <2000/2010 Mixed Tract Geographies>, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2018.

⁴¹ Martin JA, Hamilton BE, Ventura SJ, Menacker F, Park MM, Sutton PD. Births: Final data for 2001. National vital statistics reports; vol 51 no. 2. Hyattsville, Maryland: National Center for Health Statistics. 2002. Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr51/nvsr51_02.pdf

The level of uncertainty associated with an incidence rate is reflected in the width of its confidence interval. Very wide confidence intervals mean that the incidence rate is estimated with a small degree of certainty. Smaller intervals indicate an incidence rate estimate with a greater level of certainty.

The width of a confidence interval is influenced by two factors: (a) the number of cancer cases in the population and (b) the size of the population under consideration. When a cancer rate is calculated for a small population in which only a handful of cases were diagnosed, we would expect the confidence interval for the rate to be very wide. On the other hand, when a cancer rate is calculated for a large population in which many cases were diagnosed, we expect the confidence interval for the rate to be narrower.

The width of a confidence interval is important because it is used to determine if the amount by which two incidence rates differ is statistically significant. If the confidence interval for an incidence rate in one area overlaps with the confidence interval for a rate in another area, the rates are said to be “not statistically significantly different from one another.” Even though the two rates may look very different, if the cancer rate for one area is NOT statistically significantly different from the cancer rate for another area, researchers cannot say that one rate is truly different from the other rate.

On the other hand, if the confidence interval for the incidence rate in one area does NOT overlap with the confidence interval for an incidence rate in another area, the two rates are statistically significantly different. When the rate for one area is significantly different from the rate for another area, the difference between the rates is greater than would be expected by chance alone.

For each census tract, the all-site cancer incidence rate is compared to the all-site cancer incidence rate for the state. This allows DPH to identify census tracts with cancer incidence rates that are statistically significantly higher or lower than the incidence rate for Delaware. If the confidence interval for an incidence rate overlaps with the confidence interval for the state incidence rate, the census tract rate is not statistically significantly different from the state rate. If the confidence interval for a census tract rate does not overlap with the confidence interval for the state rate, the census tract rate is said to be statistically significantly different from the state rate. Census tracts with statistically significantly higher or lower cancer rates compared to the state are denoted in the rate table in Appendix H and in all color-coded maps in Appendices I and J.

SUPPLEMENTAL INFORMATION

For 2011-2015, two census tracts had fewer than 25 cancer cases: census tracts 145.01 and 411.00 (denoted by the symbol “*” in Appendix H). When incidence rates are computed for an entire geographic area based on a very small number of cases, rates are estimated with a larger degree of uncertainty. This uncertainty is represented by a wide confidence interval that is more likely to overlap with the confidence intervals of incidence rates from other areas. This means that it is more difficult to establish a significant difference between incidence rates. For this reason, rates based on fewer than 25 cases should be interpreted with caution; they are denoted in both the rate table and color-coded maps.

APPENDIX G: CANCER INCIDENCE RATES BY CENSUS TRACT – INTERPRETATION

In brief:

- A cancer rate in a census tract will change year to year because of the relatively small population in each of the census tracts. For this reason, the incidence rates are uncertain, subject to wide variation, and difficult to interpret.
- To help understand how much confidence we should have in a cancer rate for a census tract, we calculated a confidence interval. A confidence interval represents the range of values in which the cancer incidence rate could reasonably fall. It is sometimes referred to as the “margin of error.”
- If the confidence interval of a cancer incidence rate in a census tract does not overlap with the confidence interval for the state, we say that there is enough confidence to call the incidence rate in the census tract “significantly different” from the state rate.
- Appendix H shows the confidence intervals for the cancer rates in each census tract and for the state. These data will help you determine if the incidence rate in a particular census tract is significantly different from the state rate.

Analysis of disease rates for small areas, such as census tracts, is difficult to interpret and can be misleading if not considered carefully. To understand cancer in Delaware, researchers need to track the number of all newly diagnosed cancer cases each year. Researchers use different types of information to calculate cancer rates. This information includes estimates of the number of people living in Delaware and data on the cancer cases diagnosed in our state.

Even though researchers calculate cancer rates using the best possible information, cancer rates have some uncertainty. The rate of any disease in a population provides a snapshot of the impact of that disease for a specific time period. Because Delaware is a small state, researchers must interpret this snapshot carefully.

In a small group, such as a census tract, the snapshot changes much from year to year. If one case of cancer is diagnosed in a census tract one year, and three cases of cancer are diagnosed in the same census tract the next year, the cancer rate for that census tract will change dramatically from one year to the next. These big fluctuations do not typically occur in larger populations. If we compare the cancer rate for a census tract to the cancer rate for the whole state of Delaware for a given time period, it would not be unusual to find the comparison different (perhaps even reversed) the following year. DPH publishes five-year cancer incidence rates to better understand cancer patterns among small populations. Cancer rates for five-year time periods are less vulnerable to yearly fluctuations of cancer cases diagnosed in small populations.

DPH can tell how much uncertainty there is in a cancer rate by studying its confidence interval. A confidence interval is a range of values that shows where the cancer rate could reasonably be. This means that the cancer rate could be anywhere between the lower confidence limit and the upper confidence limit.

If the difference between the upper confidence limit and the lower confidence limit is wide, there is greater uncertainty in the reliability of the cancer incidence rate. If the difference between the upper confidence limit and the lower confidence limit is very narrow, there is much less uncertainty in the cancer rate.

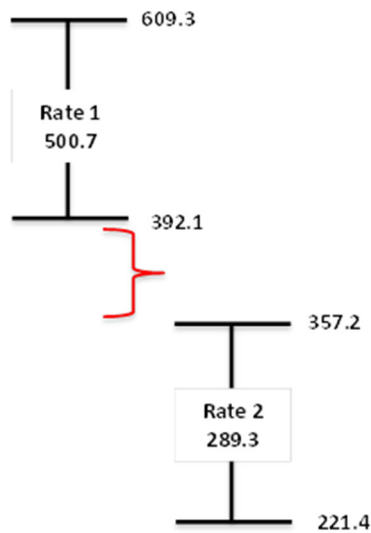
The width of a confidence interval depends on two things: (a) the number of people living in that area and (b) the number of cancer cases diagnosed in that area.

When a cancer rate is calculated for a small area (like a census tract or a neighborhood block), usually a small number of people live in that area. A much smaller number of people in that area will have been diagnosed with cancer. When a cancer rate is calculated for a small area, the cancer rate has a lot of uncertainty because researchers do not have very much information. Cancer rates based on small numbers of cases or deaths will typically have very wide confidence intervals.

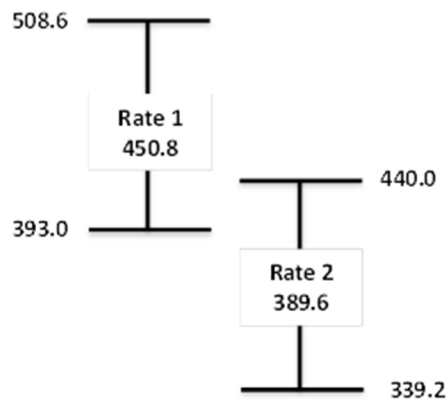
On the other hand, when a cancer rate is calculated for a large area (like a state or a country) with a large population, the odds are that more people will have been diagnosed with cancer compared to a smaller area. When a cancer rate is calculated based on a large number of cases or deaths, researchers are more certain of the level of cancer in that area. This means that cancer rates for large areas will usually have narrow confidence intervals.

Confidence intervals are important for another reason, too. They help researchers determine if differences in cancer rates for two different areas are statistically significant. If the confidence interval for the incidence rate in one area does NOT overlap with the confidence interval for an incidence rate in another area, the two rates are significantly different. The figure below shows what non-overlapping confidence intervals look like.

If “Rate 1” is statistically significantly higher than “Rate 2,” the lower confidence limit for “Rate 1” is greater than the upper confidence limit for “Rate 2.” When one rate is significantly different from another rate, the difference between the two rates is larger than we would expect by chance alone.



If the confidence interval for the incidence rate in one area overlaps with the confidence interval for an incidence rate in another area, the two rates are NOT significantly different. The figure below shows how the confidence intervals look when the cancer rates for two areas are NOT significantly different from one another.



If “Rate 1” is NOT significantly greater than “Rate 2”, the lower confidence limit for “Rate 1” is less than the upper confidence limit for “Rate 2.” Even though the numbers may look very different, if the cancer rate for one area is not significantly different from the cancer rate for another area, researchers cannot say that one rate is truly different from the other rate.

DPH compared cancer incidence rates for each census tract to the cancer rate for the state to tell if any census tracts had a statistically significantly higher-than-expected or lower-than-expected overall cancer rate compared to the whole state.

When interpreting the cancer rates for any census tract, review the maps, plus the table in Appendix H that lists the actual rate and the confidence intervals for both the state and for each census tract. When viewing the cancer rate in a census tract, it is important to look at the confidence interval. If a cancer rate has a relatively wide confidence interval, the cancer rate has a lot of uncertainty. When cancer rates have a lot of uncertainty, conclusions should be drawn cautiously. Even our best guess may overestimate or underestimate the actual rate of cancer in a census tract.

APPENDIX H: FIVE-YEAR AGE-ADJUSTED 2011-2015 ALL-SITE CANCER INCIDENCE RATES BY CENSUS TRACT, DELAWARE

TABLE H-1: FIVE-YEAR AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY CENSUS TRACT; DELAWARE, 2011-2015

Blue = Incidence rate is statistically significantly lower than the state rate.
 Yellow = Incidence rate is statistically significantly higher than the state rate.

2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)		2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)	
	Age-Adjusted Rate (95% confidence Interval)			Age-Adjusted Rate (95% confidence Interval)	
2.00	471.4 (394.4, 559.5)		109.00	451 (366.8, 553.1)	
3.00	474.5 (370.8, 598.2)		110.00	416.8 (336.8, 512.7)	
4.00	528.6 (431.9, 642.6)		111.00	418.6 (336.3, 519.8)	
5.00	462.3 (360.5, 584)		112.01	522.5 (397.3, 675.6)	
6.01	482.1 (370.6, 616.2)		112.02	512.8 (428.8, 610.7)	
6.02	579.6 (462.6, 718.3)		112.03	523.9 (437.7, 622.7)	
9.00	603.2 (449.7, 790.5)		112.04	443.4 (365.5, 536.2)	
11.00	442.2 (358.6, 559.6)		112.05	394 (298.9, 515.6)	
12.00	558.7 (395.1, 778.4)		112.06	407.4 (339.5, 487.4)	
13.00	507.1 (422.7, 606.6)		113.00	370.5 (279.5, 485.5)	
14.00	431.5 (324, 565.3)		114.00	427.1 (349.1, 520.9)	
15.00	444 (337.4, 574.8)		115.00	514.6 (421.7, 624.5)	
16.00	493.3 (368.5, 646.6)		116.00	420.3 (334.9, 522)	
19.02	525.1 (335.1, 775.8)		117.00	442.8 (356.8, 546.3)	
21.00	631.1 (474.9, 821.9)		118.00	445.5 (370.3, 533.7)	
22.00	468.5 (345.5, 618.5)		119.00	437.2 (356.3, 535.1)	
23.00	515.7 (395.8, 658.8)		120.00	429.1 (356.8, 513)	
24.00	459.1 (376.3, 554.7)		121.00	456.3 (363.4, 566.7)	
25.00	529.4 (416.2, 663.4)		122.00	461.3 (377.5, 558.3)	
26.00	490 (386, 612.4)		123.00	570.5 (447.4, 717)	
27.00	580.9 (389.3, 824.6)		124.00	508.8 (421.1, 609.5)	
28.00	372 (239.5, 552.8)		125.00	556.6 (475, 648.5)	
29.00	666.7 (544.1, 808)		126.00	531.7 (425, 658.4)	
30.02	548.3 (360.8, 790.4)		127.00	534.3 (454.5, 625.4)	
101.01	481.6 (394.6, 582)		129.00	492.3 (407.5, 589.8)	
101.04	504.4 (401.4, 625.7)		130.00	498.1 (374.3, 651.6)	
102.00	533.7 (410.9, 685.1)		131.00	443.2 (341.6, 566.4)	
103.00	529.7 (422.7, 656.2)		132.00	461.8 (359.1, 585.5)	
104.00	430.2 (355.6, 516.9)		133.00	458 (348.5, 595.3)	
105.02	507 (431.2, 592.8)		134.00	579.3 (476.2, 701.6)	
107.02	474 (391.3, 569)		135.01	418.3 (355.9, 489.9)	
108.00	393.5 (331.4, 466.3)		135.03	460.8 (398.2, 531.2)	

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

* Age-adjusted incidence rate is based on fewer than 25 cases.

Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.

**TABLE H-1: FIVE-YEAR AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY CENSUS TRACT;
DELAWARE, 2011-2015 (CONTINUED)**

Blue = Incidence rate is statistically significantly lower than the state rate.

Yellow = Incidence rate is statistically significantly higher than the state rate.

2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)		2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)	
	Age-Adjusted Rate (95% confidence Interval)			Age-Adjusted Rate (95% confidence Interval)	
135.05	557.4 (444.8, 691.8)		148.08	578.8 (468.5, 705.5)	
135.06	537.4 (441.6, 649.6)		148.09	542.5 (463.4, 630.8)	
136.04	527.3 (443.4, 623.8)		148.10	523.7 (440.1, 618.3)	
136.07	365.2 (304.6, 435)		149.03	624.7 (501.7, 766.1)	
136.08	537.6 (406.4, 698.9)		149.04	595.9 (492, 714.4)	
136.10	485.8 (410, 571.7)		149.06	541 (403.9, 705.6)	
136.11	479.1 (395.6, 574.8)		149.07	468 (381.3, 568.6)	
136.12	398.6 (336.4, 470.1)		149.08	593.1 (444.8, 773)	
136.13	448.6 (377, 530.4)		149.09	541 (442.1, 654.1)	
136.14	485.1 (384.8, 603.8)		150.00	534.2 (450.4, 629.5)	
136.15	575.8 (488, 677.9)		151.00	492.2 (407, 591.8)	
137.00	509.5 (406, 630.5)		152.00	456.2 (381.1, 541.8)	
138.00	447.4 (372.6, 533)		154.00	472.8 (381, 581.2)	
139.01	435.8 (331.8, 562.4)		155.02	520.3 (413.1, 647.5)	
139.03	570 (439.6, 723.9)		156.00	503 (391.2, 638.7)	
139.04	510.3 (427.7, 603.4)		158.02	531.5 (403, 687.4)	
140.00	520.3 (437.1, 614.8)		159.00	488.2 (396.7, 595.8)	
141.00	592.5 (494.4, 703.9)		160.00	471.5 (368.1, 595.9)	
142.00	587.7 (444.6, 765.8)		161.00	492.8 (384.1, 629)	
143.00	371.8 (303.3, 454.7)		162.00	487.3 (384.9, 610.2)	
144.02	325.6 (240.6, 434.2)		163.01	605.8 (514.1, 709.4)	
144.03	408.3 (319.4, 514.7)		163.02	524.5 (444.6, 614.3)	
144.04	524 (428.7, 635.4)		163.05	537.7 (456, 629.3)	
145.01	*		164.01	560 (463.7, 669.8)	
145.02	710 (462.2, 1046.5)		164.04	546.9 (441.4, 671.3)	
147.02	477 (356.7, 626.6)		166.01	528 (470.4, 590.9)	
147.03	472 (396, 559.1)		166.02	599.6 (500.6, 711.8)	
147.05	548.2 (466.8, 640.1)		166.04	618.9 (542.5, 702.5)	
147.06	530.6 (385.4, 710.3)		166.08	620.6 (512.8, 744.6)	
148.03	442.7 (365.3, 533.2)		168.01	584.5 (492.8, 687.9)	
148.05	619.5 (529.3, 719.7)		168.04	600.2 (503.9, 709)	
148.07	477.5 (395.8, 570)		169.01	651.7 (518.3, 810.7)	

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

* Age-adjusted incidence rate is based on fewer than 25 cases.

Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.

**TABLE H-1: FIVE-YEAR AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY CENSUS TRACT;
DELAWARE, 2011-2015 (CONTINUED)**

Blue = Incidence rate is statistically significantly lower than the state rate.

Yellow = Incidence rate is statistically significantly higher than the state rate.

2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)		2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)	
	Age-Adjusted Rate (95% confidence Interval)			Age-Adjusted Rate (95% confidence Interval)	
169.04	451.1 (342.4, 590.2)		433.00	517.9 (428.2, 621.1)	
401.00	655.5 (571.4, 748.8)		434.00	532.3 (448.8, 628)	
402.01	532 (439.9, 637.3)		501.01	503.9 (419.9, 601.4)	
402.02	500.8 (451.1, 554.7)		501.03	495.6 (419, 584)	
402.03	619.7 (527.2, 724)		501.04	490.4 (408.1, 584.8)	
405.01	465.6 (388.2, 554.4)		501.05	574.8 (488.2, 672.4)	
405.02	568.4 (449, 714.1)		502.00	466.7 (373, 577.9)	
407.00	445.7 (375, 526.8)		503.01	560.5 (493.4, 634.8)	
409.00	499 (383.5, 642.8)		503.02	536.6 (450.2, 634.7)	
410.00	436.6 (366, 517)		504.01	412.7 (332.9, 506.9)	
411.00	*		504.03	463.9 (373.5, 570.5)	
412.00	592.9 (499.1, 699.8)		504.05	540.4 (452.1, 642.3)	
413.00	436 (321.1, 579.1)		504.06	367.4 (301.7, 443.7)	
414.00	452.8 (361.7, 560.1)		504.07	494 (417.4, 581.9)	
415.00	524.7 (434.9, 628.3)		504.08	633.1 (541.9, 736)	
416.00	465.8 (369.2, 586.6)		505.01	511.8 (423, 615.3)	
417.01	577.7 (504, 660)		505.03	465.5 (375.5, 569.4)	
417.02	580.1 (490.6, 682.3)		505.04	390.3 (326, 463.9)	
418.01	576.3 (513.2, 645.2)		506.01	529.3 (448.7, 620.8)	
418.02	525.7 (434.8, 629.6)		506.02	484.8 (414.7, 564.1)	
419.00	551.3 (469, 644.3)		507.01	510.2 (432.4, 601)	
420.00	535.1 (435.8, 651.7)		507.03	416.2 (316.6, 543)	
421.00	499.3 (412.4, 600.4)		507.04	629.7 (537.7, 735.8)	
422.01	535.4 (467.9, 609.8)		507.05	488.6 (417.3, 572.5)	
422.02	557.9 (492.3, 629.9)		507.06	489.9 (346.2, 686.6)	
425.00	552.2 (449.8, 671)		508.01	552.3 (458.3, 660.8)	
428.00	568.1 (497, 646.9)		508.02	618.9 (534.5, 714)	
429.00	505.6 (427.3, 595.2)		508.03	606.3 (537.5, 683.2)	
430.00	541.6 (462, 631.4)		509.01	458.4 (365.6, 573.7)	
431.00	556.1 (441.9, 692.3)		509.02	496.4 (426.8, 579.3)	
432.02	546.8 (455.8, 652)		510.03	441.5 (376.1, 517.4)	

Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

* Age-adjusted incidence rate is based on fewer than 25 cases.

Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.

**TABLE H-1: FIVE-YEAR AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY CENSUS TRACT;
DELAWARE, 2011-2015 (CONTINUED)**

Blue = Incidence rate is statistically significantly lower than the state rate.

Yellow = Incidence rate is statistically significantly higher than the state rate.

2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)	2010 Census Tract ID	Delaware: 495.3 (489.4, 501.2)
	Age-Adjusted Rate (95% confidence Interval)		Age-Adjusted Rate (95% confidence Interval)
510.04	475.7 (404.2, 559.9)	513.01	518.3 (451.7, 595.7)
510.05	515.5 (443.5, 599.7)	513.02	475.1 (383.4, 585.5)
510.06	577.2 (476.1, 700.7)	513.03	509.9 (439.1, 592.3)
510.07	495 (420.2, 583)	513.05	540.8 (452.8, 648.8)
511.01	578.7 (340.6, 1005.3)	513.06	441.3 (348, 565.7)
511.02	413.4 (288.8, 615.1)	514.00	492.1 (405, 593.6)
511.03	437.1 (304.5, 647.6)	515.00	501.8 (429, 584.3)
512.01	385.3 (277.3, 556.8)	517.01	519.3 (433, 618.8)
512.02	306.2 (182.6, 587.4)	517.02	543.5 (468.1, 628.3)
512.03	196 (131.3, 393.5)	518.01	437.2 (364.9, 520.3)
512.04	350.7 (245.7, 782.6)	518.02	423.5 (344.2, 516)
512.05	349.6 (156, 750.4)	519.00	446.5 (371.7, 532.9)

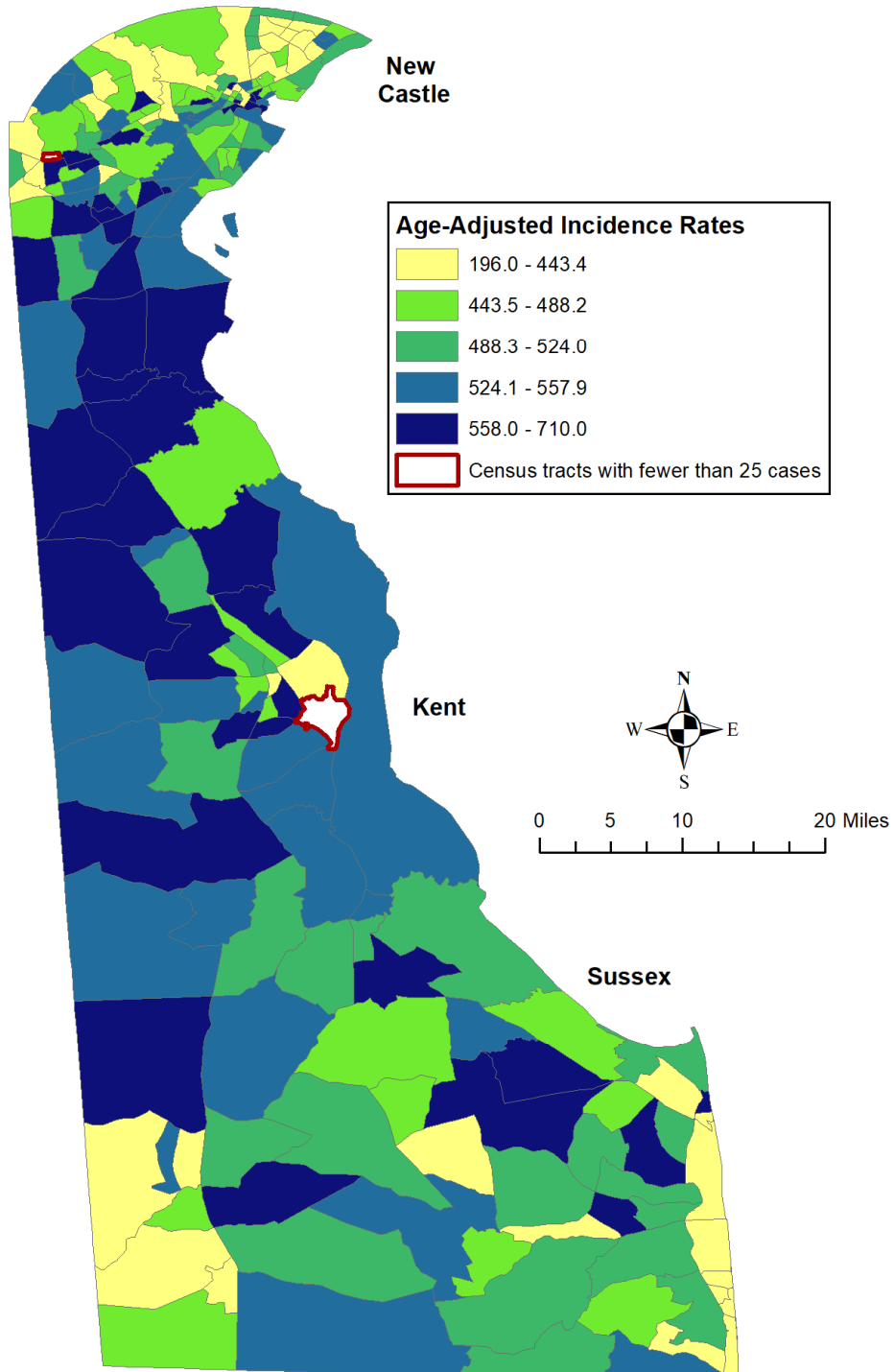
Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

* Age-adjusted incidence rate is based on fewer than 25 cases.

Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.

APPENDIX I: MAPS OF CANCER INCIDENCE RATES QUINTILES BY CENSUS TRACTS, DELAWARE, 2011-2015

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

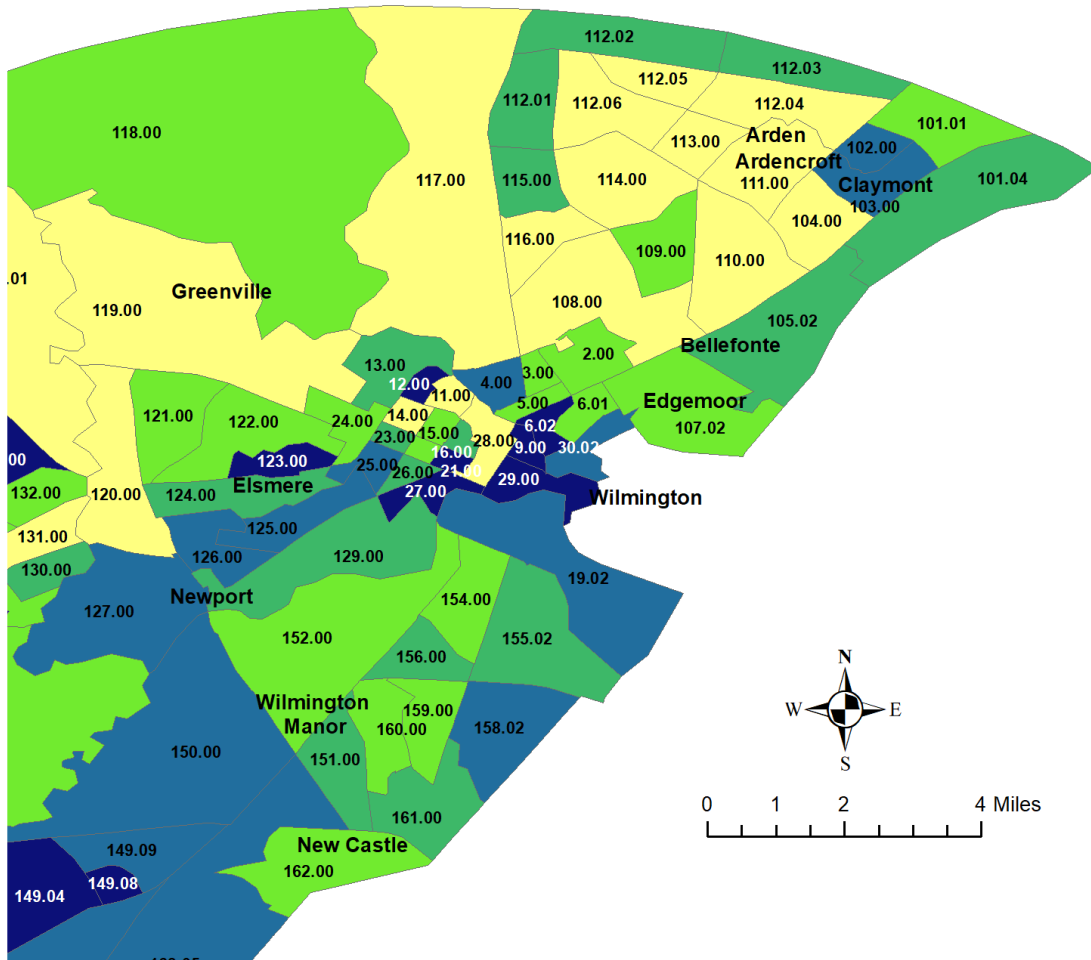


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018

Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

Wilmington and Northeastern New Castle County

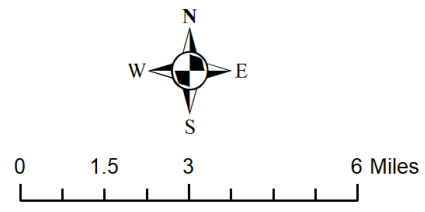
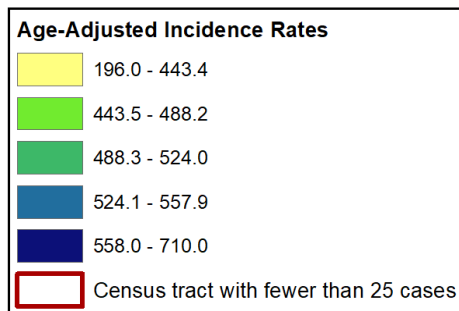
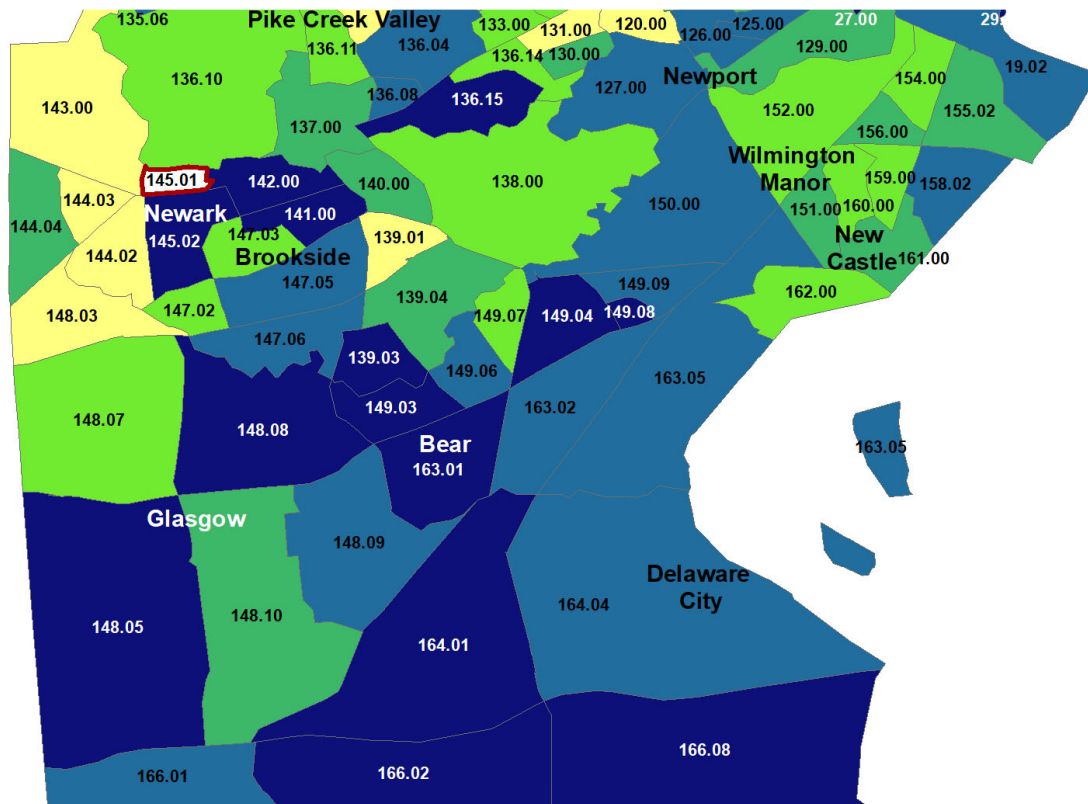


Age-Adjusted Incidence Rates	
	196.0 - 443.4
	443.5 - 488.2
	488.3 - 524.0
	524.1 - 557.9
	558.0 - 710.0

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

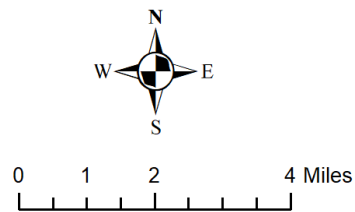
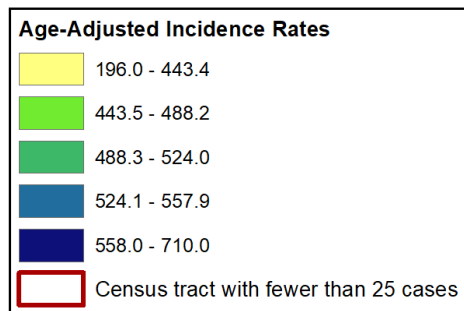
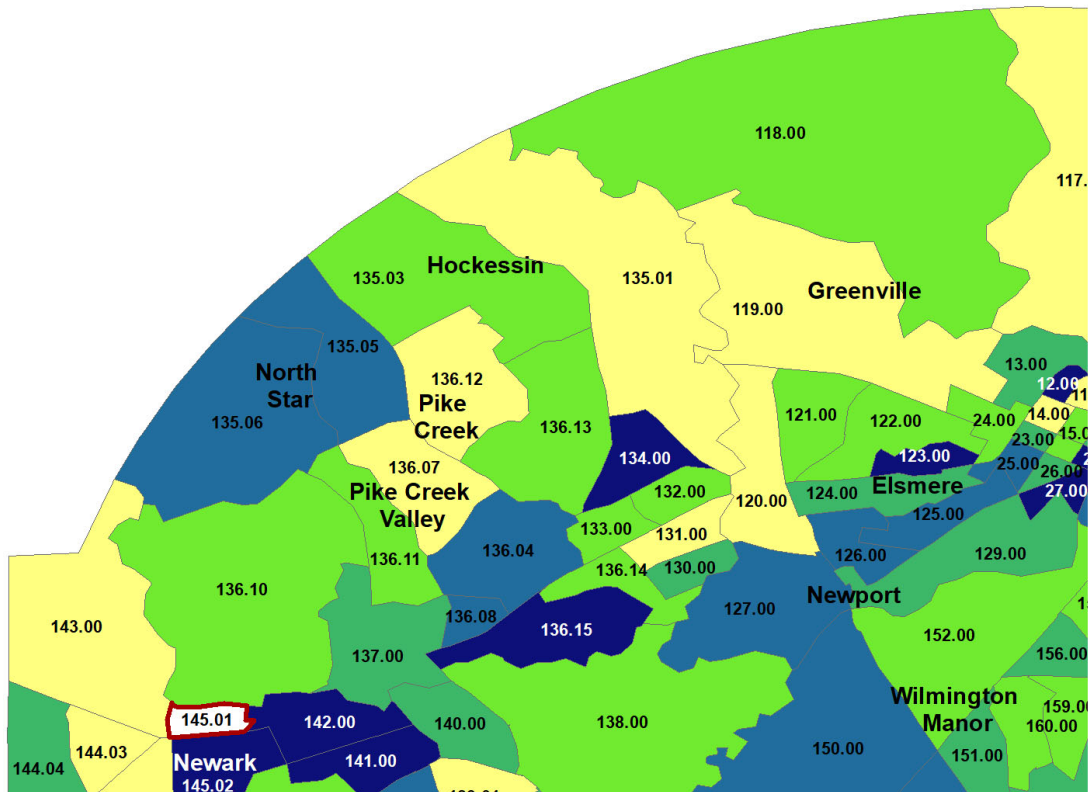
Newark, New Castle, and Central New Castle County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

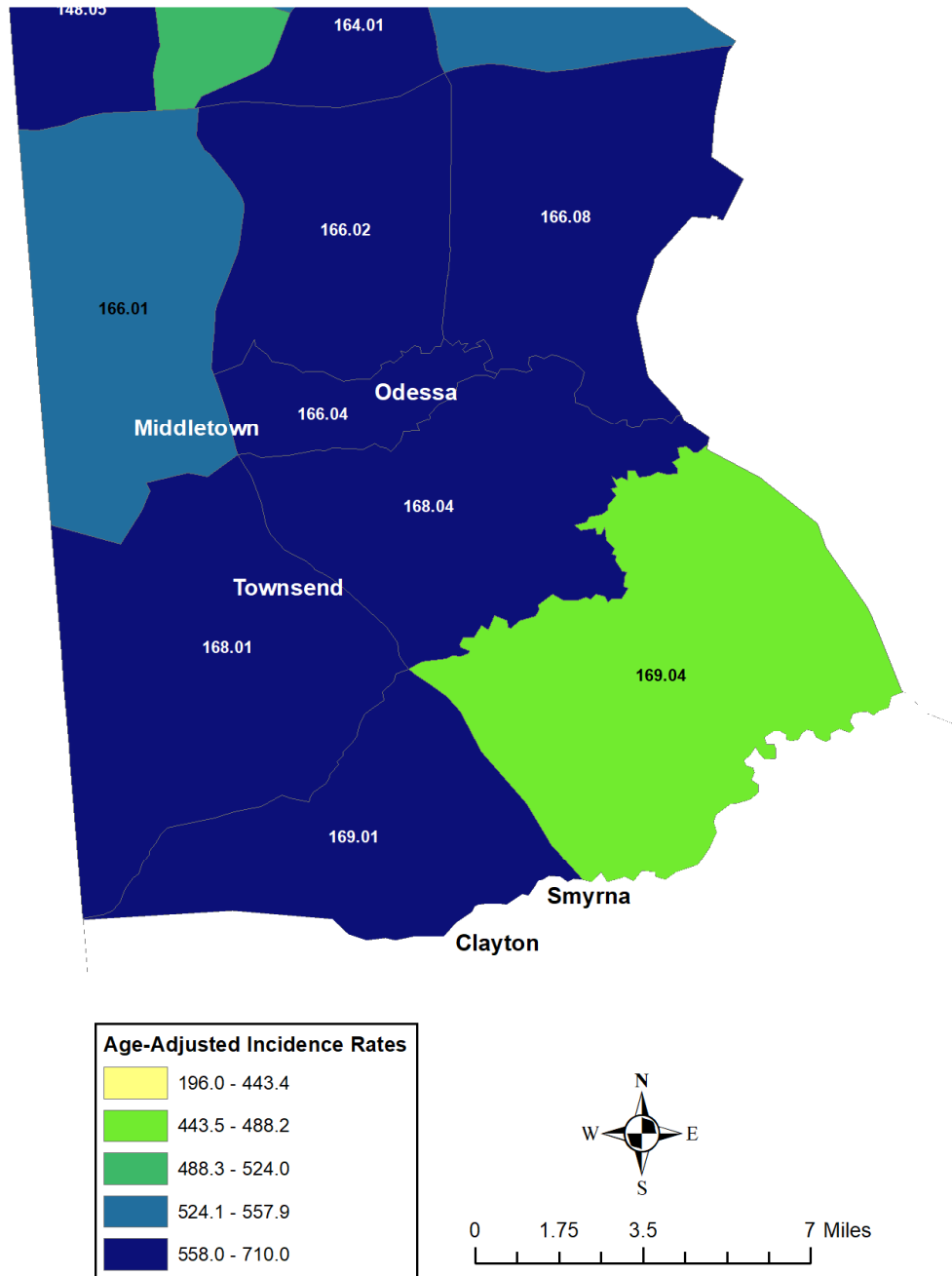
Hockessin and Northwestern New Castle County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

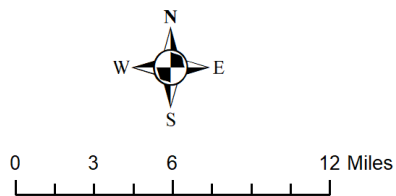
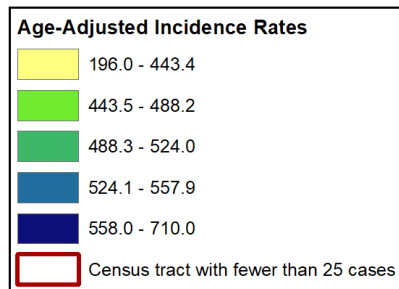
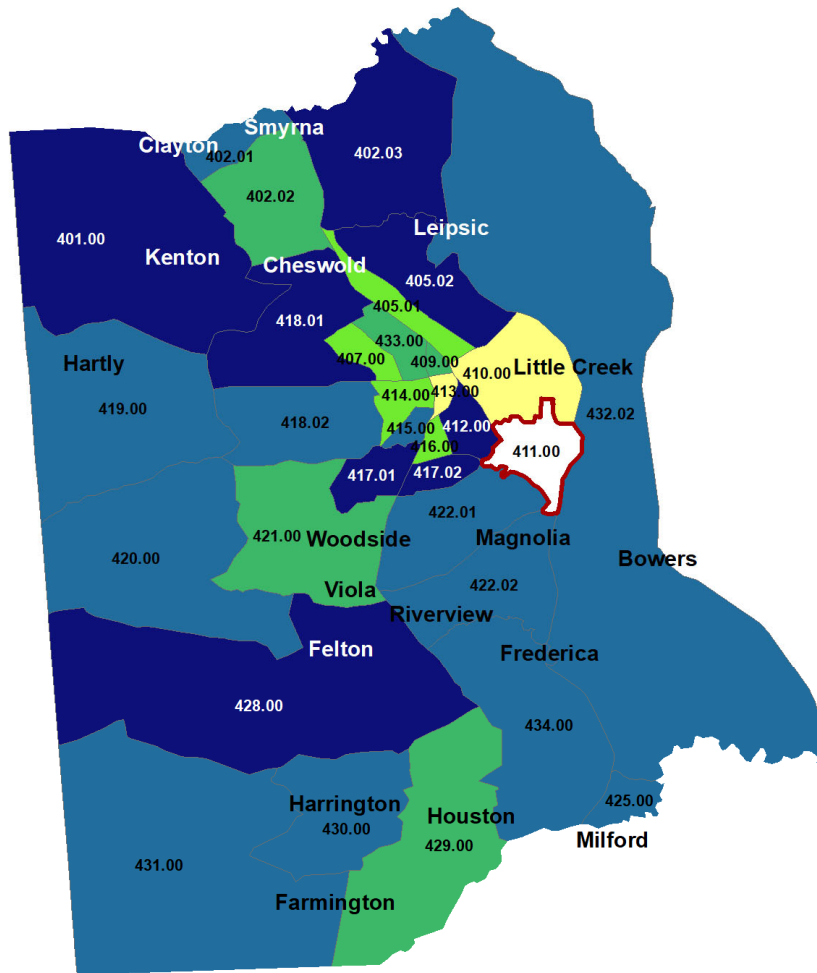
Southern New Castle County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

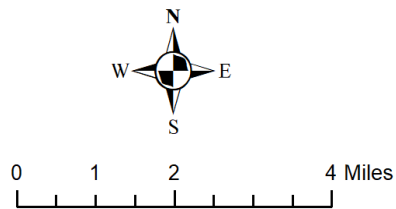
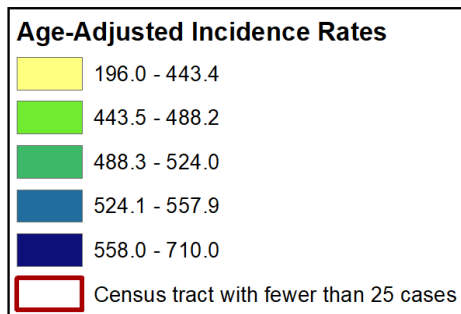
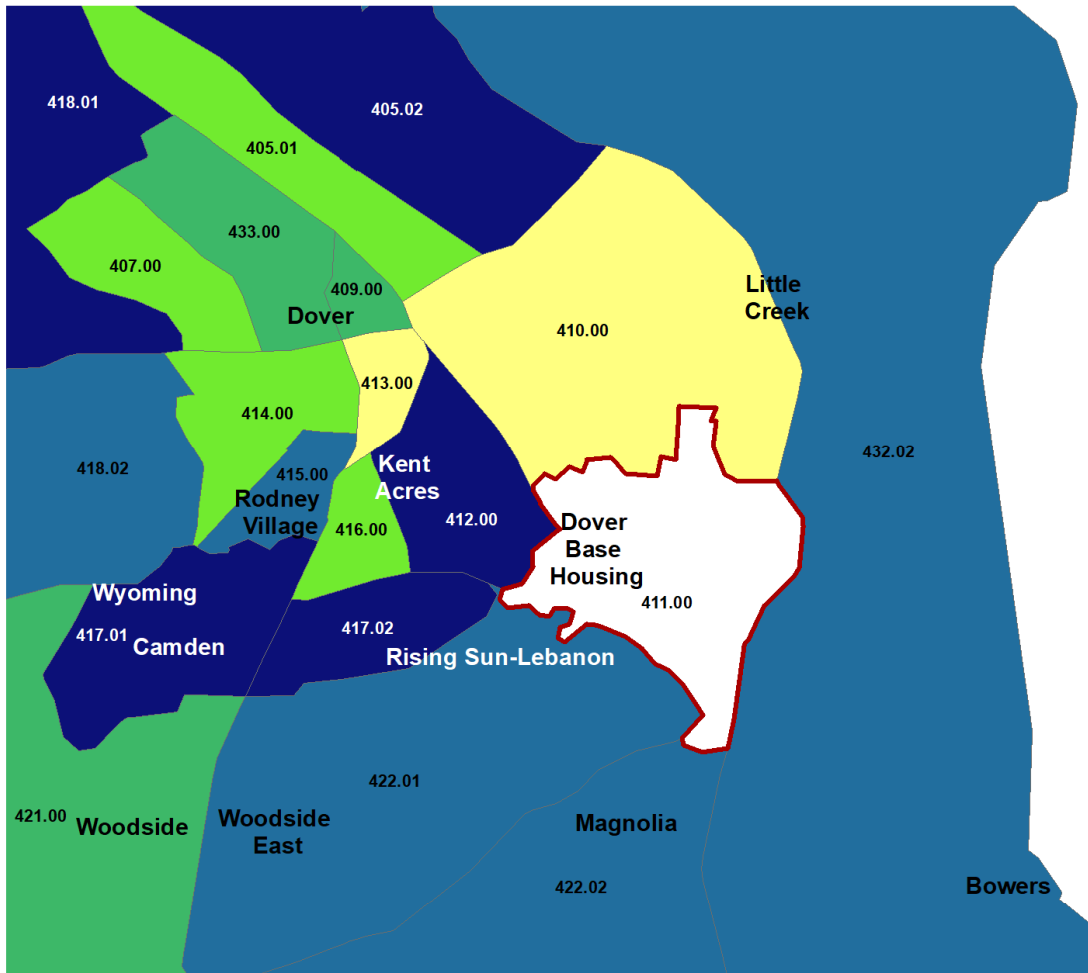
Kent County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

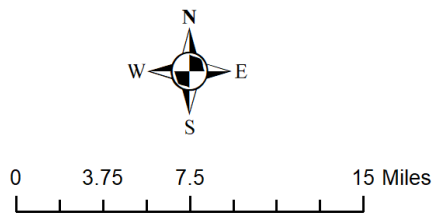
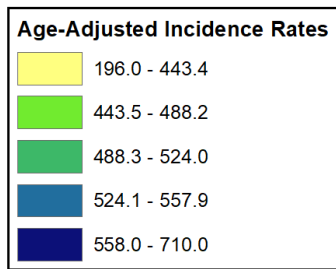
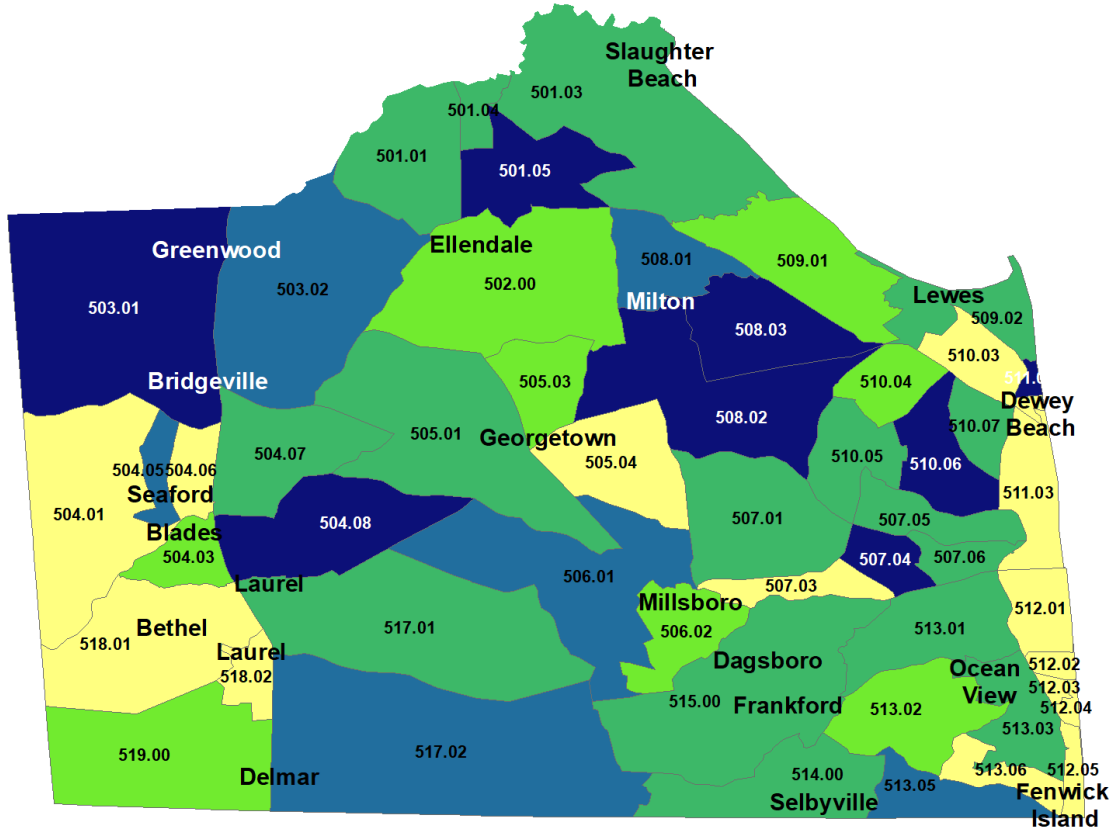
Greater Dover



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

Sussex County

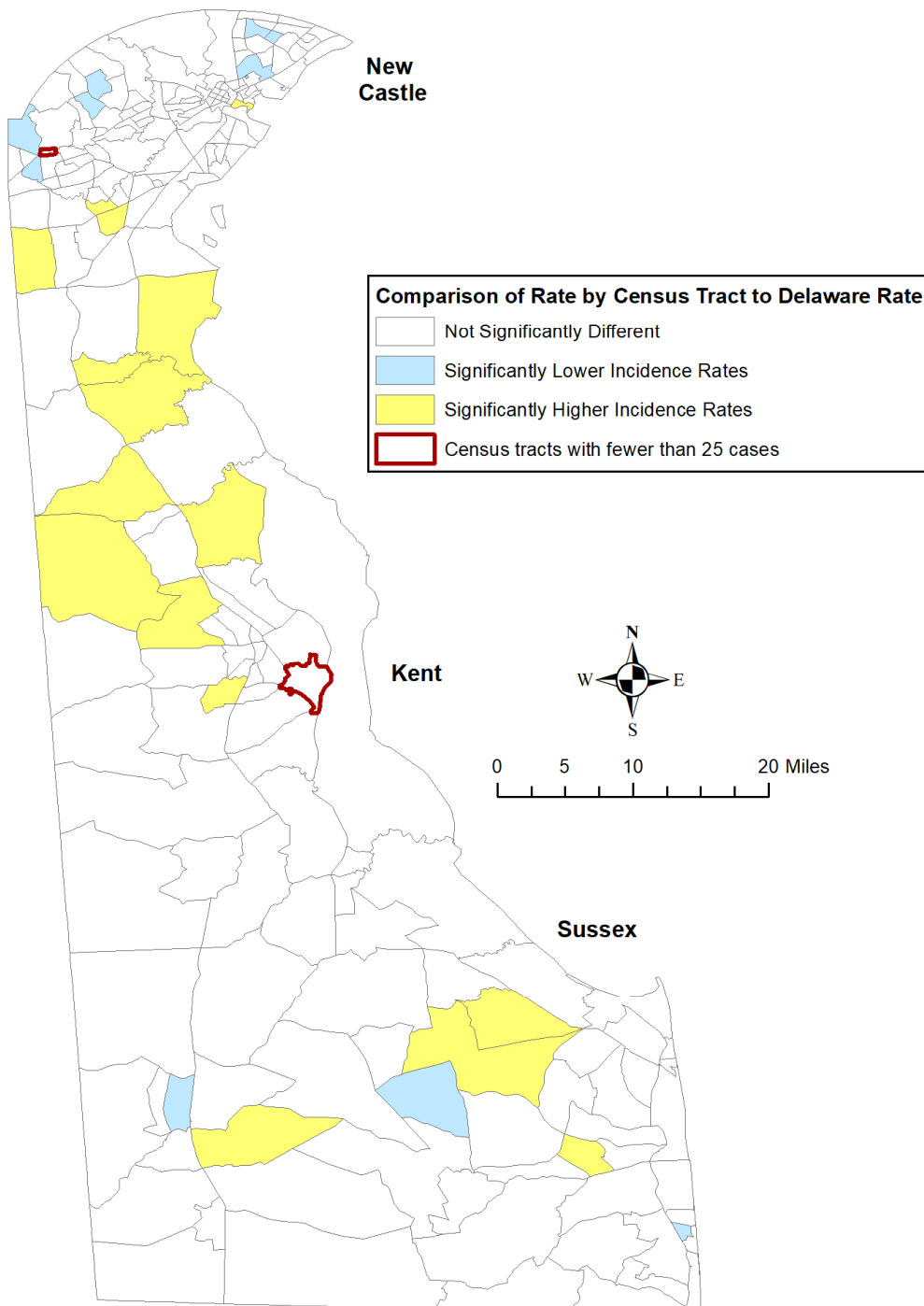


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.

Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

APPENDIX J: MAPS OF HIGH/LOW CANCER INCIDENCE RATES BY CENSUS TRACTS, DELAWARE, 2011-2015

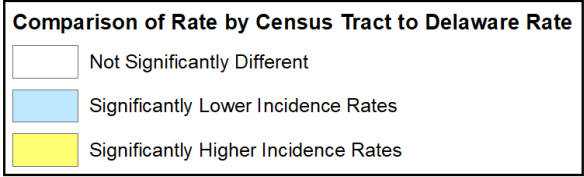
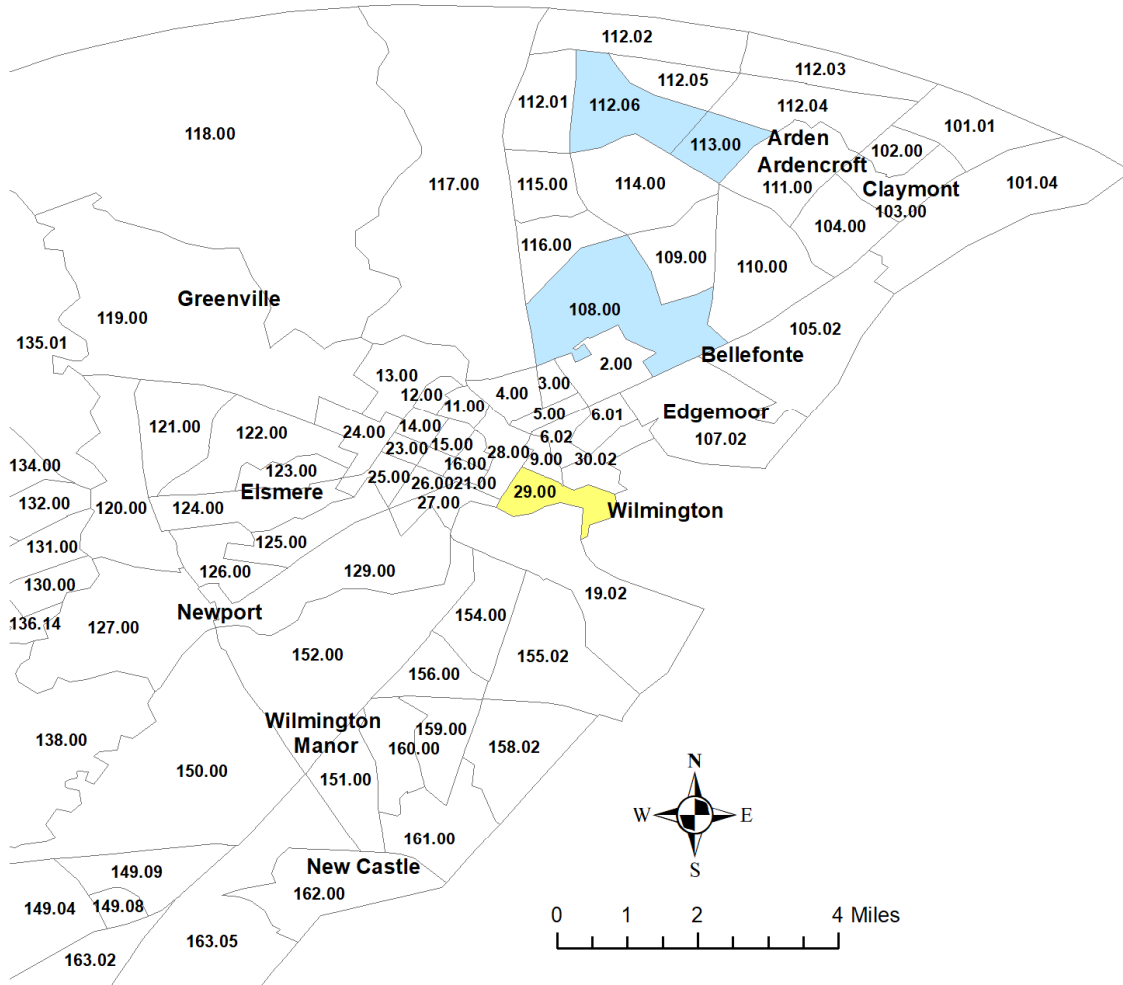
Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

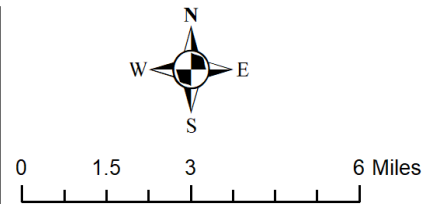
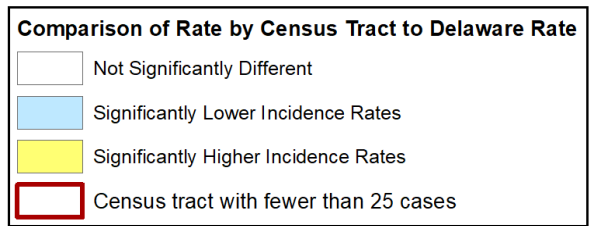
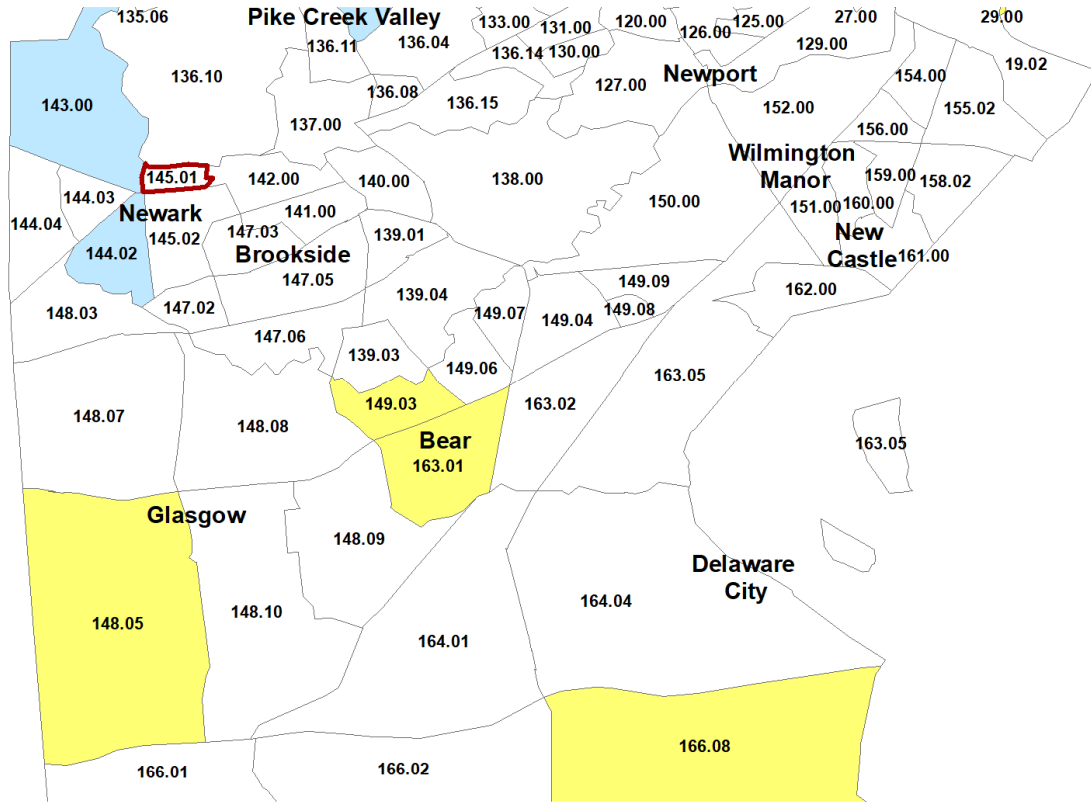
Wilmington and Northeastern New Castle County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

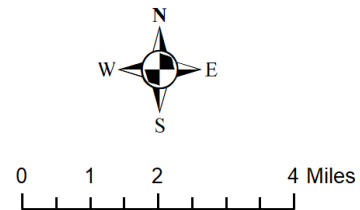
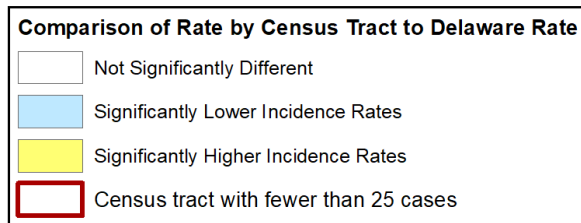
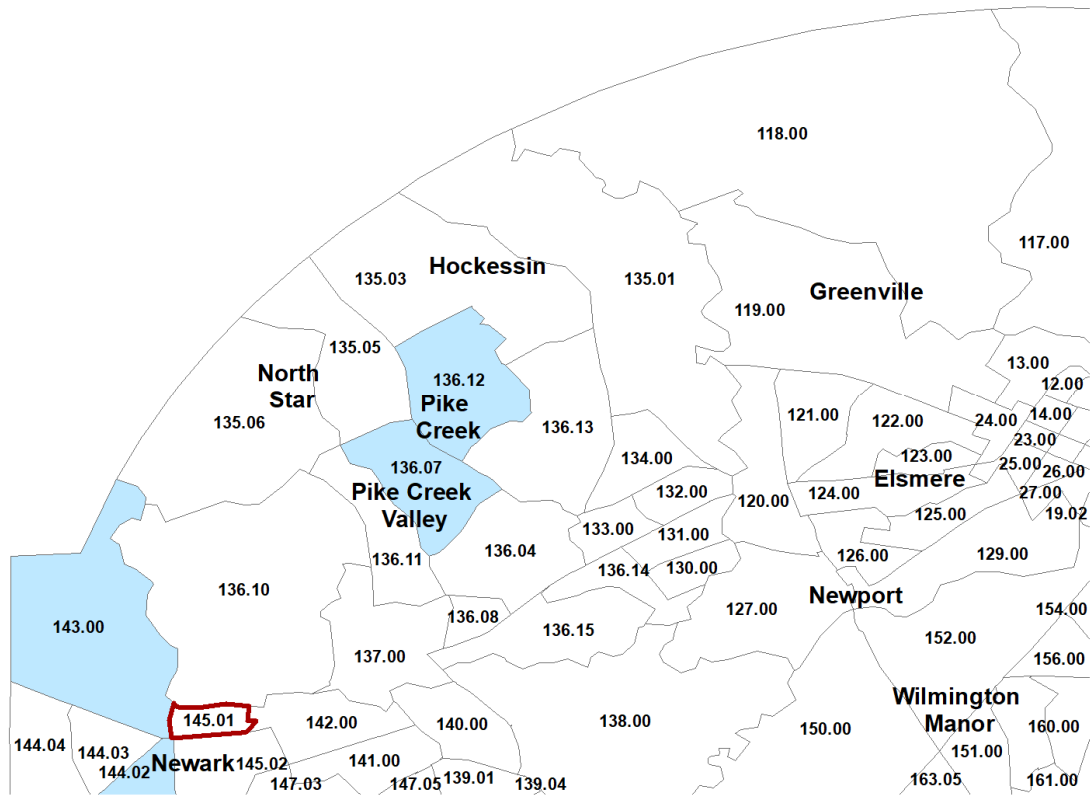
Newark, New Castle, and Central New Castle County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

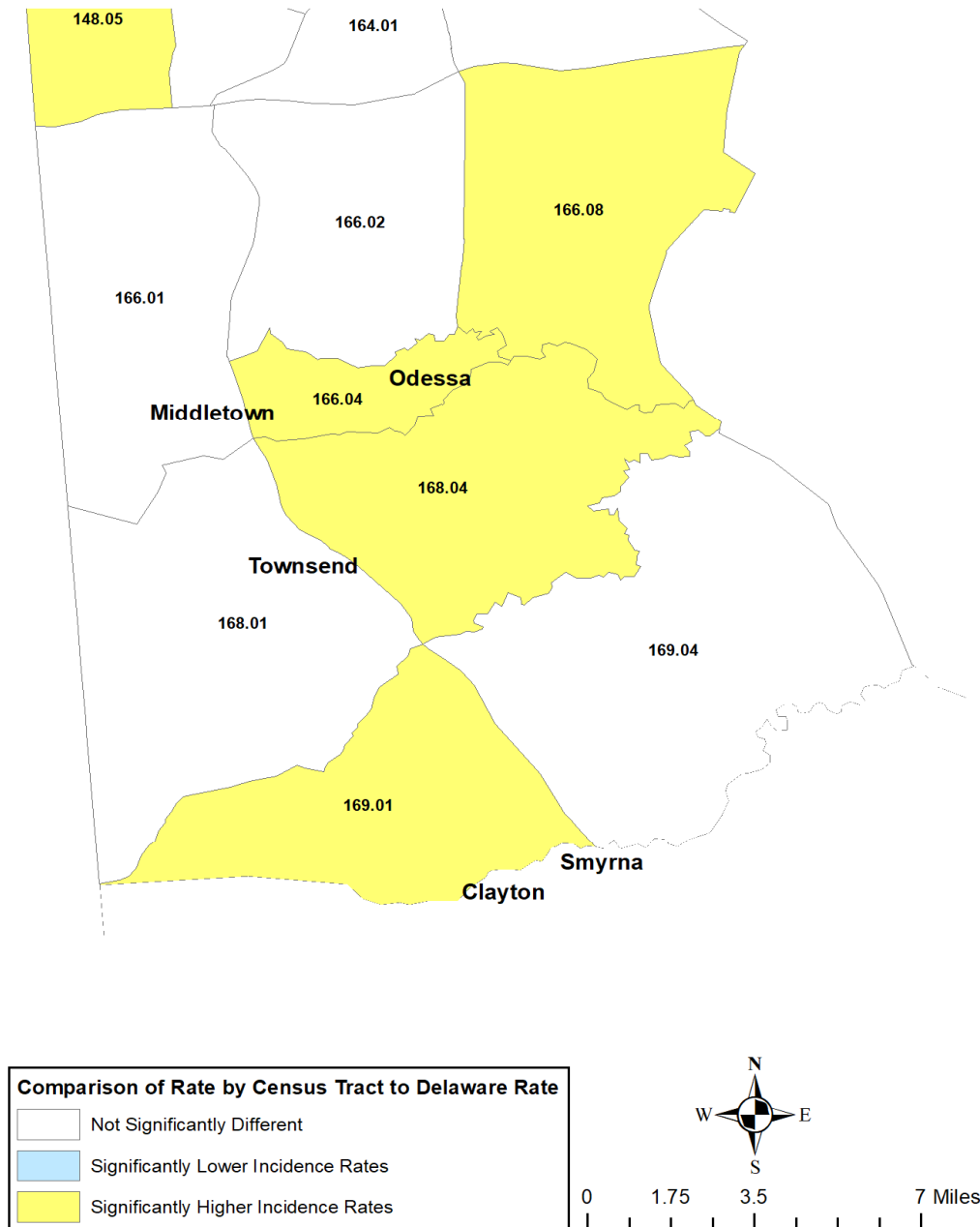
Hockessin and Northwestern New Castle County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

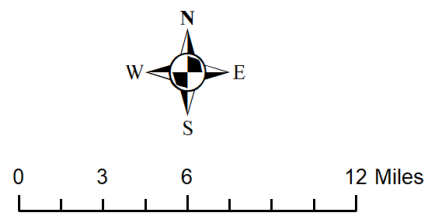
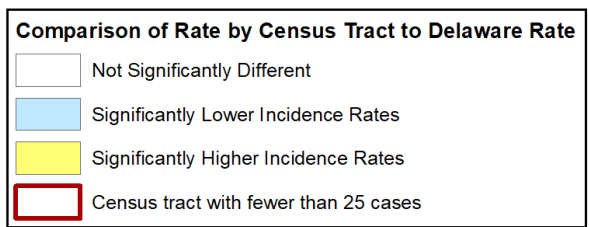
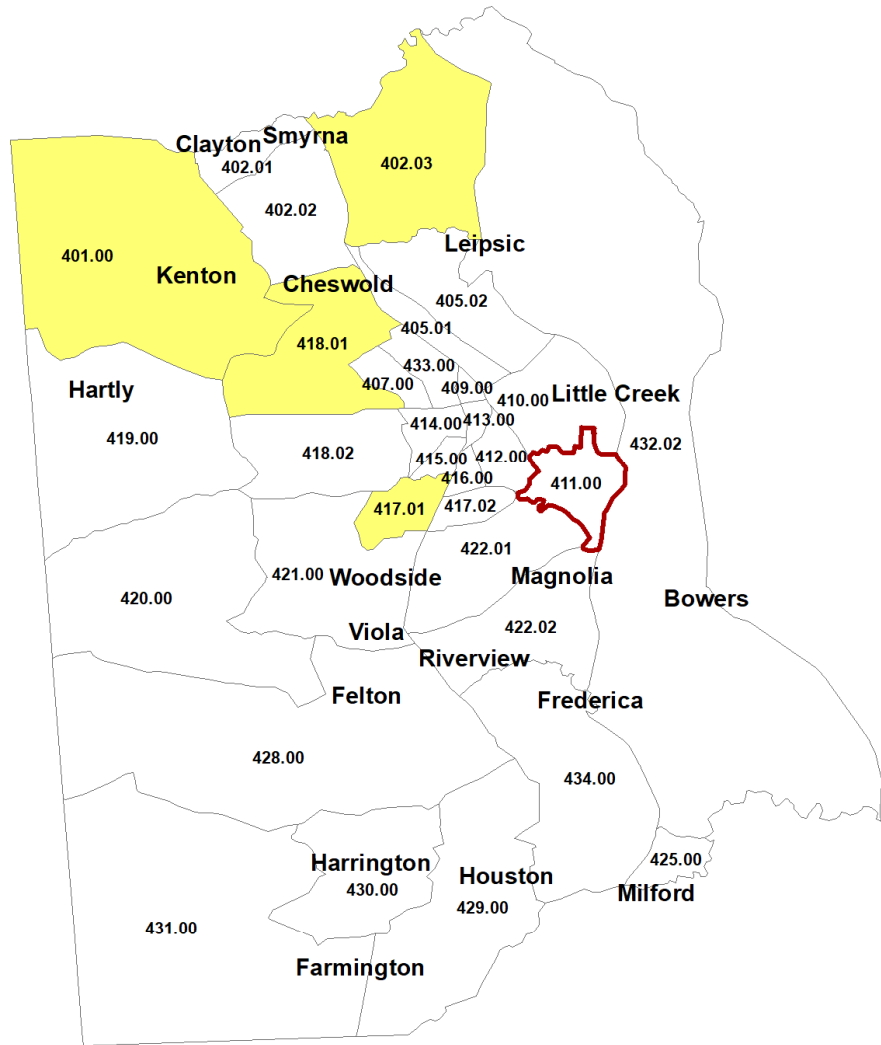
Southern New Castle County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

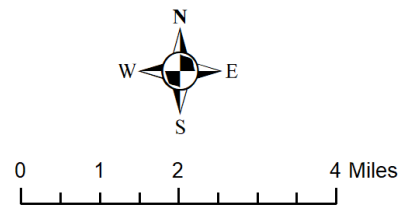
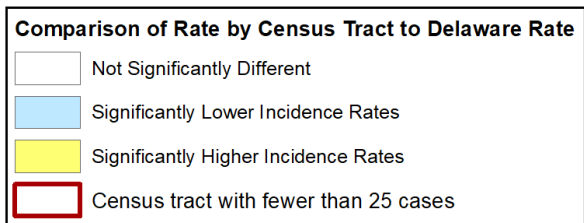
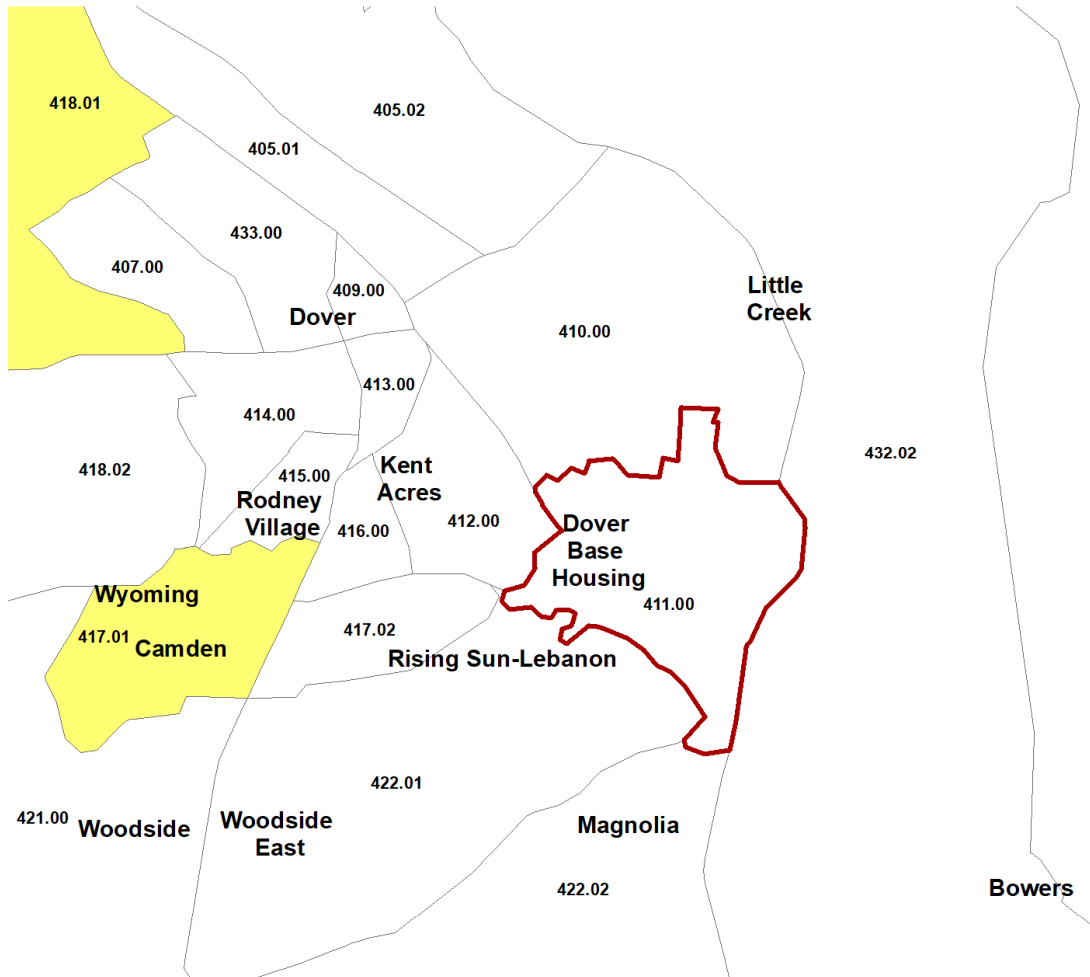
Kent County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

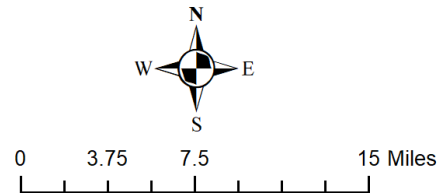
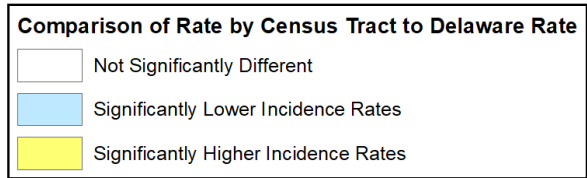
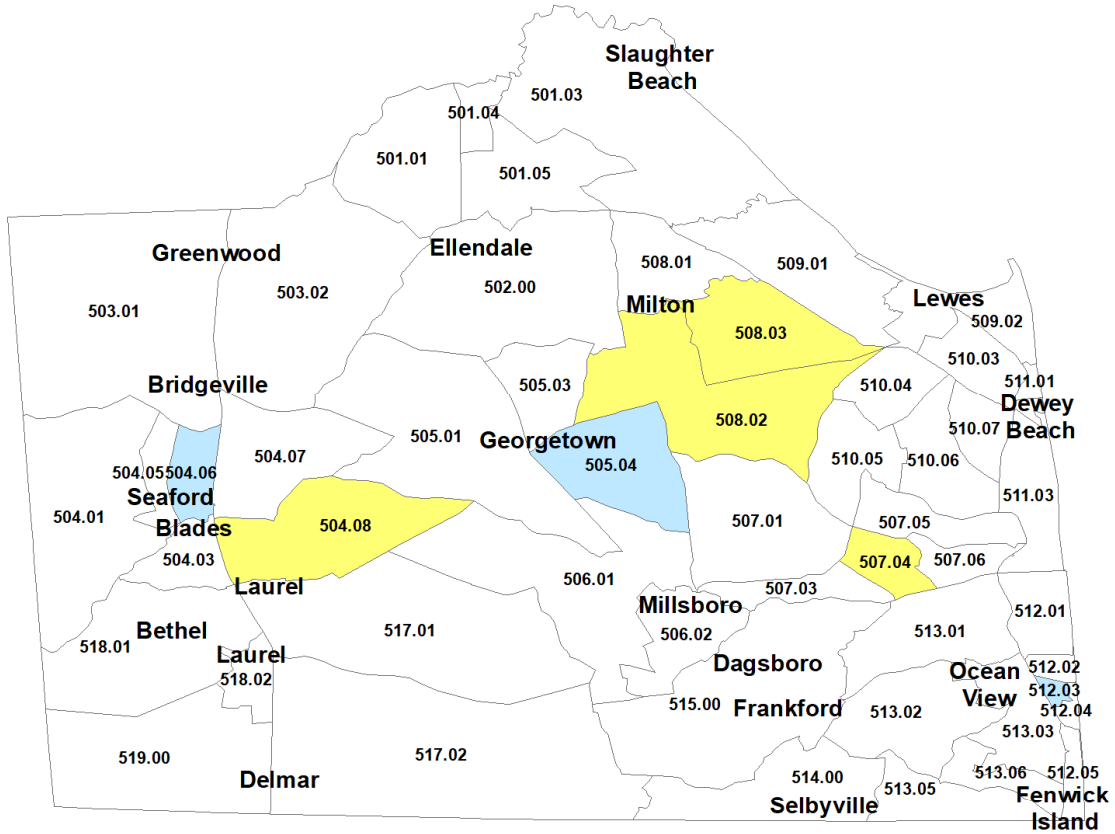
Greater Dover



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>

Five-Year Age-Adjusted Cancer Incidence Rates by Census Tract, Delaware, 2011-2015

Sussex County



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2018.
 Source: 2010 U.S. Census county and tract shapefiles: <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.2010.html>