Cancer Incidence and Mortality in Delaware

April 2013

DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

DELAWARE
CANCER
CONSORTIUM

This report is made possible with funding from the Delaware Health Fund, with strategic leadership and guidance provided by the Delaware Cancer Consortium.

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1. EXECUTIVE SUMMARY

This report includes cancer statistics for overall cancer as well as 23 site-specific cancers These cancer statistics were updated to include incidence and mortality data for two time periods: 2004–2008 and 2005–2009. We compare Delaware's incidence and mortality data for 2005–2009 with national data for 2005–2009 and assess trends over the past 10 five-year time periods.

Although there were variations in all-site (meaning all types of cancer) incidence from 1995–1999 through 2005–2009 and significant progress in combating cancer mortality, Delaware's 2005–2009 overall cancer incidence rate was the same as in 1995–1999, while the U.S. incidence rate decreased 3.9 percent during the same time period. In Delaware, cancer incidence increased 0.1 percent among males and decreased 2.0 percent among females. African American females in Delaware, however, have shown improvement with a 5.4 percent reduction in all-site cancer incidence. However, much work still needs to be done since Delaware's 2005–2009 overall cancer incidence rate (515.3 per 100,000) was 10.8 percent higher than the U.S. rate (465.2 per 100,000).

At its height Delaware was ranked second in the country for cancer mortality, it is now number fourteen. Improvements in cancer mortality continue to be noteworthy**. From 1995–1999 through 2005–2009, Delaware's cancer death rate decreased 18.7 percent, an improvement that was 50 percent greater than the decline seen nationally (12.5 percent).** Male Delawareans experienced a greater rate of decline than females (22.2 percent male vs. 17.4 percent female). Also, African American Delawareans have shown a greater improvement when compared with Caucasians (declines of 33.1 percent vs. 16.1 percent, respectively).

Many factors contribute to the progress that Delaware has made in reducing our cancer burden:

Lung Cancer

- **An estimated 85 to 90 percent of all lung cancer cases are known to be caused by tobacco use.** Delaware has been reaping benefits of reductions in tobacco use that began decades ago, but these benefits were seen primarily in males.
- **Lung cancer continued to play an enormous role in Delaware's overall cancer burden**. In 2005–2009, lung cancer accounted for 15.2 percent of all newly-diagnosed cancer cases and 30.3 percent of all cancer deaths in the state. Up until January 2013, there had not been a screening recommendation from the American Cancer Society to detect lung cancer early. Also, treatment options are not nearly as effective as for some other forms of cancer.
- Lung cancer incidence continued to improve among Delaware males, with a 19.3 percent decline from 1995–1999 through 2005–2009, compared with a 12.5 percent decline among U.S. males. Incidence of lung cancer among females, however, has not improved. Incidence among female Delawareans increased 6.4 percent in contrast with a 1.5 percent increase nationally during the past 10 five-year time periods.
- Although Delaware's lung cancer mortality rates have been higher than U.S. rates, the gap has narrowed. In 2005–2009, the mortality rate among Delaware males was only 3.2 percent higher than the U.S. male rate, compared with 19.2 percent higher in 1980-1984. **The greatest improvement in the state's lung cancer mortality rate from 1995–1999 through 2005–2009 was among male African Americans, among whom lung cancer mortality declined by 39.5 percent.**
- Only minimal progress has been made among female Delawareans, whose 2005–2009 lung cancer death rate was 20 percent higher than the U.S. rate. Between 1995–1999 and 2005–2009, lung cancer mortality decreased 27.6 percent among males but only 4.6 percent among females.
- **In fact, Delaware females ranked fourth highest in the nation in lung cancer mortality while Delaware males ranked 19th during 2005–2009.**

Colorectal Cancer

- From 1995–1999 through 2005–2009, Delaware's colorectal cancer incidence rate declined 22.6 percent, while the U.S. rate declined 16.6 percent. In Delaware, improvement was greatest among African American females (30.4 percent decline).

- **For the first time, colorectal cancer incidence was significantly lower among African Americans in Delaware than nationally; for both sexes combined and for females**.
- From 1995–1999 through 2005–2009, Delaware's colorectal cancer mortality rate decreased 28.9 percent compared with 22.7 percent nationally. The decline in colorectal cancer mortality has been most notable among African American females (45.8 percent).
- **Increases in early detection were responsible for some of the improvement seen in colorectal cancer mortality. In 2010, Delaware ranked sixth in the U.S. in colorectal cancer screening; 74.0 percent of Delawareans age 50 and older reported ever having had a sigmoidoscopy or colonoscopy, compared to 65.2 percent nationally.**
- In recent years, colorectal cancer screening prevalence has increased dramatically among African American Delawareans such that the 2010 screening prevalence among African Americans was higher than that among Caucasians (74.9 percent vs. 74.0 percent, respectively).
- During 2005–2009, 52.7 percent of all colorectal cancer cases diagnosed in Delaware were detected in the regional or distant stages; i.e. after cancer had spread from its original location. This reflects a 17.6 percent decline since 1995–1999 when 63.7 percent of colorectal cancer cases were diagnosed in the regional or distant stages.

Female Breast Cancer

- The 2005–2009 female breast cancer incidence rate for Delaware (127.1 per 100,000) was higher than the U.S. rate (124.3 per 100,000), but the difference was not statistically significant. From 1995–1999 through 2005–2009, Delaware's decline in breast cancer incidence was limited to Caucasian females (9.0 percent decrease) while incidence among African American females increased 4.6 percent.
- Although Delaware's 2005–2009 female breast cancer mortality rate (22.5 per 100,000) was only slightly lower than the U.S. rate (23.0 per 100,000), African Americans in Delaware had a significantly lower mortality rate (22.6 per 100,000) than African Americans nationally (31.6 per 100,000). **Delaware's decline in female breast cancer mortality (29.0 percent) was 52.6 percent greater than the decline seen nationally (19.0 percent) from 1995–1999 through 2005–2009. In Delaware, African Americans showed a greater rate of decline than Caucasians (40.7 and 25.5 percent, respectively)**
- It is highly likely that improvement in early detection of breast cancer contributed to progress seen in breast cancer mortality. Data from the 2010 Behavioral Risk Factor Surveillance (BRFS) survey showed that Delaware women ranked second highest (tied with two other states) nationally in the prevalence of women ages 40 and over who have had a mammogram within the past two years (81.4 percent).

Prostate Cancer

- Prostate cancer incidence in Delaware has increased 5.0 percent in contrast to a decline of 10.7 percent nationally over the past 10 years. This discrepancy most likely reflects a greater prevalence of prostate cancer screening in Delaware compared with that seen nationally, as seen in results from the BRFS survey.
- The proportion of prostate cancer cases detected in the local stage has increased dramatically during the past 30 years in Delaware. During 2005–2009, 86.1 percent of prostate cancer cases diagnosed in Delaware were detected in the local stage compared to only 49.6 percent of cases diagnosed in 1980–1984; an increase of 73.5 percent.
- **The prostate cancer burden continues to affect African Americans disproportionately in Delaware as well as nationally; Delaware's 2005–2009 prostate cancer incidence rate was 80 percent higher among African Americans than among Caucasians.**
- There have been improvements, however, in mortality from prostate cancer. From 1995–1999 through 2005–2009 African Americans in Delaware experienced a substantial decline in mortality (51.5 percent) when compared with Caucasians in Delaware (34.0 percent) and with African Americans nationally (29.0 percent).

Children and Adolescents

- Delaware's cancer incidence rate among children and adolescents was higher than the U.S. rate in both Caucasians and African Americans but neither difference was statistically significantly elevated.
- From 1995–1999 through 2005–2009 in Delaware, the incidence of cancer among children and adolescents increased 9.6 percent overall while the U.S. rate increased 6.9 percent. Cancer incidence

increased 18.2 percent among male children and decreased 0.8 percent among female children during 1995–1999 through 2005–2009 in Delaware.

- **During 2005–2009, Delaware's cancer mortality rate among children and adolescents was the same as the U.S. mortality rate. From 1995–1999 through 2005–2009 in Delaware, mortality from cancer among children and adolescents decreased 14.3 percent overall while the U.S. rate decreased 13.8 percent.**

Trends in Cancer Incidence

Tables A and B summarize 2005–2009 age-adjusted incidence and mortality rates, respectively, for Delaware and the U.S. for all sites combined and each of the 23 individual cancer sites included in this report. Also shown are confidence intervals for the age-adjusted rate in each of the site categories and the percent change during the last 10 five-year time periods (1995–1999 through 2005–2009).

In 2005–2009, Delaware's overall cancer incidence was significantly higher than the U.S. rate and statistically significant excesses were also seen for cancers of the colon and rectum, lung, prostate, thyroid, urinary bladder, uterus and malignant melanoma of the skin (Table A). For cancer of the liver and bile duct, Delaware's incidence rate was significantly lower than the U.S. rate.

Although Delaware's all-site cancer incidence rate was the same in 2005–2009 as in 1995–1999, incidence rates for several cancer sites have shown considerable changes over the past 10 time periods. Cancer sites with dramatic increases in incidence, both in Delaware and nationally, were cancers of the liver, thyroid and kidney, and malignant melanoma. **Important declines in incidence were seen for cancers of the ovary, larynx, colon and rectum, cervix, esophagus, stomach and Hodgkin lymphoma.**

Table A: Average Annual Age-Adjusted Cancer Incidence Rates with 95% Confidence Intervals; Delaware vs. U.S., 2005–2009

Cancer Site	DE Incidence Rate 2005–2009	U.S. Incidence Rate 2005–2009	DE % Change: 95-99 to 05-09	U.S. % Change: 95-99 to 05-09
All site *	515.3 (508.9 , 521.7)	465.2 (464.5 , 465.9)	0.0%	-3.9%
Brain	7.3 (6.5 , 8.1)	6.5 (6.4 , 6.5)	5.7%	-3.0%
Female breast	127.1 (122.7 , 131.5)	124.3 (123.9 , 124.8)	-7.2%	-9.5%
Cervix	8.9 (7.7 , 10.2)	8.1 (8.0 , 8.2)	-18.7%	-10.0%
Colorectal *	49.3 (47.3 , 51.3)	46.3 (46.1 , 46.5)	-19.8%	-16.6%
Esophagus	5.3 (4.6 , 5.9)	4.5 (4.4 , 4.6)	-16.7%	-4.3%
Hodgkin lymphoma	3.0 (2.5 , 3.6)	2.8 (2.8 , 2.9)	-14.5%	0.0%
Kidney / renal pelvis	15.7 (14.6 , 16.9)	15.1 (15.0 , 15.2)	32.2%	33.6%
Larynx	3.9 (3.4 , 4.5)	3.4 (3.4 , 3.5)	-27.7%	-19.0%
Leukemia	12.4 (11.4 , 13.5)	12.5 (12.4 , 12.6)	10.3%	-4.6%
Liver and bile duct **	6.2 (5.5 , 6.9)	7.5 (7.4 , 7.6)	75.3%	70.5%
Lung / bronchus *	77.3 (74.9 , 79.8)	62.6 (62.4 , 62.9)	-7.9%	-6.0%
Melanoma of skin *	25.8 (24.4 , 27.3)	21.0 (20.9 , 21.2)	63.7%	20.0%
Multiple myeloma	6.1 (5.4 , 6.9)	5.8 (5.8 , 5.9)	17.6%	0.0%
Non-Hodgkin lymphoma	20.1 (18.8 , 21.4)	19.6 (19.5 , 19.8)	7.9%	-0.5%
Oral cavity / pharynx	11.3 (10.4 , 12.3)	10.8 (10.7 , 10.9)	1.3%	-4.4%
Ovary	12.0 (10.7 , 13.5)	12.7 (12.6 , 12.9)	-31.5%	-12.4%
Pancreas	12.6 (11.6 , 13.6)	12.1 (12.0 , 12.3)	18.5%	7.1%
Prostate *	181.4 (175.9 , 187.1)	162.3 (161.9 , 162.7)	5.0%	-7.0%
Stomach	6.8 (6.1 , 7.6)	7.6 (7.5 , 7.7)	-15.7%	-10.6%
Testis	5.4 (4.4 , 6.5)	5.4 (5.3 , 5.5)	6.3%	1.9%
Thyroid *	11.3 (10.3 , 12.3)	10.1 (10.0 , 10.2)	56.5%	70.6%
Urinary bladder *	25.2 (23.8 , 26.6)	21.0 (20.9 , 21.1)	8.7%	-1.9%
Uterus *	28.1 (26.2 , 30.3)	23.5 (23.3 , 23.7)	16.9%	-5.6%

Rates are per 100,000 and age-adjusted to 2000 U.S. standard population. U.S. incidence rates for 2005–09 based on SEER 18 areas.

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

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

Trends in Cancer Mortality

Although Delaware's 2005–2009 mortality rate for all cancer sites combined was significantly higher than the U.S. rate, Delaware's cancer mortality has shown a greater rate of decline (18.7 percent) than the U.S. (12.5 percent) over the past 10 five-year time periods (Table B). A similar pattern was seen for lung cancer, where Delaware's mortality rate for 2005–2009 was significantly higher than the U.S. rate. Delaware's lung cancer mortality rate, however, has declined 16.8 percent compared with 11.5 percent nationally over the past 10 five-year time periods.

In Delaware, nine cancer sites have shown considerable improvements in mortality (i.e. 20 percent or more decrease) over the past 10 five-year time periods. These are cancers of the cervix (54.3 percent decline), prostate (35.0 percent), colon and rectum (29.0 percent), female breast (29.0 percent), stomach (25.5 percent), oral cavity and pharynx (25.2 percent), esophagus (23.7 percent) and larynx (22.0 percent), and non-Hodgkin lymphoma (22.2 percent). With the exception of stomach cancer and non-Hodgkin lymphoma, Delaware's decrease in mortality was greater than that seen for the U.S. over the last 10 five-year time periods.

Table B: Average Annual Age-Adjusted Cancer Mortality Rates with 95% Confidence Intervals; Delaware vs. U.S., 2005–2009

Cancer Site #	DE Mortality Rate 2005–2009	U.S. Mortality Rate 2005–2009	DE % Change: 95-99 to 05-09	U.S. % Change: 95-99 to 05-09
All site *	185.7 (181.9 , 189.6)	178.7 (178.4 , 178.9)	-18.7%	-12.5%
Brain	4.4 (3.9 , 5.1)	4.3 (4.2 , 4.3)	9.7%	-8.5%
Female breast	22.5 (20.7 , 24.4)	23.0 (22.9 , 23.1)	-29.0%	-19.0%
Cervix	2.1 (1.6 , 2.8)	2.4 (2.4 , 2.4)	-54.3%	-22.6%
Colorectal	16.7 (15.6 , 17.9)	16.7 (16.6 , 16.8)	-29.0%	-22.7%
Esophagus	4.2 (3.6 , 4.8)	4.3 (4.3 , 4.3)	-23.7%	0.0%
Kidney / renal pelvis	3.7 (3.2 , 4.3)	4.0 (4.0 , 4.0)	-11.3%	-4.8%
Larynx	1.3 (1.0 , 1.7)	1.2 (1.2 , 1.2)	-22.0%	-20.0%
Leukemia	6.8 (6.0 , 7.5)	7.1 (7.1 , 7.1)	-12.9%	-7.8%
Liver and bile duct	5.3 (4.6 , 5.9)	5.5 (5.4 , 5.5)	40.0%	22.2%
Lung / bronchus *	56.0 (53.9 , 58.1)	50.6 (50.5 , 50.7)	-16.8%	-11.5%
Melanoma of skin	2.8 (2.4 , 3.3)	2.7 (2.7 , 2.8)	-12.5%	0.0%
Multiple myeloma	3.5 (3.0 , 4.1)	3.4 (3.4 , 3.5)	-14.1%	-12.8%
Non-Hodgkin lymphoma	6.3 (5.6 , 7.1)	6.6 (6.5 , 6.6)	-22.2%	-24.1%
Oral cavity / pharynx	2.4 (2.0 , 2.9)	2.5 (2.4 , 2.5)	-25.2%	-16.7%
Ovary	8.0 (7.0 , 9.2)	8.2 (8.2 , 8.3)	-17.1%	-7.9%
Pancreas	10.7 (9.8 , 11.7)	10.8 (10.8 , 10.9)	-0.3%	2.9%
Prostate	24.3 (22.1 , 26.7)	23.6 (23.5 , 23.7)	-35.0%	-31.2%
Stomach	3.8 (3.3 , 4.4)	3.6 (3.6 , 3.6)	-25.5%	-28.0%
Urinary bladder	4.9 (4.3 , 5.6)	4.4 (4.3 , 4.4)	-18.2%	0.0%
Uterus	5.0 (4.2 , 5.9)	4.2 (4.1 , 4.2)	18.2%	2.4%

All rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

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

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

= Mortality data are not presented for Hodgkin lymphoma and cancers of the testis and thyroid due to low number of deaths.

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 F). Census tract analyses were conducted for two time periods: 2004–2008 and 2005–2009. Beginning with 2004–2008, census tracts were determined by the 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 2004–2008 show that:

- in 11 of Delaware's 214 census tracts, the overall cancer incidence rate was statistically significantly higher than Delaware's average 2004–2008 incidence rate (515.6 per 100,000)[1],
- in 17 census tracts, the overall cancer incidence rate was significantly lower than Delaware's average incidence rate (515.6 per 100,000), and
- incidence rates for the remaining 186 census tracts were not significantly different from the state's average rate.

Results for 2005–2009 show that:

- in nine of Delaware's 214 census tracts, the overall cancer incidence rate was statistically significantly higher than Delaware's average 2005–2009 incidence rate (515.6 per 100,000)[2],
- in 17 census tracts, the overall cancer incidence rate was significantly lower than Delaware's average incidence rate (515.6 per 100,000) and
- incidence rates for the remaining 188 census tracts were not significantly different from the state's average rate.

Age-adjusted five-year cancer incidence rates by census tract with 95 percent confidence intervals are presented in Appendix I for both 2004–2008 and 2005–2009. Census tract maps that were color-coded by quintiles are in Appendices J and L for 2004–2008 and 2005–2009, respectively. Census tract maps that indicate tracts with significantly high or significantly low incidence rates are in Appendices K and M for 2004–2008 and 2005–2009, respectively.

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 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) in the following time period.

When assessing cancer incidence data by census tract, it should be kept in mind that 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 five percent of all comparisons will be significantly different due to chance alone.

[1] 515.6 is average 2004–2008 Delaware incidence rate calculated by Excel rather than SEER*Stat (515.4).
[2] 515.6 is average 2005–2009 Delaware incidence rate calculated by Excel rather than SEER*Stat (515.3).

INTRODUCTION

Delaware Cancer Registry

The Delaware Cancer Registry (DCR) is managed by Delaware's Division of Public Health (DPH) and serves as the state's central cancer information center. The DCR was founded in 1972 and legally established in 1980 under the Delaware Cancer Control Act. 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 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 extends the reporting deadline to 180 days from initial diagnosis or treatment.

Today, Delaware is one of 45 states whose central cancer registry is supported by the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC).[3] The DCR ensures accurate, timely and routine surveillance of cancer trends among Delawareans.

Reporting Facilities

Sixty physicians and 31 facilities currently submit data to the DCR; these facilities include seven hospitals, 10 diagnostic laboratories and 14 free-standing ambulatory surgery centers. Additionally, the DCR has reciprocal data exchange agreements with Alaska, Florida, Maryland, New Jersey, Pennsylvania, South Carolina, Texas, Washington, 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. Cancer data are submitted from reporting facilities using computerized data encryption techniques. Published reports and data releases are limited to aggregate data. DCR datasets are released only after removal of all personal identifiers. 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 have been 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 separate hospitals and each hospital submits a cancer case reporting form to the DCR.

[3] http://www.cdc.gov/cancer/npcr

NAACCR Certification and NPCR Standard Status

NAACCR certifies DCR data on an annual basis. Gold or Silver Standard certifications are awarded following an evaluation of data quality, completeness and timeliness of reporting. The DCR has received Gold Standard certification from diagnosis years 1999, 2003, 2004, 2005, 2006, 2007, 2008 and 2009. 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 CDC. Delaware's data submission for diagnosis years 2000 through 2009 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 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 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 overall cancer as well as 23 site-specific cancers. In addition, there is a separate section on cancers among children and adolescents. These cancer statistics were updated to include incidence and mortality data for two time periods; 2004–2008 and 2005–2009. Delaware's incidence and mortality data for 2005–2009 were compared with national data for that time period and trends for the past 10 five-year time periods were assessed. Cancer statistics shown throughout this report include data on cancer incidence, stage at diagnosis and mortality by sex, race (Caucasian and African American), county and age group (where data were available).

Limited data on cancer incidence and mortality rates by Hispanic ethnicity are presented in Appendix C. Relevant behavioral risk factor data are presented throughout the report and Appendix E summarizes behavioral risk factor data specific to adult Delawareans.

Delaware's 2005–2009 ranking in the U.S. is given by cancer site for both incidence and mortality. State rankings for cancer incidence were provided by the U.S. Cancer Statistics Working Group.[4] State mortality rankings are from the Cancer Statistics Review (1975-2009) provided by the Surveillance, Epidemiology and End Results (SEER) program of the National Cancer Institute.[5]

[4] U.S. Cancer Statistics Working Group. United States Cancer Statistics: 1999–2009 Incidence and Mortality Web-based Report. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2013. Available at: www.cdc.gov/uscs

[5] Howlader N, Noone AM, Krapcho M, Neyman N, Aminou R, Altekruse SF, Kosary CL, Ruhl J, Tatalovich Z, Cho H, Mariotto A, Eisner MP, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2009 (Vintage 2009 Populations), National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2009_pops09/, based on November 2011 SEER data submission, posted to the SEER web site, April 2012.

Supplemental Information

Data sources and methodology are described in Appendix A.
Primary site definitions are listed in Appendix B.
In Appendix D are Delaware population estimates by sex, race, five–year age groups and five-year time periods.

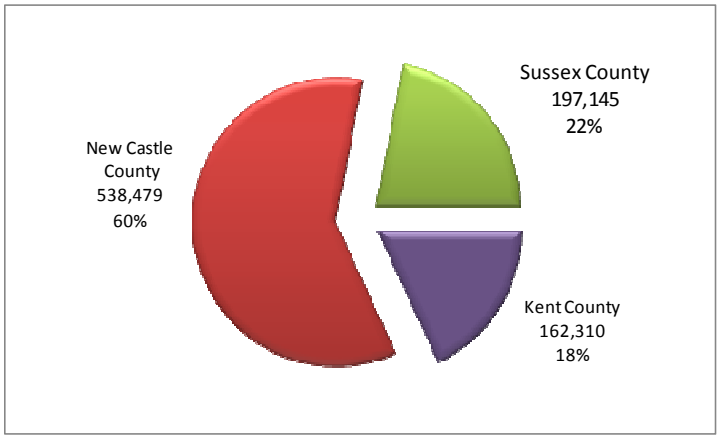
Appendices F through M are related to the census tract analyses:

- Appendix F: Title 16 Chapter 292 of the Delaware code
- Appendix G: Census tract methodology
- Appendix H: Interpretation of cancer incidence rates by census tract
- Appendix I: Age-adjusted cancer incidence rates and 95 percent confidence intervals by 2010 census tract and time period (2004–2008 and 2005–2009)
- Appendix J through Appendix M: Maps for census tract analyses

Population of Delaware

According to the 2010 Census, Delaware's 2010 population was 897,934, with 61% living in New Castle County, 21% in Sussex, and 18% in Kent County (Figure 1).

Figure 1. Distribution of Delaware Population by County, 2010

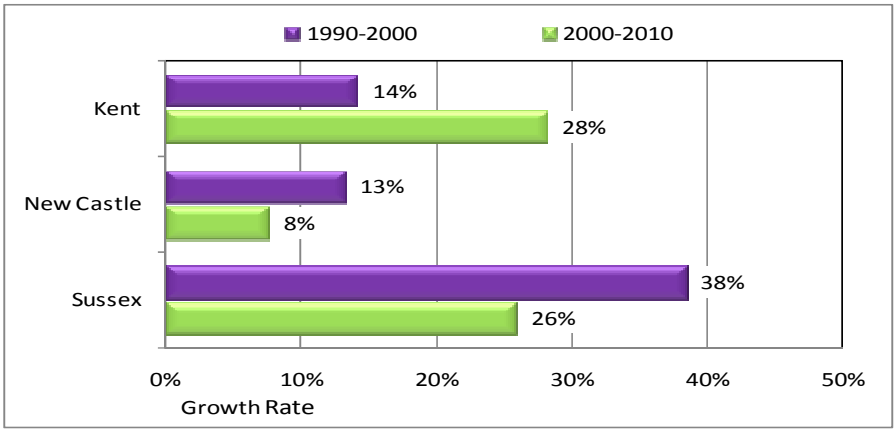


Source: U.S. Census Bureau, American FactFinder http://factfinder2.census.gov/

New Castle, the largest county with a population of 538,479, grew by the smallest percentage during both decades shown in Figure 2; 13.2% and 7.6% during 1990-2000 and 2000-2010, respectively. Sussex County, with a 2010 population of 197,145, experienced a 38.3% growth rate during 1990-2000 and a 25.9% rate during 2000-2010. Kent County, though smallest in population (162,310), had a 14.1% growth rate during 1990-2000 and the largest percentage growth during 2000-2010 (28.1%).

Overall, 68.9% of Delawareans were Caucasian, ranging from 79.0% in Sussex County to 67.8% and 65.5% in Kent and New Castle Counties, respectively (Table 1). African Americans comprised 21.4% of the population; from 12.7% in Sussex County to 23.7% and 24.0% in New Castle and Kent County, respectively. About three percent of Delawareans were Asian, with the highest proportion (4.3%) in New Castle County. Persons of Hispanic ethnicity, regardless of race, comprised 8.2% of the population (8.7%, 8.6% and 5.8% in New Castle, Sussex and Kent Counties, respectively).

Figure 2. Growth Rate of Delaware's Population by County and Decade, 1990-2000 and 2000-2010



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

Table 1. Distribution of Delaware's Population by Race/Ethnicity and County, 2010

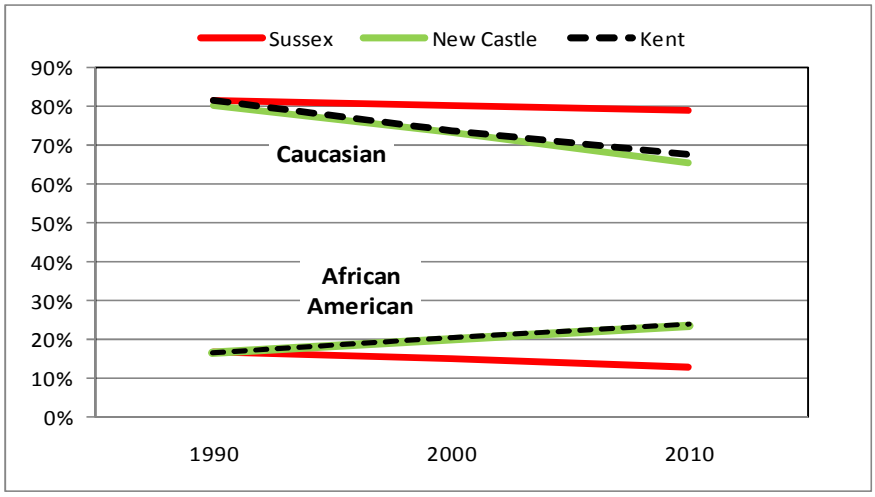
Race	Delaware	Kent	New Castle	Sussex
Caucasian	**68.9%**	67.8%	65.5%	79.0%
African American	**21.4%**	24.0%	23.7%	12.7%
American Indian/ Alaska Native	**0.5%**	0.6%	0.3%	0.8%
Asian	**3.2%**	2.0%	4.3%	1.0%
Other or 2 or more races	**6.1%**	5.5%	6.1%	6.4%
Ethnicity – Hispanic	**8.2%**	5.8%	8.7%	8.6%

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

The proportion of African American residents in 1990 was essentially the same across all three of Delaware's counties (16.5% to 16.8%) as was the proportion of Caucasian residents (80.3% to 81.6%). The proportion of Caucasians decreased to 74.6% of the population during 1990-2000 and then to 68.9% by 2010. The decrease in proportion of Caucasians in Delaware is accompanied by a concurrent growth in the African American population and a relatively smaller increase in the Asian population, which grew from 1.3% of the state population in 1990 to 3.2% in 2010. In addition, there is an increase in the "other" race category during these two decades which includes: (1) "some other race" groups that were too small to enumerate separately, (2) unknown race and (3) mixed race; i.e. two or more races. The increase in this last category is due to revisions in data standards implemented in 1997 that change the way race is asked by the Census Bureau. Beginning in 2000, respondents were given the option of selecting one or more race categories to indicate racial identities. Because of this change, the U.S. Census 2000 data on race were not directly comparable with data from the 1990 or earlier censuses.

Both Kent and New Castle Counties showed an increase in the proportion of African American residents and a concurrent decrease in the proportion of Caucasian residents from 1990 to 2010 (Figure 3). The opposite was seen in Sussex County where the Caucasian population declined slightly from 81.6% of the population in 1990 to 79.0% in 2010 (a 3% decrease). During the same time period, Sussex County's African American population decreased from 16.8% in 1990 to 12.7% in 2010, a 24% decline.

Figure 3. Proportions of Caucasian and African American Residents in Delaware by County and Decade, 1990, 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 were expressed per 100,000 Delawareans and rates for the U.S. were 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 percent 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. 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 Division of Public Health Policy Memorandum 49 (Data and Data Release Standards):

- Incidence and mortality frequencies of less than six were not shown to protect patient 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 new cancer cases or deaths helps protect patient privacy and confidentiality. [6, 7]
- Age-adjusted incidence and mortality rates based on fewer than 25 cases or deaths were suppressed to protect patient privacy and confidentiality. Cancer rates based on a very small number of cases are inherently unstable and cannot be reliably interpreted.

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

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

3. ALL CANCER SITES (ALL SITE)

Data Highlights

All Site Cancer Incidence (Tables 3.1 – 3.3, Figures 3.1 – 3.4)

- A total of 25,068 cases of cancer were diagnosed among Delawareans from 2005 through 2009, an average of 5,014 cases per year. 13,341 cases (53.2 percent) were male and 11,727 cases (46.8 percent) were female.
- Caucasians comprised 82.3 percent of cancer cases diagnosed from 2005–2009, African Americans comprised 15.8 percent and 1.9 percent were other or unknown race.
- More than half of cases were from New Castle County (54.7 percent or 13,718 cases), 27.8 percent (6,959 cases) were from Sussex County and 17.5 percent (4,391 cases) were Kent County residents.
- Delaware's 2005–2009 all-site cancer incidence rate of 515.3 per 100,000 was significantly higher than the U.S. rate of 465.2 per 100,000. This significant excess was observed for both Delaware males (608.2 per 100,000 versus 541.8 per 100,000 nationally) and females (445.2 per 100,000 versus 412.3 per 100,000 nationally).
- Within Delaware, the 2005–2009 all-site cancer incidence rate among males (608.2 per 100,000) was significantly higher than among females (445.2 per 100,000); this difference persisted for both Caucasians and African Americans and within all three counties.
- Delaware's 2005–2009 all-site cancer incidence rate for African Americans (537.8 per 100,000) was higher than the rate for Caucasians (514.8 per 100,000) but not statistically significant.
- The all-site cancer incidence rate was significantly higher for African Americans than for Caucasians among all male Delawareans (682.8 per 100,000 versus 599.7 per 100,000) and within Sussex County (780.2 per 100,000 versus 574.5 per 100,000),
- Nationally, the all-site incidence rate for African American females was significantly lower than for Caucasians, but the disparity observed among female Delawareans was not statistically significant (431.3 per 100,000 African American versus 451.1 per 100,000 Caucasian).
- Among females in Kent County, however, the all-site cancer incidence rate among African Americans (414.9 per 100,000) was significantly lower than that observed for Caucasians (495.2 per 100,000).
- Delaware's 2005–2009 all-site cancer incidence rate was the same as in 1995–1999, with minor changes in between. During the same 10 five-year time periods, the U.S. all-site cancer incidence rate decreased 3.9 percent.
- In Delaware from 1995–1999 through 2005–2009, the all-site cancer incidence rate increased by 0.6 percent among Caucasians and decreased by 4.2 percent among African Americans.
- During this time period in Delaware, all-site cancer incidence increased 0.1 percent among males and declined 2.0 percent among females.
- African American females in Delaware had the greatest reduction in all-site cancer incidence, falling 5.4 percent from 1995–1999 through 2005–2009.
- The risk of developing cancer increased with age from birth through ages 75-84 and then decreased slightly among those ages 85 and older. Among African American males, however, the incidence of cancer peaked at ages 65-74.
- From ages 65-74 and above, the risk of developing cancer was on average about 70 percent higher among males than among females.
- During 2005–2009, Delaware's all-site cancer incidence rate was third highest in the U.S. Male Delawareans ranked second highest and Delaware females ranked tenth in overall cancer incidence (U.S. Cancer Statistics Working Group).

All Site Cancer Mortality (Tables 3.4 – 3.6, Figures 3.5 – 3.8)

- From 2005 through 2009, 9,087 Delawareans died from cancer; 4,730 decedents (52.1 percent) were male and 4,357 (47.9 percent) female.
- 83.5 percent or 7,588 cancer deaths that occurred during 2005–2009 were Caucasian, 15.4 percent (1,399 deaths) were African American and the remainder (1.1 percent) were other or unknown race.
- The majority of cancer deaths during 2005–2009 were New Castle County residents (54.9 percent or 4,991 deaths), 27.6 percent (2,509 deaths) were from Sussex County and the remainder (17.5 percent or 1,587 deaths) were Kent County residents.
- Delaware's 2005–2009 overall cancer mortality rate of 185.7 per 100,000 was significantly higher than the U.S. rate of 178.7 per 100,000. Although the all-site cancer mortality rate for Delaware has historically been higher than the U.S. rate, the gap has narrowed in recent time periods.
- In Delaware, the 2005–2009 all-site cancer mortality rate for males (224.8 per 100,000) was significantly higher than the rate for females (158.4 per 100,000). This significant male to female excess occurred among both Caucasians and African Americans and within all three Delaware counties.
- At the national level, the all-site cancer mortality rate for males was also significantly greater than that for females (219.4 per 100,000 vs. 151.1 per 100,000, respectively).
- In the U.S. during 2005–2009 all-site cancer mortality rates for African Americans of either sex were significantly higher than mortality rates for their Caucasian counterparts. The same significant excess was seen among all male Delawareans and males from Sussex County.
- Similarly disparate mortality patterns were observed among female Delawareans, but differences were not significant.
- In Delaware from 1995–1999 through 2005–2009, the all-site cancer mortality rate decreased 18.7 percent while nationally the all-site cancer mortality rate decreased 12.5 percent.
- Over the same time period the all-site cancer mortality rate for males and females declined 22.2 percent and 17.4 percent, respectively. Nationally during the same time period, the all-site cancer mortality rate for males and females decreased 15.4 percent and 10.9 percent, respectively.
- Although African American males had the highest all-site cancer mortality rate (256.5 per 100,000) in Delaware, they were the sex/race group with the largest percentage decrease in cancer mortality. Over the last 10 five-year time periods (from 1995–1999 through 2005–2009), the all-site cancer mortality rate for African American males in Delaware decreased 37.5 percent.
- From 1995–1999 through 2005–2009, Delaware's all-site cancer mortality rates declined by 19.5 percent, 15.1 percent and 33.1 percent for Caucasian males, Caucasian females and African American females, respectively.
- Age-specific mortality rates among African Americans were comparable to those seen for Caucasians with the exception of ages 85 and older when the death rate seen among Caucasians was 19.0 percent higher than among African Americans.
- Beginning with ages 65-74, males have had a higher cancer mortality rate than females. By age 85 and over, the death rate among males was about 80 percent higher than the rate among females.
- During 2005–2009, Delaware's rank in mortality from all cancer sites combined was 14th highest in the nation. Delaware males ranked 18th highest and Delaware females ranked sixth highest in overall cancer mortality (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 3.1. Number of Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	25,068	13,341	11,727	20,629	10,964	9,665	3,970	2,147	1,823
Kent	4,391	2,386	2,005	3,511	1,877	1,634	799	476	323
New Castle	13,718	7,121	6,597	10,950	5,672	5,278	2,519	1,321	1,198
Sussex	6,959	3,834	3,125	6,168	3,415	2,753	652	350	302

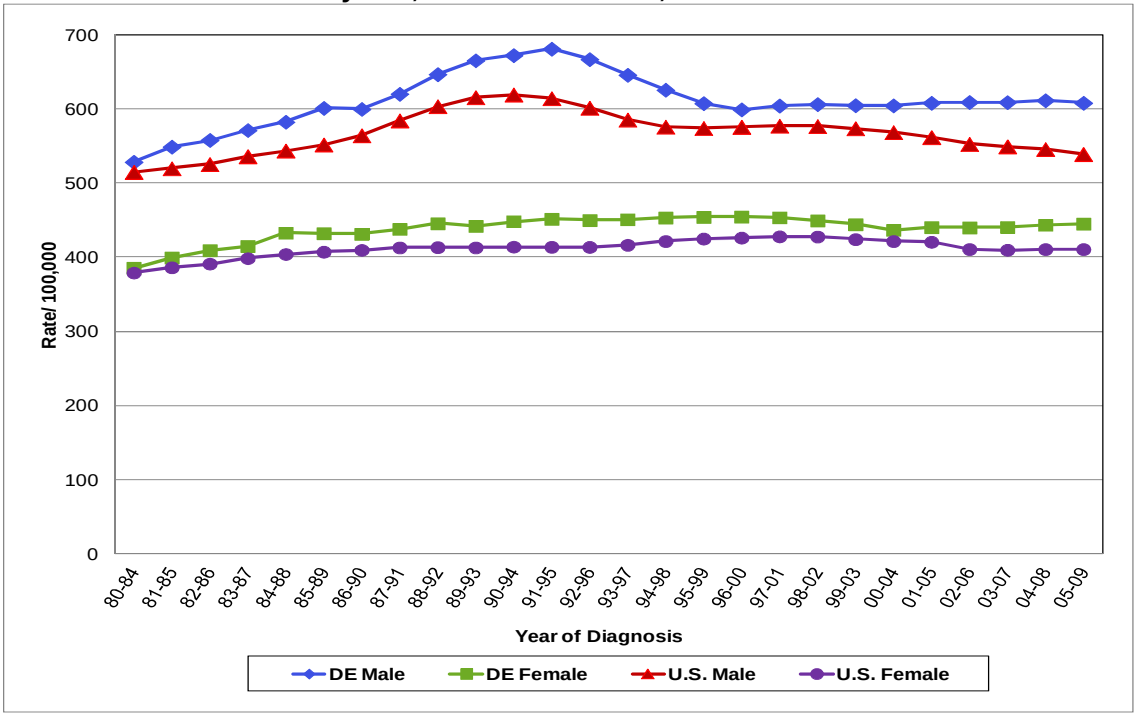
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 3.2. Five-Year Average Age-Adjusted All Site Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE / REGION	All	Male	Female
ALL RACES			
United States	465.2 (464.5 , 465.9)	541.8 (540.7 , 542.9)	412.3 (411.4 , 413.1)
Delaware	515.3 (508.9 , 521.7)	608.2 (597.8 , 618.7)	445.2 (437.1 , 453.5)
Kent	567.2 (550.4 , 584.3)	691.7 (663.6 , 720.6)	471.6 (451.1 , 492.9)
New Castle	505.0 (496.5 , 513.6)	596.0 (581.9 , 610.2)	440.5 (429.8 , 451.4)
Sussex	509.7 (497.4 , 522.3)	591.5 (572.5 , 611.1)	443.0 (426.7 , 459.7)
CAUCASIAN			
United States	471.7 (470.9 , 472.4)	542.7 (541.6 , 543.9)	423.1 (422.2 , 424.1)
Delaware	514.8 (507.7 , 521.9)	599.7 (588.4 , 611.2)	451.1 (441.9 , 460.4)
Kent	578.1 (559.0 , 597.7)	690.5 (659.0 , 723.0)	495.2 (471.2 , 520.0)
New Castle	509.4 (499.8 , 519.1)	593.7 (578.2 , 609.6)	450.9 (438.6 , 463.4)
Sussex	495.6 (482.6 , 508.8)	574.5 (554.7 , 595.0)	429.5 (412.5 , 447.2)
AFRICAN AMERICAN			
United States	489.5 (487.3 , 491.8)	627.1 (623.0 , 631.3)	398.3 (395.7 , 400.9)
Delaware	537.8 (520.6 , 555.3)	682.8 (652.5 , 714.1)	431.3 (411.4 , 452.0)
Kent	569.3 (529.7 , 611.0)	750.0 (682.2 , 822.5)	414.9 (370.2 , 463.4)
New Castle	512.4 (491.7 , 533.6)	635.6 (599.0 , 673.8)	424.3 (399.9 , 449.7)
Sussex	600.6 (554.9 , 649.1)	780.2 (698.4 , 868.6)	482.7 (429.4 , 540.7)

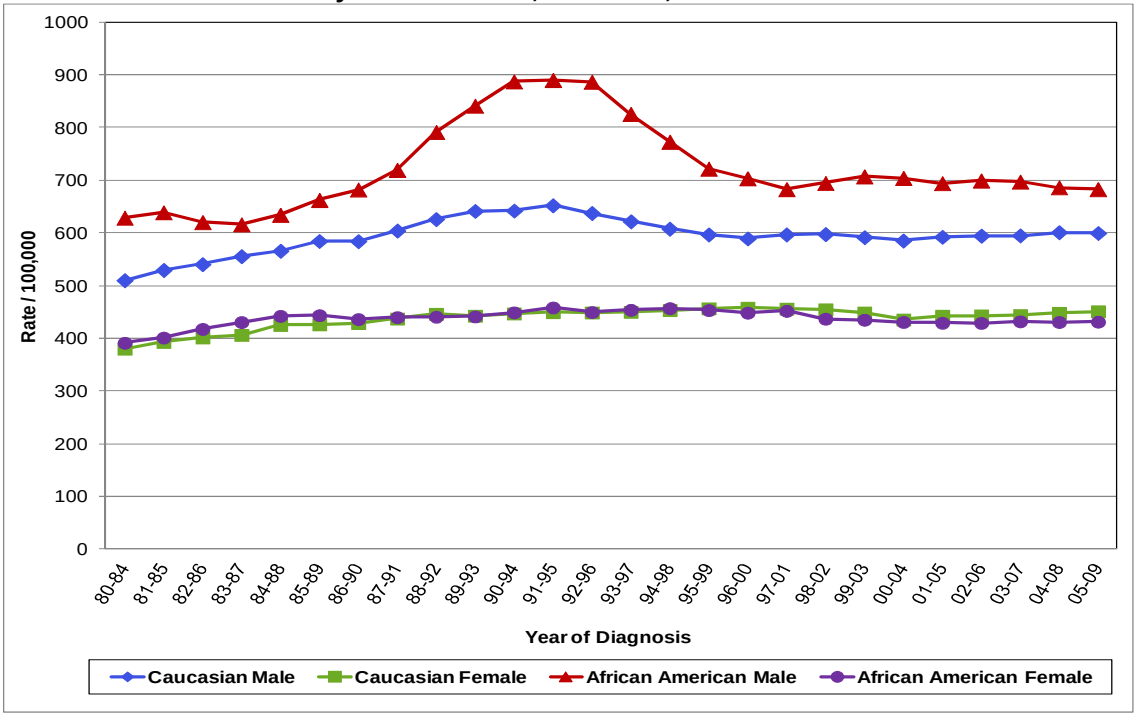
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 3.1. Five-Year Average Age-Adjusted All Site Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 3.2. Five-Year Average Age-Adjusted All Site Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



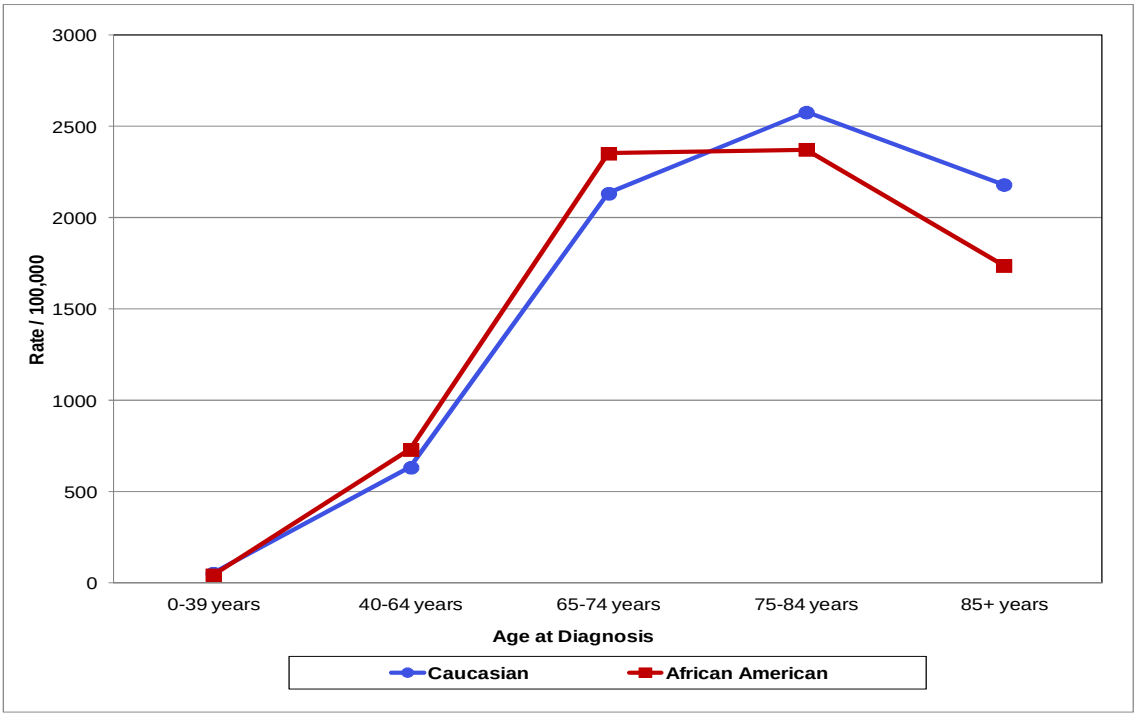
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 3.3. Age-Specific All Site Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	53.0	43.7	61.9	55.3	47.1	63.4	46.4	33.1	58.2
40-64	643.8	676.2	615.1	634.5	650.0	621.6	732.2	863.4	624.0
65-74	2151.7	2792.6	1600.5	2134.0	2716.7	1626.5	2352.9	3431.6	1496.0
75-84	2548.9	3286.2	2007.9	2578.3	3311.3	2028.5	2374.3	3118.6	1914.1
85+	2131.9	2964.2	1759.4	2182.0	3061.5	1782.6	1739.4	2262.8	1544.0

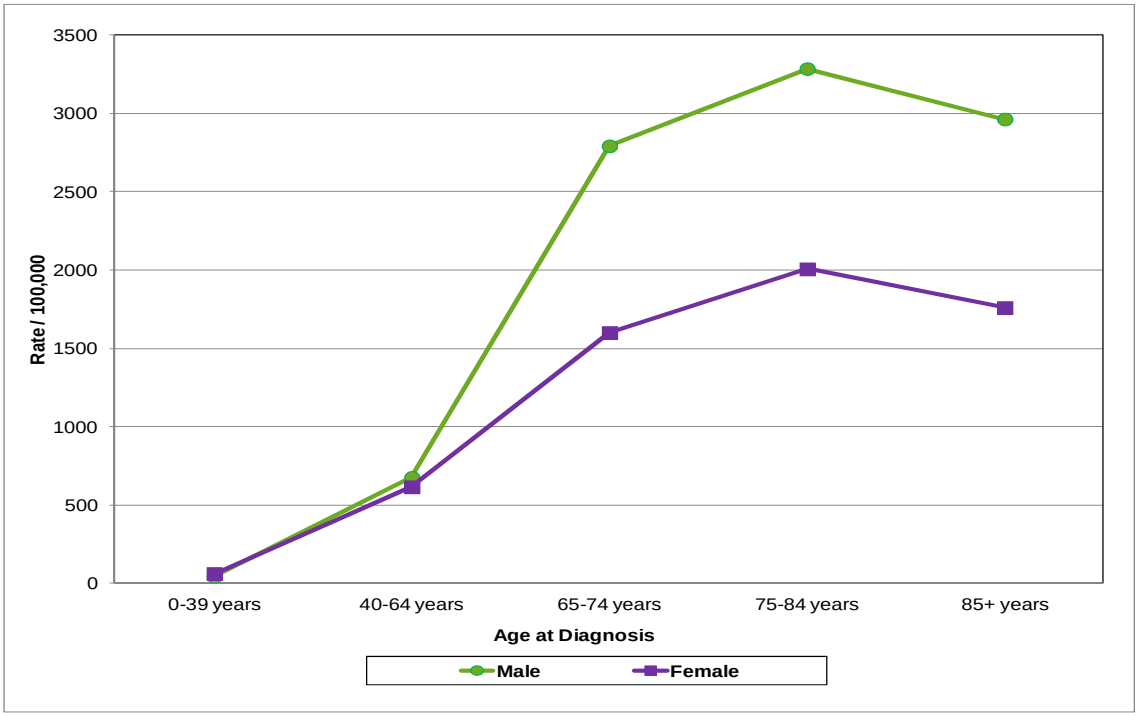
***** = Rates are per 100,000 population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 3.3. Age-Specific All Site Cancer Incidence Rates by Race; Delaware, 2005–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 3.4. Age-Specific All Site Cancer Incidence Rates by Sex; Delaware, 2005–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

All Site Cancer Mortality

Table 3.4. Number of All Site Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	9,087	4,730	4,357	7,588	3,965	3,623	1,399	719	680
Kent	1,587	824	763	1,308	674	634	260	144	116
New Castle	4,991	2,559	2,432	4,043	2,092	1,951	894	438	456
Sussex	2,509	1,347	1,162	2,237	1,199	1,038	245	137	108

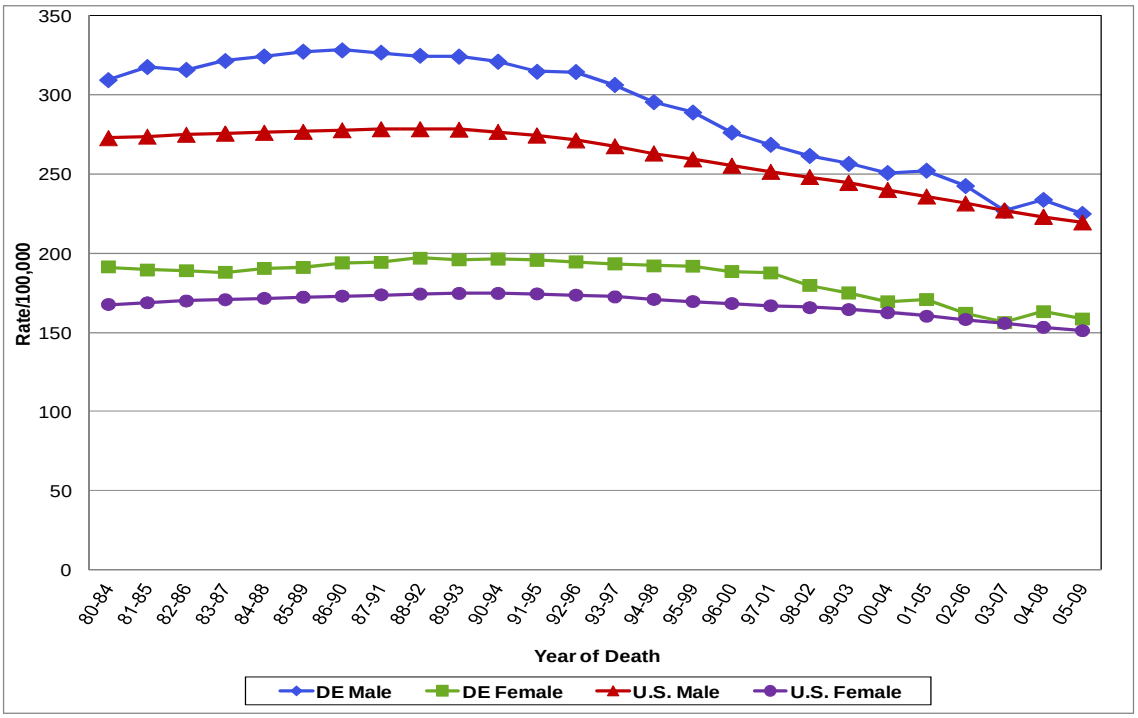
SOURCE: Delaware Health Statistics Center, 2012.

Table 3.5. Five-Year Average Age-Adjusted All Site Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	178.7 (178.4 , 178.9)	219.4 (219.0 , 219.7)	151.1 (150.8 , 151.3)
Delaware	185.7 (181.9 , 189.6)	224.8 (218.4 , 231.4)	158.4 (153.7 , 163.3)
Kent	209.5 (199.3 , 220.1)	256.0 (238.3 , 274.5)	177.8 (165.4 , 191.0)
New Castle	185.7 (180.6 , 191.0)	227.5 (218.6 , 236.7)	158.6 (152.3 , 165.2)
Sussex	175.1 (168.2 , 182.3)	207.5 (196.4 , 219.2)	149.6 (140.8 , 158.8)
CAUCASIAN			
United States	177.6 (177.3 , 177.8)	216.7 (216.3 , 217.1)	150.8 (150.5 , 151.1)
Delaware	184.2 (180.1 , 188.4)	222.3 (215.3 , 229.4)	157.4 (152.3 , 162.8)
Kent	216.7 (205.0 , 228.8)	263.1 (243.2 , 284.2)	186.1 (171.8 , 201.3)
New Castle	185.2 (179.5 , 191.1)	227.4 (217.7 , 237.5)	157.4 (150.4 , 164.7)
Sussex	169.8 (162.6 , 177.2)	199.4 (188.0 , 211.5)	146.1 (136.9 , 155.8)
AFRICAN AMERICAN			
United States	216.4 (215.6 , 217.2)	288.3 (286.8 , 289.8)	174.6 (173.7 , 175.4)
Delaware	204.1 (193.2 , 215.4)	256.5 (236.8 , 277.3)	169.9 (157.1 , 183.4)
Kent	196.7 (173.1 , 222.5)	242.9 (203.5 , 287.4)	159.6 (131.5 , 191.6)
New Castle	200.0 (186.5 , 214.1)	244.9 (220.3 , 271.2)	172.9 (157.0 , 190.0)
Sussex	230.3 (202.0 , 261.2)	320.2 (267.4 , 379.8)	173.6 (142.2 , 209.8)

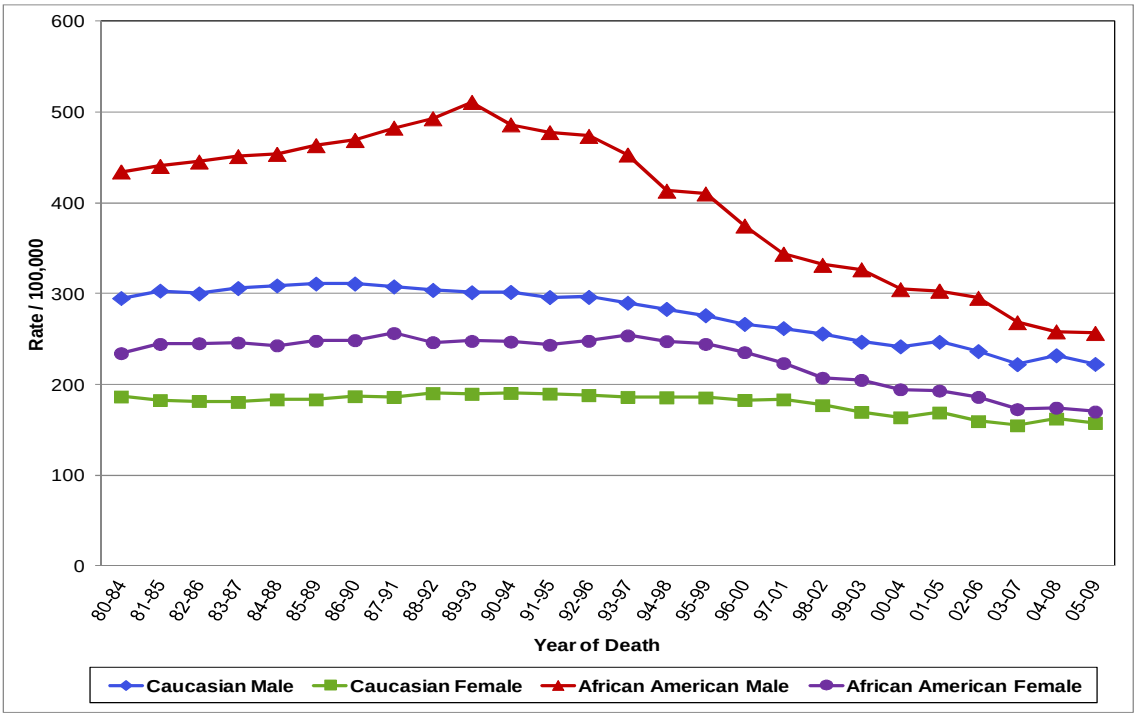
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 3.5. Five-Year Average Age-Adjusted All Site Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 3.6. Five-Year Average Age-Adjusted All Site Cancer Mortality Rates* by Race and Sex; Delaware, 1980–2009



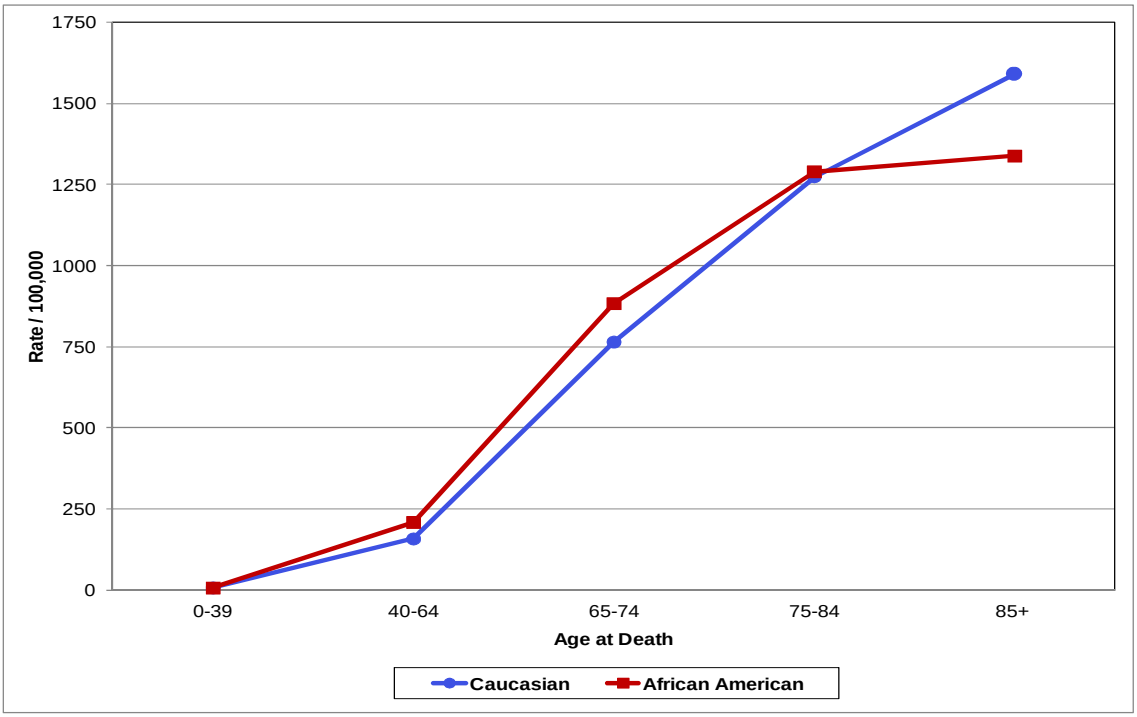
* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 3.6. Age-Specific All Site Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	6.7	6.5	7.0	7.0	7.0	7.1	6.7	---	---
40-64	164.0	177.4	151.8	157.7	170.3	146.1	208.9	235.3	187.2
65-74	772.4	909.7	654.4	764.3	883.2	660.8	882.5	1167.6	655.7
75-84	1266.5	1609.7	1019.8	1273.7	1620.8	1017.4	1288.9	1648.4	1076.4
85+	1559.8	2252.9	1249.6	1590.7	2290.4	1273.0	1337.1	2001.7	1088.9

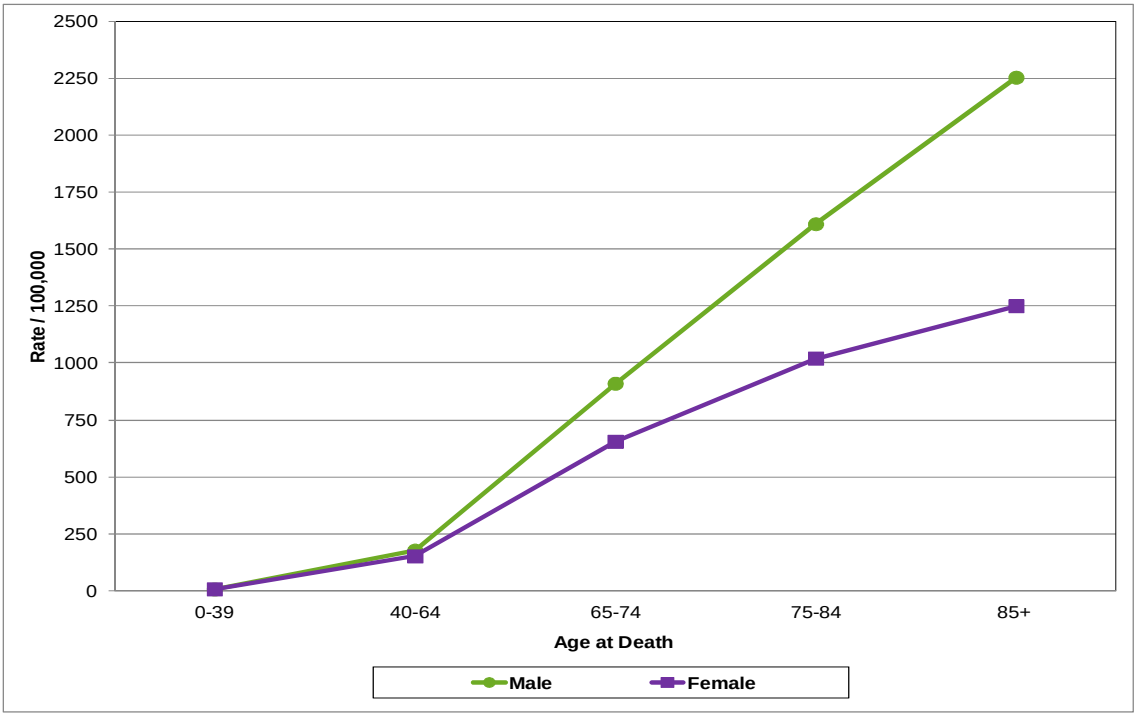
* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 3.7. Age-Specific All Site Cancer Mortality Rates by Race; Delaware, 2005–2009



SOURCE: Delaware Health Statistics Center, 2012.

Figure 3.8. Age-Specific All Site Cancer Mortality Rates by Sex; Delaware, 2005–2009



SOURCE: Delaware Health Statistics Center, 2012.

4. BRAIN AND CENTRAL NERVOUS SYSTEM CANCER [8]

Risk Factors

Lifestyle Risk Factors for Brain Cancer:

- ingestion of aspartame (a sugar substitute) (suspected)
- cell phone use – there is limited evidence on the effects of long-term use (suspected)

Environmental and Medically-Related Causes of Brain Cancer:

- exposure to radiation – usually radiation therapy
- workplace exposures – vinyl chloride (used to manufacture plastics), petroleum products, and certain other chemicals (suspected)
- exposure to electromagnetic fields from power lines and transformers (suspected)
- infection with certain viruses (suspected)

Brain Cancer Risk Factors that Cannot be Changed:

- family history – genetic predisposition identified in about four percent of cases

Factors Protective against Brain Cancer:

- Although there are no known lifestyle risk factors for brain cancer, managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), tobacco use, alcohol use and physical activity will help promote better health.

Early Detection of Brain Cancer:

- Currently there are no tests recommended to screen for brain tumors.
- For people with certain inherited syndromes that put them at higher risk for brain tumors, health care professionals may recommend frequent physical exams and other tests starting when they are young.

Data Highlights

Brain Cancer Incidence (Tables 4.1 – 4.3, Figures 4.1 – 4.3)

- The 337 brain cancer cases diagnosed in Delaware accounted for 1.3 percent of all cancer cases among Delawareans during 2005–2009.
- The majority of brain cancer cases (2005–2009) were New Castle County residents (198 cases or 58.8 percent), 82 cases (24.3 percent) Sussex County and 57 cases (16.9 percent) Kent County residents.
- More than half of the brain cancers diagnosed were male (195 or 57.9 percent) and 142 (42.1 percent) female.
- Caucasian residents comprised 86.9 percent (293) and African Americans comprised 11.0 percent (37) of all brain cancer cases in 2005–2009. Seven cases were other or unknown races.
- Nationally, brain cancer incidence was 42.6 percent higher among males (7.7 per 100,000) than females (5.4 per 100,000). In Delaware the number of cases was too small to calculate a reliable incidence rate for female residents.
- The highest brain cancer incidence rate for 2005–2009 was among Caucasian males in Kent County.

[8] Brain and Other Nervous System Cancer' is referred to as 'Brain Cancer' throughout this section.

- Overall, Delaware's brain cancer incidence rate (7.3 per 100,000) was 23.3 percent higher than the U.S. estimate (6.5 per 100,000) for 2005–2009 but the difference was not statistically significant.
- African Americans in Delaware had a significantly lower brain cancer incidence rate (4.7 per 100,000 in 2005–2009) than Caucasians (7.9 per 100,000). Race-specific comparisons by sex were not possible due to the low case count among African Americans.
- According to U.S. estimates, brain cancer incidence has been decreasing at a slow rate (average of 0.3 percent decline per year) since 1987 among both males and females.
- From 1995–1999 through 2005–2009 brain cancer incidence increased 5.8 percent in Delaware while the national rate fell 3.0 percent.
- The increase seen during this time period in Delaware was attributable to incidence patterns among males. From 1995–1999 through 2005–2009, brain cancer incidence increased 19.0 percent among Caucasian males and increased 37.5 percent among African American males.
- Among females in Delaware, brain cancer incidence decreased 6.1 percent among Caucasians and decreased 14.0 percent among African Americans during the past 10 five-year time periods.
- Up to age 40, brain cancer incidence was 33 percent higher in males than females in Delaware. The male to female gap increased to two-thirds higher for ages 75 – 84. National data have shown that brain cancer incidence peaked at ages 75–84 and there was a secondary peak in the 0–4 year age group.
- Delawareans ranked eighth highest in the U.S. for brain cancer incidence during 2005–2009. Males ranked third highest and Delaware females ranked 27th in brain cancer incidence (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Brain Cancer (Tables 4.4 – 4.5, Figures 4.4 – 4.5)

- During 2005–2009 in Delaware, the percentage of brain and central nervous system cancers detected at the local, regional and distant stages were 77.7, 13.1 and 1.8 percent, respectively. Comparable percentages for the U.S. were 75.1 percent, 15.8 percent and 2.3 percent, respectively.
- Among those diagnosed with brain cancer, females were less likely to have had their cancer diagnosed in the local stage than males (72.5 percent vs. 81.5 percent, respectively). This difference was largely due to the larger proportion of cancers with unknown stage diagnosed among females than males (11.3 percent vs. 4.6 percent, respectively).

Brain Cancer Mortality (Tables 4.6 – 4.8, Figures 4.6 – 4.7)

- Deaths from brain cancer accounted for 2.3 percent of all cancer deaths in Delaware during 2005–2009.
- During 2005–2009, 210 Delawareans died from brain cancer; 117 males (55.7 percent) and 93 females (44.3 percent).
- Caucasians comprised 87.6 percent of decedents (184 deaths) and African Americans 11.4 percent (24 deaths).
- A total of 125 deaths (59.5 percent) were from New Castle, 56 deaths (26.7 percent) from Sussex and 29 deaths (13.8 percent) from Kent County.
- Delaware's 2005–2009 brain cancer mortality rate was 55.6 percent higher among males (5.6 per 100,000) than females (3.6 per 100,000) and the difference was significant.
- Brain cancer mortality was more than one-third higher among Caucasian (4.8 per 100,000) than among African American (3.5 per 100,000) Delawareans during 2005–2009. Mortality rates among African Americans, however, were not reliable due to the small number of deaths.
- From 1995–1999 thorough 2005–2009, brain cancer mortality in Delaware increased 10.0 percent while the U.S. mortality rate decreased 8.5 percent. The increase in Delaware was due to a 27.3 percent increased mortality among men: both African American (82.6 percent) and Caucasian (27.1 percent).
- U.S. data show that the median age at death from brain cancer was 64 years of age.
- During 2005–2009, Delaware ranked 21st highest in mortality from cancers of the brain and central nervous system. Delaware males ranked 12th highest and Delaware females ranked 28th in brain and central nervous system cancer mortality (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Brain Cancer Incidence

Table 4.1. Number of Brain Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	337	195	142	293	172	121	37	18	19
Kent	57	34	23	50	29	21	6	---	---
New Castle	198	103	95	172	92	80	22	8	14
Sussex	82	58	24	71	51	20	9	---	---

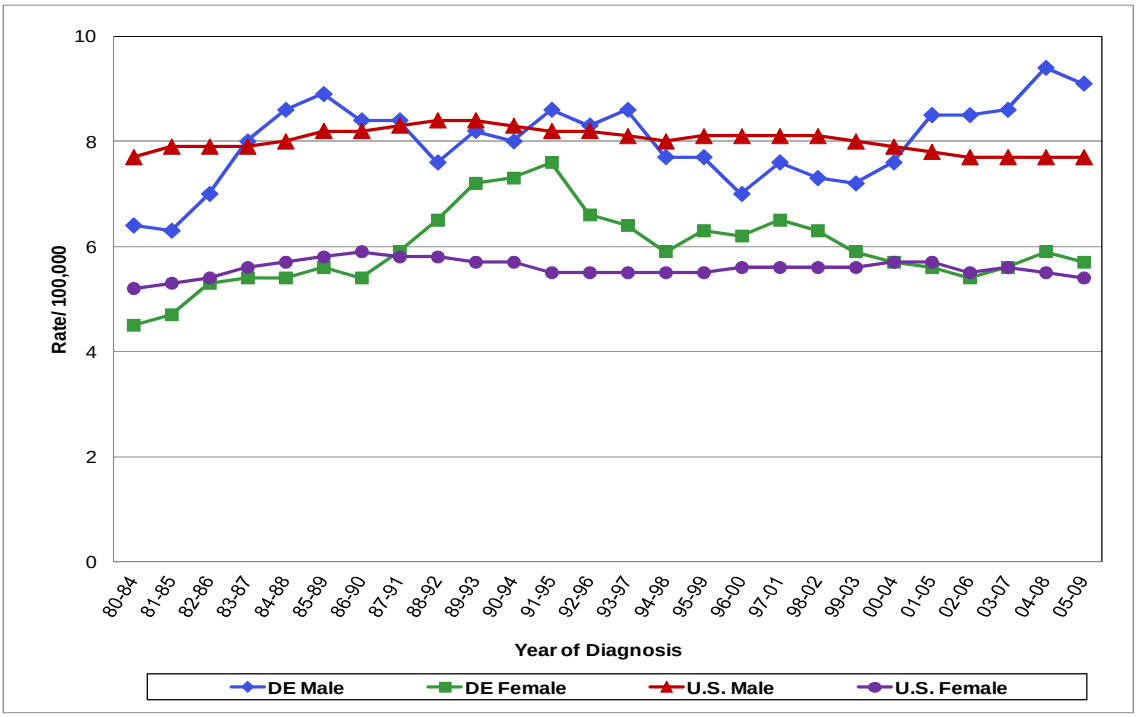
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 4.2. Five-Year Average Age-Adjusted Brain Cancer Incidence Rates * and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	6.5 (6.4 , 6.5)	7.7 (7.6 , 7.8)	5.4 (5.3 , 5.5)
Delaware	7.3 (6.5 , 8.1)	9.1 (7.9 , 10.5)	5.7 (4.8 , 6.8)
Kent	7.6 (5.7 , 9.8)	10.0 (6.9 , 14.1)	5.8 (3.7 , 8.7)
New Castle	7.5 (6.5 , 8.6)	8.6 (7.0 , 10.4)	6.6 (5.3 , 8.1)
Sussex	7.0 (5.4 , 8.8)	10.4 (7.8 , 13.6)	---
CAUCASIAN			
United States	7.1 (7.0 , 7.2)	8.4 (8.3 , 8.6)	5.9 (5.8 , 6.0)
Delaware	7.9 (7.0 , 8.9)	10.0 (8.5 , 11.6)	6.1 (5.1 , 7.4)
Kent	8.6 (6.4 , 11.4)	11.0 (7.3 , 15.9)	---
New Castle	8.4 (7.1 , 9.7)	9.8 (7.9 , 12.1)	7.2 (5.6 , 9.0)
Sussex	6.9 (5.3 , 9.0)	10.4 (7.6 , 14.1)	---
AFRICAN AMERICAN			
United States	4.0 (3.9 , 4.2)	4.7 (4.4 , 5.0)	3.6 (3.4 , 3.9)
Delaware	4.7 (3.3 , 6.6)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

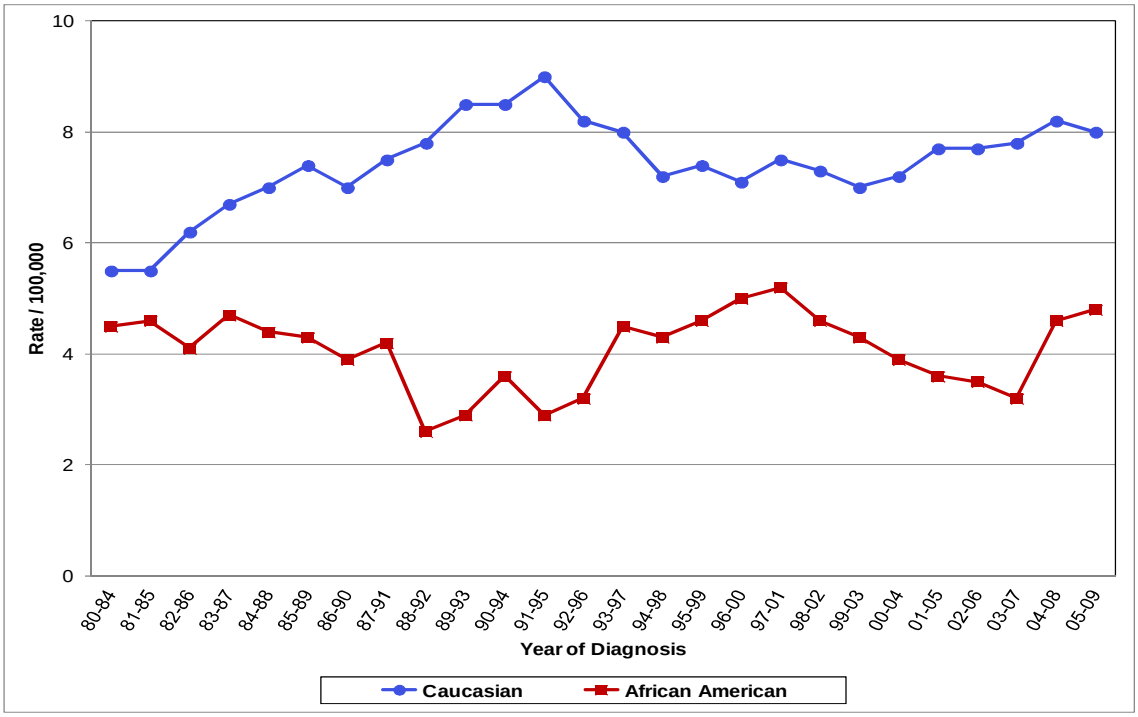
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 4.1. Five-Year Average Age-Adjusted Brain Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 4.2. Five-Year Average Age-Adjusted Brain Cancer Incidence Rates* by Race; Delaware, 1980–2009



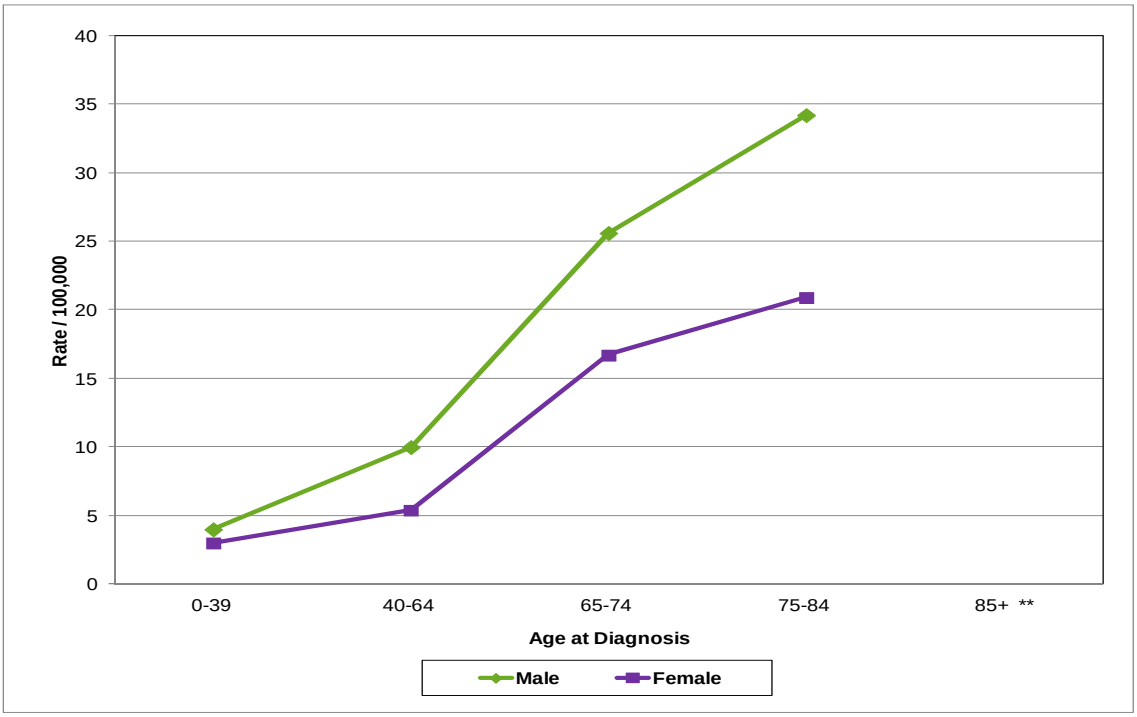
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 4.3. Age-Specific Brain Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	3.5	4.0	3.0	3.5	4.0	---	---	---	---
40-64	7.6	10.0	5.4	9.2	12.3	6.2	---	---	---
65-74	20.9	25.6	16.7	22.2	27.1	17.8	---	---	---
75-84	26.6	34.2	20.9	28.1	34.6	22.9	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 4.3. Age-Specific Brain Cancer Incidence Rates by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Brain Cancer by Stage

Table 4.4. Number of Brain Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	262	159	103	228	140	88	27	14	13
Regional	44	23	21	38	21	17	6	---	---
Distant	6	---	---	---	---	---	---	---	---
Unknown	25	---	---	---	---	---	---	---	---
Total	337	195	142	293	172	121	37	18	19

--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 4.5. Percent of Brain Cancer Cases by Stage at Diagnosis, Race & Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	77.7	81.5	72.5	77.8	81.4	72.7	73.0	77.8	68.4
Regional	13.1	11.8	14.8	13.0	12.2	14.1	16.2	---	---
Distant	1.8	---	---	---	---	---	---	---	---
Unknown	7.4	---	---	---	---	---	---	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

--- = Percentages based on cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 4.4. Percent of Brain Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009

Figure 4.4a. Delaware: 2005–2009

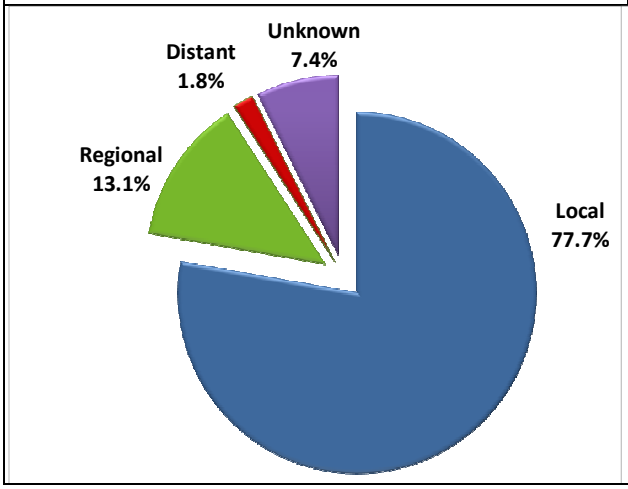
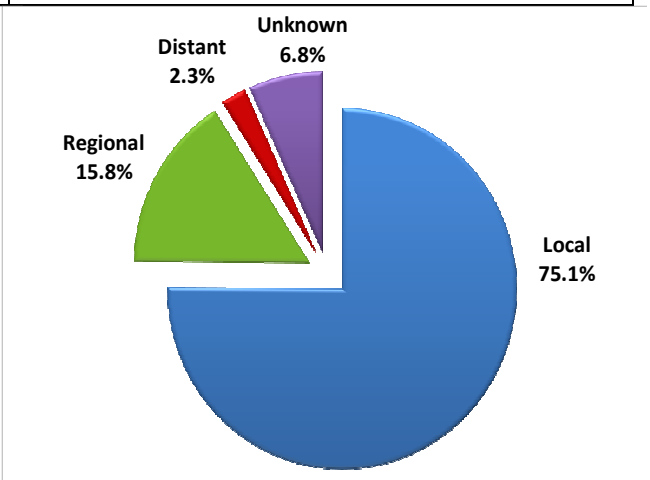
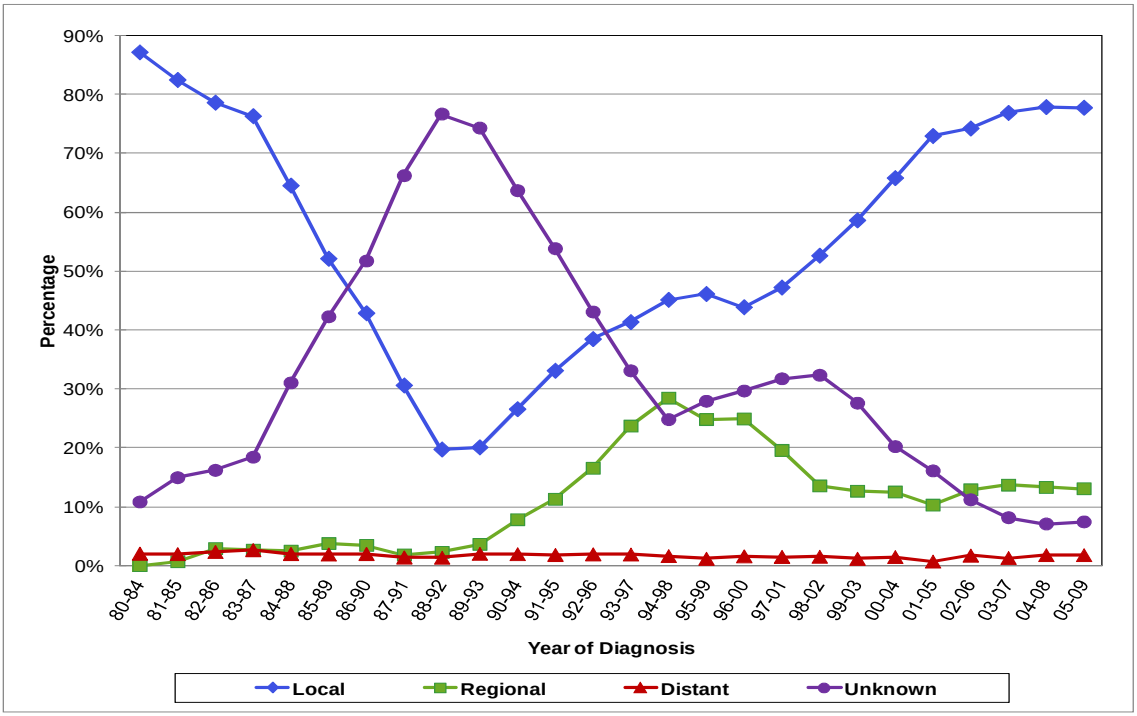


Figure 4.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 4.5. Percent of Brain Cancer Cases by Stage at Diagnosis: Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Brain Cancer Mortality

Table 4.6. Number of Brain Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	210	117	93	184	104	80	24	11	13
Kent	29	18	11	23	15	8	---	---	---
New Castle	125	63	62	110	57	53	14	---	---
Sussex	56	36	20	51	32	19	---	---	---

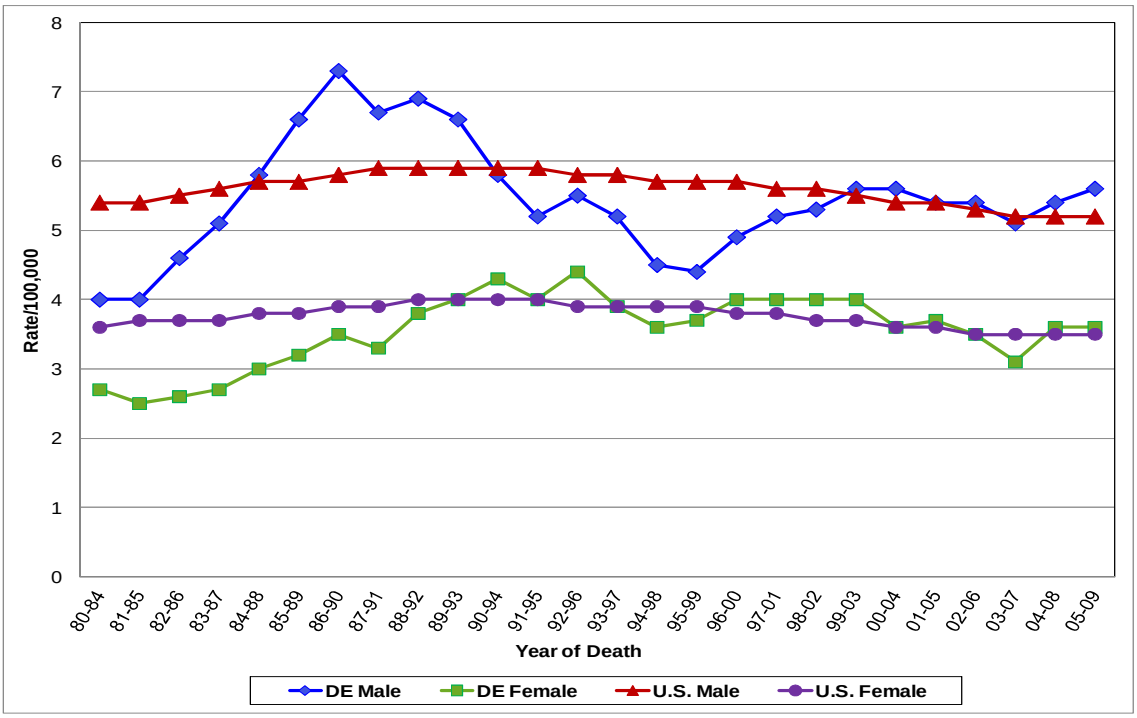
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 4.7. Five-Year Average Age-Adjusted Brain Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	4.3 (4.2 , 4.3)	5.2 (5.2 , 5.3)	3.5 (3.4 , 3.5)
Delaware	4.4 (3.9 , 5.1)	5.6 (4.6 , 6.7)	3.6 (2.9 , 4.4)
Kent	3.8 (2.5 , 5.4)	---	---
New Castle	4.7 (3.9 , 5.6)	5.5 (4.2 , 7.1)	4.2 (3.2 , 5.4)
Sussex	4.4 (3.3 , 5.9)	6.2 (4.2 , 8.7)	---
CAUCASIAN			
United States	4.6 (4.6 , 4.7)	5.6 (5.6 , 5.7)	3.8 (3.7 , 3.8)
Delaware	4.8 (4.1 , 5.6)	6.1 (4.9 , 7.4)	3.7 (3.0 , 4.7)
Kent	---	---	---
New Castle	5.2 (4.3 , 6.3)	6.3 (4.8 , 8.2)	4.5 (3.3 , 5.9)
Sussex	4.7 (3.4 , 6.3)	6.3 (4.1 , 9.3)	---
AFRICAN AMERICAN			
United States	2.5 (2.4 , 2.6)	3.1 (2.9 , 3.2)	2.1 (2.0 , 2.1)
Delaware	---	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

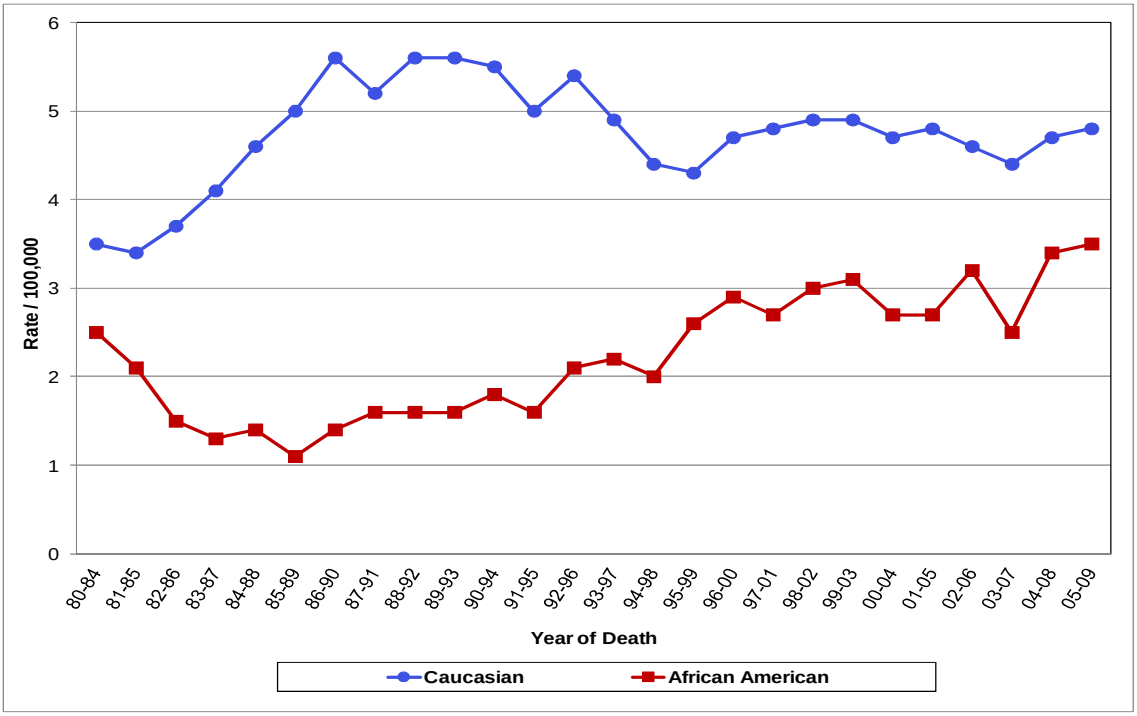
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 4.6. Five-Year Average Age-Adjusted Brain Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 4.7. Five-Year Average Age-Adjusted Brain Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 4.8. Age-Specific Brain Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	4.8	5.7	4.0	5.5	6.6	4.4	---	---	---
65-74	17.6	23.1	---	18.5	24.7	---	---	---	---
75-84	18.9	---	---	18.1	---	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 4.8. Age-Specific Brain Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 4.8 is not displayed because of the low number of deaths.

5. BREAST CANCER (FEMALE)

Risk Factors and Early Detection

Risk Factors for Female Breast Cancer:

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

Lifestyle Risk Factors for Female Breast Cancer:

- alcohol – two to five alcoholic drinks daily
- obesity or overweight after menopause
- reproductive history – Risk increases among women who have not had children or who had their first child after age 30.
- high-fat diet, low intake of fruits and vegetables (suspected)
- smoking and secondhand smoke – Chemicals from the smoke reach breast tissue and are present in breast milk. (suspected)

Environmental and Medically-Related Causes of Female Breast Cancer:

- birth control pills within the previous 10 years
- combined hormone therapy (both estrogen and progesterone) for two or more years after menopause; risk returns to normal five years after the therapy had ended
- history of high-dose radiation therapy to the chest area as a child or young adult
- diethylstilbestrol (DES) – given during pregnancy or having a mother who took DES during pregnancy

Breast Cancer Risk Factors that Cannot be Changed:

- Gender – 100 times more common in women than men
- increasing age – About one of eight invasive breast cancers are in women younger than 45, and two of three invasive breast cancers occur in women age 55 and older.
- family history – Having one first-degree relative (mother, sister, or daughter) with breast cancer approximately doubles a woman's risk and two first-degree relatives increases risk three-fold. About 15 percent of women with breast cancer have a family history of the disease.
- gene defects or mutations – Five to 10 percent of breast cancer cases appear to result from gene defects or mutations inherited from a parent. The most common is an inherited mutation in the BRCA1 or BRCA2 genes, found most often in Jewish women of Eastern European origin.
- personal history of breast cancer – three- to four-fold risk of developing a new cancer in another part of the breast or in the other breast
- race – Caucasian women ages 45 and over are more likely to develop breast cancer than are African-American women. African-American women, however, are more likely to be diagnosed with breast cancer at a younger age and are more likely to die from breast cancer.
- denser breast tissue increases risk of breast cancer and also makes it more difficult to spot potential problems on a mammogram
- personal history of certain benign breast conditions
- early age at menarche (before age 12) and/or a later age at menopause (after age 55)
- exposure to chemical compounds in the environment that have estrogen-like properties – including pesticides (e.g. DDE) and polychlorinated biphenyls (PCBs), as well as substances found in some plastics, certain cosmetics and personal care products

Factors Protective against Female Breast Cancer:

- History of regular breast cancer screenings is beneficial since a breast cancer diagnosed at an early stage can be treated more effectively.
- Drugs such as tamoxifen and raloxifene have been shown to be beneficial for women at increased risk of breast cancer.
- Newer drugs (aromatase inhibitors), dietary supplements and herbs may help lower the risk of breast cancer.
- Breastfeeding for 1½ to two years may slightly lower the risk of breast cancer.
- Risk of female breast cancer can be lowered by managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), tobacco use, alcohol use and physical activity.

Early Detection of Female Breast Cancer:

A screening mammogram (x-ray of the breast) is used to detect breast disease in women who appear to have no breast problems. For early breast cancer detection in women without breast symptoms the American Cancer Society (ACS) recommends a baseline mammogram at age 40 and then annual mammograms continuing for as long as she is in good health. In addition to mammograms, the ACS recommends a clinical breast exam every three years for women in their 20s and 30s and every year for women 40 and over. Also, women should know how their breasts normally look and feel and report any breast change promptly to their health care provider. Breast self-exam is an option for women starting in their 20s.[9] Women 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. The Delaware Cancer Consortium also recommends this schedule for screening breast cancer.

Mammography Screening among Women in Delaware:

The Behavioral Risk Factor Survey (BRFS) has collected data on mammography use annually up to 2000 and biannually since then. The BRFS questionnaire uses two years as the threshold for a mammogram rather than the one year recommended by the American Cancer Society because minor variations in scheduling would cause some women to miss the one-year threshold; for example an appointment that is 14 months after the previous appointment.

Recent data from the BRFS provide information on breast cancer screening among Delawarean women:

- In 2010, 81.4 percent of Delaware women age 40 and older reported having a mammogram within the previous two years compared to 75.2 percent of U.S. women age 40 and older. Delaware women ranked second highest (tied with two other states) in the U.S. for this response.
- In Delaware, the percentages of Caucasian and African American women age 40 and older who reported having a mammogram in the past two years were not significantly different (81.4 percent vs. 82.4 percent, respectively).
- There was a trend of increasing mammography use with increasing annual income.
- Delaware females (age 40 and older) who were college graduates were more likely to have had a mammogram than non-college graduates, but the difference was not significant.
- The percentage of Delaware women who reported having a mammogram within the past two years increased with increasing age.

9 American Cancer Society recommendations for early breast cancer detection in women without breast symptoms. Accessed July 9, 2011. http://www.cancer.org/Cancer/BreastCancer/MoreInformation/BreastCancerEarlyDetection/breast-cancer-early-detection-acs-recs

Data Highlights

Incidence of Female Breast Cancer (Tables 5. 1 – 5.3, Figures 5.1 – 5.3)

- Breast cancer is the most frequently-diagnosed cancer among females in Delaware and in the U.S. During 2005–2009 in Delaware, 3,298 new cases of breast cancer were diagnosed that accounted for 28.1 percent of all new cancer cases among female Delawareans.
- Eighty percent (2,647 cases) of female Delawareans diagnosed with breast cancer were Caucasian, 17.6 percent (582 cases) African American and 2.1 percent (69 cases) were other or unknown race.
- The 2005–2009 female breast cancer incidence rate for Delaware (127.1 per 100,000) was higher than the U.S. rate (124.3 per 100,000), but the difference was not statistically significant.
- The 2005–2009 breast cancer incidence rate for African Americans in Delaware (133.5 per 100,000) was significantly higher than the U.S. rate for African Americans (121.2 per 100,000).
- Among Caucasian females, however, Delaware's 2005–2009 breast cancer incidence rate (126.2 per 100,000) was lower than the U.S. rate (127.3 per 100,000) but the difference was not significant.
- At the national level, the 2005–2009 breast cancer incidence rate for African American females (121.2 per 100,000) was significantly lower than the rate for Caucasian females (127.3 per 100,000). For Delaware and within each county, however, the opposite pattern was seen with the African American incidence rate being higher than the rate for Caucasians in each instance, although not statistically significant.
- From 1995–1999 through 2005–2009, Delaware's female breast cancer incidence rate decreased 7.2 percent while the U.S. incidence rate decreased 9.5 percent. Delaware's decline in incidence was limited to Caucasian females (9.0 percent decline) while incidence among African American females increased 4.6 percent.
- Although Delaware's breast cancer incidence has been higher among Caucasian than African American females, as of 2002-2006 incidence among African Americans surpassed that of Caucasians.
- Among Caucasians in Delaware, the 2005–2009 incidence of female breast cancer increased with age, from birth to a peak during ages 65-84, and then declined in the oldest age group. Among African Americans, incidence peaked at ages 75-84, with limited data in the oldest age group.
- Female Delawareans ranked 13th highest in the U.S. for incidence of breast cancer during 2005–2009 (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Female Breast Cancer (Table 5.4, Figures 5.4 – 5.5)

- For 2005–2009, 64.3 percent, 28.4 percent and 5.3 percent of female breast cancer cases in Delaware were diagnosed at the local, regional and distant stages, respectively. Comparable U.S. rates were slightly less favorable; 62.0 percent local, 30.6 percent regional and 5.3 distant.
- During 2005–2009, 1,109 cases (33.6 percent of all female breast cancers) were late-stage diagnoses (i.e., either regional or distant). The percentage of late-stage diagnoses was higher among African American females (37.2 percent) than among Caucasians (32.7 percent).
- Since 1980–1984 in Delaware, the proportion of breast cancers diagnosed at the local stage improved from 42.3 percent to 64.3 percent. Accordingly, over this same time, the proportion of regional stage breast cancers decreased from 43.3 percent to 28.4 percent and the proportion of distant stage breast cancers decreased from 8.3 percent to 5.2 percent.

Female Breast Cancer Mortality (Tables 5.5 – 5.7, Figures 5.6 – 5.7)

- During 2005–2009, there were 606 breast cancer deaths among female Delawareans; 506 deaths (83.5 percent) were Caucasian, 97 deaths (16.0 percent) were African American and three deaths were other or unknown race.
- For 2005–2009, breast cancer was the second leading cause of cancer death among females after lung cancer and breast cancer accounted for 13.9 percent of all cancer deaths among female Delawareans.
- Although Delaware's 2005–2009 female breast cancer mortality rate was only slightly lower than the U.S. rate (22.5 per 100,000 Delaware vs. 23.0 per 100,000 U.S.), African American Delawareans had a significantly lower female breast cancer mortality rate than African American females nationally (22.6 per 100,000 Delaware vs. 31.6 per 100,000 U.S.)
- Nationally, the 2005–2009 breast cancer mortality rate for African American females (31.6 per 100,000) was significantly higher than for Caucasians (22.4 per 100,000) but in Delaware, mortality rates for both race categories were comparable.
- Historically, Delaware's female breast cancer mortality has been significantly higher than the U.S. rate, but recent rates were comparable. From 1995–1999 through 2005–2009, Delaware's female breast cancer mortality rate decreased 29.0 percent while the U.S. rate only fell 19.0 percent.
- From 1995–1999 through 2005–2009, Delaware's female breast cancer mortality rate decreased 40.7 percent among African Americans and 25.5 percent among Caucasians.
- Among Caucasians in Delaware, breast cancer mortality increased with age; from 33.1 deaths per 100,000 among women ages 40-64 to 143.5 per 100,000 for ages 85 and older. The number of deaths among African Americans was too small to allow for a comparison.
- Delaware females ranked 23rd highest in mortality from cancer of the breast during 2005–2009 (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Female Breast Cancer Incidence

Table 5.1. Number of Female Breast Cancer Cases by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	3,298	2,647	582
Kent	521	408	103
New Castle	1,928	1,495	395
Sussex	849	744	84

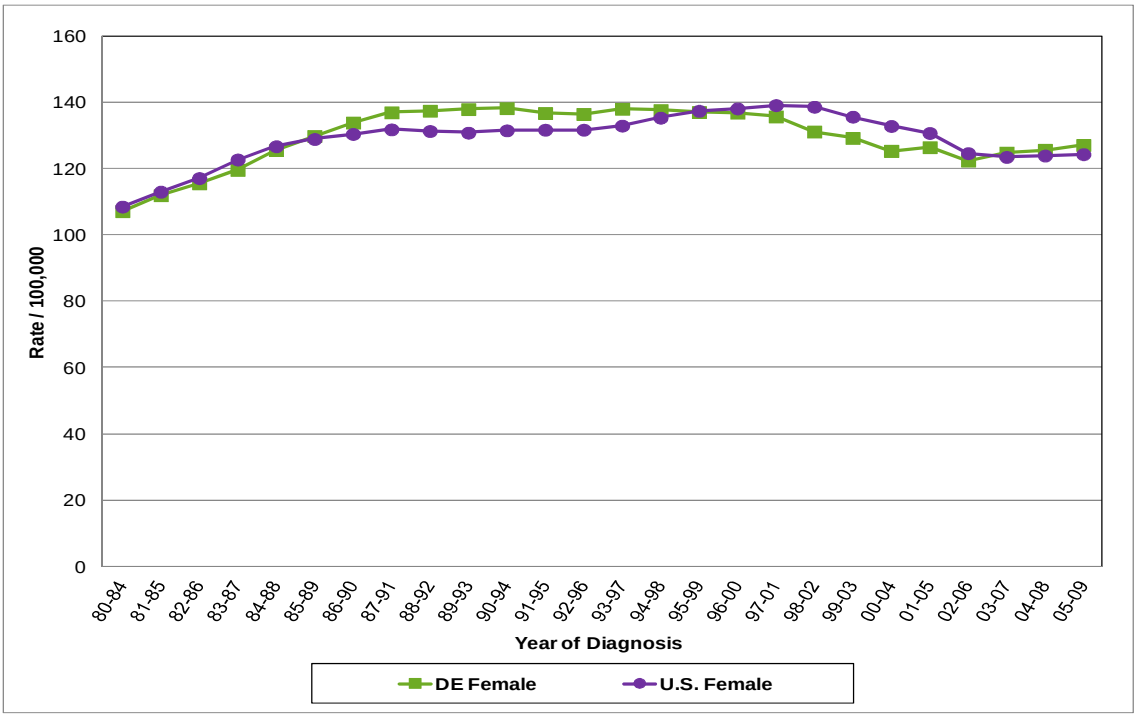
SOURCE: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 5.2. Five-Year Average Age-Adjusted Female Breast Cancer Incidence Rates * and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
United States	124.3 (123.9 , 124.8)	127.3 (126.8 , 127.8)	121.2 (119.8 , 122.6)
Delaware	127.1 (122.7 , 131.5)	126.2 (121.3 , 131.2)	133.5 (122.7 , 145.0)
Kent	122.5 (112.2 , 133.6)	124.5 (112.6 , 137.3)	128.6 (104.6 , 156.4)
New Castle	129.3 (123.5 , 135.3)	129.4 (122.8 , 136.3)	134.3 (121.0 , 148.5)
Sussex	126.7 (117.9 , 136.1)	122.0 (112.7 , 131.8)	135.9 (108.2 , 168.5)

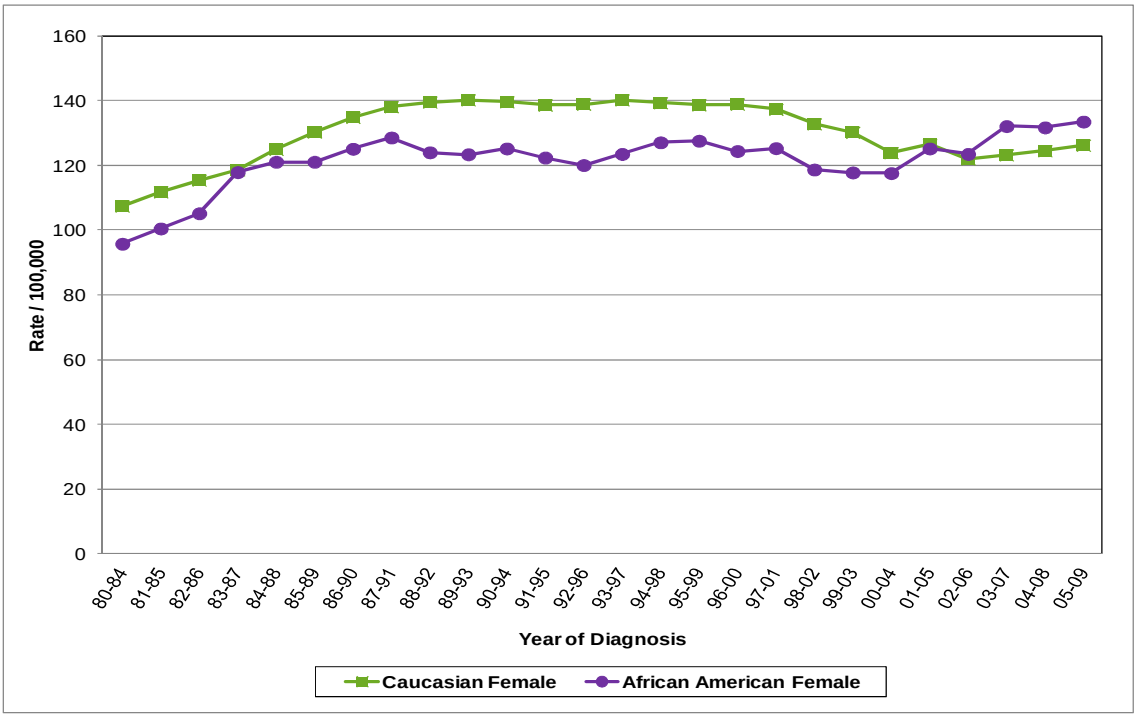
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 5.1. Five-Year Average Age-Adjusted Female Breast Cancer Incidence Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 5.2. Five-Year Average Age-Adjusted Female Breast Cancer Incidence Rates* by Race; Delaware, 1980–2009



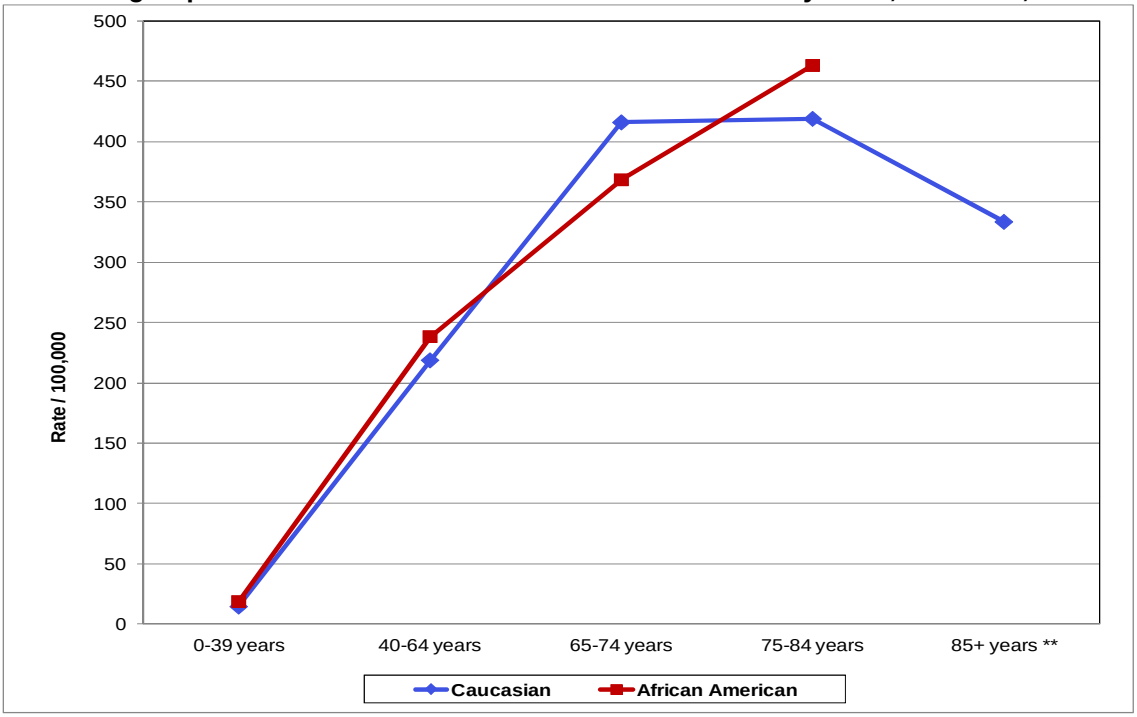
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 5.3. Age-Specific Female Breast Cancer Incidence Rates* by Race; Delaware, 2005–2009

Age at Diagnosis	All Female	Caucasian Female	African American Female
0-39	15.6	14.6	18.8
40-64	221.2	218.7	238.3
65-74	407.0	415.8	368.4
75-84	422.0	418.7	463.0
85+	331.3	333.4	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 5.3 Age-Specific Female Breast Cancer Incidence Rates* by Race; Delaware, 2005–2009



* = Rates are per 100,000 population.
** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Female Breast Cancer by Stage

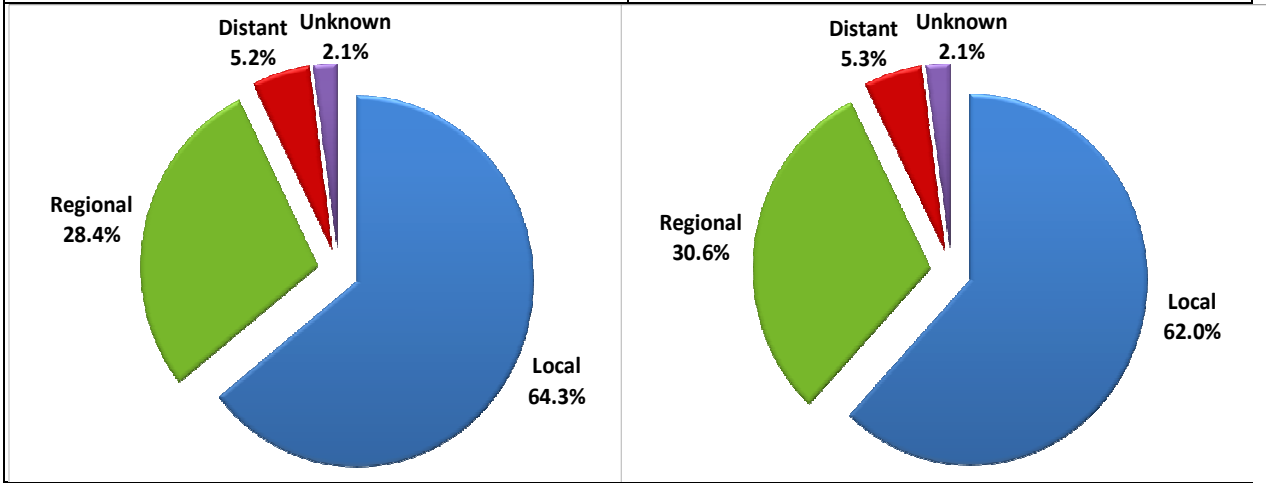
Table 5.4. Number and Percent of Female Breast Cancer Cases by Stage at Diagnosis and Race; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All Female	Caucasian	African American	All Female	Caucasian	African American
Local	2,121	1,724	356	64.3	65.1	61.1
Regional	936	736	181	28.4	27.8	31.0
Distant	173	131	36	5.2	4.9	6.2
Unknown	69	56	10	2.1	2.1	1.7
Total	3,299	2,647	583	100.0	100.0	100.0

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

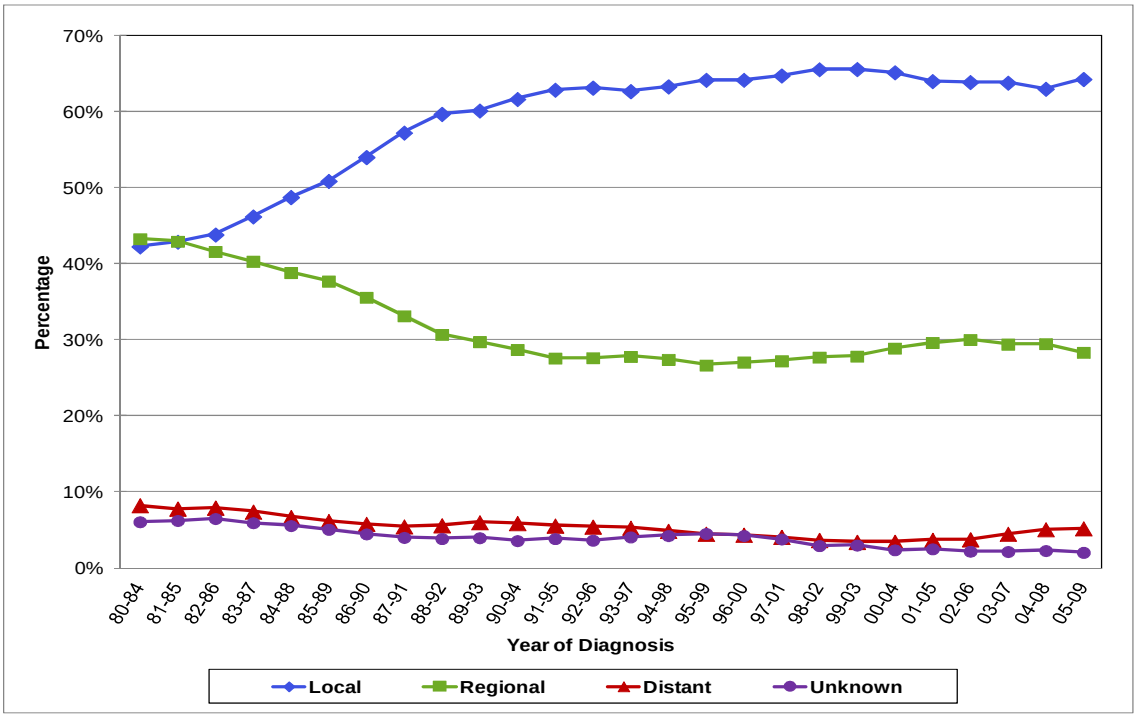
Figure 5.4. Percent of Female Breast Cancer Cases by Stage at Diagnosis and Race; U.S. and Delaware, 2005–2009

Figure 5.4a. Delaware: 2005–2009	Figure 5.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 5.5. Percent of Female Breast Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 5.5. Number of Female Breast Cancer Deaths by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	606	506	97
Kent	113	98	15
New Castle	327	260	65
Sussex	166	148	17

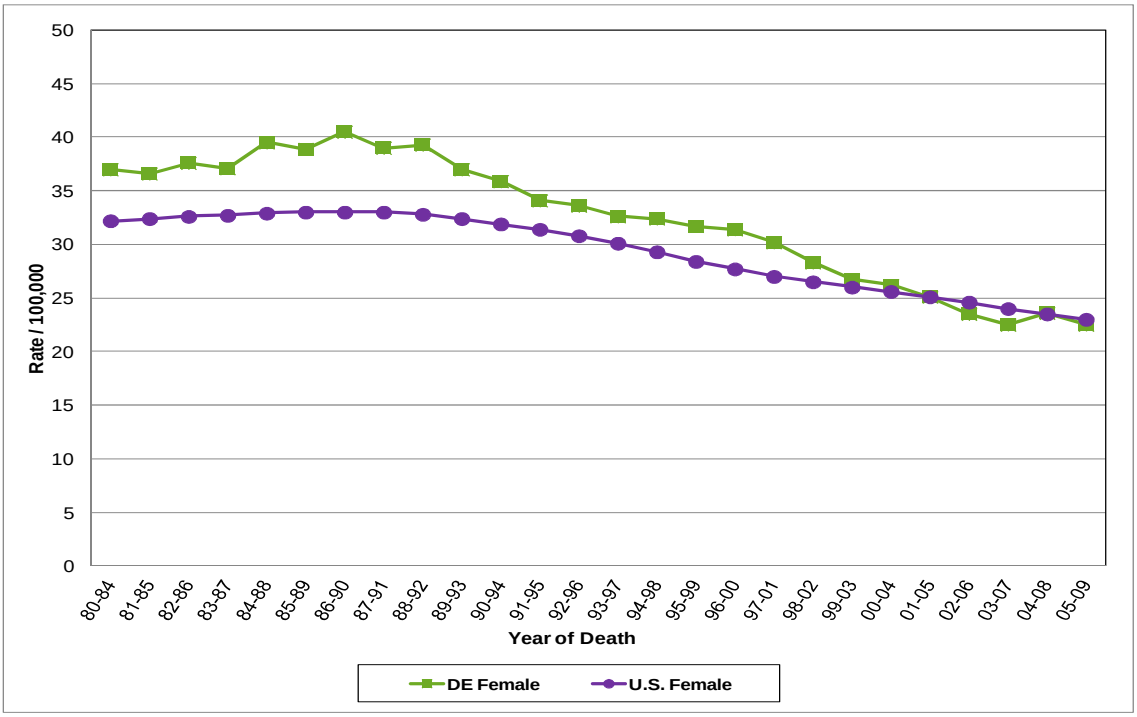
SOURCE: Delaware Health Statistics Center, 2012.

Table 5.6. Five-Year Average Age-Adjusted Female Breast Cancer Mortality Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

Region	All Female	Caucasian Female	African American Female
United States	23.0 (22.9 , 23.1)	22.4 (22.3 , 22.5)	31.6 (31.2 , 32.0)
Delaware	22.5 (20.7 , 24.4)	22.8 (20.8 , 25.0)	22.6 (18.3 , 27.7)
Kent	26.4 (21.7 , 31.8)	29.0 (23.5 , 35.5)	---
New Castle	21.3 (19.0 , 23.8)	21.4 (18.8 , 24.2)	22.2 (17.0 , 28.5)
Sussex	23.7 (20.0 , 27.9)	23.2 (19.3 , 27.7)	---

SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.

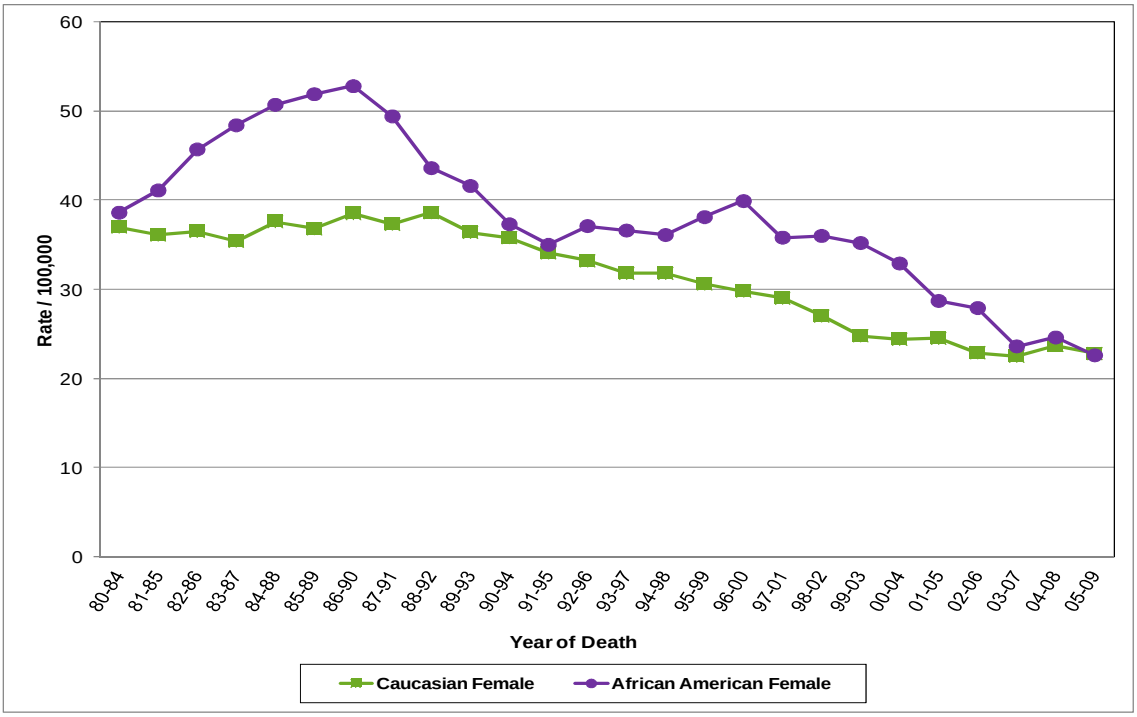
Figure 5.6. Five-Year Average Age-Adjusted Female Breast Cancer Mortality Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Health Statistics Center, 2012;

U.S.: National Center for Health Statistics, 2012.

Figure 5.7. Five-Year Average Age-Adjusted Female Breast Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 5.7. Age-Specific Female Breast Cancer Mortality Rates* by Race; Delaware, 2005–2009

Age at Death	All Female	Caucasian Female	African American Female
0-39	---	---	---
40-64	33.1	32.7	39.1
65-74	71.4	74.2	---
75-84	105.8	107.5	---
85+	143.5	153.1	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 5.8. Age-Specific Female Breast Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 5.8 is not displayed because of the small number of deaths.

6. CERVICAL CANCER

Risk Factors and Early Detection

Risk Factors for Cervical Cancer:

- The most important risk factor for cervical cancer is infection from the human papilloma virus (HPV). HPV is a group of more than 100 related viruses. About two-thirds of all cervical cancers are caused by HPV 16 and 18.

Cervical Cancer Risk Factors Related to Lifestyle or Reproductive History:

- obesity or overweight – increases risk of adenocarcinoma of the cervix
- cigarette smoking – doubles risk
- diet low in fruits and vegetables
- human immunodeficiency virus (HIV), the virus that causes AIDS, damages the body's immune system and places women at higher risk for HPV infection
- infection from Chlamydia, a relatively common bacteria that can infect the reproductive system
- certain sexual practices; i.e. having one or more of the following:
    - sexual intercourse at a young age
    - multiple partners
    - a partner who has had many sexual partners
    - intercourse with uncircumcised males
- long-term use (five or more years) of oral contraceptives
- three or more full-term pregnancies
- having first full-term pregnancy before age 17 – doubles risk later in life compared to a woman whose first pregnancy was at age 25 or later

Environmental and Medically-Related Causes of Cervical Cancer:

- Having a mother who took diethylstilbestrol (DES) during pregnancy to prevent miscarriage (from 1940 through 1971) increases risk of clear cell adenocarcinoma of the cervix.

Cervical Cancer Risk Factors that Cannot be Changed:

- family history – Having a mother or sister with cervical cancer increases risk two- to three-fold.
- race – African American or American Indian
- ethnicity – Hispanic

Factors Protective against Cervical Cancer:

- Two cervical cancer vaccines have Food and Drug Administration approval in the U.S. for girls and women ages 11–26 — Gardasil® and Cervarix®. Both vaccines can prevent most cases of cervical cancer if given before a girl or woman is exposed to the virus. In addition, both vaccines can prevent most vaginal and vulvar cancer in women and Gardasil® can prevent genital warts in women and men.
- Condoms provide some protection against HPV infection.
- Risk of cervical cancer can be lowered by managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), tobacco use, physical activity and sexual practices.

Early Detection of Cervical Cancer:

The Pap test detects changes in cells in the cervix that are caused by HPV infection. HPV tests look for HPV infections by finding genes from HPV in the cervical cells. In March 2012, the American Cancer Society, the American Society for Colposcopy and Cervical Pathology and the American Society for Clinical Pathology jointly released new cervical cancer screening guidelines that extend the time interval between screening tests for most women. The Delaware Cancer Consortium also endorses these guidelines:

Cervical Cancer Screening Guidelines (March 2012)[10]

Population	Recommended Screening	Comments
< 21 years	No screening	HPV (human papillomavirus) testing should not be used for screening or management of ASC–US[§] in this age group.
21 – 29 years	Cytology alone every 3 years	HPV testing should not be used for screening in this age group.
30 – 65 years	HPV and cytology 'co-testing' every 5 years (preferred)	Screening by HPV testing alone is not recommended for most clinical settings.
	Cytology alone every 3 years (acceptable)	
over 65 years	No screening following adequate negative prior screening	Women with a history of CIN2[§§] or a more severe diagnosis should continue routine screening for at least 20 years.
after hysterectomy	No screening	Applies to women without a cervix and without a history of CIN2 or a more severe diagnosis in the past 20 years or cervical cancer ever.
HPV-vaccinated	Follow age-specific recommendations (same as unvaccinated women)	

§ – ASC–US, atypical squamous cells of undetermined significance
§§ – CIN2: cervical intraepithelial neoplasia grade 2

Cervical Cancer Screening among Women in Delaware:

The Behavioral Risk Factor Survey (BRFS) has collected data on cervical cancer screening in Delaware annually from 1995 to 2000 and biannually since then.

- In 2010, 82.7 percent of Delaware women age 18 and older reported that they had had a Pap test within the previous three years. By comparison, 81.3 percent of U.S. women age 18 and older reported having had a Pap test within the previous three years.
- In Delaware, the rates of receiving a Pap test were comparable in Caucasians and African Americans (84.4 percent vs. 84.7 percent, respectively).
- In 2010, significantly fewer Delaware women ages 65 and older reported having had a Pap test in the last three years compared to women ages 55-64 (69.4 percent vs. 86.9 percent, respectively).

[10] Saslow D, Solomon D, Lawson HW, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. Am J Clin Pathol. 2012 Apr;137(4):516-42.

Data Highlights

Cervical Cancer Incidence (Tables 6.1 – 6.3, Figures 6.1 – 6.2)

- During 2005–2009, 208 cases of cervical cancer were newly-diagnosed in Delaware, accounting for 1.8 percent of all new cancer cases diagnosed among females. The majority of cases were Caucasian (149 or 71.6 percent), 51 cases (24.5 percent) were African American and eight cases were other or unknown race.
- Delaware's overall incidence rate for cervical cancer (8.9 per 100,000) during 2005–2009 was higher than the rate for the U.S. (8.1 per 100,000) but the difference was not statistically significant.
- In Delaware, the 2005–2009 cervical cancer incidence rate for African American females (11.1 per 100,000) was higher than the rate for Caucasians (8.6 per 100,000), but the difference was not significant.
- Nationally during 2005–2009, African Americans had a significantly higher cervical cancer incidence rate (9.8 per 100,000) than Caucasians (8.0 per 100,000).
- Delaware's 2005–2009 cervical cancer incidence rate for African American females (11.1 per 100,000) was higher than the U.S. rate (9.8 per 100,000) but the difference was not significant.
- Similarly, Delaware's 2005–2009 cervical cancer incidence rate for Caucasian females (8.6 per 100,000) was higher than the U.S. rate (8.0 per 100,000) and this difference was not significant.
- Delaware's cervical cancer incidence rate decreased 18.3 percent from 1995–1999 through 2005–2009. During this same period, the U.S. cervical cancer incidence rate decreased 10.0 percent
- From 1995–1999 through 2005–2009, Delaware's cervical cancer incidence rate decreased 35.5 percent among African Americans and decreased 13.1 percent among Caucasians.
- Whereas in 1995–1999 Delaware's African American cervical cancer incidence rate was 70 percent higher than among Caucasians, in 2005–2009 African Americans had an incidence rate that was only 30 percent higher than Caucasians.
- In Delaware, the incidence of cervical cancer appears to peak at ages 40-64, but data were too sparse to identify any trends.
- Delaware women ranked tenth highest in the U.S. for cervical cancer incidence during 2005–2009 (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Cervical Cancer (Table 6.4, Figures 6.4 – 6.5)

- For 2005–2009, 51.0 percent, 30.8 percent and 14.4 percent of cervical cancer cases in Delaware were diagnosed at the local, regional and distant stages, respectively. In the U.S., comparable percentages were 46.5 percent, 36.4 percent and 12.3 percent, respectively.
- During 2005–2009, 93 cases of cervical cancer (44.9 percent of all cervical cancers diagnosed during this period) were late-stage diagnoses (i.e., either regional or distant cancer at the time of diagnosis). The percentage of late-stage cervical cancer diagnoses was higher among Caucasian (45.9 percent) than among African American females (43.1 percent).
- The proportion of cervical cancers diagnosed at the local stage, after reaching a peak of 55.0 percent in 1998–2002 has decreased to 51.2 percent by 2005–2009; a 6.8 percent relative decline over seven five-year time periods.
- The proportion of cervical cancers diagnosed at the distant stage, after reaching a low of 6.5 percent in 1999–2003, has more than doubled to 14.5 percent by 2005–2009; an increase of 122.2 percent over the last five five-year time periods.

Cervical Cancer Mortality (Tables 6.5 – 6.6, Figure 6.6)

- In Delaware during 2005–2009 there were 53 deaths due to cervical cancer that comprised 1.2 percent of all cancer deaths among females during this time period. Eighty-one percent were Caucasian (43 deaths), 15.1 percent African American (eight deaths) and two deaths were other or unknown race.
- Delaware's 2005–2009 cervical cancer mortality rate (2.1 per 100,000) was lower than the U.S. rate (2.4 per 100,000) but the difference was not significant. The cervical cancer mortality rate in Kent County was equal to rates seen for the U.S. Sussex County has the lowest mortality rate of all three counties (1.9 per 100,000).
- Nationally the 2005–2009 cervical cancer mortality rate for African Americans was significantly higher than for Caucasians; there were insufficient data to compute mortality rates for African Americans at the county or state level.
- Cervical cancer mortality rates have been higher for Delaware than the U.S., but rates for the two areas no longer differ significantly. From 1995–1999 through 2005–2009, Delaware's cervical cancer mortality rate decreased 54.2 percent, while the U.S. rate fell 22.6 percent.
- From 1995–1999 through 2005–2009, Delaware's cervical cancer mortality rate decreased 46.5 percent among Caucasians.
- The number of deaths from cancer of the cervix in Delaware was too small to examine mortality patterns by age at diagnosis.
- During 2005–2009, Delaware females ranked 27th highest in mortality from cancer of the cervix (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Cervical Cancer Incidence

Table 6.1. Number of Cervical Cancer Cases by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	208	149	51
Kent	35	26	8
New Castle	132	92	34
Sussex	41	31	9

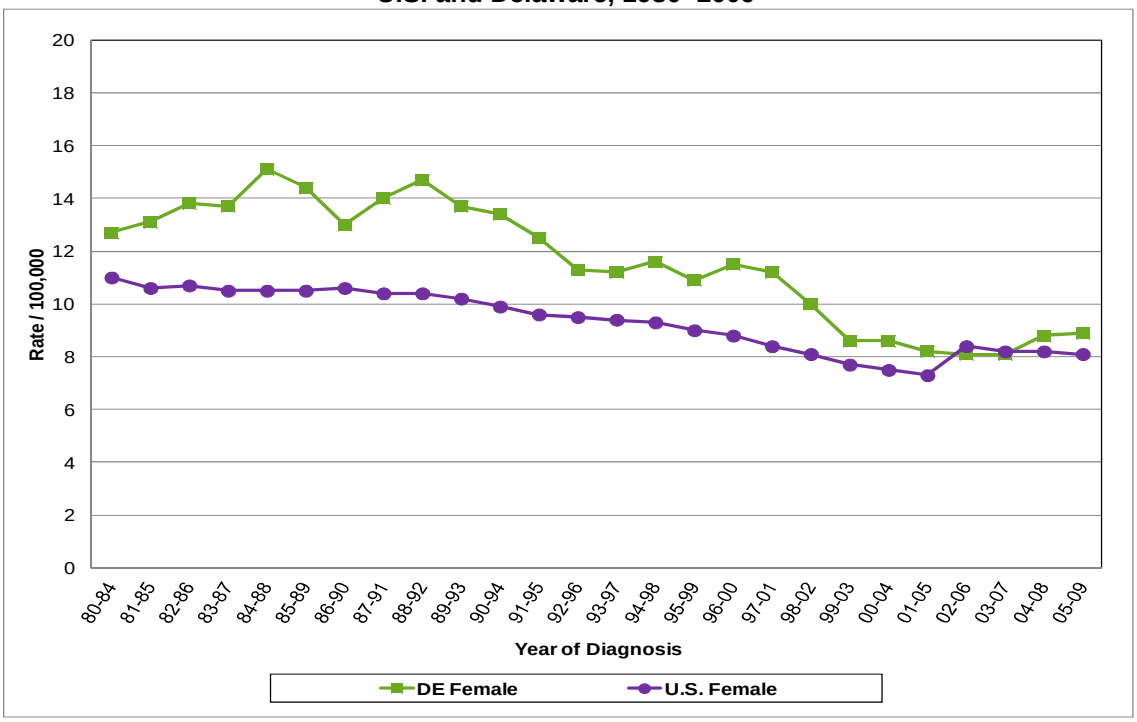
SOURCE: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 6.2. Five-Year Average Age-Adjusted Cervical Cancer Incidence Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
United States	8.1 (8.0 , 8.2)	8.0 (7.8 , 8.1)	9.8 (9.4 , 10.2)
Delaware	8.9 (7.7 , 10.2)	8.6 (7.2 , 10.1)	11.1 (8.2 , 14.6)
Kent	9.0 (6.3 , 12.6)	9.4 (6.1 , 13.8)	---
New Castle	9.2 (7.7 , 10.9)	8.9 (7.2 , 11.0)	11.1 (7.6 , 15.6)
Sussex	8.3 (5.8 , 11.4)	7.5 (4.9 , 10.9)	---

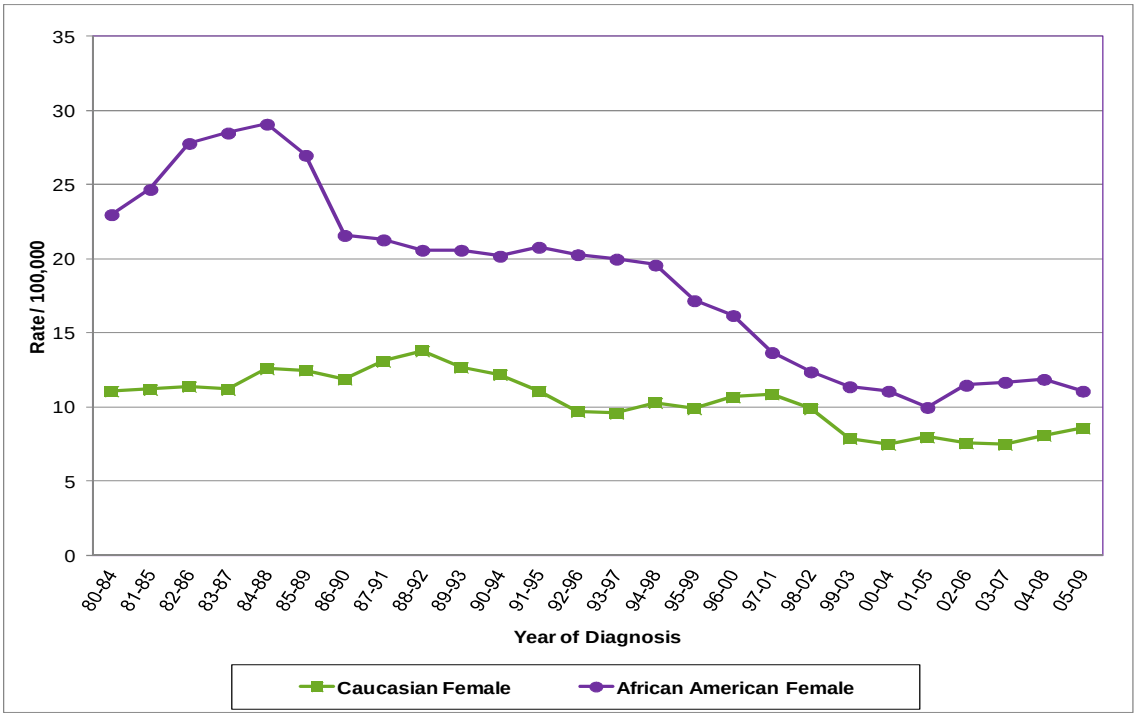
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 6.1. Five-Year Average Age-Adjusted Cervical Cancer Incidence Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 6.2. Five-Year Average Age-Adjusted Cervical Cancer Incidence Rates* by Race; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 6.3. Age-Specific Cervical Cancer Incidence Rates* by Race; Delaware, 2005–2009

Age at Diagnosis	All Female	Caucasian Female	African American Female
0-39	5.0	5.1	---
40-64	15.9	15.2	18.9
65-74	---	---	---
75-84	---	---	---
85+	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 6.3 Age-Specific Cervical Cancer Incidence Rates* by Race; Delaware, 2005–2009

NOTE: Figure 6.3 is not displayed because of the small number of cases.

Cervical Cancer by Stage

Table 6.4. Number and Percent of Cervical Cancer Cases by Stage at Diagnosis and Race; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All Female	Caucasian	African American	All Female	Caucasian	African American
Local	106	73	28	51.0	49.0	54.9
Regional	64	46	17	30.8	30.9	33.3
Distant	30	---	---	14.4	---	---
Unknown	8	---	---	3.8	---	---
Total	208	149	51	100.0	100.0	100.0

--- = Cell counts and percentages less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 6.4. Percent of Cervical Cancer Cases by Stage at Diagnosis and Race; U.S. and Delaware, 2005–2009

Figure 6.4a. Delaware: 2005–2009

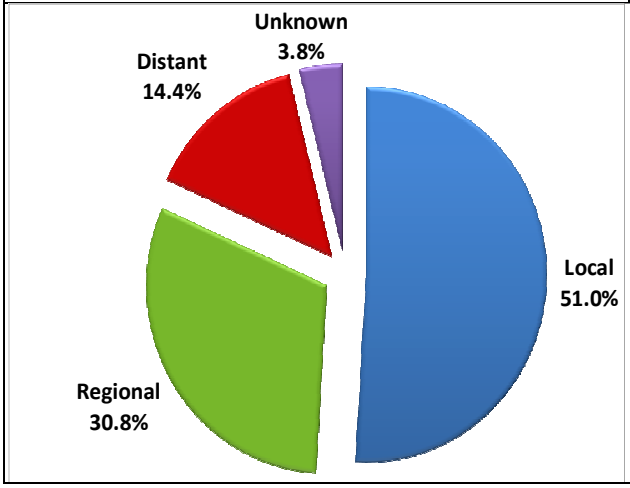
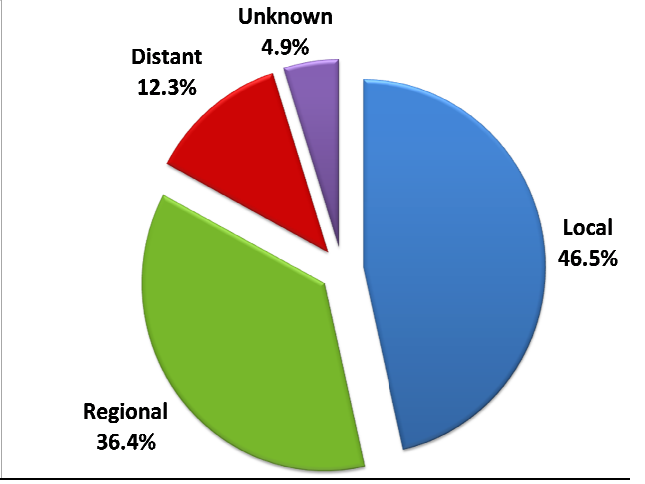
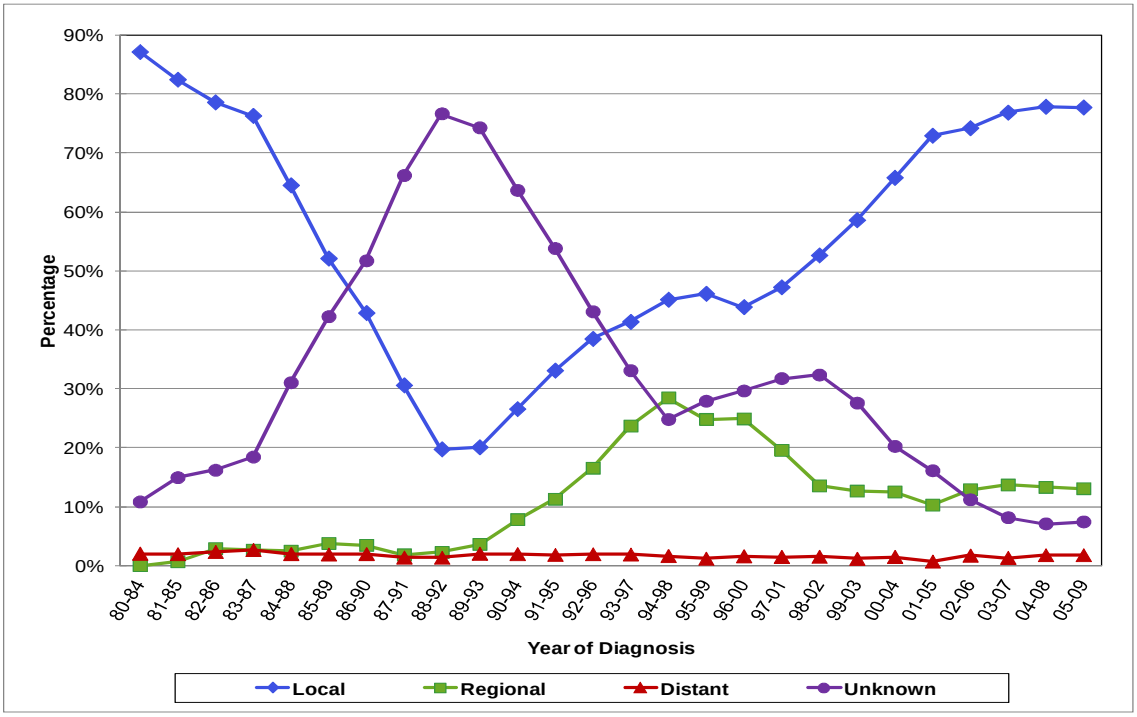


Figure 6.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 6.5. Percent of Cervical Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Cervical Cancer Mortality

Table 6.5. Number of Cervical Cancer Deaths by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	53	43	8
Kent	10	---	---
New Castle	31	---	---
Sussex	12	---	---

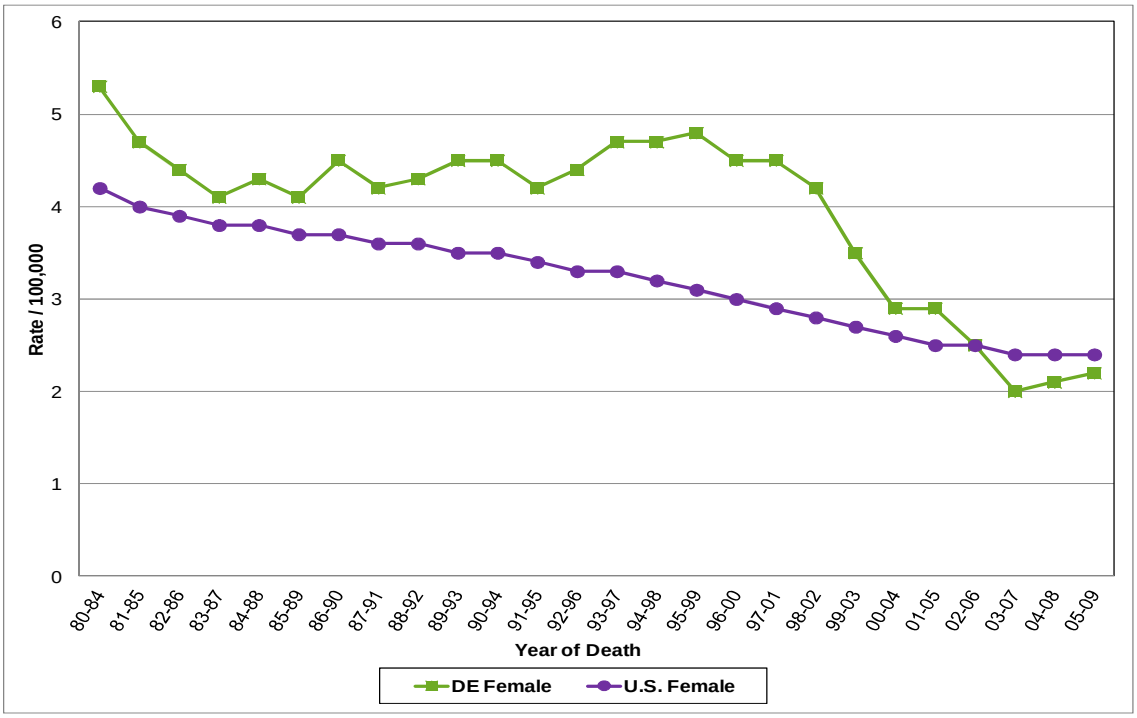
--- = Cell counts less than six are not shown to protect patient confidentiality
SOURCE: Delaware Health Statistics Center, 2012.

Table 6.6. Five-Year Average Age-Adjusted Cervical Cancer Mortality Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

Region	All Female	Caucasian Female	African American Female
United States	2.4 (2.4 , 2.4)	2.2 (2.1 , 2.2)	4.3 (4.2 , 4.4)
Delaware	2.1 (1.6 , 2.8)	2.3 (1.6 , 3.1)	---
Kent	2.4 (1.1 , 4.4)	---	---
New Castle	2.1 (1.4 , 3.1)	2.6 (1.7 , 3.7)	---
Sussex	1.9 (1.0 , 3.6)	---	---

* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 6.6. Five-Year Average Age-Adjusted Cervical Cancer Mortality Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Table 6.7 & Figure 6.7. Age-Specific Cervical Cancer Mortality Rates* by Race; Delaware, 2005–2009

NOTE: Table 6.7 and Figure 6.7 are not displayed because of the small number of deaths.

7. COLORECTAL CANCER

Risk Factors and Early Detection

Colorectal cancer is cancer that originates either in the colon or the rectum. Since they have many features in common, they are grouped together in this document.

Lifestyle Risk Factors for Colorectal Cancer:

- diet high in red meat and processed meats
- lack of physical activity
- obesity – link appears to be stronger in men than women
- long-term tobacco use
- heavy use of alcohol
- type 2 diabetes – even after accounting for lifestyle risk factors

Environmental and Medically-Related Causes of Colorectal Cancer:

- personal history of testicular cancer – probably because of treatment
- history of radiation therapy for prostate cancer
- women who work a night shift at least three nights a month for at least 15 years – based on limited data

Risk Factors for Colorectal Cancer that Cannot be Changed:

- age – although younger adults can develop colorectal cancer, chance increases markedly after age 50.
- race – African American
- ethnicity – Jewish men and women of Eastern European descent
- personal history of colorectal adenomatous polyps
- personal history of colorectal cancer
- Long history of an inflammatory bowel disease such as ulcerative colitis or Crohn's disease can lead to dysplasia in the lining of the colon and rectum. These abnormal cells can develop into colorectal cancer over time.
- familial adenomatous polyposis (FAP) – responsible for about one percent of colorectal cancers
- hereditary non-polyposis colorectal cancer (HNPCC) – linked to 3 to 5 percent of colorectal cancers
- family history of colorectal cancer or adenomatous polyps in one or more first-degree relatives

Factors Protective against Colorectal Cancer:

- Regular screening is the most effective way to prevent colorectal cancer since removal of colorectal polyps can prevent colorectal cancer from developing.
- Risk of colorectal cancer can be lowered by managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), alcohol use and physical activity.
- Some studies have shown favorable results from taking multi-vitamins containing folic acid, vitamin D and/or magnesium but more research is needed.
- People who use aspirin and other anti-inflammatory drugs such as ibuprofen show a lower risk of getting colorectal cancer but there is concern because of the potential for serious side effects associated with prolonged use.
- Combined hormone replacement therapy, which includes both estrogen and progesterone, may reduce a woman's risk of postmenopausal colorectal cancer.

Early Detection of Colorectal Cancer:

The American Cancer Society's colorectal cancer screening guidelines are as follows:[11]

Beginning at age 50, both men and women at average risk of developing colorectal cancer should use one of the screening options below:

(1) Tests that find polyps and cancer:

- flexible sigmoidoscopy every five years§
- colonoscopy every 10 years;
- double-contrast barium enema every five years§
- CT colonography (virtual colonoscopy) §

(2) Tests that find mainly cancer:

- fecal occult blood test (FOBT) every year§
- fecal immunochemical test (FIT) every year§

§ – colonoscopy should be done if test results are positive

Suggested screening guidelines for people at higher risk of developing colorectal cancer are specified by risk factor in the ACS screening guidelines referenced above.

Colorectal Cancer Screening among Delawareans:

Data from the Behavioral Risk Factor Surveillance (BRFS) survey provide information on colorectal cancer screening patterns among Delawareans:

- In 2010, 16.0 percent of Delawareans age 50 and older report having used an at-home blood stool test within the past two years; while a slightly higher percentage of African Americans than Caucasians reported using an at-home blood stool test within the past two years (17.1 percent vs. 16.3 percent, respectively), the difference was not significant.
- Among Delawareans age 50 and older, 74.0 percent reported that they had ever had a sigmoidoscopy or a colonoscopy.
- The percentage of Delawareans who have had a colonoscopy or sigmoidoscopy increased with age. Significantly more Delawareans ages 65 and older reported ever having had a colonoscopy or sigmoidoscopy compared to those ages 50-59 (80.5 percent vs. 64.3 percent, respectively).
- In 2010, African Americans age 50 and older in Delaware were slightly more likely to have ever had a colonoscopy or sigmoidoscopy than Caucasians (74.9 percent vs. 74.0 percent, respectively).
- Education level and income category do not significantly affect the percentage of Delawareans ever having had a colonoscopy or sigmoidoscopy.

Data Highlights

Colorectal Cancer Incidence (Tables 7.1 – 7.3, Figures 7.1 – 7.4)

- Colorectal cancer is the third most commonly-diagnosed cancer among males and females in Delaware as well as nationally.
- A total of 2,317 cases of colorectal cancer were diagnosed in Delaware during 2005–2009, accounting for 9.2 percent of all cancer cases diagnosed during this time period.
- Males were slightly more prevalent among newly-diagnosed cases: 1,202 cases (51.9 percent) were male and 1,115 cases (48.1 percent) female.

[11] Detailed screening guidelines for colorectal cancer: http://www.cancer.org/Cancer/ColonandRectumCancer/MoreInformation/ColonandRectumCancerEarlyDetection/colorectal-cancer-early-detection-acs-recommendations

- Caucasians comprised 82.3 percent (1,907 cases) of colorectal cancer cases in 2005–2009, African Americans comprised 15.8 percent (365 cases) and 45 cases were other or unknown race.
- Delaware's 2005–2009 colorectal cancer incidence rate (47.6 per 100,000) was not significantly different from the U.S. rate (46.3 per 100,000).
- Colorectal cancer incidence among African Americans in Delaware was significantly lower than nationally for both sexes combined (50.2 per 100,000 versus 57.0 per 100,000) and among females (42.1 per 100,000 versus 50.3 per 100,000)
- As seen in U.S. data, Delaware's colorectal cancer incidence rates were significantly higher for males than females among both Caucasians (55.0 per 100,000 versus 40.5 per 100,000) and African Americans (61.2 per 100,000 versus 42.1 per 100,000).
- Although U.S. colorectal cancer incidence rates for 2005–2009 were significantly higher among African Americans than Caucasians for both males and females, the racial disparity observed among Delawareans was no longer statistically significant.
- Although the incidence rate for female African Americans was significantly higher than for female Caucasians at the national level, this pattern was not seen in Delaware.
- From 1995–1999 through 2005–2009, the U.S. colorectal cancer incidence rate decreased 18.3 percent among males and 15.7 percent among females. During the same time period, Delaware's colorectal incidence rates have shown a steeper decline; 22.5 percent for males and 24.2 percent for females.
- From 1995–1999 through 2005–2009, Delaware's colorectal cancer incidence rates decreased 22.9 percent among both male and female Caucasians, and 25.5 percent and 30.4 percent among male and female African Americans, respectively.
- The 2005–2009 data have shown a direct relation between increasing age and colorectal cancer incidence among Caucasian Delawareans.
- During 2005–2009, Delaware ranked 19th highest in the U.S. for colorectal cancer incidence. Males ranked 16th and females ranked 20th (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Colorectal Cancer (Tables 7.4 – 7.5, Figures 7.5 – 7.6)

- During 2005–2009 in Delaware, the percentage of colorectal cancers detected at the local, regional and distant stages were 39.3, 37.4 and 17.1 percent, respectively. Comparable percentages for the U.S. were 40.0 percent, 35.4 percent and 18.8 percent, respectively.
- In Delaware during 2005–2009, 1,283 colorectal cancer cases (54.5 percent) were diagnosed in the late stages (i.e., regional or distant stage).
- Among those diagnosed with colorectal cancer, African Americans were less likely than Caucasians to have had their cancer diagnosed in the local stage (36.4 percent vs. 39.8 percent, respectively).
- In Delaware, the percentage of colorectal cancer cases diagnosed in the local stage increased from 31.7 percent in 1980–1984 to 39.3 percent in 2005–2009. Consequently there was a decrease in cases diagnosed in the regional stage, from 41.9 percent in 1980–1984 to 37.4 percent in 2005–2009, as well as a decrease in cases diagnosed in the distant stage, from 20.0 percent in 1980–1984 to 17.1 percent in 2005–2009.

Colorectal Cancer Mortality (Tables 7.6 – 7.8, Figures 7.7 – 7.9)

- Colorectal cancer is the state's third most common cause of cancer deaths among both males and females for 2005–2009.
- The 848 deaths from colorectal cancer accounted for 9.3 percent of all cancer deaths in Delaware during 2005–2009.
- Of the Delaware residents who died from colorectal cancer, 50.6 percent were male and 49.4 percent female.
- Delaware's 2005–2009 colorectal cancer mortality rate (18.4 per 100,000) was not significantly different from that of the U.S. (17.6 per 100,000).
- During 2005–2009, colorectal cancer mortality rates were significantly higher for males than females at both the state and national levels.

- Historically, Delaware's colorectal cancer mortality rate has been higher than the U.S. rate; however, Delaware's 2005–2009 colorectal cancer mortality rate was not significantly different from the U.S. rate.
- From 1995–1999 to 2005–2009, Delaware's colorectal cancer mortality rate dropped 29.4 and 31.7 percent for males and females, respectively, while the U.S. rate dropped 23.2 and 23.0 percent for males and females
- Delaware's greatest decline in mortality occurred among African American females, with a decrease of 45.8 percent. During the last 10 five-year time periods (1995–1999 through 2005–2009) colorectal cancer mortality decreased by 28.6 percent among male African Americans, and by 28.7 and 28.4 percent among male and female Caucasians, respectively.
- For all races combined, 2005–2009 age-specific mortality rates increased with age; Delawareans ages 85 and older had the highest age-specific mortality rate (200.9 per 100,000).
- During 2005–2009, Delaware's rank in mortality from cancers of the colon and rectum was 21st in the nation. Delaware males and females both ranked 24th highest in colorectal cancer mortality (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Colorectal Cancer Incidence

Table 7.1. Number of Colorectal Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	2,317	1,202	1,115	1,907	987	920	365	193	172
Kent	367	182	185	292	144	148	65	34	31
New Castle	1,270	648	622	1,018	520	498	228	115	113
Sussex	680	372	308	597	323	274	72	44	28

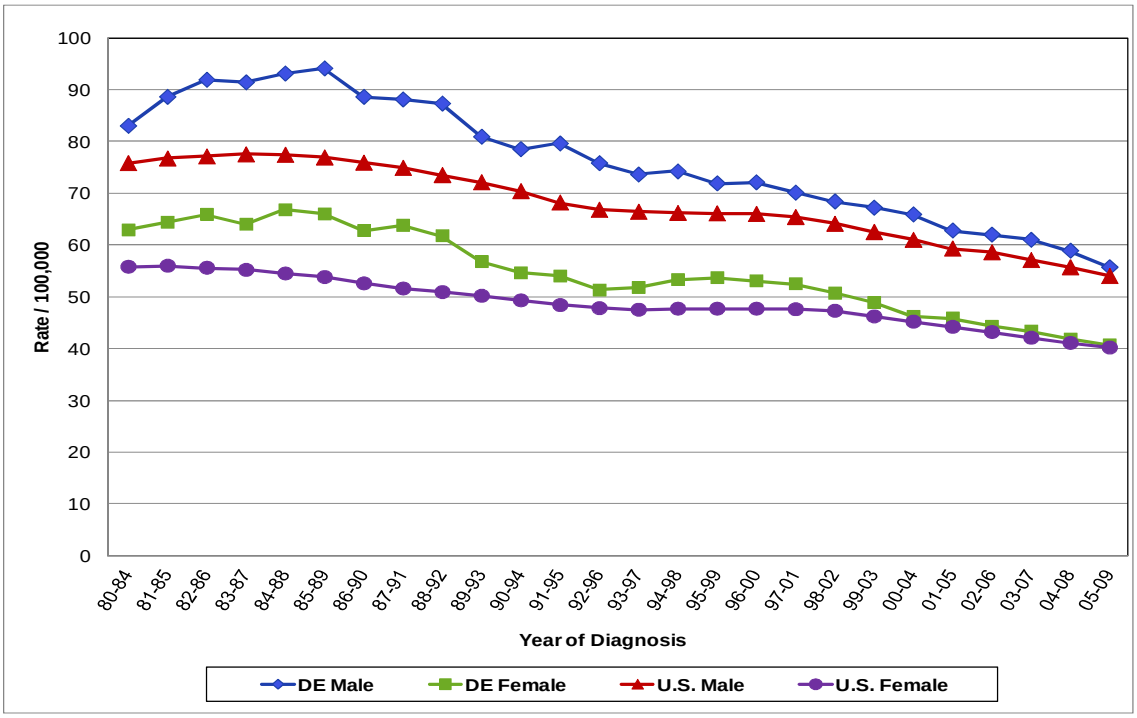
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 7.2. Five-Year Average Age-Adjusted Colorectal Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	46.3 (46.1 , 46.5)	54.0 (53.7 , 54.3)	40.2 (39.9 , 40.4)
Delaware	47.6 (45.7 , 49.6)	55.7 (52.6 , 59.0)	40.7 (38.4 , 43.2)
Kent	47.7 (43.0 , 52.9)	53.3 (45.7 , 61.8)	42.9 (36.9 , 49.6)
New Castle	47.1 (44.5 , 49.7)	54.8 (50.6 , 59.3)	40.7 (37.5 , 44.0)
Sussex	49.0 (45.3 , 53.0)	59.3 (53.3 , 66.0)	39.8 (35.4 , 44.7)
CAUCASIAN			
United States	45.4 (45.2 , 45.6)	53.1 (52.7 , 53.5)	39.2 (38.9 , 39.5)
Delaware	47.2 (45.0 , 49.3)	55.0 (51.5 , 58.5)	40.5 (37.8 , 43.2)
Kent	48.2 (42.8 , 54.0)	53.8 (45.2 , 63.5)	43.7 (36.9 , 51.4)
New Castle	47.2 (44.3 , 50.2)	55.1 (50.4 , 60.1)	40.7 (37.1 , 44.5)
Sussex	47.1 (43.3 , 51.3)	56.5 (50.2 , 63.4)	38.5 (33.9 , 43.6)
AFRICAN AMERICAN			
United States	57.0 (56.2 , 57.8)	66.9 (65.5 , 68.3)	50.3 (49.3 , 51.2)
Delaware	50.2 (45.1 , 55.8)	61.2 (52.3 , 71.1)	42.1 (36.0 , 49.0)
Kent	45.8 (35.2 , 58.6)	50.4 (34.6 , 71.0)	40.4 (27.3 , 57.4)
New Castle	47.2 (41.0 , 54.0)	53.9 (43.8 , 65.5)	41.6 (34.1 , 50.2)
Sussex	67.1 (52.3 , 84.5)	100.8 (72.3 , 136.0)	45.3 (30.0 , 65.5)

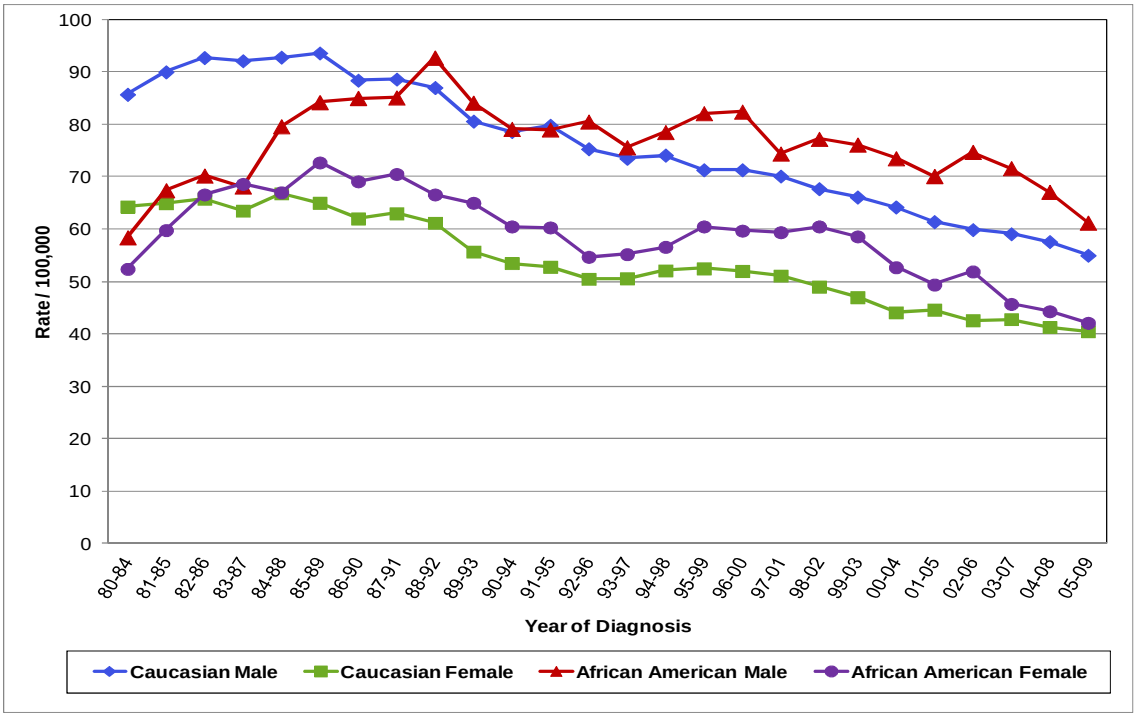
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 7.1. Five-Year Average Age-Adjusted Colorectal Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 7.2. Five-Year Average Age-Adjusted Colorectal Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



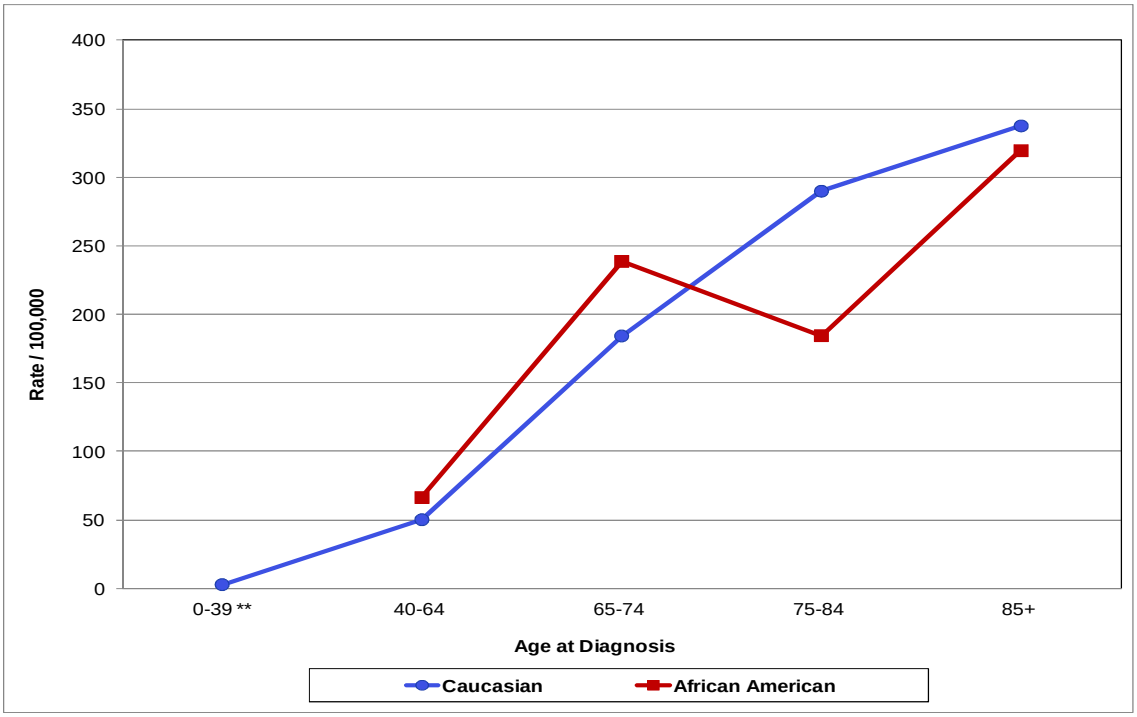
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 7.3. Age-Specific Colorectal Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	2.3	3.3	---	2.7	3.8	---	---	---	---
40-64	52.7	63.6	42.6	50.1	60.6	40.2	66.2	82.2	53.0
65-74	189.7	224.9	159.4	184.2	216.7	155.8	238.7	285.6	200.0
75-84	279.3	302.8	260.5	289.8	311.7	271.4	184.4	---	176.1
85+	334.3	390.6	309.2	337.5	392.5	312.5	319.5	---	---

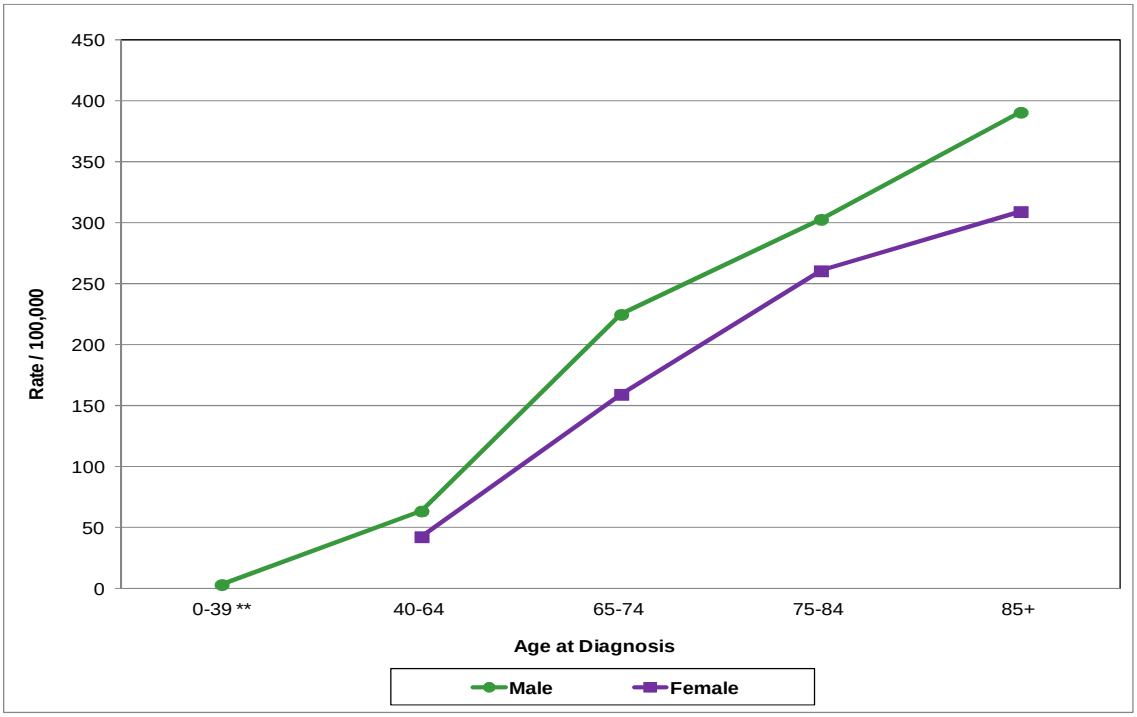
* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 7.3. Age-Specific Colorectal Cancer Incidence Rates* by Race; Delaware, 2005–2009



* = Rates are per 100,000 population.
** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 7.4. Age-Specific Colorectal Cancer Incidence Rates* by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Colorectal Cancer by Stage

Table 7.4. Number of Colorectal Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	948	483	465	783	392	391	145	82	63
Regional	802	424	378	659	354	305	128	63	65
Distant	418	219	199	346	183	163	65	33	32
Unknown	149	76	73	119	58	61	27	15	12
Total	2,317	1,202	1,115	1,907	987	920	365	193	172

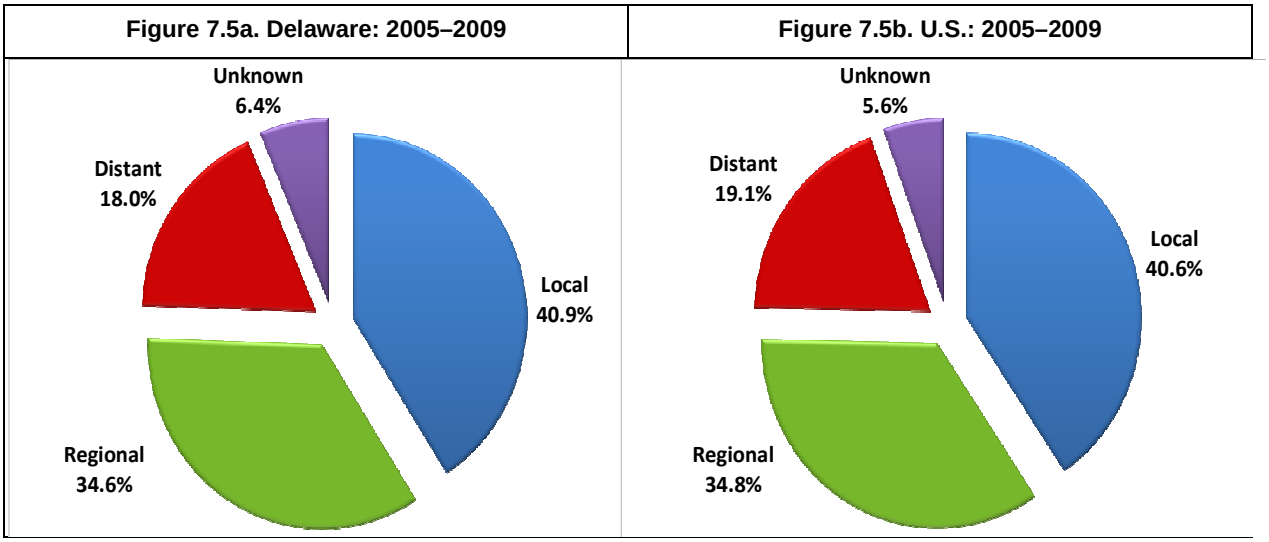
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 7.5. Percent of Colorectal Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	40.9	40.2	41.7	41.1	39.7	42.5	39.7	42.5	36.6
Regional	34.6	35.3	33.9	34.6	35.9	33.2	35.1	32.6	37.8
Distant	18.0	18.2	17.8	18.1	18.5	17.7	17.8	17.1	18.6
Unknown	6.4	6.3	6.5	6.2	5.9	6.6	7.4	7.8	7.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

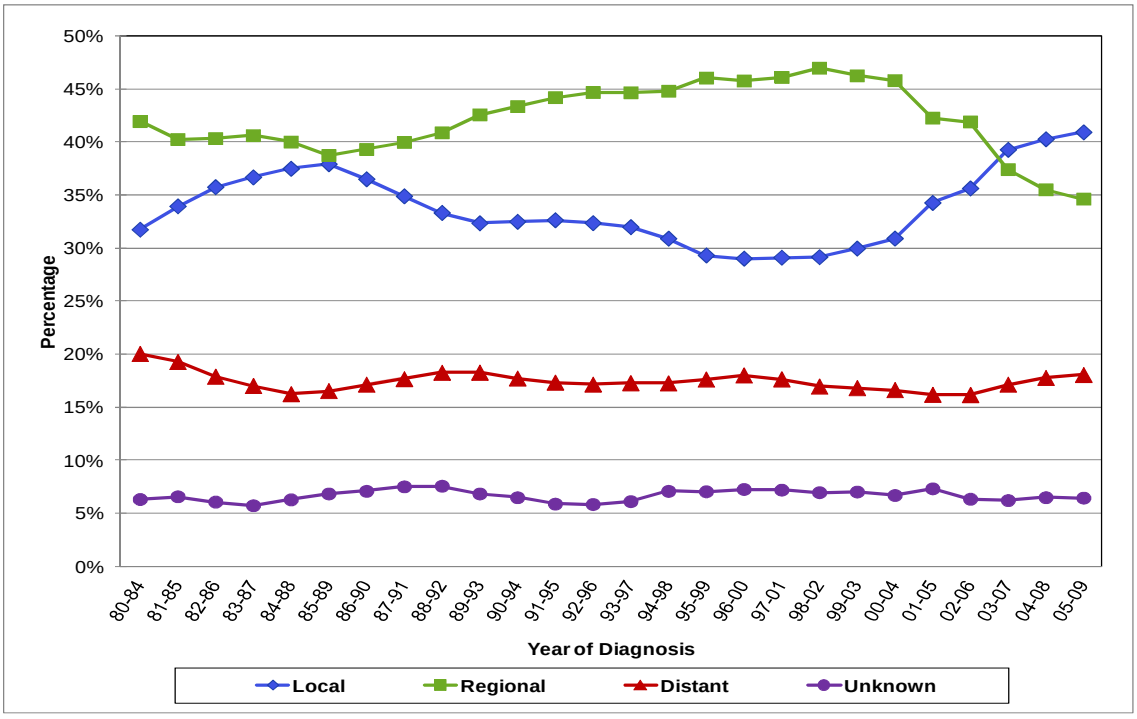
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 7.5. Percent of Colorectal Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 7.6. Percent of Colorectal Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 7.6. Number of Colorectal Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	817	421	396	687	356	331	123	61	62
Kent	148	80	68	121	65	56	27	15	12
New Castle	425	212	213	345	176	169	75	33	42
Sussex	244	129	115	221	115	106	21	13	8

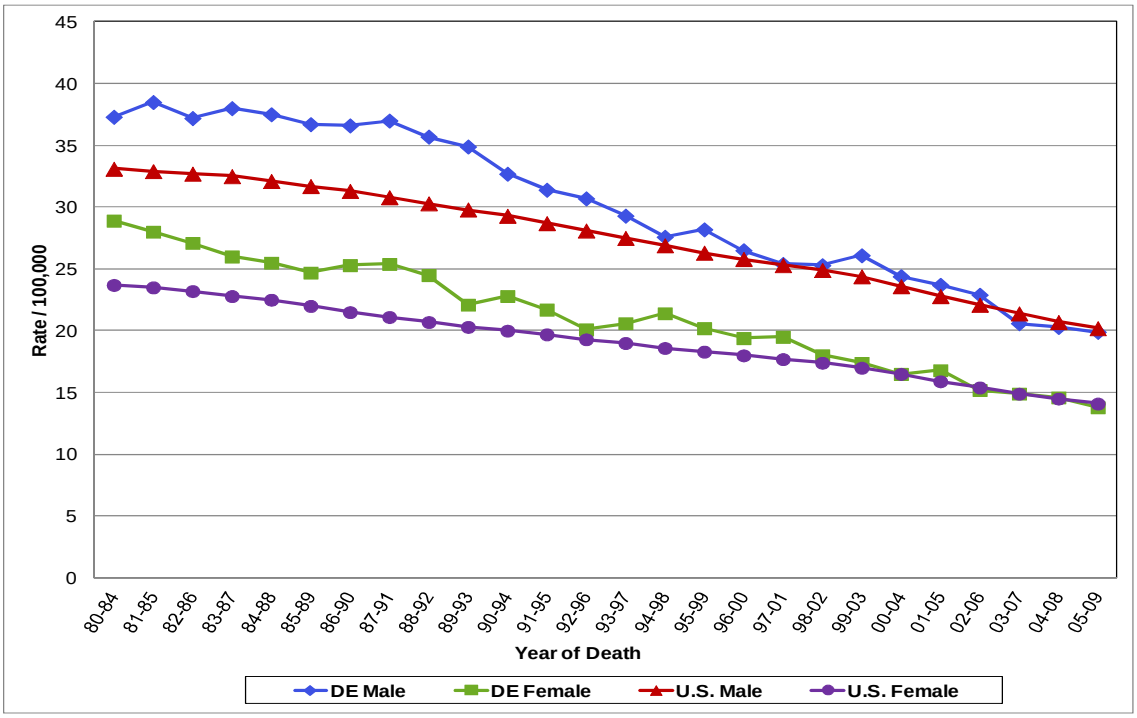
SOURCE: Delaware Health Statistics Center, 2012.

Table 7.7. Five-Year Average Age-Adjusted Colorectal Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION ALL RACES	All	Male	Female
United States	16.7 (16.6 , 16.8)	20.2 (20.0 , 20.3)	14.1 (14.0 , 14.2)
Delaware	16.7 (15.6 , 17.9)	19.9 (18.0 , 21.9)	13.8 (12.5 , 15.3)
Kent	19.8 (16.7 , 23.3)	24.5 (19.3 , 30.5)	15.6 (12.1 , 19.9)
New Castle	15.8 (14.3 , 17.4)	18.7 (16.2 , 21.4)	13.4 (11.7 , 15.4)
Sussex	17.0 (14.9 , 19.4)	20.1 (16.8 , 24.1)	13.9 (11.4 , 16.9)
CAUCASIAN			
United States	16.2 (16.1 , 16.2)	19.5 (19.4 , 19.6)	13.6 (13.5 , 13.7)
Delaware	16.6 (15.4 , 17.9)	19.9 (17.9 , 22.1)	13.6 (12.1 , 15.2)
Kent	20.2 (16.8 , 24.2)	25.0 (19.2 , 31.9)	16.0 (12.1 , 20.9)
New Castle	15.7 (14.1 , 17.5)	19.0 (16.3 , 22.1)	12.9 (11.0 , 15.1)
Sussex	16.9 (14.7 , 19.4)	19.5 (16.0 , 23.7)	14.1 (11.5 , 17.4)
AFRICAN AMERICAN			
United States	23.7 (23.4 , 23.9)	29.8 (29.4 , 30.3)	19.8 (19.5 , 20.1)
Delaware	18.7 (15.4 , 22.4)	22.0 (16.5 , 28.7)	16.1 (12.3 , 20.7)
Kent	20.6 (13.4 , 30.1)	---	---
New Castle	17.6 (13.7 , 22.2)	18.4 (12.1 , 26.6)	16.8 (12.0 , 22.8)
Sussex	---	---	---

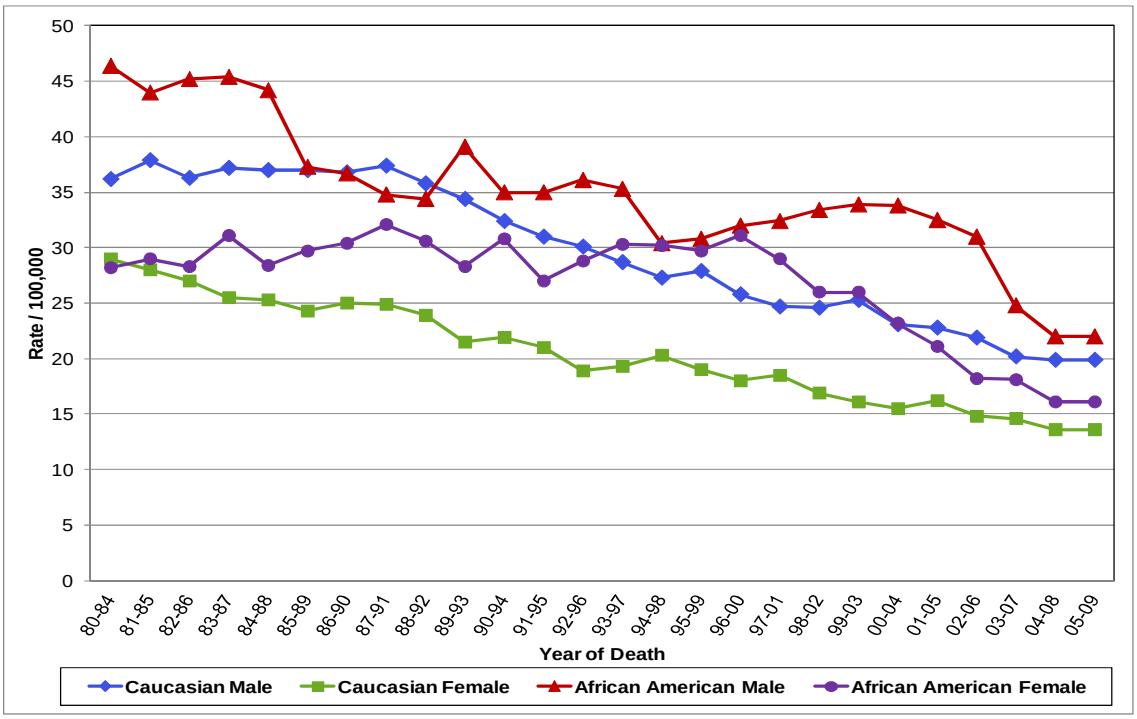
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 7.7. Five-Year Average Age-Adjusted Colorectal Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 7.8. Five-Year Average Age-Adjusted Colorectal Cancer Mortality Rates* by Race and Sex; Delaware, 1980–2009



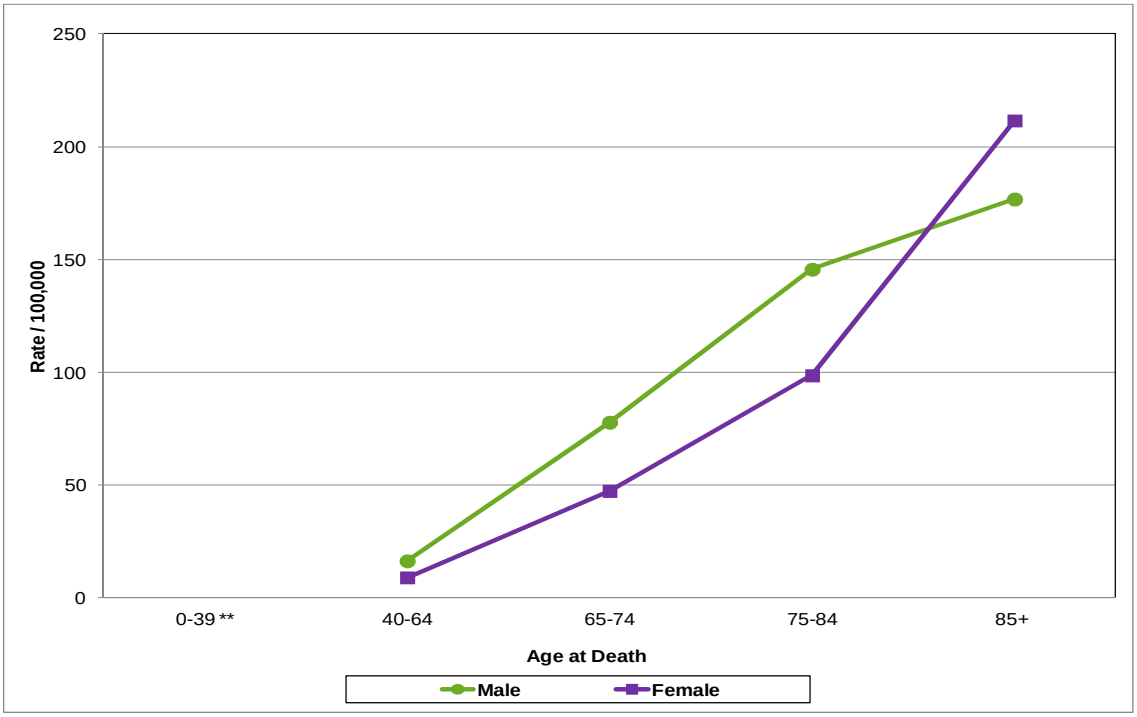
* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 7.8. Age-Specific Colorectal Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	12.7	16.5	9.2	11.9	15.8	8.2	16.8	20.4	---
65-74	61.6	77.9	47.5	63.8	78.4	51.0	---	---	---
75-84	118.9	145.7	98.7	116.1	145.0	93.7	157.9	---	---
85+	200.9	176.8	211.6	206.2	180.1	218.1	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 7.9. Age-Specific Colorectal Cancer Mortality Rates* by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
** = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

8. ESOPHAGEAL CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Esophageal Cancer:

- smoking cigarettes, cigars or pipes and chewing tobacco – risk increases as length of use increases
- excessive alcohol consumption – risk increases as amount increases
- smoking and drinking alcohol together – combination raises risk much more than either alone
- overweight or obesity

Environmental and Medically-Related Causes of Esophageal Cancer:

- workplace exposures to dry cleaning solvents or other chemical fumes
- injury to the esophagus by mistakenly drinking lye increases risk about 40 years later

Esophageal Cancer Risk Factors that Cannot be Changed:

- increasing age – 85 percent of cases are in people age 55 and over
- gender – men are three times more likely to develop esophageal cancer than women.
- Tylosis, a rare inherited disease – greatly increases risk of squamous cell cancer of esophagus.
- Achalasia (condition at lower end of esophagus)
- gastroesophageal reflux disease or GERD – 30 percent of esophageal cancers can be linked to GERD
- Barrett's esophagus – condition in which cells lining the esophagus are changed through history of reflux or GERD

Factors Protective against Esophageal Cancer:

- Risk of esophageal cancer can be lowered by managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), use of tobacco and alcohol, and physical activity.

Early Detection of Esophageal Cancer:

- Experts recommend that people with a high risk of esophageal cancer, such as those with Barrett's esophagus, have an upper endoscopy regularly.

Data Highlights

Incidence of Esophageal Cancer (Tables 8.1 – 8.3, Figures 8.1 – 8.2)

- The 259 esophageal cancer cases diagnosed during 2005–2009 in Delaware accounted for 1.0 percent of all cancer cases.
- The majority of esophageal cancer cases in 2005–2009 were New Castle County residents (144 or 55.6 percent) and the remainder were from Sussex (75 or 29.0 percent) and Kent (40 or 15.4 percent) Counties.
- More than three-quarters of the 259 esophageal cancer cases in 2005–2009 were male (200 or 77.2 percent) and 59 (22.8 percent) female.
- Caucasian residents comprised 85.7 percent (222 cases) of the esophageal cancer cases in 2005–2009, African Americans comprised 13.5 percent (35 cases) and two cases were other or unknown race.
- Esophageal cancer incidence was more than four times higher among males (9.1 per 100,000) than females (2.1 per 100,000) in 2005–2009 in Delaware and this difference was significant.

- Delaware's esophageal cancer incidence rate (5.3 per 100,000) was higher than the U.S. estimate (4.5 per 100,000) and the difference nears statistical significance. Among both males and females, Delaware's incidence rates were higher than the U.S. but the differences were not significant.
- Caucasians in Delaware had a higher esophageal cancer incidence rate (5.4 per 100,000 in 2005–2009) than African Americans (4.5 per 100,000), but the difference was not statistically significant.
- From 1995–1999 through 2005–2009 Delaware's esophageal cancer incidence rate decreased 17.2 percent while the U.S. rate declined only 4.5 percent.
- From 1995–1999 through 2005–2009 esophageal cancer incidence in Delaware decreased 15.7 percent among males and 30.0 percent among females. The rate among African Americans has been decreasing at a faster rate than among Caucasians (49.4 percent versus 10.0 percent).
- Esophageal cancer incidence peaked at ages 75–79 with a less-pronounced secondary peak in the 0–4 age group (U.S. estimates).
- During 2005–2009, Delaware ranked 17th in the U.S. for incidence of esophageal cancer. Males ranked 20th and females ranked 14th in esophageal cancer incidence (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Esophageal Cancer (Table 8.4, Figures 8.4 – 8.5)

- For 2005–2009, 20.5 percent, 27.4 percent and 36.3 percent of esophageal cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 22.6 percent, 28.9 percent and 35.1 percent, respectively.
- In Delaware during 2005–2009, 165 esophageal cancer cases (63.7 percent) were diagnosed in the late stages (i.e., regional or distant stage).
- Although the number of African American cases diagnosed was small, they were more likely to have had esophageal cancer diagnosed in the local stage than Caucasians (22.9 percent vs. 19.8 percent, respectively).
- In Delaware, the percentage of esophageal cancer cases diagnosed in the local stage decreased from 25.3 percent in 1980–1984 to 20.5 percent in 2005–2009. Accompanying this was a more than two-fold increase in the percentage of cases with unknown stage; from 6.8 percent in 1980–1984 to 15.8 percent in 2005–2009.

Esophageal Cancer Mortality (Tables 8.5 – 8.7, Figures 8.6 – 8.7)

- Esophageal cancer accounted for 2.3 percent of all cancer deaths in Delaware during 2005–2009.
- During 2005–2009, 209 Delawareans died from esophageal cancer; 174 males (83.3 percent) and 35 females.
- Caucasians comprised 88.0 percent of decedents (184 deaths) and African Americans 12.0 percent (25 deaths).
- A total of 123 deaths (58.9 percent) were from New Castle, 50 deaths (23.9 percent) from Sussex and 36 deaths (17.2 percent) from Kent County.
- The 2005–2009 esophageal cancer mortality rate was more than six times higher among males (8.0 per 100,000) than females (1.3 per 100,000).
- Esophageal cancer mortality was nearly 30 percent higher among Caucasian (4.4 per 100,000) than among African American (3.4 per 100,000) Delawareans during 2005–2009. Mortality rates among African Americans, however, were relatively unstable due to the small number of deaths.
- During 2005–2009, esophageal cancer mortality was highest in Kent and New Castle Counties (4.7 and 4.5 per 100,000.
- Delaware's esophageal cancer mortality rates for 2005–2009 were comparable to those seen nationally.
- From 1995–1999 through 2005–2009, Delaware's esophageal cancer mortality rate decreased 15.7 percent while the 2005–2009 U.S. rate remained the same as in 1995–1999. In Delaware, the greatest declines were 55.0 percent among African Americans (51.9 among males and 57.5 among females) and 47.8 percent among Caucasian females.

- Age-specific mortality patterns for esophageal cancer were difficult to discern due to the relatively small number of deaths. U.S. data have shown that mortality from esophageal cancer peaked at ages 85+ in males and ages 75-79 in women.
- During 2005–2009, Delaware's rank in mortality from cancers of the esophageal was 34th in the nation. Delaware males ranked 21st highest and Delaware females ranked 45th in esophageal cancer mortality (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Incidence of Esophageal Cancer

Table 8.1. Number of Esophageal Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	259	200	59	222	174	48	35	25	10
Kent	40	31	9	29	---	---	10	---	---
New Castle	144	109	35	125	96	29	18	12	6
Sussex	75	60	15	68	54	14	7	---	---

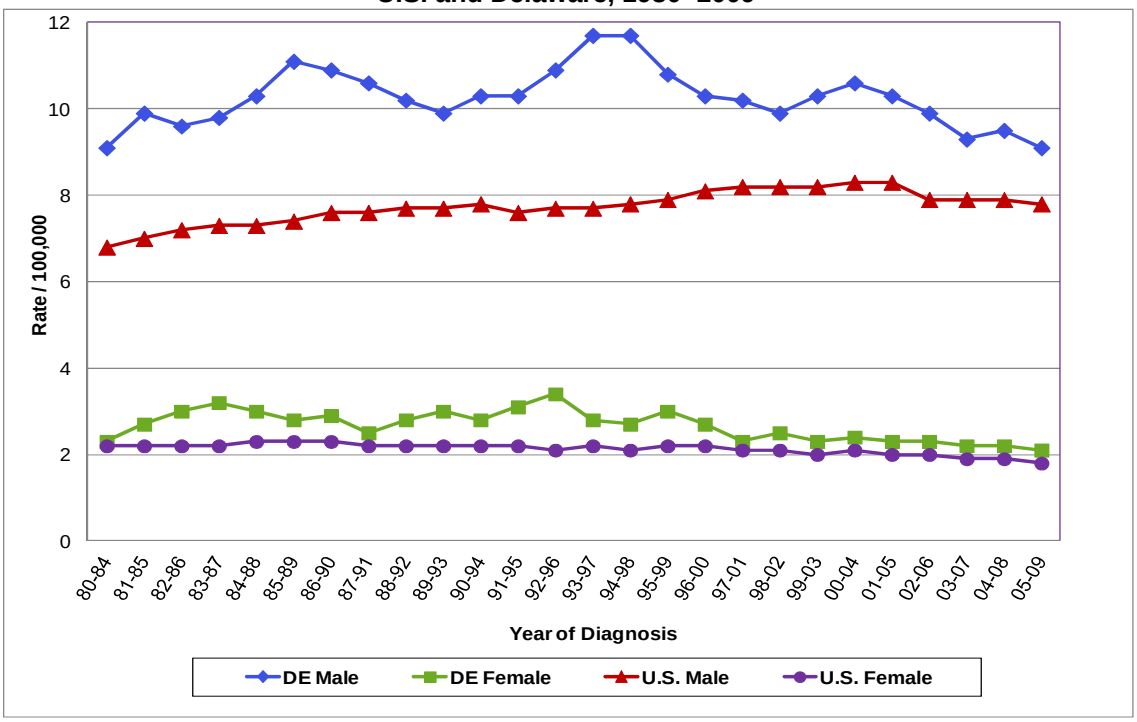
. --- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012

Table 8.2. Five-Year Average Age-Adjusted Esophageal Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	4.5 (4.4 , 4.6)	7.8 (7.6 , 7.9)	1.8 (1.8 , 1.9)
Delaware	5.3 (4.6 , 5.9)	9.1 (7.8 , 10.4)	2.1 (1.6 , 2.8)
Kent	5.0 (3.6 , 6.9)	8.9 (6.0 , 12.7)	---
New Castle	5.3 (4.5 , 6.3)	9.3 (7.6 , 11.2)	2.2 (1.6 , 3.1)
Sussex	5.3 (4.1 , 6.7)	9.0 (6.8 , 11.7)	---
CAUCASIAN			
United States	4.6 (4.5 , 4.7)	8.0 (7.9 , 8.2)	1.8 (1.7 , 1.8)
Delaware	5.4 (4.7 , 6.2)	9.4 (8.1 , 11.0)	2.1 (1.5 , 2.8)
Kent	4.7 (3.1 , 6.7)	---	---
New Castle	5.8 (4.8 , 6.9)	10.1 (8.1 , 12.3)	2.3 (1.5 , 3.3)
Sussex	5.2 (4.0 , 6.7)	8.8 (6.5 , 11.7)	---
AFRICAN AMERICAN			
United States	5.3 (5.1 , 5.5)	8.9 (8.4 , 9.4)	2.8 (2.6 , 3.0)
Delaware	4.5 (3.1 , 6.3)	8.0 (5.0 , 12.0)	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

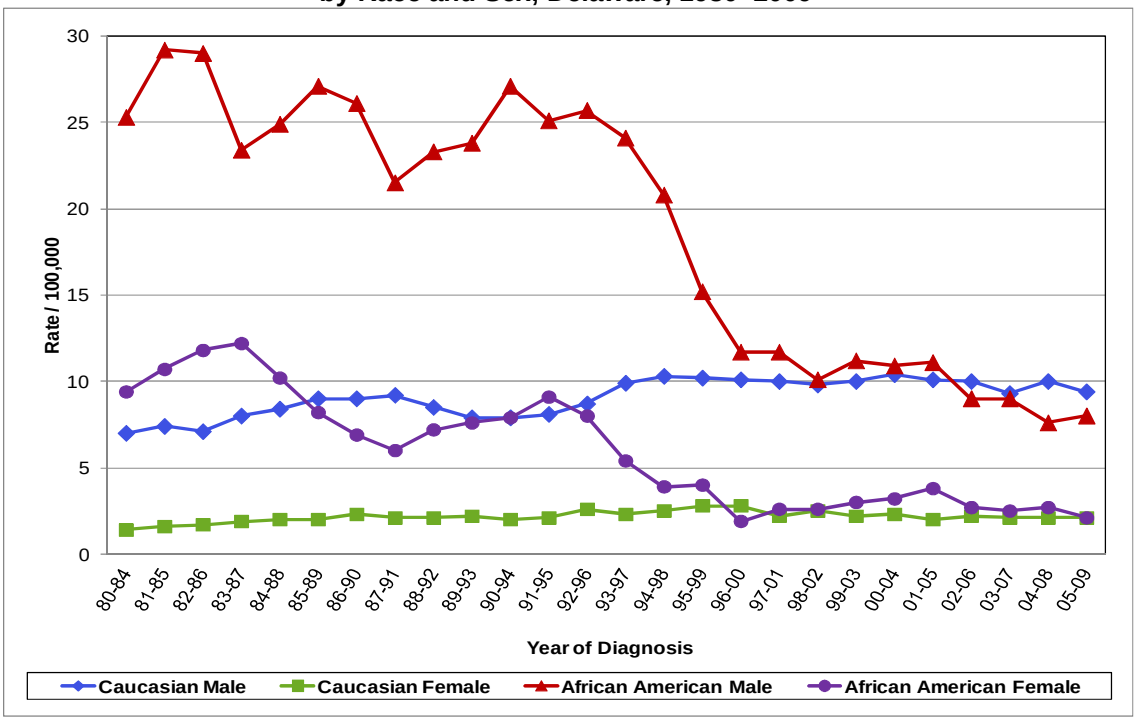
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 8.1. Five-Year Average Age-Adjusted Esophageal Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 8.2. Five-Year Average Age-Adjusted Esophageal Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 8.3. Age-Specific Esophageal Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	6.6	11.1	---	6.5	11.6	---	---	---	---
65-74	24.3	41.7	---	25.5	42.7	---	---	---	---
75-84	26.6	44.5	---	28.8	46.3	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 8.3. Age-Specific Esophageal Cancer Incidence Rates by Race; Delaware, 2005–2009

NOTE: Figure 8.3 is not displayed because of the small number of cases.

Esophageal Cancer by Stage

Table 8.4. Number and Percent of Esophageal Cancer Cases by Stage at Diagnosis and Sex; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All	Male	Female	All	Male	Female
Local	53	39	14	20.5	19.5	23.7
Regional	71	50	21	27.4	25.0	35.6
Distant	94	76	18	36.3	38.0	30.5
Unknown	41	35	6	15.8	17.5	10.2
Total	259	200	59	100.0	100.0	100.0

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 8.4. Percent of Esophageal Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009

Figure 8.4a. Delaware: 2005–2009

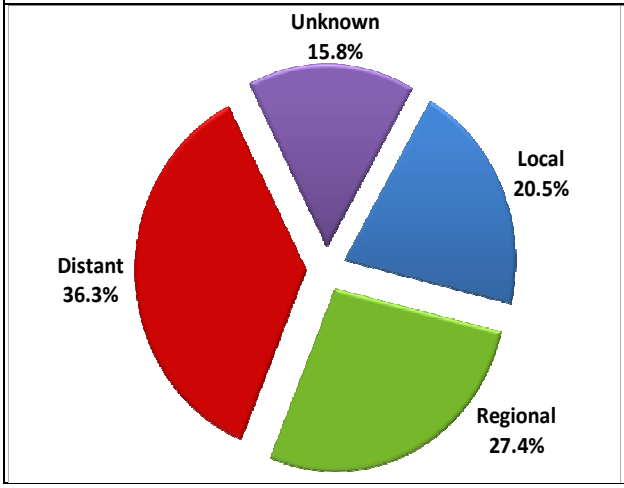
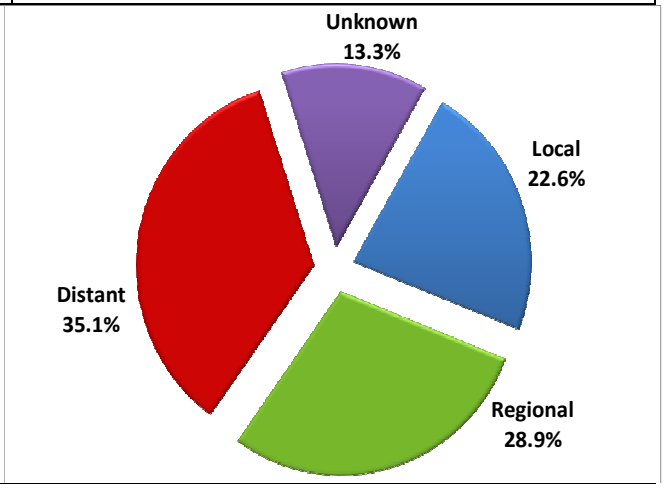
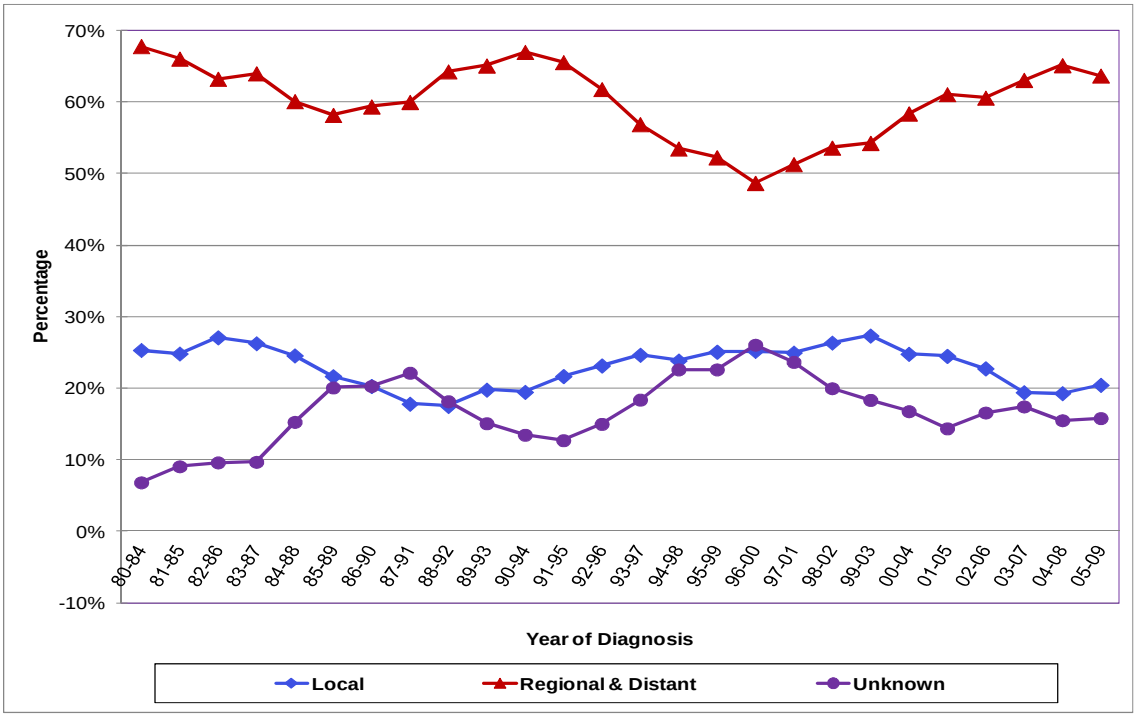


Figure 8.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 8.5. Percent of Esophageal Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Esophageal Cancer Mortality

Table 8.5. Number of Esophageal Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	209	174	35	184	156	28	25	18	7
Kent	36	---	---	30	---	---	---	---	---
New Castle	123	100	23	107	90	17	16	10	6
Sussex	50	---	---	47	---	---	---	---	---

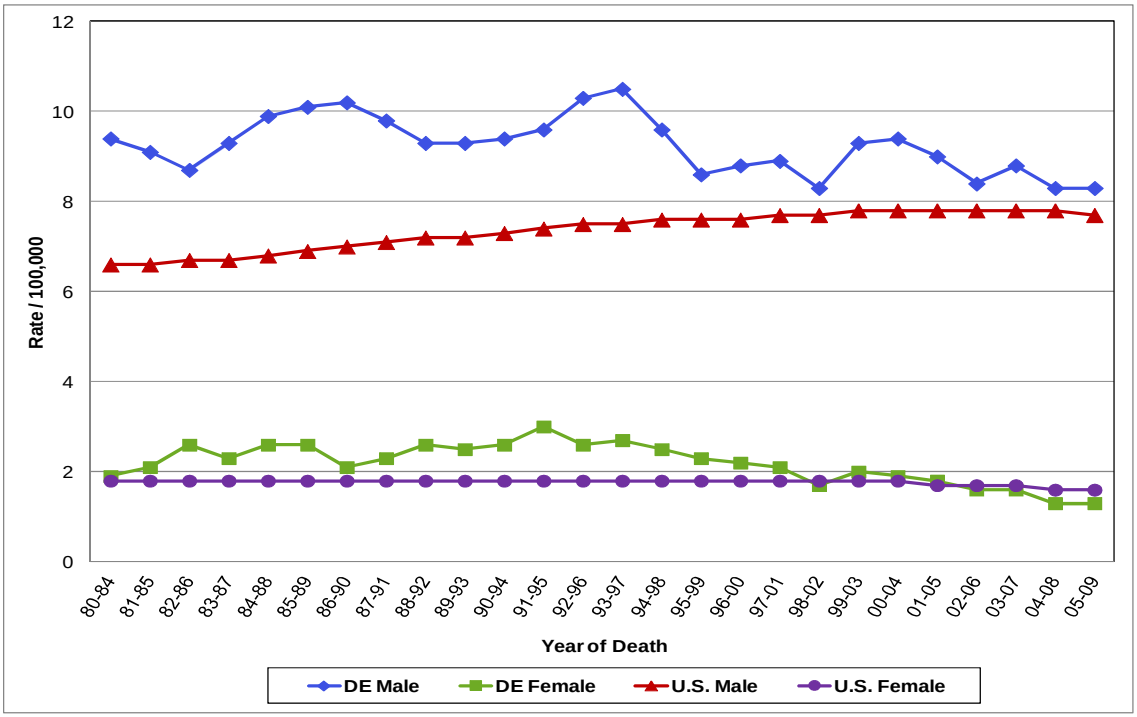
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 8.6. Five-Year Average Age-Adjusted Esophageal Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	4.3 (4.3 , 4.3)	7.7 (7.7 , 7.8)	1.6 (1.6 , 1.6)
Delaware	4.2 (3.6 , 4.8)	8.0 (6.8 , 9.3)	1.3 (0.9 , 1.8)
Kent	4.7 (3.3 , 6.5)	---	---
New Castle	4.5 (3.7 , 5.4)	8.6 (7.0 , 10.6)	---
Sussex	3.4 (2.5 , 4.5)	6.2 (4.4 , 8.4)	---
CAUCASIAN			
United States	4.4 (4.3 , 4.4)	7.9 (7.8 , 8.0)	1.6 (1.5 , 1.6)
Delaware	4.4 (3.8 , 5.1)	8.5 (7.2 , 9.9)	1.2 (0.8 , 1.7)
Kent	4.9 (3.3 , 7.0)	---	---
New Castle	4.9 (4.0 , 5.9)	9.5 (7.6 , 11.8)	---
Sussex	3.4 (2.5 , 4.7)	6.1 (4.4 , 8.5)	---
AFRICAN AMERICAN			
United States	4.6 (4.5 , 4.7)	8.2 (7.9 , 8.4)	2.2 (2.1 , 2.3)
Delaware	3.4 (2.2 , 5.1)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

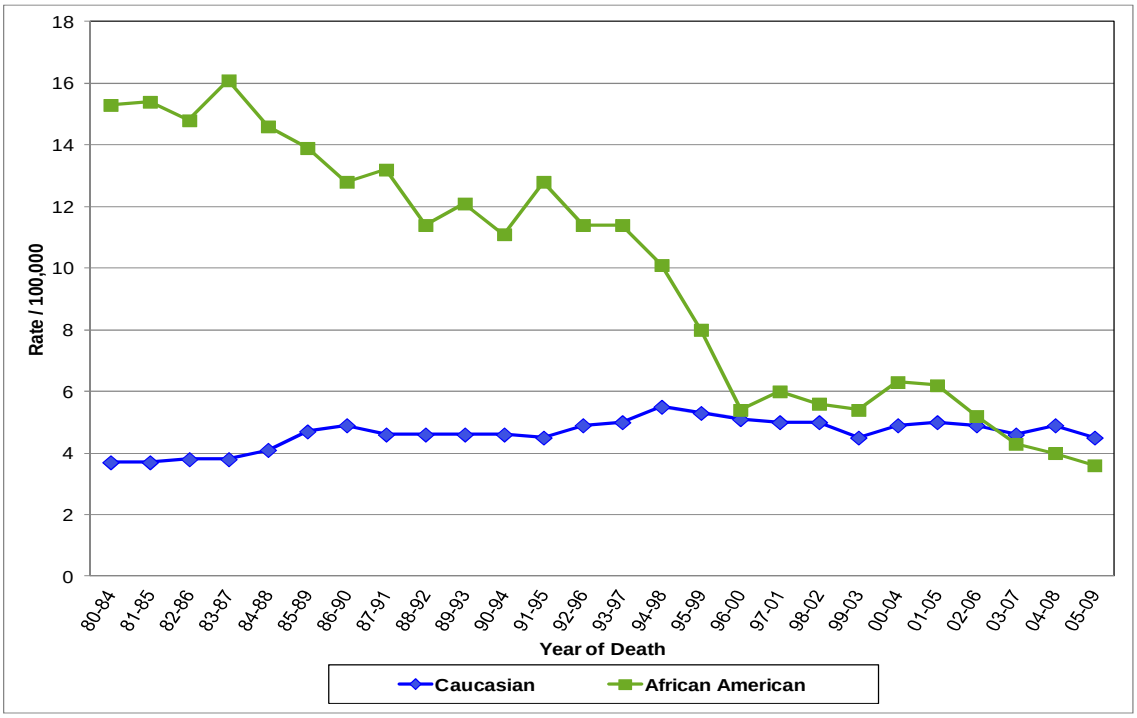
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 8.6. Five-Year Average Age-Adjusted Esophageal Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 8.7. Five-Year Average Age-Adjusted Esophageal Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 8.7. Age-Specific Esophageal Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	4.7	8.4	---	4.9	9.0	---	---	---	---
65-74	21.5	39.5	---	21.8	40.1	---	---	---	---
75-84	19.2	36.4	---	20.8	39.7	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 8.8. Age-Specific Esophageal Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 8.8 is not displayed because of the small number of deaths.

9. HODGKIN LYMPHOMA

Risk Factors and Early Detection

Lifestyle Risk Factors for Hodgkin Lymphoma:

- cigarette smoking (suspected)
- Most risk factors for Hodgkin lymphoma are not related to lifestyle.

Environmental and Medically-Related Causes of Hodgkin Lymphoma:

- socioeconomic status – risk is greater among those with higher income and education
- exposure to low-level solvent and metal mixtures

Risk Factors for Hodgkin Lymphoma that Cannot be Changed:

- age – most between the ages of 15 and 35, as well as those older than 55
- family history – higher risk in brothers and sisters of young people with Hodgkin lymphoma
- gender – slightly more common in males than females
- race – more common in Caucasians than African Americans
- personal history of Epstein-Barr virus (EBV) infection (mononucleosis or 'mono')
- having a weakened immune system; e.g. due to infection with HIV, the virus that causes AIDS

Factors Protective against Hodgkin Lymphoma:

- There is no known way to prevent Hodgkin lymphoma since most known risk factors cannot be avoided.
- One way to prevent increased risk is to avoid known risk factors for HIV infection; e.g. intravenous drug use or unprotected sex with many partners.

Early Detection of Hodgkin Lymphoma:

- There are no screening tests to detect Hodgkin lymphoma.

Data Highlights

Hodgkin Lymphoma Incidence (Tables 9.1 – 9.2, Figures 9.1 – 9.2)

- The 132 cases of Hodgkin lymphoma diagnosed in Delaware during 2005–2009 accounted for 0.5 percent of all cancer cases diagnosed in Delaware.
- This group was 62.1 percent male (82 cases) and 37.9 percent female (50 cases). The case group was nearly 80 percent Caucasian (105 cases or 79.5 percent), 19.9 percent (26 cases) African American and one case was other or unknown race.
- Delaware's 2005–2009 Hodgkin lymphoma incidence rate (2.8 per 100,000) does not differ from the U.S. rate (3.0 per 100,000).
- The Hodgkin lymphoma incidence rate for males was significantly higher than the rate for females in Delaware (3.8 per 100,000 vs. 2.2 per 100,000, respectively) and nationally (3.2 per 100,000 vs. 2.5 per 100,000).
- A significant male-to-female difference was seen in both Caucasians and African Americans nationally. In Delaware, a non-significant excess was seen among Caucasian males, but sex-specific rates could not be calculated among African Americans due to the small number of cases.

- Nationally, the Hodgkin lymphoma incidence rate was higher among Caucasians than African Americans for both sexes, but the differences were not significant. Again, sex- and county-specific incidence rates cannot be computed for African Americans due to the small number of cases.
- From 1995–1999 through 2005–2009, Delaware's Hodgkin lymphoma incidence rate decreased 14.3 percent (15.6 percent in males vs. 15.4 percent in females). Nationally, the incidence rate remained the same among females, but the incidence rate increased 3.2 percent among males.
- Data were too sparse to examine age-specific incidence rates for Hodgkin lymphoma.
- During 2005–2009, Delaware ranked 18th highest in the U.S. for Hodgkin lymphoma incidence. Males ranked seventh and females ranked 39th in incidence of Hodgkin lymphoma (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Hodgkin Lymphoma (Tables 9.4 – 9.5, Figures 9.4 – 9.5)

- For 2005–2009, 17.4 percent, 40.9 percent and 40.2 percent of Hodgkin lymphoma cases in Delaware were diagnosed at the local, regional and distant stages, respectively. In the U.S., comparable percentages were 17.2 percent, 38.9 percent and 38.7 percent, respectively.
- Among persons diagnosed with Hodgkin's lymphoma, males were less likely to be diagnosed in the local stage than females (15.9 percent vs. 20.0 percent, respectively).
- Since 1995–1999, the percentage of cases diagnosed in the regional and distant stages decreased 10.8 percent (from 91.9 percent to 81.1 percent) while the percentage of cases diagnosed in the local stage has increased by the same percentage (from 7.4 percent to 17.4 percent)

Hodgkin Lymphoma Mortality

- Mortality patterns from Hodgkin lymphoma are not presented here since there were only 18 deaths reported during 2005–2009 in Delaware.
- Data for 2005–2009 show that Delaware ranked 23rd highest for mortality from Hodgkin lymphoma (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Hodgkin Lymphoma Incidence

Table 9.1. Number of Cases of Hodgkin Lymphoma by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	132	82	50	105	65	40	26	16	10
Kent	20	13	7	18	12	6	---	---	---
New Castle	86	52	34	64	38	26	22	14	8
Sussex	26	17	9	23	15	8	---	---	---

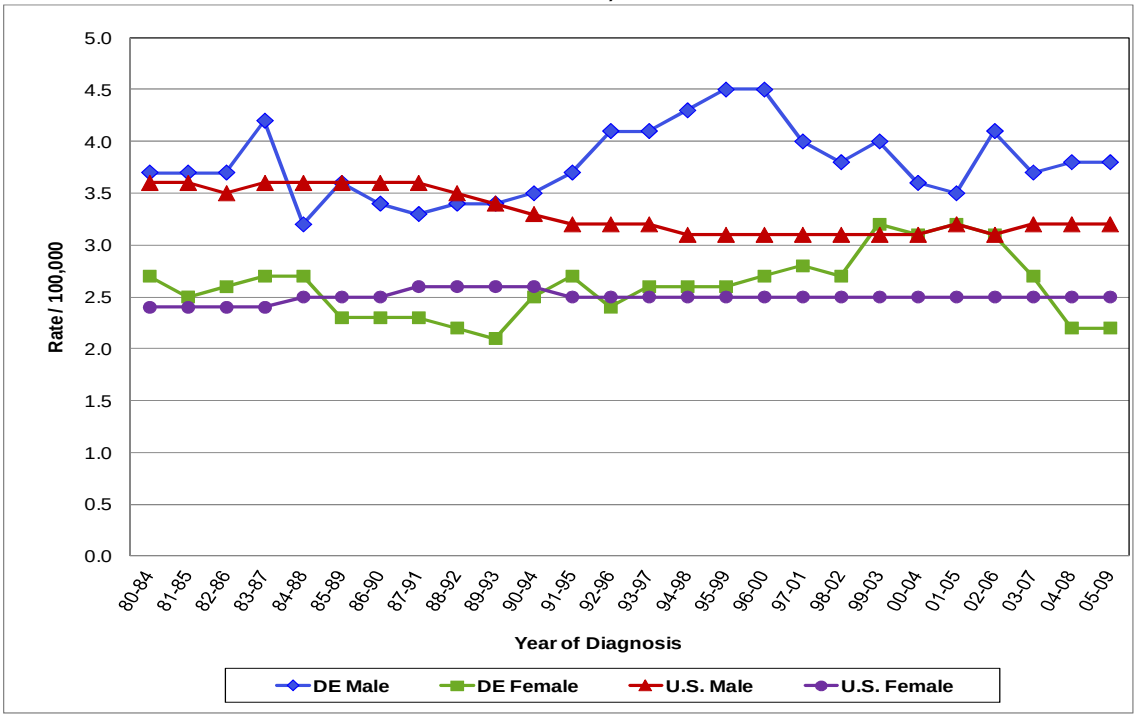
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 9.2. Five-Year Average Age-Adjusted Hodgkin Lymphoma Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	2.8 (2.8 , 2.9)	3.2 (3.1 , 3.2)	2.5 (2.4 , 2.6)
Delaware	3.0 (2.5 , 3.6)	3.8 (3.1 , 4.8)	2.2 (1.7 , 3.0)
Kent	---	---	---
New Castle	3.2 (2.6 , 4.0)	3.9 (2.9 , 5.1)	2.5 (1.7 , 3.5)
Sussex	3.0 (1.9 , 4.4)	---	---
CAUCASIAN			
United States	3.0 (2.9 , 3.1)	3.3 (3.2 , 3.4)	2.7 (2.6 , 2.8)
Delaware	3.3 (2.7 , 4.0)	4.1 (3.2 , 5.3)	2.4 (1.7 , 3.3)
Kent	---	---	---
New Castle	3.3 (2.5 , 4.2)	3.9 (2.8 , 5.4)	2.7 (1.7 , 4.0)
Sussex	---	---	---
AFRICAN AMERICAN			
United States	2.7 (2.6 , 2.9)	3.1 (2.9 , 3.3)	2.4 (2.2 , 2.6)
Delaware	2.8 (1.8 , 4.1)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

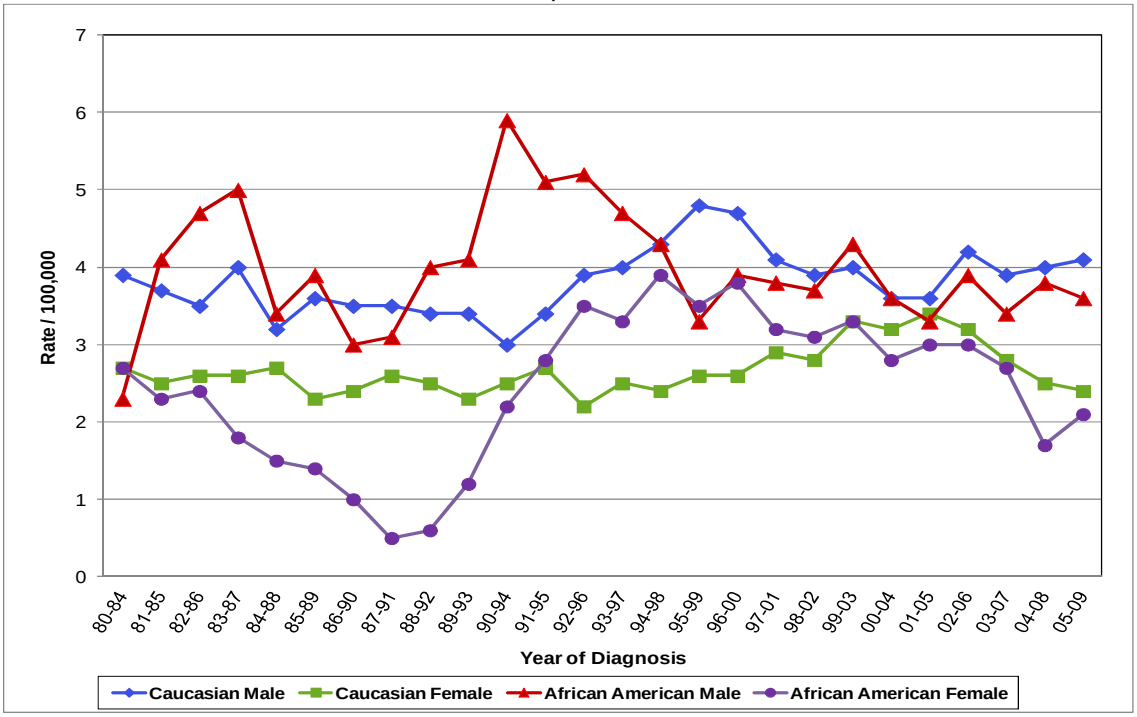
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 9.1. Five-Year Average Age-Adjusted Hodgkin Lymphoma Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 9.2. Five-Year Average Age-Adjusted Hodgkin Lymphoma Incidence Rates* by Race; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 9.3. Age-Specific Hodgkin Lymphoma Incidence Rates by Race; Delaware, 2005–2009

NOTE: Table 9.3 and Figure 9.3 are not displayed because of the small number of cases.

Hodgkin Lymphoma by Stage

Table 9.4. Number of Hodgkin Lymphoma Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	23	13	10	17	10	7	5	---	---
Regional	54	29	25	44	23	21	10	---	---
Distant	53	38	15	44	32	12	9	---	---
Unknown	---	---	---	---	---	---	---	---	---
Total	132	82	50	105	65	40	26	16	10

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.
--- = Cell counts less than six are not shown to protect patient confidentiality.

Table 9.5. Percent of Hodgkin Lymphoma Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	**Male**	**Female**	**All**	**Male**	**Female**	**All**	**Male**	**Female**
Local	17.4	15.9	20.0	16.2	15.4	17.5	19.2	---	---
Regional	40.9	35.4	50.0	41.9	35.4	52.5	38.5	---	---
Distant	40.2	46.3	30.0	41.9	49.2	30.0	34.6	---	---
Unknown	---	---	---	---	---	---	---	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.
--- = Percentages based on cell counts less than six are not shown to protect patient confidentiality.

Figure 9.4. Percent of Hodgkin Lymphoma Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009

Figure 9.4a. Delaware: 2005–2009

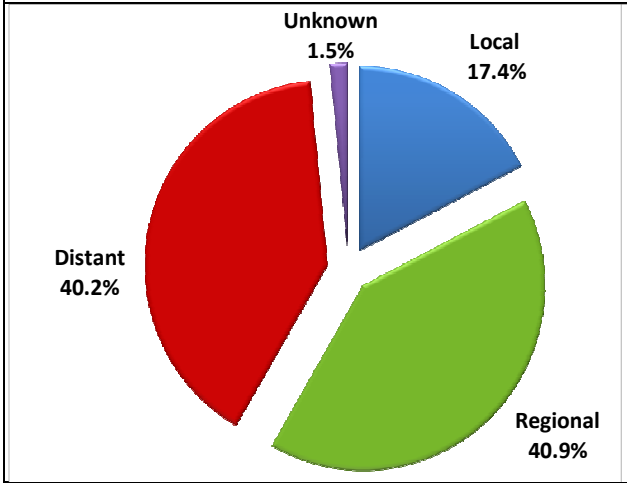
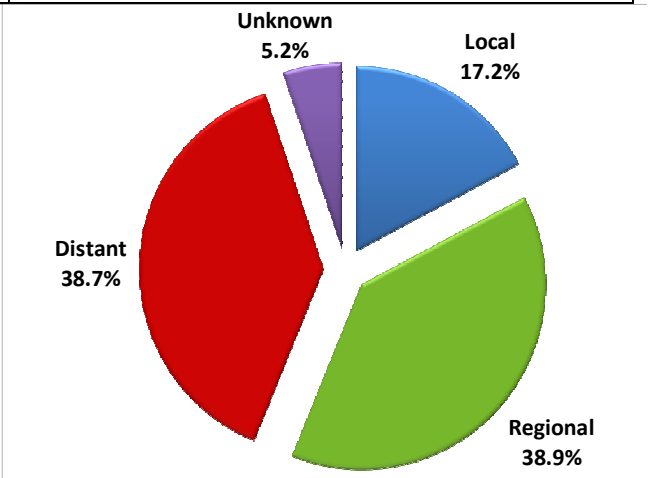
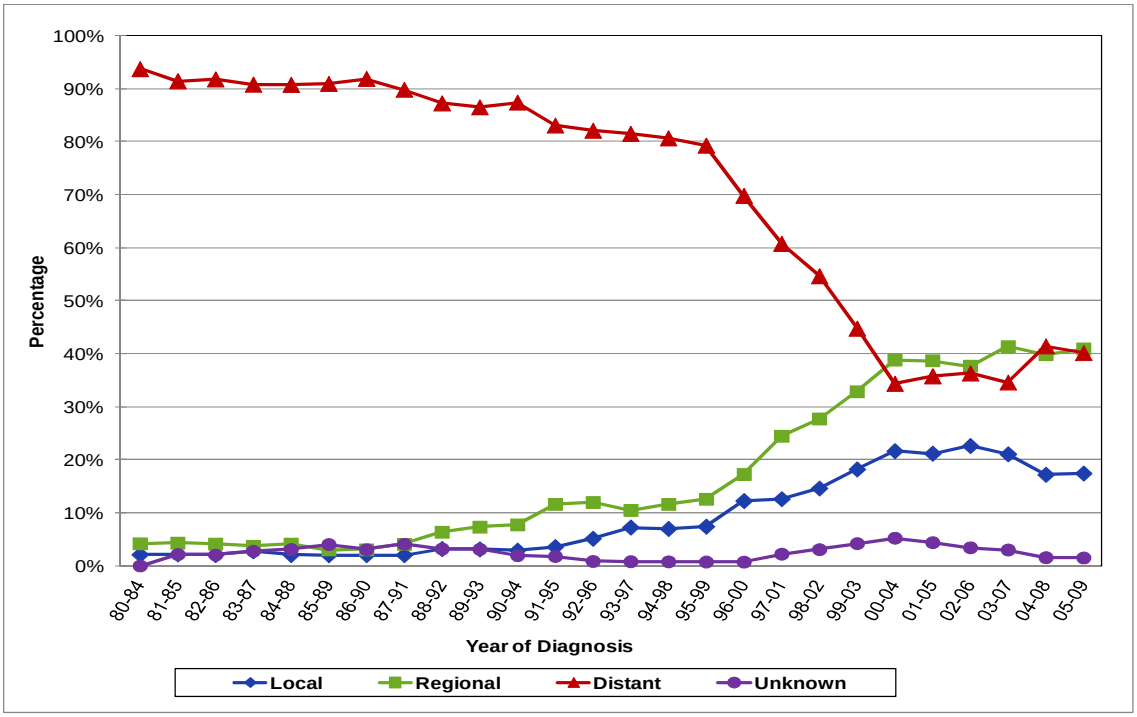


Figure 9.4b. U.S.: 2005–2009



OURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 9.5. Percent of Hodgkin Lymphoma Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Hodgkin Lymphoma Mortality

NOTE: Mortality patterns for Hodgkin lymphoma in Delaware are not presented here since there were only 18 deaths reported in Delaware during 2005–2009.

10. KIDNEY AND RENAL PELVIS CANCER[12]

Risk Factors and Early Detection

Lifestyle Risk Factors for Kidney Cancer:

- cigarette or cigar smoking
- obesity or overweight
- high blood pressure

Environmental and Medically-Related Causes of Kidney Cancer:

- occupational exposures to certain chemicals such as:
  - asbestos
  - cadmium
  - benzene
  - some herbicides
  - organic solvents, particularly trichloroethylene
- long-term dialysis for advanced kidney disease (suspected)

Risk Factors for Kidney Cancer that Cannot be Changed:

- gender – males are twice as likely to develop cancer of the kidney than females.
- race – African Americans are slightly more likely to develop kidney cancer than Caucasians
- family history of kidney cancer, particularly a sibling
- inherited conditions; e.g.:
  - Von Hippel-Lindau (VHL) Syndrome
  - papillary renal cell carcinoma
  - leiomyoma-renal cell carcinoma
  - Birt-Hogg-Dube Syndrome
  - renal oncocytoma

Factors Protective against Kidney Cancer:

- Risk of kidney cancer can be lowered by managing lifestyle risk factors such as increased physical activity and having a diet high in fruits, vegetables and whole grains.

Early Detection of Cancer of the Kidney:

- There are currently no recommended screening guidelines for kidney cancer – persons at increased risk should discuss screening options with their health care provider.

Data Highlights

Incidence of Kidney Cancer (Tables 10.1 – 10.3, Figures 10.1 – 10.3)

- The 759 kidney cancer cases diagnosed during 2005–2009 in Delaware accounted for 3.0 percent of all cancer cases.
- The majority of kidney cancer cases (2005–2009) were New Castle County residents (422 cases or 55.6 percent), 195 cases (25.7 percent) Sussex County and 142 cases (18.7 percent) Kent County.
- A total of 462 kidney cancer cases (60.9 percent) were male and 297 cases (39.1 percent) were female.

[12] "Kidney cancer" is used instead of "kidney and renal pelvis cancer" throughout this section.

- A total of 615 Caucasian residents comprised 81.0 percent of all kidney cancer cases, African Americans comprised 17.9 percent (136 cases) and eight cases were other or unknown race.
- Kidney cancer incidence was nearly 82 percent higher among males (20.9 per 100,000) than females (11.5 per 100,000) in 2005–2009.
- Kent County has the highest kidney cancer incidence overall, among both males and females and for each of the two race categories.
- Delaware's kidney cancer incidence rates were slightly higher than U.S. estimates in both males and women.
- African American Delawareans had a higher kidney cancer incidence rate (17.9 per 100,000 in 2005–2009) than Caucasians (15.6 per 100,000) but the difference was not significant. This excess among African Americans occurred in both males and females.
- From 1995–1999 through 2005–2009, kidney cancer incidence increased 31.9 percent in Delaware and 33.6 percent nationally. The greatest increase was seen in African American males where the incidence rate doubled from 12.1 per 100,000 in 1995–1999 to 24.3 per 100,000 in 2005–2009.
- Kidney cancer incidence peaked at ages 75-84 among Caucasians but the number of cases was too small to identify any age-specific patterns among African Americans.
- Delawareans ranked 22nd highest in the U.S. for kidney cancer incidence during 2005–2009; males 25th and females 19th (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Kidney Cancer (Tables 10.4 – 10.5, Figures 10.4 – 10.5)

- During 2005–2009, the percentage of kidney cancers diagnosed in Delaware detected at the local, regional and distant stages were 68.2, 15.3 and 12.5 percent respectively. Comparable percentages for the U.S. were 64.8 percent, 15.9 percent and 15.0 percent, respectively.
- In Delaware during 2005–2009, 211 kidney cancer cases (27.8 percent) were diagnosed in the late stages (i.e., regional or distant stage).
- Among those diagnosed with kidney cancer, male African Americans were more likely to have had their cancer diagnosed in the local stage than male Caucasians (80.0 percent vs. 65.9 percent, respectively).
- In Delaware, the percentage of kidney cancer cases diagnosed in the local stage increased from 43.7 percent in 1980–1984 to 68.2 percent in 2005–2009. Concurrently there was a decline in the percentage of cases diagnosed in the regional stage, from 19.1 percent in 1980–1984 to 15.3 percent in 2005–2009, as well as a decline in cases diagnosed in the distant stage, from 29.0 percent in 1980–1984 to 12.5 percent in 2005–2009.

Kidney Cancer Mortality (Tables 10.6 – 10.8, Figures 10.6 – 10.7)

- Deaths from kidney cancer accounted for 2.0 percent of all cancer deaths in Delaware during 2005–2009.
- During 2005–2009, 185 Delawareans died from kidney cancer; 113 males (61.1 percent) and 72 females.
    - Caucasians comprised 82.2 percent of kidney cancer deaths (152 deaths) and African Americans comprised 17.3 percent or 32 deaths.
- A total of 113 deaths (61.1 percent) were from New Castle, 40 deaths (21.6 percent) from Sussex and 32 deaths (17.3 percent) from Kent County.
- The 2005–2009 kidney cancer mortality rate among males was more than twice that observed among females (5.3 per 100,000 versus 2.6 per 100,000).
- Kidney cancer mortality was higher among African Americans than among Caucasians (4.1 per 100,0000 versus 3.6 per 100,000). Mortality rates among African Americans, however, were relatively unstable due to the small number of deaths.
- Kidney cancer mortality in Delaware was highest among African Americans in Sussex County.
- From 1995–1999 through 2005–2009, kidney cancer mortality decreased 4.8 percent nationally and 11.9 percent in Delaware; 15.1 percent decline among Caucasian and 5.6 percent decline among African American Delawareans.

- Delaware mortality data were too sparse to determine age-specific patterns but national data have shown that mortality from kidney cancer peaked at ages 85+ for males and ages 75-79 for women.
- During 2005–2009, Delaware's rank in mortality from kidney cancer was 37th in the nation. Delaware males ranked 40th and Delaware females ranked 26th in kidney cancer mortality (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Kidney Cancer Incidence

Table 10.1. Number of Kidney Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	759	462	297	615	379	236	136	80	56
Kent	142	89	53	111	67	44	30	22	8
New Castle	422	253	169	330	203	127	86	47	39
Sussex	195	120	75	174	109	65	20	11	9

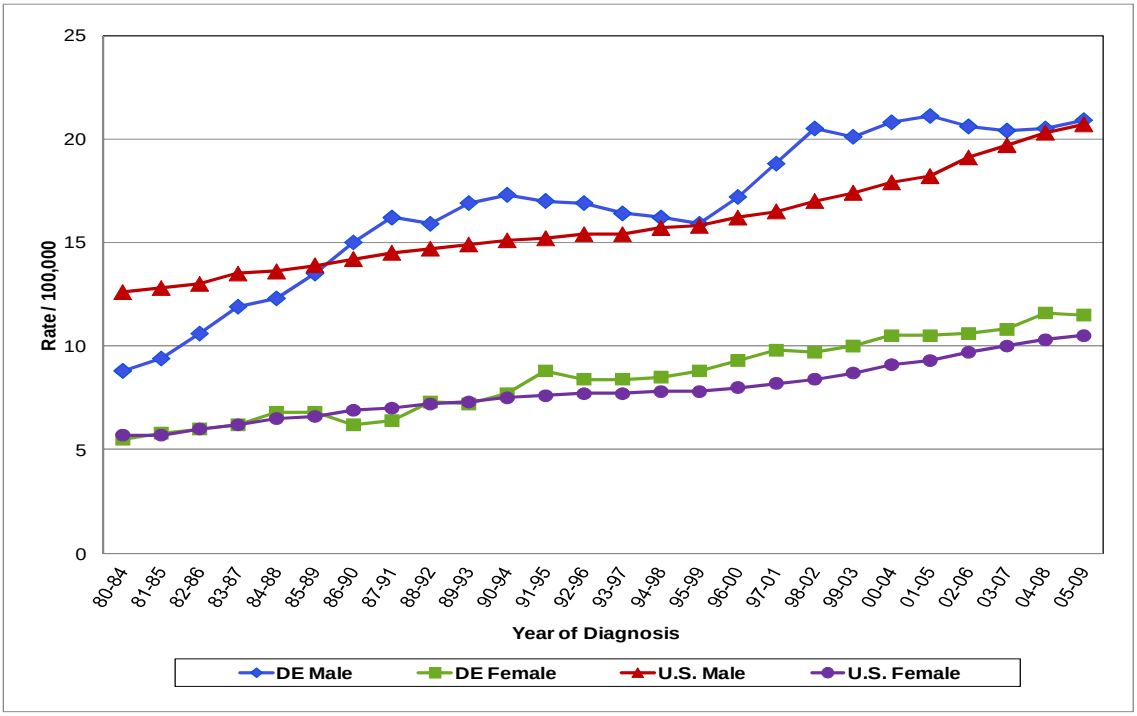
7SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 10.2. Five-Year Average Age-Adjusted Kidney Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	15.1 (15.0 , 15.2)	20.7 (20.5 , 21.0)	10.5 (10.4 , 10.6)
Delaware	15.7 (14.6 , 16.9)	20.9 (19.1 , 23.0)	11.5 (10.2 , 12.9)
Kent	18.5 (15.6 , 21.9)	24.8 (19.9 , 30.6)	12.9 (9.7 , 17.0)
New Castle	15.5 (14.1 , 17.1)	20.8 (18.3 , 23.5)	11.5 (9.8 , 13.4)
Sussex	15.0 (12.9 , 17.4)	19.7 (16.2 , 23.8)	10.9 (8.5 , 13.9)
CAUCASIAN			
United States	15.5 (15.4 , 15.6)	21.2 (20.9 , 21.4)	10.7 (10.6 , 10.9)
Delaware	15.6 (14.4 , 16.9)	20.8 (18.8 , 23.1)	11.2 (9.8 , 12.8)
Kent	18.6 (15.3 , 22.4)	23.7 (18.3 , 30.3)	13.9 (10.0 , 18.7)
New Castle	15.4 (13.8 , 17.2)	21.0 (18.1 , 24.1)	11.1 (9.2 , 13.2)
Sussex	14.7 (12.5 , 17.3)	19.7 (16.0 , 24.2)	10.2 (7.7 , 13.4)
AFRICAN AMERICAN			
United States	17.2 (16.8 , 17.6)	24.3 (23.6 , 25.1)	12.0 (11.5 , 12.4)
Delaware	17.9 (15.0 , 21.3)	24.3 (19.0 , 30.5)	13.0 (9.8 , 17.0)
Kent	20.9 (14.0 , 29.9)	---	---
New Castle	17.4 (13.7 , 21.6)	21.4 (15.4 , 28.9)	14.2 (10.0 , 19.5)
Sussex	---	---	---

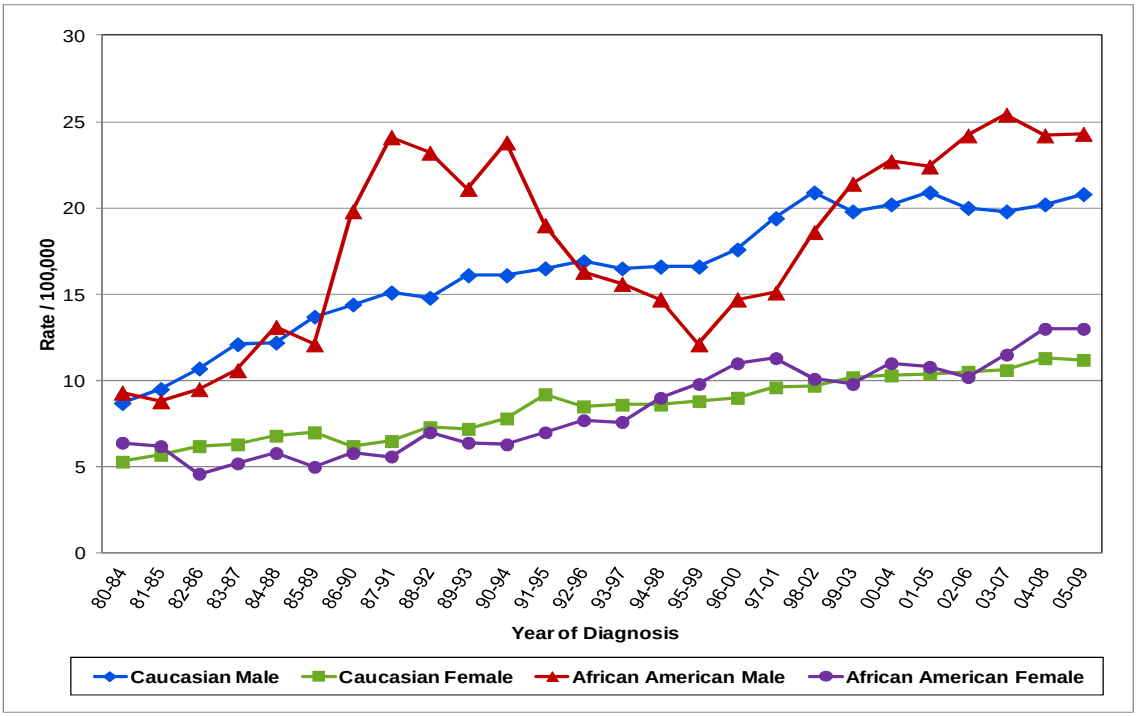
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 10.1. Five-Year Average Age-Adjusted Kidney Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 10.2. Five-Year Average Age-Adjusted Kidney Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



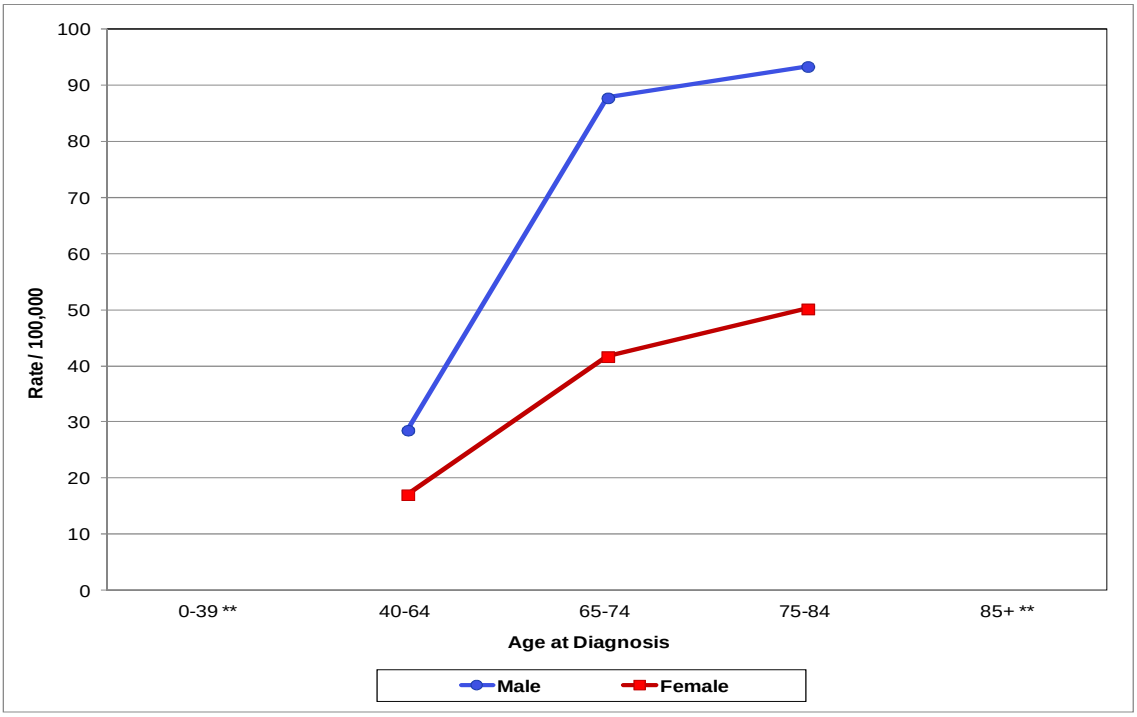
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 10.3. Age-Specific Kidney Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	1.9	---	---	1.7	---	---	---	---	---
40-64	22.6	28.6	17.1	23.0	28.9	17.4	25.0	33.1	28.0
65-74	63.0	87.8	41.7	60.2	86.6	37.2	85.2	---	---
75-84	68.5	93.4	50.2	610.4	91.1	53.2	---	---	---
85+	34.3	---	---	36.1	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 10.3. Age-Specific Kidney Cancer Incidence Rates by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population. ** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Kidney Cancer by Stage

Table 10.4. Number of Kidney Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	517	315	202	409	249	160	102	64	38
Regional	116	69	47	100	62	38	15	7	8
Distant	95	57	38	82	---	---	12	---	---
Unknown	30	20	10	23	---	---	7	---	---
Total	758	461	297	614	378	236	136	80	56

--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 10.5. Percent of Kidney Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	68.2	68.3	68.0	66.6	65.9	67.8	75.0	80.0	67.9
Regional	15.3	15.0	15.8	16.3	16.4	16.1	11.0	8.8	14.3
Distant	12.5	12.4	12.8	13.4	13.5	13.1	8.8	---	12.5
Unknown	4.0	4.3	3.4	3.7	4.2	3.0	5.1	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

--- = Percentages based on cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 10.4. Percent of Kidney Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009

Figure 10.4a. Delaware: 2005–2009

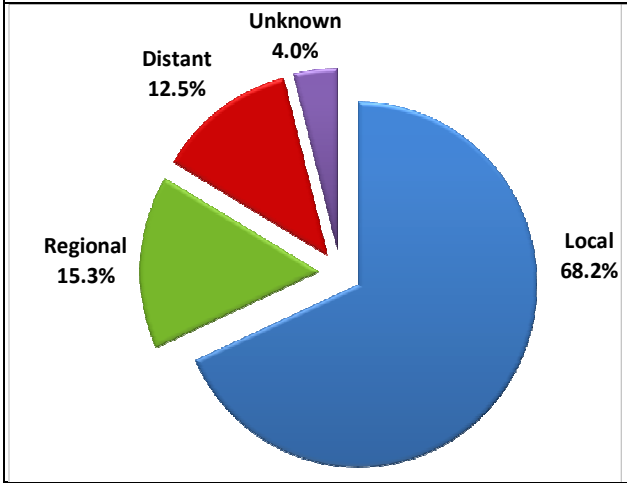
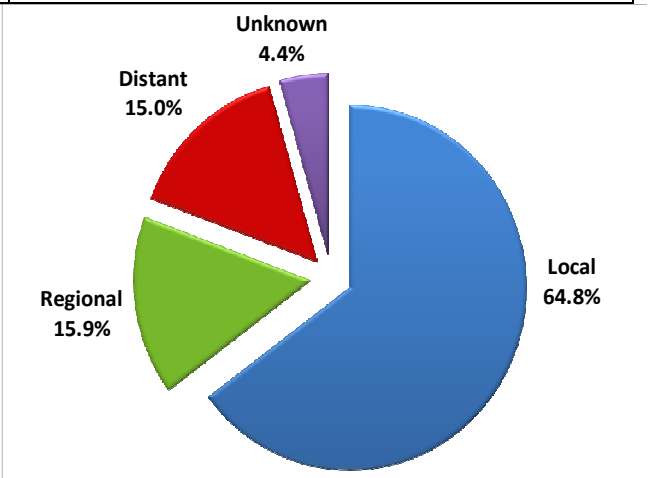
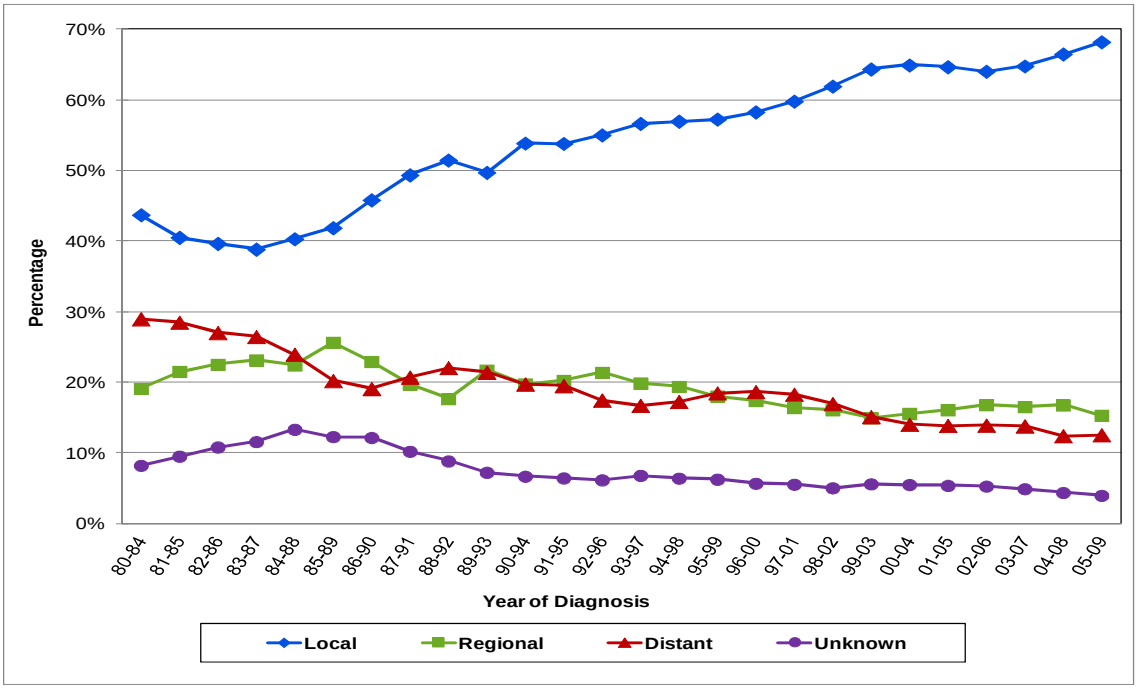


Figure 10.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 10.5. Percent of Kidney Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Kidney Cancer Mortality

Table 10.6. Number of Kidney Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	185	113	72	152	98	54	32	14	18
Kent	32	17	15	27	13	14	---	---	---
New Castle	113	72	41	93	64	29	19	7	12
Sussex	40	24	16	32	21	11	---	---	---

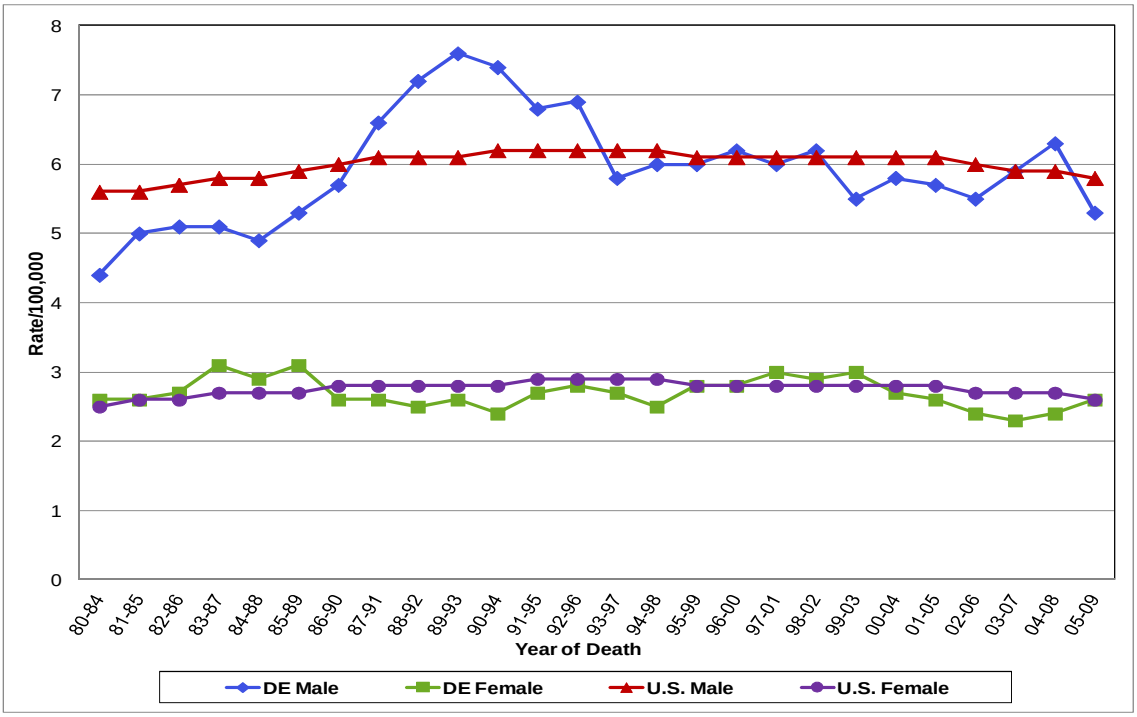
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 10.7. Five-Year Average Age-Adjusted Kidney Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	4.0 (4.0 , 4.0)	5.8 (5.8 , 5.9)	2.6 (2.6 , 2.6)
Delaware	3.7 (3.2 , 4.3)	5.3 (4.3 , 6.4)	2.6 (2.1 , 3.3)
Kent	4.2 (2.9 , 6.0)	---	---
New Castle	4.2 (3.4 , 5.0)	6.2 (4.8 , 7.9)	2.8 (2.0 , 3.8)
Sussex	2.9 (2.1 , 4.1)	---	---
CAUCASIAN			
United States	4.1 (4.0 , 4.1)	5.9 (5.9 , 6.0)	2.7 (2.6 , 2.7)
Delaware	3.6 (3.1 , 4.2)	5.4 (4.4 , 6.6)	2.3 (1.7 , 3.0)
Kent	4.4 (2.9 , 6.5)	---	---
New Castle	4.2 (3.4 , 5.2)	6.8 (5.2 , 8.7)	2.4 (1.6 , 3.5)
Sussex	2.3 (1.6 , 3.3)	---	---
AFRICAN AMERICAN			
United States	4.0 (3.9 , 4.1)	6.0 (5.8 , 6.2)	2.6 (2.5 , 2.7)
Delaware	4.1 (2.8 , 5.9)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

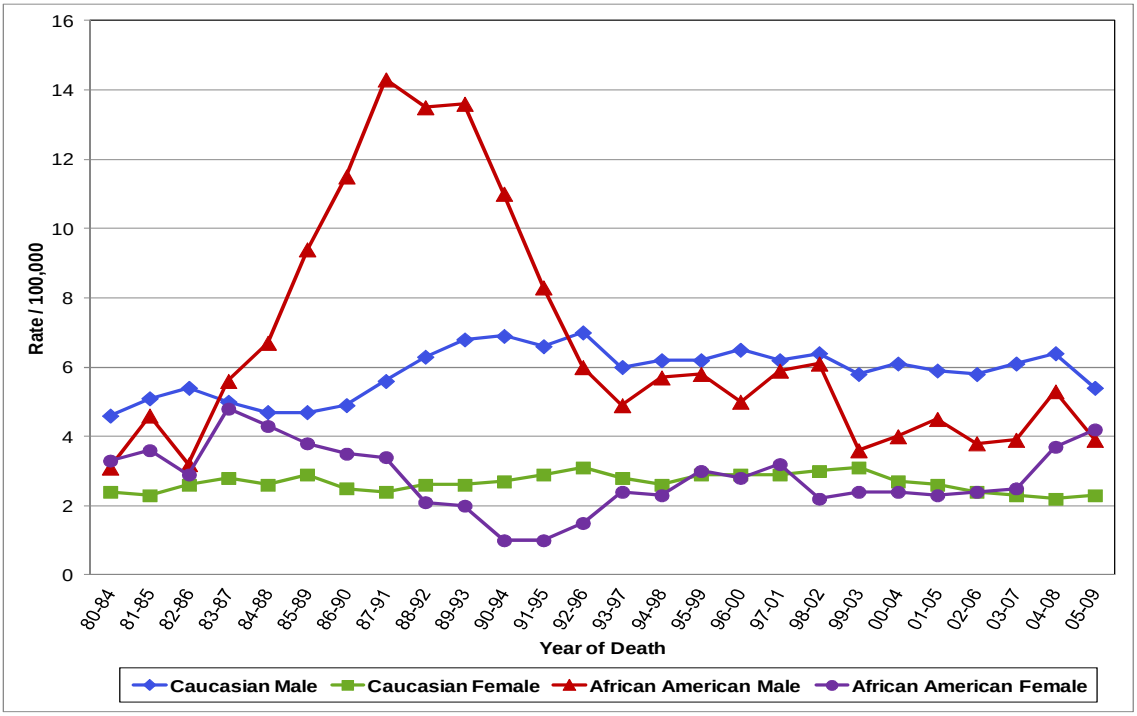
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 10.6. Five-Year Average Age-Adjusted Kidney Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 10.7. Five-Year Average Age-Adjusted Kidney Cancer Mortality Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 10.8. Age-Specific Kidney Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	3.6	5.1	---	3.0	4.6	---	---	---	---
65-74	15.6	17.7	---	17.0	---	---	---	---	---
75-84	24.9	42.0	---	25.4	43.2	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 10.8. Age-Specific Kidney Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 10.8 is not displayed because of the small number of deaths.

11. LARYNGEAL CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Laryngeal Cancer:

- tobacco use
- long-term exposure to secondhand smoke (suspected)
- moderate or heavy use of alcohol (more than one drink per day)
- combined use of alcohol and tobacco multiplies risk
- poor nutrition and/or low intake of vitamin A

Environmental and Medically-Related Causes of Laryngeal Cancer:

- long and intense occupational exposures to wood dust, paint fumes
- long and intense occupational exposure to chemicals used in metalworking, petroleum, plastics and textile industries sulfuric acid and mustard gas
- occupational exposures to asbestos, cutting oil mist and nickel smelting (suspected)
- gastroesophageal reflux disease (GERD) (suspected)

Risk Factors for Laryngeal Cancer that Cannot be Changed:

- genetic syndromes: Fanconi anemia and dyskeratosis congenita
- gender – four times more common in men than women
- age – more than half of cases are older than 65 at diagnosis
- ethnicity – more common among non-Hispanic (both Caucasians and African Americans)

Factors Protective against Laryngeal **Cancer:**

- Risk of laryngeal cancer can be lowered by managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), tobacco and alcohol use, and physical activity.

Early Detection of Laryngeal Cancer:

- There are no screening tests for laryngeal cancer in asymptomatic individuals.

Data Highlights

Incidence of Laryngeal Cancer (Tables 11.1 **–** 11.3, Figures 11.1 – 11.2)

- The 195 laryngeal cancer cases diagnosed during 2005–2009 in Delaware accounted for less than one percent (0.78 percent) of all cancer cases.
- The majority of laryngeal cancer cases (2005–2009) were New Castle County residents (113 cases or 57.9 percent), 48 cases (24.6 percent) Sussex County and 34 cases (17.4 percent) Kent County.
- The majority of laryngeal cancer cases were male (141 or 72.3 percent) and 54 (27.7 percent) female.
- Caucasians comprised 78.5 percent (153 cases) of all laryngeal cancer cases in 2005–2009, African Americans comprised 20.5 percent (40 cases) and two cases were other or unknown race.
- In Delaware, incidence of laryngeal cancer was more than three times higher among males (6.2 per 100,000) than females (2.0 per 100,000) in 2005–2009 and the difference was even greater nationally (6.2 per 100,000 male vs. 1.3 per 100,0000 female).

- In Delaware, Caucasian females had a significantly higher laryngeal cancer incidence rate (1.9 per 100,000) than the U.S. estimate (1.3 per 100,000).
- Among males, African Americans had a higher laryngeal cancer incidence rate than Caucasians, both in Delaware (9.9 per 100,000 AA vs. 5.8 per 100,000 C) and nationally (9.9 per 100,000 AA vs. 6.1 per 100,000 C) but neither difference was statistically significant.
- Incidence of laryngeal cancer incidence has declined both in Delaware and nationally. From 1995–1999 through 2005–2009, U.S. incidence declined 19.0 percent while incidence in Delaware declined 27.8 percent; 31.5 percent among Caucasians and 8.2 percent among African Americans.
- U.S. data have shown that laryngeal cancer incidence peaked at ages 75-79 with a less-pronounced secondary peak in the 0-4 age group.
- Delawareans ranked 26th in the U.S. for laryngeal cancer incidence during 2005–2009; males ranked 37th and females ranked seventh (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Laryngeal Cancer (Tables 11.4 – 11.5, Figures 11.4 – 11.5)

- During 2005–2009, the percentage of laryngeal cancers diagnosed in Delaware detected at the local, regional and distant stages were 59.5, 22.6 and 14.9 percent respectively. Comparable percentages for the U.S. were 58.4 percent, 20.1 percent and 17.8 percent, respectively.
- Among those diagnosed with laryngeal cancer, African Americans were more than three times more likely to have had their cancer diagnosed in the distant stage than Caucasians (32.5 percent vs. 9.8 percent, respectively).
- In Delaware, the percentage of laryngeal cancer cases diagnosed in the local stage decreased from 67.2 percent in 1980–1984 to 59.5 percent in 2005–2009. Consequently there was an increase in cases diagnosed in the regional and distant stages, from 30.2 percent in 1980–1984 to 37.4 percent in 2005–2009.

Laryngeal Cancer Mortality (Tables 11.6 – 11.7, Figures 11.6 – 11.7)

- The 66 deaths (52 male and 14 female) from laryngeal cancer accounted for less than one percent (0.73 percent) of all cancer deaths in Delaware during 2005–2009.
    - Caucasians comprised 72.7 percent (48 deaths) of laryngeal cancer decedents, African Americans 25.8 percent (17 deaths) and one death was other or unknown race.
- A total of 33 deaths (50.0 percent) were from New Castle, 21 deaths (31.8 percent) from Sussex and 12 deaths (18.2 percent) from Kent County.
- The 2005–2009 laryngeal cancer mortality rate was 4.8 times higher among males (2.4 per 100,000) than females (0.5 per 100,000).
- Laryngeal cancer mortality was twice as high among African American (2.4 per 100,000) than among Caucasian (1.2 per 100,000) Delawareans during 2005–2009. Mortality rates among African Americans, however, were relatively unstable due to the smaller number of deaths.
- Mortality from laryngeal cancer has declined 23.5 percent among Delawareans and 20.0 percent nationally since 1995–1999. The decline has been greater among African Americans than Caucasians (36.1 percent vs. 20.0 percent).
- Although mortality data from Delaware were limited, laryngeal cancer mortality rates in Delaware were comparable to those seen nationally.
- U.S. data have shown that mortality from laryngeal cancer peaked at ages 85+ in males and ages 75-79 in women.
- Delaware ranked tenth highest in the nation for mortality from laryngeal cancer during 2005–2009. Delaware males ranked 16th highest in mortality from cancer of the larynx but there were insufficient data to calculate a rate for females (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 11.1. Number of Laryngeal Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	195	141	54	153	110	43	40	30	10
Kent	34	24	10	28	19	9	---	---	---
New Castle	113	79	34	83	59	24	29	20	9
Sussex	48	38	10	42	32	10	---	---	---

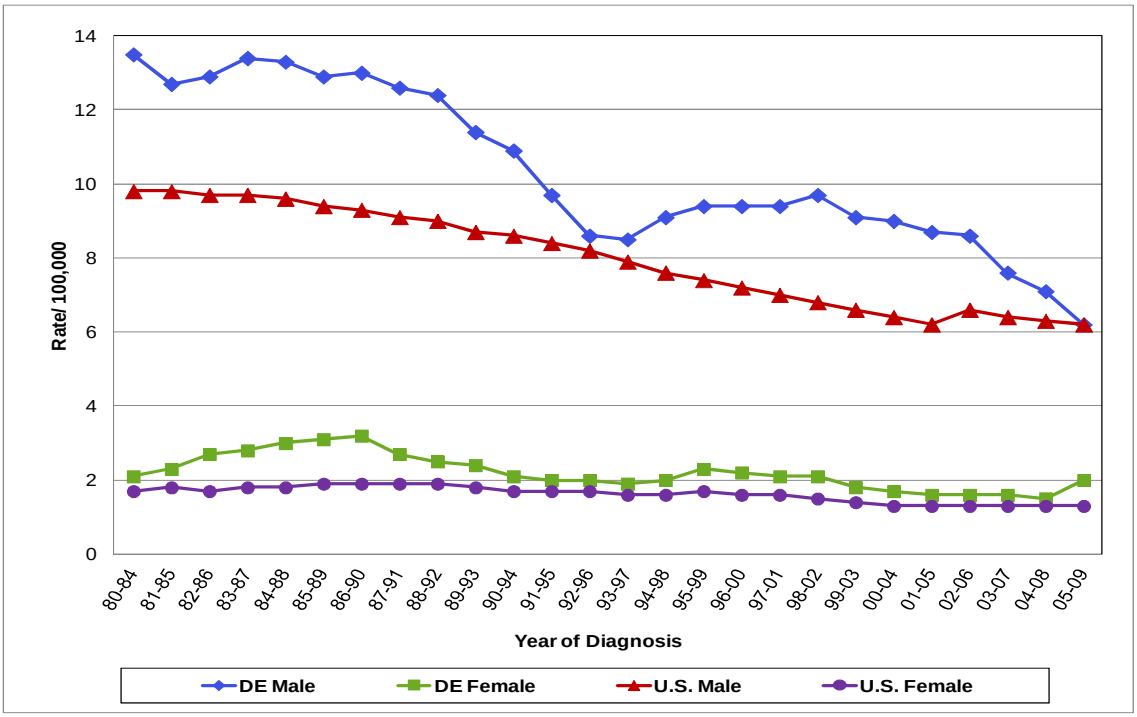
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 11.2. Five-Year Average Age-Adjusted Laryngeal Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION ALL RACES	All	Male	Female
United States	3.4 (3.4 , 3.5)	6.2 (6.0 , 6.3)	1.3 (1.2 , 1.3)
Delaware	3.9 (3.4 , 4.5)	6.2 (5.2 , 7.3)	2.0 (1.5 , 2.6)
Kent	4.3 (3.0 , 6.1)	---	---
New Castle	4.0 (3.3 , 4.8)	6.1 (4.8 , 7.7)	2.2 (1.5 , 3.1)
Sussex	3.4 (2.5 , 4.6)	5.8 (4.0 , 8.0)	---
CAUCASIAN			
United States	3.5 (3.4 , 3.5)	6.1 (6.0 , 6.3)	1.3 (1.2 , 1.3)
Delaware	3.7 (3.2 , 4.4)	5.8 (4.8 , 7.1)	1.9 (1.4 , 2.6)
Kent	4.5 (3.0 , 6.5)	---	---
New Castle	3.7 (3.0 , 4.6)	5.8 (4.4 , 7.5)	---
Sussex	3.3 (2.4 , 4.6)	5.4 (3.7 , 7.9)	---
AFRICAN AMERICAN			
United States	5.2 (4.9 , 5.4)	9.9 (9.5 , 10.5)	1.8 (1.6 , 1.9)
Delaware	5.4 (3.9 , 7.5)	9.9 (6.5 , 14.5)	---
Kent	---	---	---
New Castle	5.7 (3.8 , 8.3)	---	---
Sussex	---	---	---

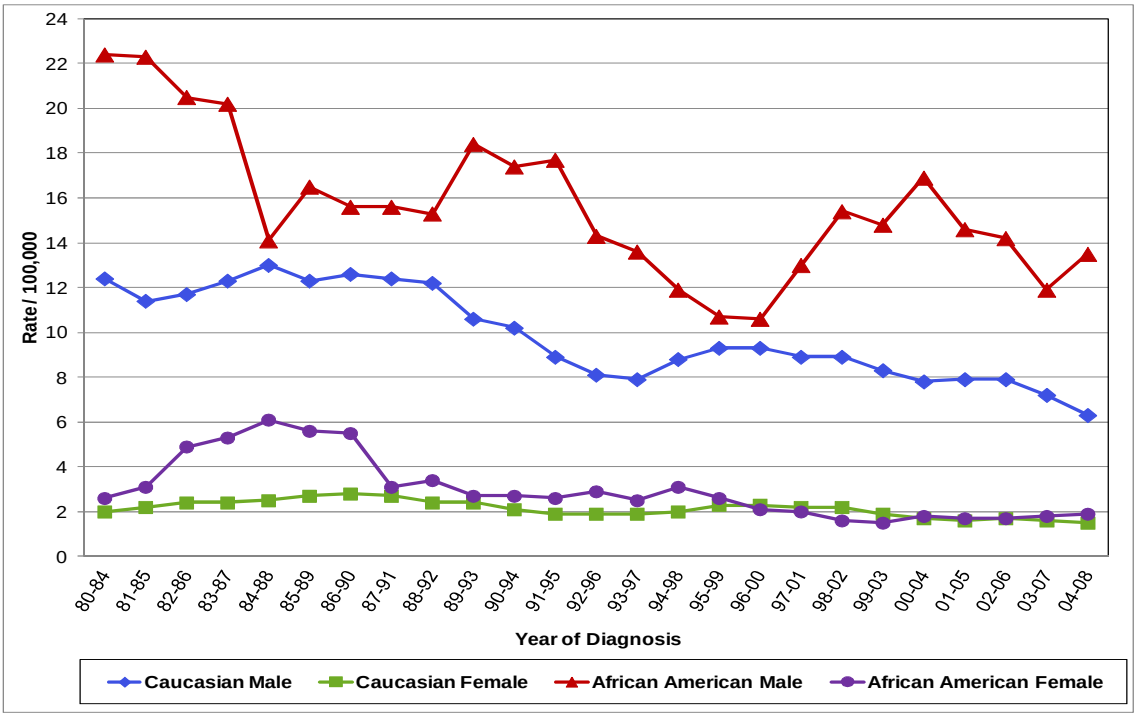
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 11.1. Five-Year Average Age-Adjusted Laryngeal Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 11.2. Five-Year Average Age-Adjusted Laryngeal Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 11.3. Age-Specific Laryngeal Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	6.1	8.9	3.5	5.9	8.4	---	---	---	---
65-74	18.6	31.8	---	18.1	31.3	---	---	---	---
75-84	13.8	---	---	---	---	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 11.3. Age-Specific Laryngeal Cancer Incidence Rates by Race; Delaware, 2005–2009

NOTE: Figure 11.3 is not displayed because of the small number of cases.

Laryngeal Cancer by Stage

Table 11.4. Number of Laryngeal Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	116	85	31	97	70	27	18	---	---
Regional	44	29	15	36	25	11	8	---	---
Distant	29	22	7	15	---	---	13	---	---
Unknown	---	---	---	---	---	---	---	---	---
Total	195	141	54	153	110	43	40	30	10

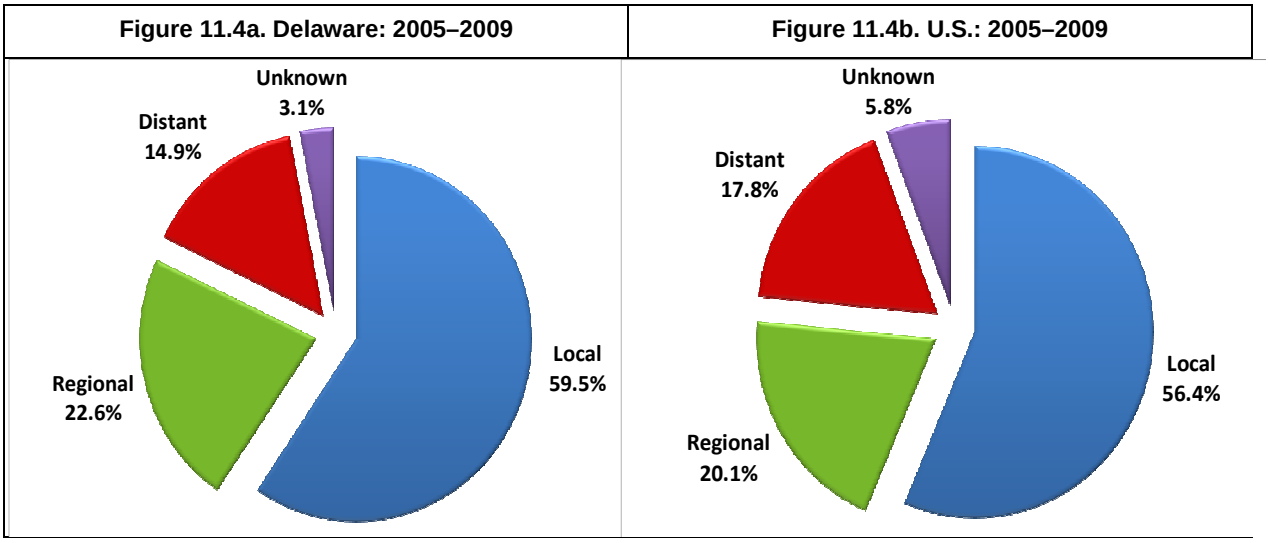
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 11.5. Percent of Laryngeal Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	59.5	60.3	57.4	63.4	63.6	62.8	45.0	---	---
Regional	22.6	20.6	27.8	23.5	22.7	25.6	20.0	---	---
Distant	14.9	15.6	13.0	9.8	---	---	32.5	---	---
Unknown	3.1	---	---	---	---	---	---	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

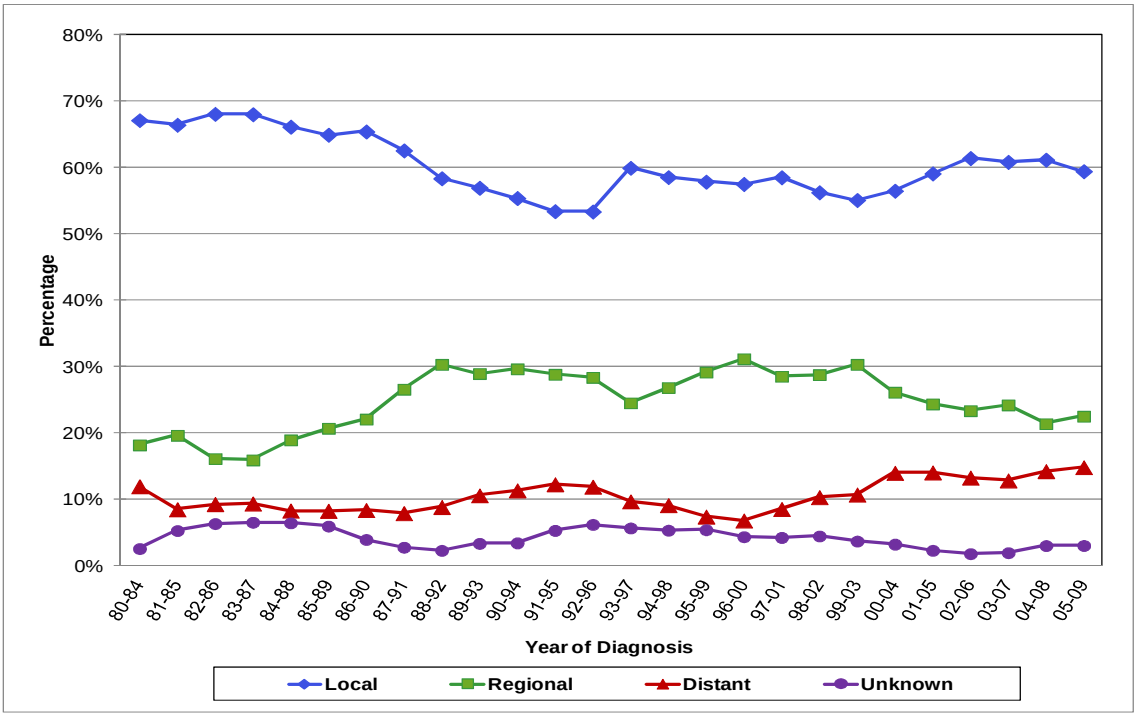
--- = Percents are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 11.4. Percent of Laryngeal Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 11.5. Percent of Laryngeal Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 11.6. Number of Laryngeal Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	66	52	14	48	36	12	17	---	---
Kent	12	---	---	---	---	---	---	---	---
New Castle	33	---	---	22	---	---	11	---	---
Sussex	21	15	6	---	---	---	---	---	---

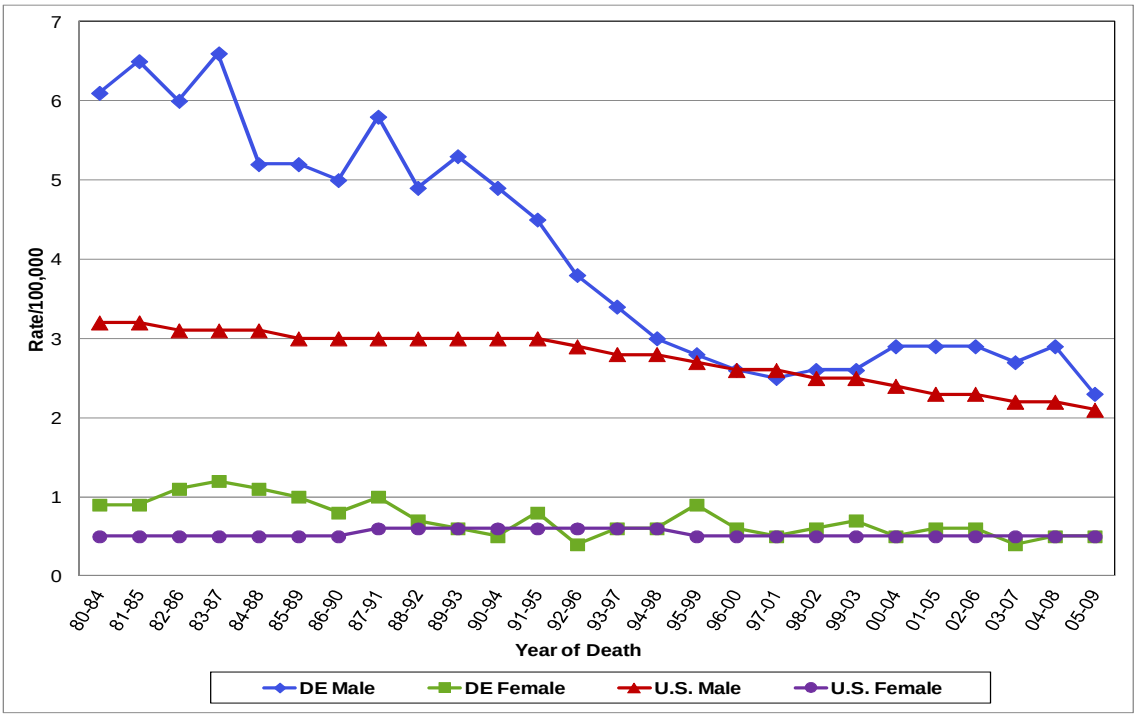
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 11.7. Five-Year Average Age-Adjusted Laryngeal Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	1.2 (1.2 , 1.2)	2.1 (2.1 , 2.1)	0.5 (0.4 , 0.5)
Delaware	1.4 (1.0 , 1.7)	2.4 (1.8 , 3.1)	---
Kent	---	---	---
New Castle	1.2 (0.8 , 1.7)	---	---
Sussex	---	---	---
CAUCASIAN			
United States	1.1 (1.1 , 1.1)	2.0 (1.9 , 2.0)	0.4 (0.4 , 0.5)
Delaware	1.2 (0.9 , 1.6)	2.0 (1.4 , 2.7)	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---
AFRICAN AMERICAN			
United States	2.1 (2.0 , 2.2)	4.2 (4.0 , 4.4)	0.7 (0.6 , 0.7)
Delaware	---	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

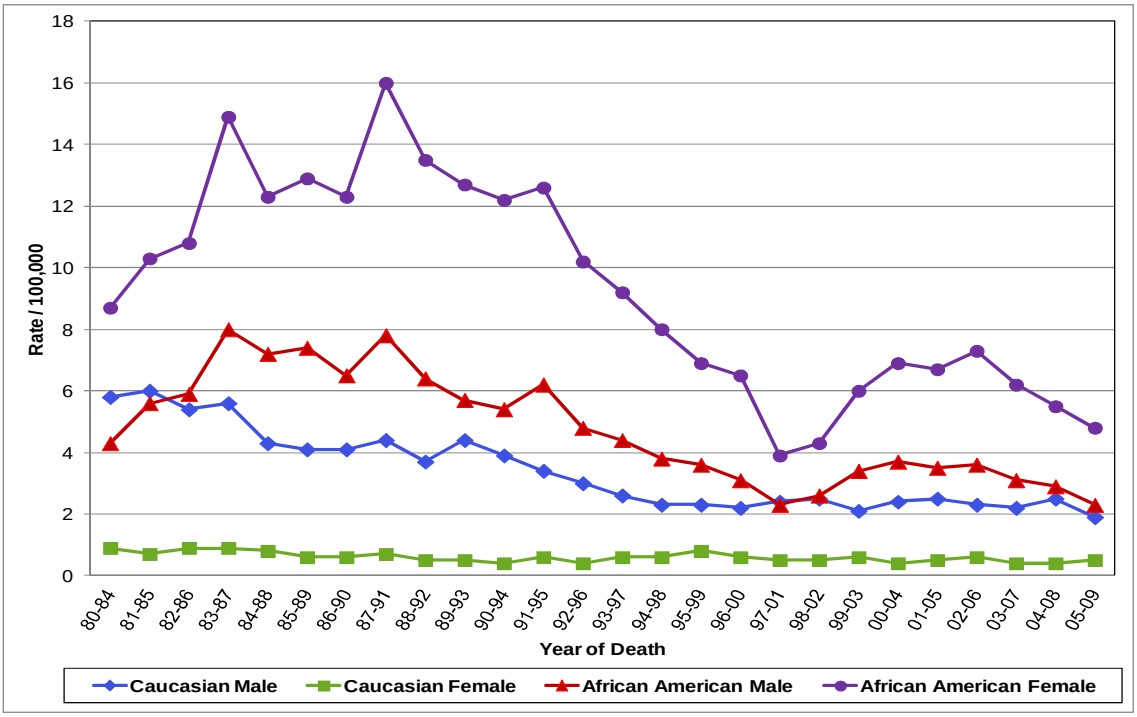
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 11.6. Five-Year Average Age-Adjusted Laryngeal Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 11.7. Five-Year Average Age-Adjusted Laryngeal Cancer Mortality Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 11.8 & Figure 11.8. Age-Specific Laryngeal Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Table 11.8 and Figure 11.8 are not displayed because of the small number of deaths.

12. LEUKEMIA

Risk Factors and Early Detection

Classifications of Leukemia:

Leukemias are grouped based on how quickly the disease develops: chronic or acute. Types of leukemia are also grouped based on the type of white blood cell that is affected; lymphoid cells (lymphoid, lymphocytic or lymphoblastic leukemia) or myeloid cells (myelogenous or myeloblastic leukemia).

The four common types of leukemia are:

- chronic lymphocytic leukemia (CLL): CLL affects lymphoid cells and usually grows slowly. CLL occurs most often among persons age 40 and over and almost never affects children.
- chronic myeloid leukemia (CML): CML affects myeloid cells and usually grows slowly at first. CML mainly affects adults.
- acute lymphocytic (lymphoblastic) leukemia (ALL): ALL affects lymphoid cells and grows quickly. ALL is the most common type of leukemia in young children and it also affects adults.
- acute myeloid leukemia (AML): AML affects myeloid cells and grows quickly. AML occurs in both adults and children.

Lifestyle Risk Factors for Leukemia:

- cigarette smoking (AML)

Environmental and Medically-Related Causes of Leukemia:

- very high levels of exposure to ionizing radiation from diagnostic x-rays, radiation therapy or atomic bomb explosions (AML, CML or ALL)
- exposure to benzene in the workplace or from cigarette smoke or gasoline (AML, CML or ALL).
- chemotherapy, especially alkylating agents (AML or ALL)
- exposure to low level solvent and metal mixtures (suspected)
- exposure to electromagnetic fields (e.g. from power lines) (suspected)

Risk Factors for Leukemia that Cannot be Changed:

- Down syndrome and certain other genetic conditions (acute leukemia)
- certain blood disorders such as myelodysplastic syndrome (AML)

Factors Protective against Leukemia:

- Risk of leukemia can be lowered by eliminating exposure to tobacco products.

Early Detection of Leukemia:

- No standardized screening tests have been shown to improve leukemia outcomes. Persons with risk factors for leukemia should discuss testing options with their health care provider.

Data Highlights

Leukemia Incidence (Tables 12.1 – 12.3, Figures 12.1 – 12.3)

- A total of 592 cases of leukemia were diagnosed in Delaware during 2005–2009, which accounted for 2.4 percent of all cancer cases diagnosed during that time period.
- More males were diagnosed than females; 339 males (57.3 percent) and 253 females (42.7 percent). Most cases were Caucasian (487cases or 82.3 percent), 88 cases (14.9 percent) were African American and 17 cases (2.4 percent) were other or unknown race.
- For both Caucasian and African American Delawareans, leukemia incidence rates were similar to those seen nationwide, both among males and females.
- In both Delaware and the U.S., leukemia incidence among males was significantly higher than that among females. This pattern of statistical significance was seen among Caucasians and African Americans in Delaware and nationwide, where adequate data were available.
- Nationwide, leukemia incidence rates were significantly higher among Caucasians than African Americans for both males and females. In Delaware, the difference in incidence rates between African Americans and Caucasians for either sex was minimal and not statistically significant
- From 1995–1999 through 2005–2009, Delaware's leukemia incidence rates increased 9.5 percent for males and 8.0 percent for females. In contrast, the U.S. leukemia incidence rate decreased 7.5 percent for males and 3.0 percent for females.
- During this same time period among Caucasians, Delaware's leukemia incidence rate increased 3.9 and 9.0 percent for male and female Caucasians and 14.5 percent for African American males. Among African American females, however, leukemia incidence decreased 9.5 percent.
- Among Caucasians in Delaware during 2005–2009, leukemia incidence increased with increasing age; from 3.7 per 100,000 in those less than 40 to 85.1 per 100,000 among those ages 85 and older. Data were too sparse to examine age-specific incidence patterns among African Americans.
- During 2005–2009, Delawareans ranked 28th highest in the U.S. for incidence of leukemia. Males ranked 28th and females ranked 31st in leukemia incidence (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Leukemia

- Leukemia is not staged as local, regional and distant.

Leukemia Mortality (Tables 12.4 – 12.6, Figures 12.4 – 12.5)

- There were 326 deaths from leukemia during 2005–2009 that accounted for 3.6 percent of all cancer deaths in Delaware.
- Of the Delaware residents who died from leukemia, 58.6 percent (191 deaths) were male and 49.4 percent (135 deaths) were female. Eighty-eight percent (288 deaths) were Caucasian. 11.0 percent (36 deaths) were African American and two deaths were other or unknown race.
- Delaware's 2005–2009 leukemia mortality rate (6.8 per 100,000) was not significantly different from that of the U.S. (7.1 per 100,000).
- For 2005–2009, at both the state and national levels, leukemia mortality was significantly higher among males than females.
- From 1995–1999 to 2005–2009, Delaware's leukemia mortality rate dropped 17.7 and 14.0 percent for males and females, respectively, while the U.S. rate dropped 7.7 and 10.2 percent, respectively.
- Leukemia mortality decreased by 21.7 and 6.9 percent among male and female Caucasians, respectively. Mortality among African Americans, however, was disparate, with a 62.3 percent decrease among females but a 19.7 percent increase among males.
- Delaware's largest rate decline occurred among African American females, with a decrease of 37.3 percent during the last 10 five-year time periods (1995–1999 through 2005–2009).
- Limited age-specific data have shown that mortality from leukemia increased with age in Caucasians; from 4.6 per 100,000 in ages 40-64 to 75.1 per 100,000 in ages 85+.

- During 2005–2009, Delaware ranked 33rd highest in the nation in mortality from leukemia; males ranked 31st and females ranked 41st (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Leukemia Incidence

Table 12.1. Number of Leukemia Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	592	339	253	487	279	208	88	52	36
Kent	77	41	36	66	36	30	8	---	---
New Castle	347	198	149	285	161	124	51	32	19
Sussex	168	100	68	136	82	54	29	---	---

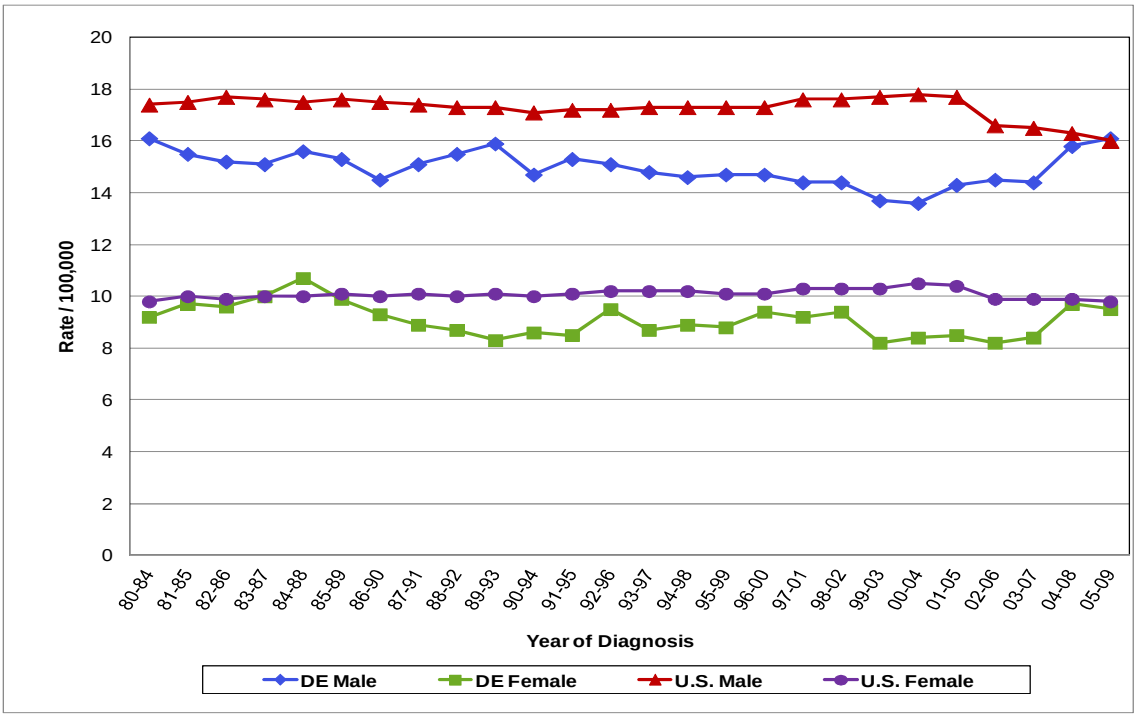
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 12.2. Five-Year Average Age-Adjusted Leukemia Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	12.5 (12.4 , 12.6)	16.0 (15.8 , 16.2)	9.8 (9.6 , 9.9)
Delaware	12.4 (11.4 , 13.5)	16.1 (14.4 , 18.0)	9.5 (8.4 , 10.8)
Kent	10.0 (7.9 , 12.5)	12.0 (8.5 , 16.3)	8.5 (5.9 , 11.8)
New Castle	12.9 (11.6 , 14.4)	17.0 (14.7 , 19.6)	9.9 (8.3 , 11.6)
Sussex	12.8 (10.8 , 15.0)	16.9 (13.6 , 20.8)	9.4 (7.2 , 12.1)
CAUCASIAN			
United States	13.1 (12.9 , 13.2)	16.8 (16.6 , 17.0)	10.2 (10.0 , 10.3)
Delaware	12.4 (11.3 , 13.6)	16.0 (14.2 , 18.1)	9.6 (8.3 , 11.1)
Kent	11.2 (8.6 , 14.2)	13.7 (9.5 , 19.1)	9.3 (6.2 , 13.4)
New Castle	13.4 (11.9 , 15.1)	17.4 (14.8 , 20.3)	10.4 (8.6 , 12.5)
Sussex	10.8 (9.0 , 13.0)	14.4 (11.3 , 18.2)	7.9 (5.9 , 10.7)
AFRICAN AMERICAN			
United States	9.7 (9.4 , 10.0)	12.5 (11.9 , 13.1)	7.8 (7.5 , 8.2)
Delaware	11.6 (9.2 , 14.4)	15.6 (11.4 , 20.9)	8.5 (5.9 , 11.8)
Kent	---	---	---
New Castle	10.2 (7.5 , 13.6)	14.4 (9.4 , 20.9)	---
Sussex	25.7 (17.1 , 36.9)	---	---

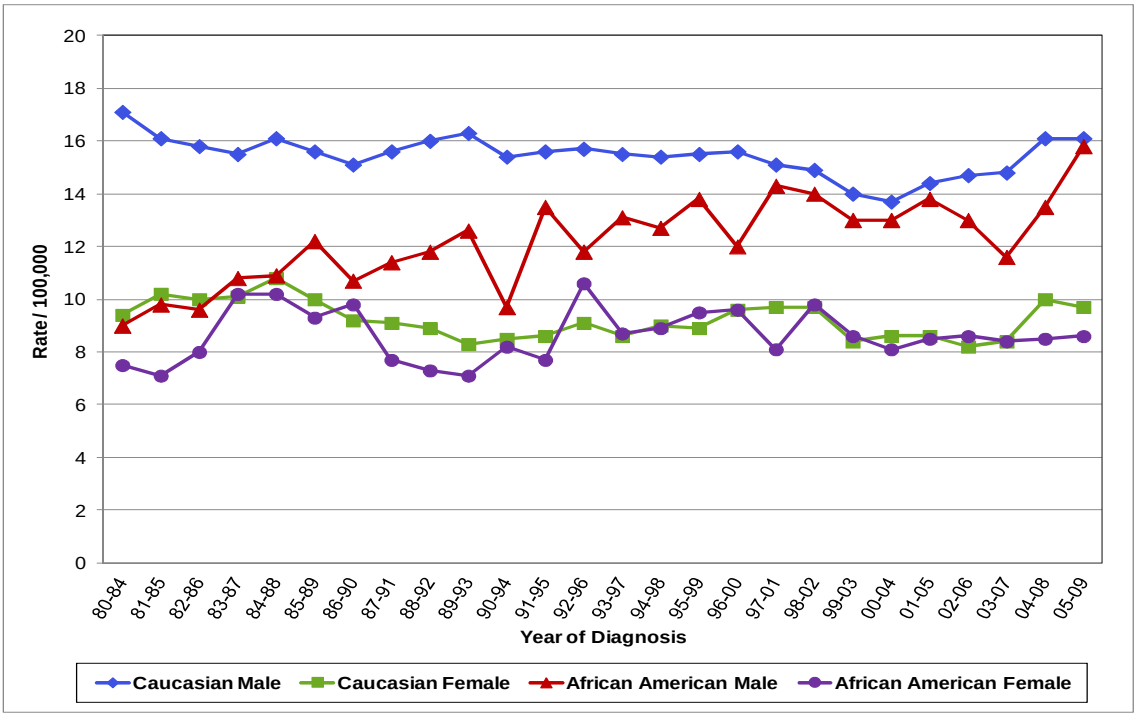
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 12.1. Five-Year Average Age-Adjusted Leukemia Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 12.2. Five-Year Average Age-Adjusted Leukemia Incidence Rates* by Race and Sex; Delaware, 1980–2009



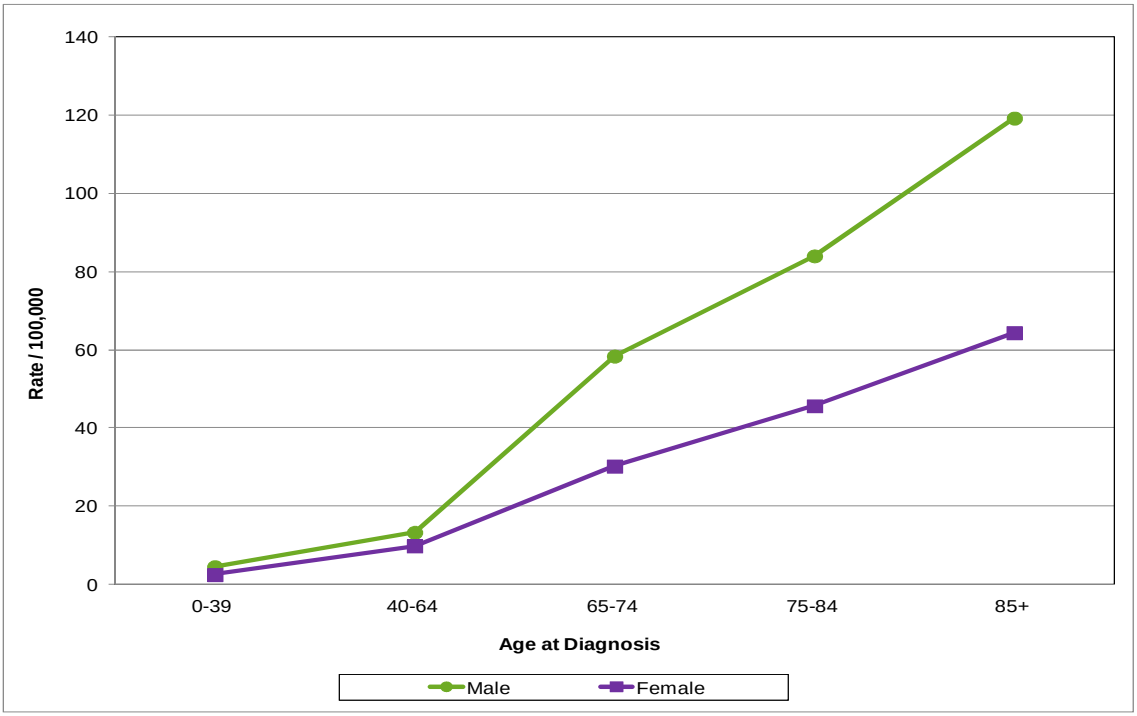
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 12.3. Age-Specific Leukemia Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	3.6	4.6	2.6	3.7	4.6	---	---	---	---
40-64	11.6	13.4	9.9	10.8	12.1	9.7	13.9	---	---
65-74	43.2	58.4	30.3	43.1	57.4	30.8	---	---	---
75-84	61.3	84.0	45.7	63.5	89.4	45.1	---	---	---
85+	81.4	119.2	64.4	85.1	124.7	67.1	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 12.3. Age-Specific Leukemia Incidence Rates by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Leukemia Mortality

Table 12.4. Number of Leukemia Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	326	191	135	288	164	124	36	25	11
Kent	41	22	19	---	---	---	---	---	---
New Castle	202	116	86	179	100	79	21	14	7
Sussex	83	53	30	---	---	---	---	---	---

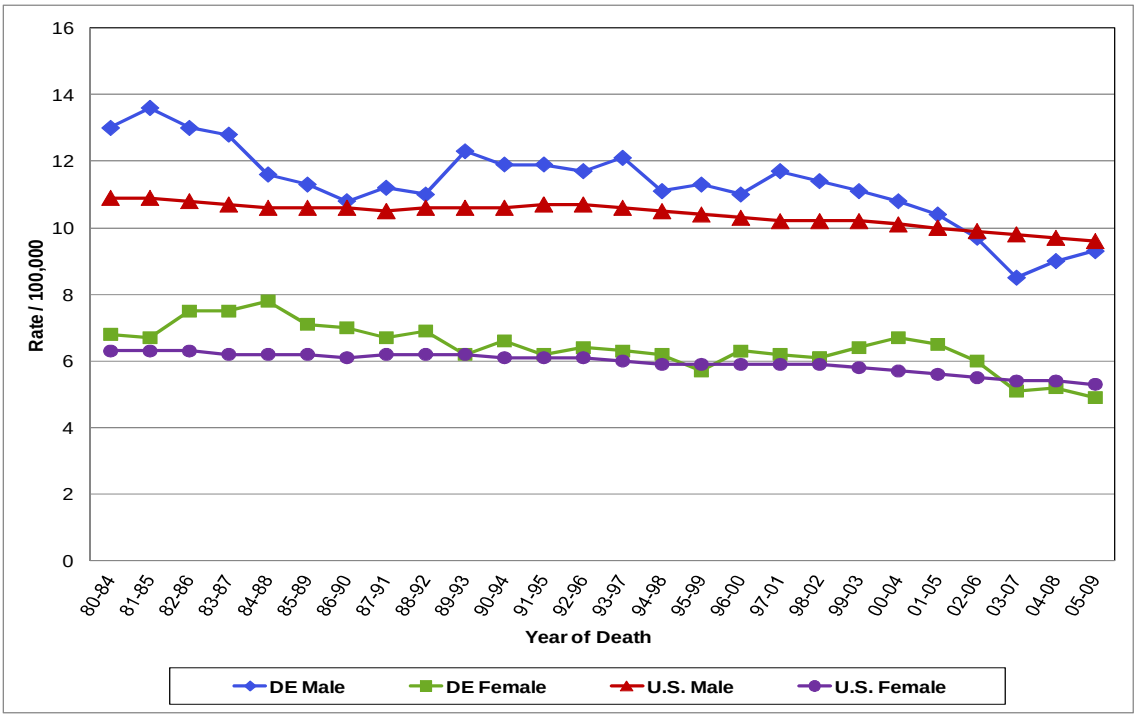
SOURCE: Delaware Health Statistics Center, 2012.
--- = Cell counts less than six are not shown to protect patient confidentiality.

Table 12.5. Five-Year Average Age-Adjusted Leukemia Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	7.1 (7.1 , 7.1)	9.6 (9.5 , 9.7)	5.3 (5.3 , 5.4)
Delaware	6.8 (6.0 , 7.5)	9.3 (8.0 , 10.7)	4.9 (4.1 , 5.8)
Kent	5.5 (3.9 , 7.4)	6.8 (4.2 , 10.4)	---
New Castle	7.6 (6.6 , 8.7)	10.6 (8.7 , 12.7)	5.5 (4.4 , 6.9)
Sussex	6.1 (4.8 , 7.7)	8.7 (6.5 , 11.5)	4.0 (2.6 , 5.9)
CAUCASIAN			
United States	7.3 (7.3 , 7.4)	9.9 (9.8 , 10.0)	5.5 (5.4 , 5.5)
Delaware	7.1 (6.3 , 8.0)	9.4 (8.0 , 11.0)	5.4 (4.5 , 6.5)
Kent	6.2 (4.3 , 8.5)	---	---
New Castle	8.2 (7.1 , 9.6)	11.2 (9.1 , 13.6)	6.3 (5.0 , 7.9)
Sussex	5.7 (4.4 , 7.4)	7.6 (5.4 , 10.5)	4.3 (2.8 , 6.4)
AFRICAN AMERICAN			
United States	6.2 (6.1 , 6.3)	8.5 (8.2 , 8.7)	4.8 (4.7 , 5.0)
Delaware	4.7 (3.3 , 6.6)	7.9 (5.0 , 11.9)	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

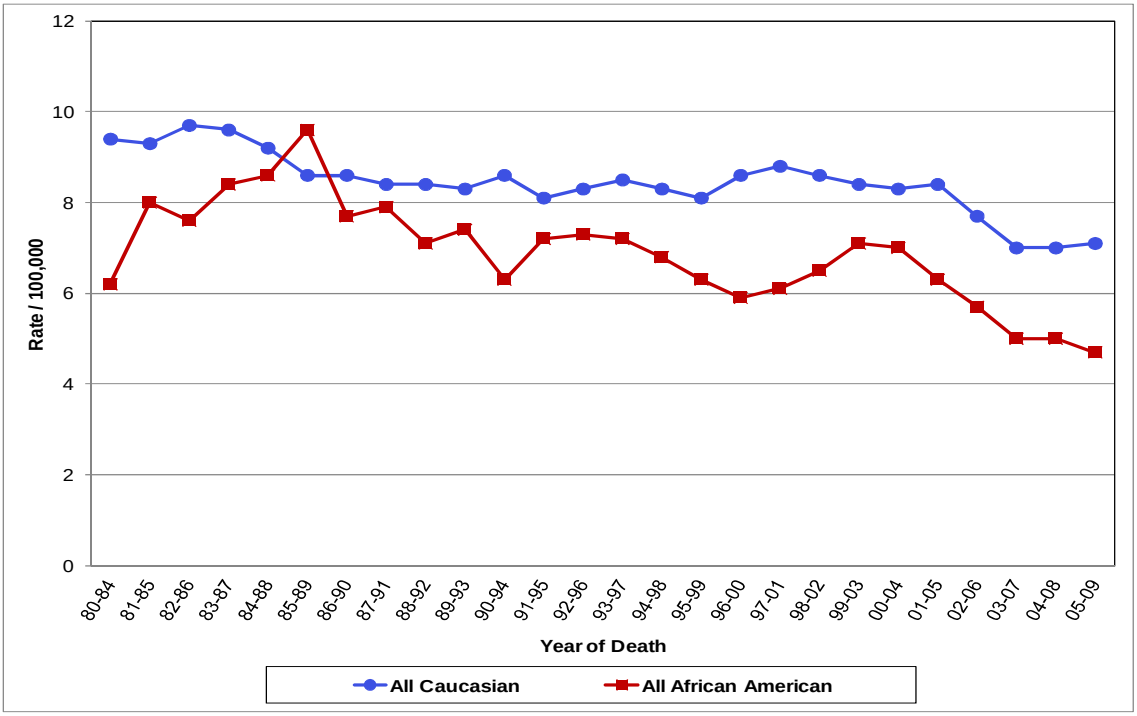
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 12.4. Five-Year Average Age-Adjusted Leukemia Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 12.5. Five-Year Average Age-Adjusted Leukemia Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 12.6. Age-Specific Leukemia Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	4.9	5.2	4.5	4.6	4.7	4.6	---	---	---
65-74	26.9	40.0	15.7	27.9	38.4	18.7	---	---	---
75-84	48.2	72.4	31.8	53.6	78.6	36.5	---	---	---
85+	70.4	---	56.5	75.1	---	59.8	---	---	---

* = Rates are per 100,000 population.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 12.6. Age-Specific Leukemia Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 12.6 is not displayed because of the small number of deaths.

13. LIVER AND BILE DUCT CANCER[13]

Risk Factors and Early Detection

Lifestyle Risk Factors for Liver Cancer:

- alcohol abuse
- obesity
- long-term exposure to aflatoxins from peanuts, wheat, soybeans, ground nuts, corn and rice
- tobacco use; particularly among people who abuse alcohol or have viral hepatitis (suspected)

Environmental and Medically-Related Causes of Liver Cancer:

- occupational exposure to vinyl chloride
- long-term use of anabolic steroids
- exposure to arsenic through drinking water from wells

Risk Factors for Liver Cancer that Cannot be Changed:

- type 2 diabetes
- cirrhosis of the liver
- male gender
- race – Asian Americans and Pacific Islanders
- long-term infection with hepatitis B and hepatitis C viruses
- certain metabolic disorders; e.g. hemochromatosis (excess accumulation of iron in the liver)

Factors Protective against Liver Cancer:

- vaccination for hepatitis B (no vaccination for hepatitis C)
- drug treatment for hepatitis C and possible hepatitis B
- management of lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), alcohol abuse, use of tobacco and physical activity.
- proper storage of certain grains, particularly in warm climates

Early Detection of Liver Cancer:

- Screening tests can be done for people at increased risk of liver cancer; those with cirrhosis, chronic hepatitis B infection.

Data Highlights

Liver Cancer Incidence (Tables 13.1 – 13.3, Figures 13.1 – 13.2)

- A total of 306 cases of liver cancer were diagnosed in Delaware during 2005–2009 that accounted for 1.2 percent of all cancer cases.
- Three of four cases (231 cases or 75.7 percent) were male.

[13] "Liver cancer" is used instead of "liver and bile duct" throughout this section.

- Delaware's 2005–2009 liver cancer incidence rate (6.2 per 100,000) was significantly lower than the U.S. rate (7.5 per 100,000). A significantly lower rate was seen both among males (10.0 per 100,000 Delaware vs. 11.6 per 100,000 U.S.) and females (2.8 per 100,000 Delaware vs. 3.9 per 100,000 U.S.) when compared with national data.
- Nationally and in Delaware, males have a significantly higher liver cancer incidence rate than females.
- This male to female excess was also seen in Caucasian Delawareans (8.7 per 100,000 male vs. 2.4 per 100,000 female) but the number of African Americans cases was too small for comparison.
- For males and for both sexes combined the 2005–2009 liver cancer incidence rate for African Americans was significantly higher than for Caucasians. Insufficient data were available for female African Americans in Delaware.
- From 1995–1999 through 2005–2009, liver cancer incidence increased 77.1 percent in Delaware compared with 70.5 percent nationally.
- Delaware's liver incidence for males rate nearly doubled (96.1 percent increase) and increased 27.3 percent for females from 1995–1999 through 2005–2009.
- Delaware's liver cancer incidence rate increased 68.8 percent for Caucasians (102.3 percent increase for males and 4.3 percent for females) and increased 98.0 percent among African Americans (74.2 percent for males and 175.0 percent for females) from 1995–1999 through 2005–2009.
- The 2005–2009 liver cancer incidence rate increased with age; Delawareans ages 85 and older had the highest age-specific incidence rate.
- For all races and age groups, the state's 2005–2009 liver cancer incidence rates were significantly higher among males than females.
- During 2005–2009, Delaware's liver cancer incidence rate was 18th highest in the U.S. Male Delawareans ranked 9th and Delaware females ranked 48th in liver cancer incidence (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Liver Cancer (Tables 13.4 – 13.5, Figures 13.4 – 13.5)

- For 2005–2009, 44.4 percent, 23.9 percent and 18.0 percent of liver cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 41.5 percent, 25.5 percent and 17.5 percent, respectively.
- In Delaware, 128 liver cancer cases (41.8 percent) were diagnosed in the late stages (i.e., regional or distant stage) during 2005–2009 compared with 42.9 percent nationally.
- Among those diagnosed with liver cancer, Caucasians were more likely than African Americans to have had their cancer diagnosed in the local stage (46.1 percent vs. 38.5 percent, respectively). Males were more likely than females to have had their cancer diagnosed in the local stage (47.2 percent vs. 36.0 percent, respectively).
- In Delaware, the percentage of liver cancer cases diagnosed in the local stage increased from 14.6 percent in 1980–1984 to 44.4 percent in 2005–2009. Accordingly, there was a decline in cases diagnosed in the late stages, from 52.1 percent in 1980–1984 to 41.8 percent in 2005–2009.

Liver Cancer Mortality (Tables 13.6 – 13.8, Figures 13.6 – 13.7)

- There were 261 deaths from liver cancer that accounted for 2.9 percent of all cancer deaths in Delaware during 2005–2009.
- Of the Delawareans who died from liver cancer, 73.6 percent were male and 26.4 percent female. More than three-quarters were Caucasian (200 deaths or 76.6 percent), 52 deaths were African American (19.9 percent) and nine deaths were other or unknown race.
- In 2005–2009, Delaware's liver cancer mortality rate does not differ from the U.S. rate (5.3 per 100,000 vs. 5.5 per 100,000, respectively).
- For 2005–2009 at both the state and national levels, liver cancer mortality was significantly higher among males than females.
- Between 1995–1999 and 2005–2009, Delaware's liver cancer mortality rate increased 35.9 percent while the U.S. rate increased 22.2 percent.

- While the liver mortality rate increased 70.0 percent among males the rate among females decreased 13.8 percent.
- Among Delaware males, liver cancer mortality increased 86.7 percent among African Americans and 63.8 percent among Caucasians.
- Among Delaware females, however, liver cancer mortality declined 54.5 percent among African Americans and 7.7 percent among Caucasians.
- There were too few deaths to examine age-specific liver cancer mortality rates either by race or sex.
- During 2005–2009, Delaware ranked 16th highest in the nation for mortality from liver cancer. Delaware males ranked 9th in liver cancer mortality and Delaware females ranked 48th (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Liver Cancer Incidence

Table 13.1. Number of Liver Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	306	231	75	217	164	53	78	60	18
Kent	49	37	12	29	---	---	15	---	---
New Castle	180	140	40	122	94	28	54	43	11
Sussex	77	54	23	66	---	---	9	---	---

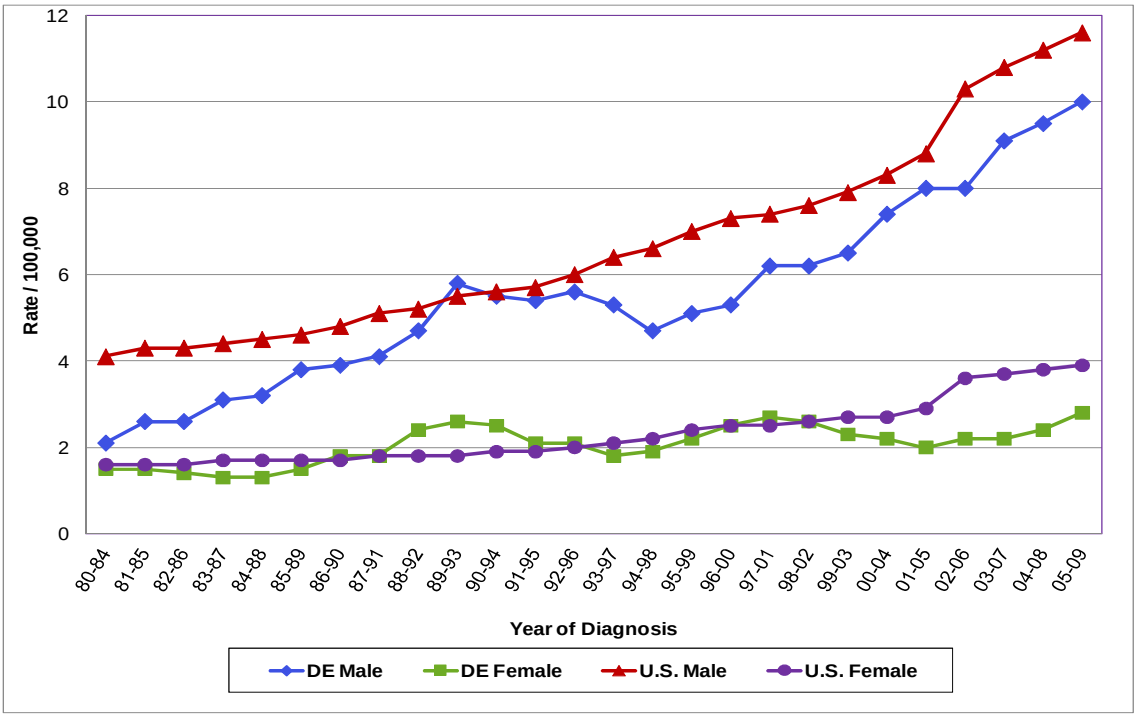
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 13.2. Five-Year Average Age-Adjusted Liver Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	7.5 (7.4 , 7.6)	11.6 (11.5 , 11.8)	3.9 (3.9 , 4.0)
Delaware	6.2 (5.5 , 6.9)	10.0 (8.7 , 11.4)	2.8 (2.2 , 3.5)
Kent	6.2 (4.6 , 8.3)	10.0 (7.0 , 13.9)	---
New Castle	6.4 (5.5 , 7.4)	10.8 (9.1 , 12.8)	2.7 (1.9 , 3.6)
Sussex	5.6 (4.4 , 7.1)	8.3 (6.2 , 10.9)	---
CAUCASIAN			
United States	6.5 (6.4 , 6.6)	10.0 (9.9 , 10.2)	3.4 (3.3 , 3.5)
Delaware	5.3 (4.7 , 6.1)	8.7 (7.4 , 10.1)	2.4 (1.8 , 3.1)
Kent	4.8 (3.2 , 6.9)	---	---
New Castle	5.6 (4.6 , 6.7)	9.3 (7.5 , 11.4)	2.4 (1.6 , 3.5)
Sussex	5.4 (4.1 , 7.0)	8.1 (5.9 , 10.9)	---
AFRICAN AMERICAN			
United States	9.0 (8.7 , 9.3)	14.9 (14.3 , 15.5)	4.4 (4.2 , 4.7)
Delaware	9.7 (7.6 , 12.2)	16.6 (12.5 , 21.6)	---
Kent	---	---	---
New Castle	10.0 (7.4 , 13.2)	18.5 (13.0 , 25.5)	---
Sussex	---	---	---

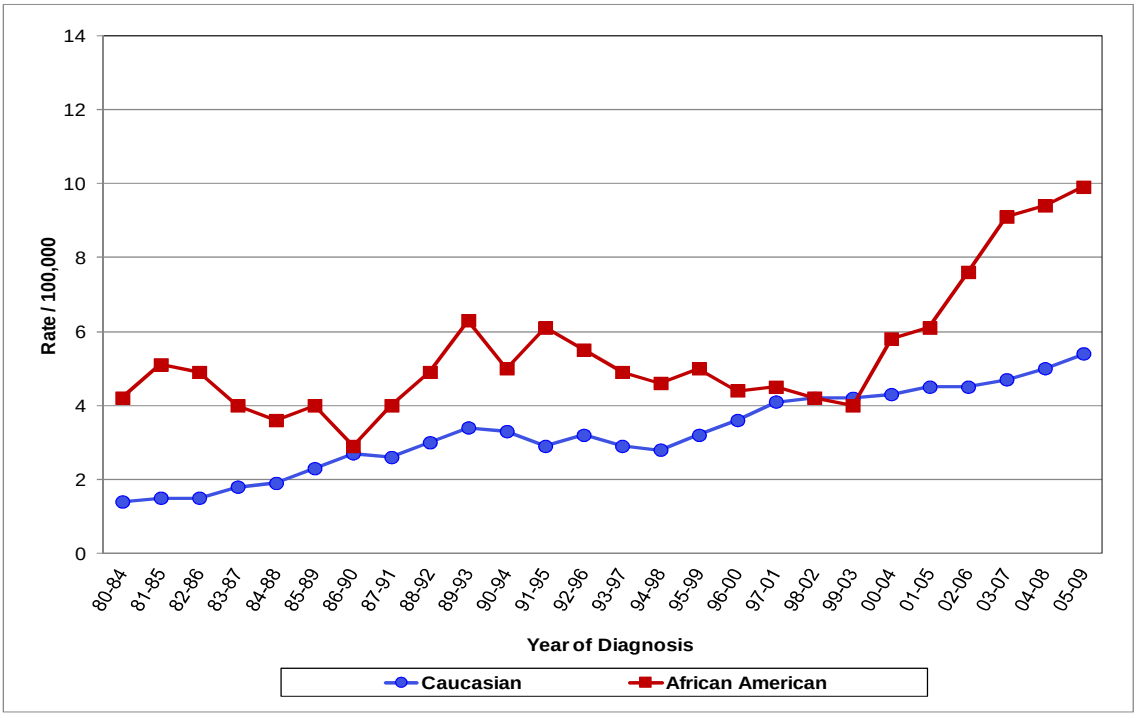
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 13.1. Five-Year Average Age-Adjusted Liver Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 13.2. Five-Year Average Age-Adjusted Liver Cancer Incidence Rates* by Race; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 13.3. Age-Specific Liver Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	10.5	18.3	3.2	8.7	15.1	18.5	33.9	---	---
65-74	24.0	34.6	14.9	21.5	31.5	---	---	---	---
75-84	23.0	35.3	---	21.9	34.7	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 13.3. Age-Specific Liver Cancer Incidence Rates by Race; Delaware, 2005–2009

NOTE: Figure 13.3 is not displayed because of the small number of cases.

Liver Cancer by Stage

Table 13.4. Number of Liver Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	136	109	27	100	---	---	30	---	---
Regional	73	53	20	50	---	---	20	---	---
Distant	55	39	16	36	---	---	18	---	---
Unknown	42	30	12	31	---	---	10	---	---
Total	306	231	75	217	---	---	78	---	---

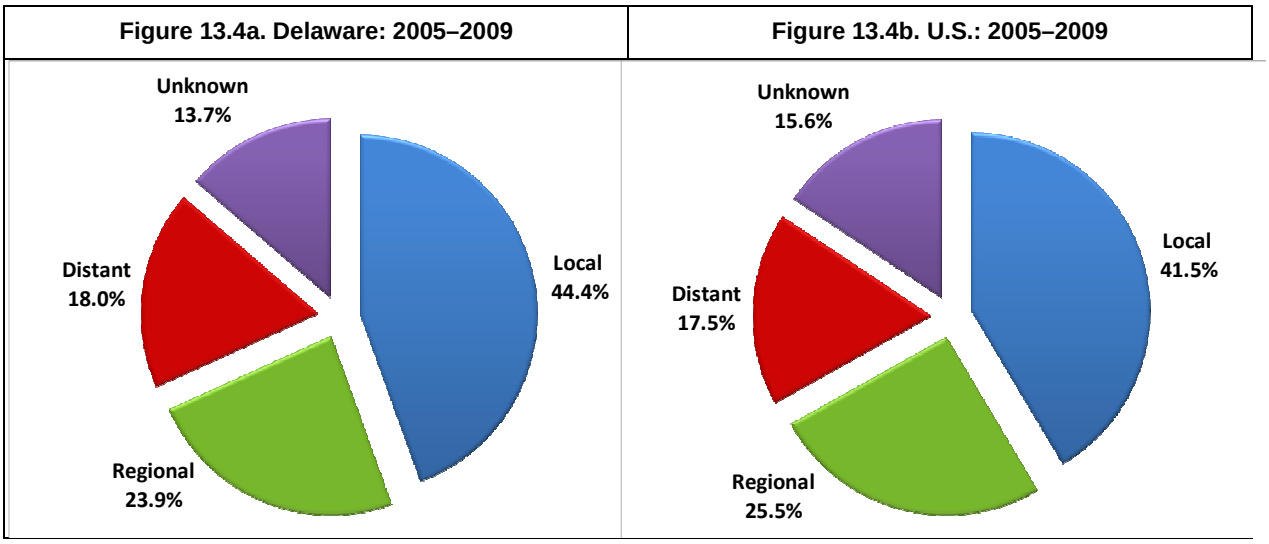
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 13.5. Percent of Liver Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	44.4	47.2	36.0	46.1	---	---	38.5	---	---
Regional	23.9	22.9	26.7	23.0	---	---	25.6	---	---
Distant	18.0	16.9	21.3	16.6	---	---	23.1	---	---
Unknown	13.7	13.0	16.0	14.3	---	---	12.8	---	---
Total	100.0	100.0	100.0	100.0	---	---	100.0	---	---

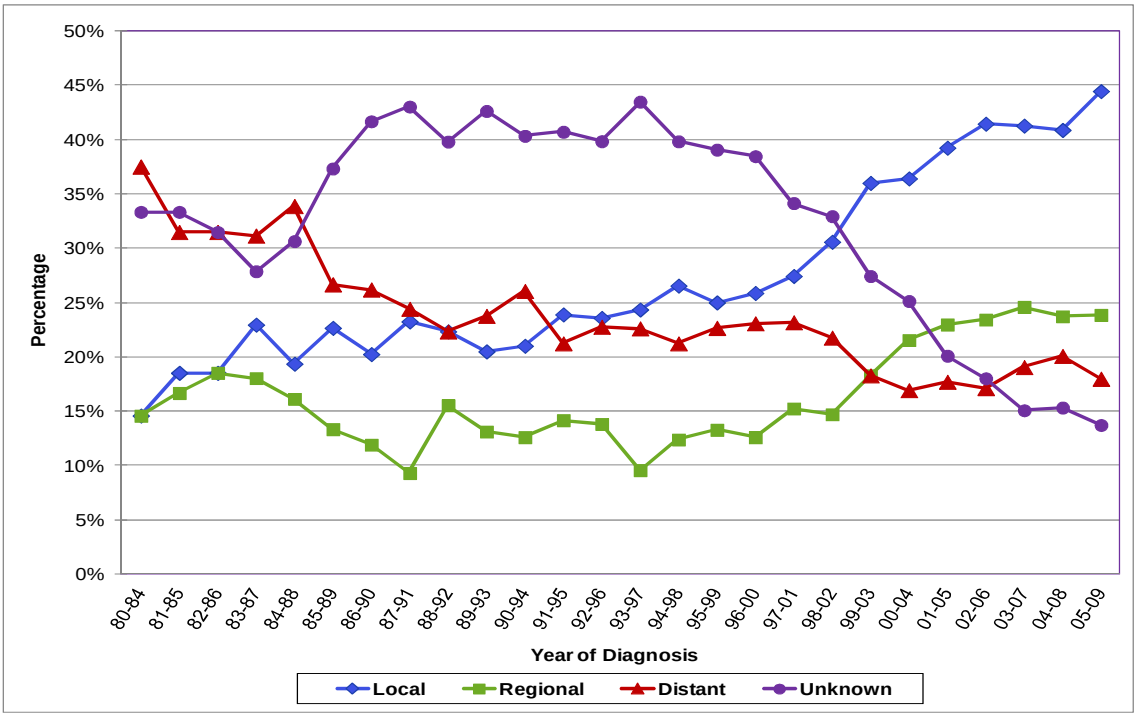
--- = Percentages based on cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 13.4. Percent of Liver Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 13.5. Percent of Liver Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 13.6. Number of Liver Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	261	192	69	200	144	56	52	42	10
Kent	50	39	11	34	---	---	---	---	---
New Castle	148	114	34	108	82	26	37	29	8
Sussex	63	39	24	58	---	---	---	---	---

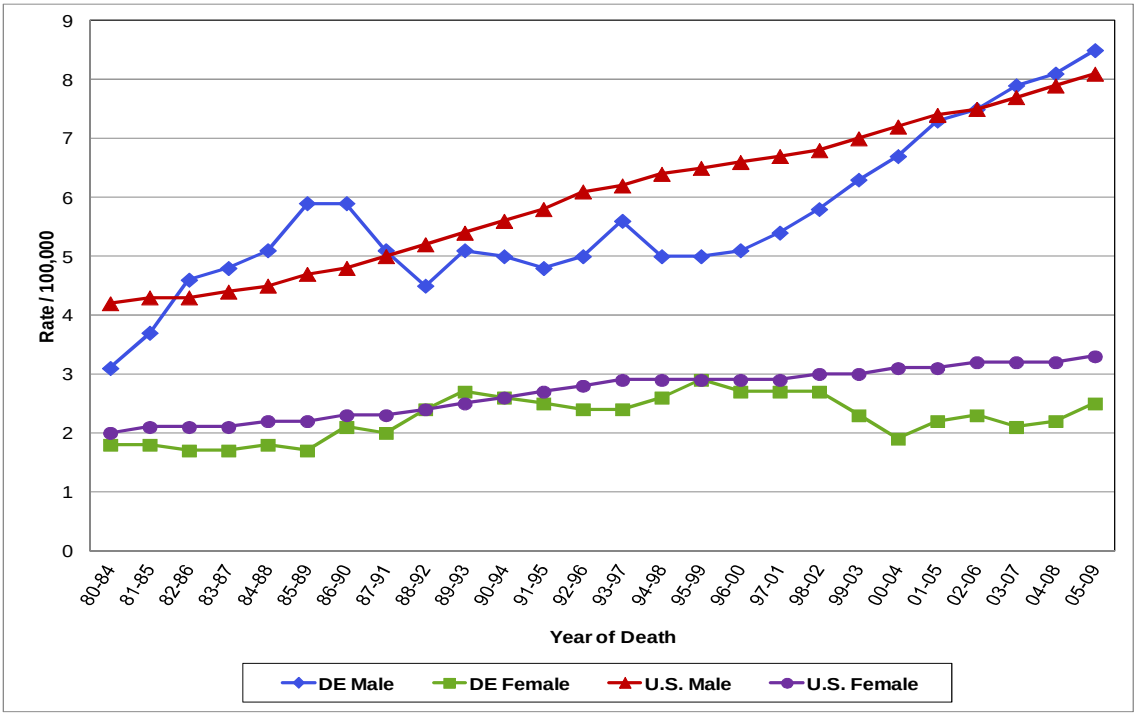
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 13.7. Five-Year Average Age-Adjusted Liver Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION ALL RACES	All	Male	Female
United States	5.5 (5.4 , 5.5)	8.1 (8.1 , 8.2)	3.3 (3.2 , 3.3)
Delaware	5.3 (4.6 , 5.9)	8.5 (7.3 , 9.8)	2.5 (1.9 , 3.2)
Kent	6.3 (4.7 , 8.3)	10.7 (7.6 , 14.7)	---
New Castle	5.4 (4.5 , 6.3)	9.2 (7.6 , 11.1)	2.2 (1.5 , 3.1)
Sussex	4.4 (3.4 , 5.8)	5.9 (4.1 , 8.1)	---
CAUCASIAN			
United States	5.0 (5.0 , 5.1)	7.4 (7.3 , 7.5)	3.1 (3.0 , 3.1)
Delaware	4.9 (4.2 , 5.6)	7.7 (6.5 , 9.1)	2.4 (1.8 , 3.2)
Kent	5.5 (3.8 , 7.7)	9.2 (6.0 , 13.6)	---
New Castle	4.9 (4.0 , 6.0)	8.5 (6.7 , 10.5)	2.1 (1.4 , 3.2)
Sussex	4.5 (3.4 , 5.9)	5.8 (4.1 , 8.3)	---
AFRICAN AMERICAN			
United States	7.3 (7.2 , 7.5)	11.9 (11.6 , 12.1)	4.0 (3.8 , 4.1)
Delaware	6.4 (4.8 , 8.5)	11.2 (8.0 , 15.2)	---
Kent	---	---	---
New Castle	7.0 (4.8 , 9.7)	11.6 (7.6 , 17.0)	---
Sussex	---	---	---

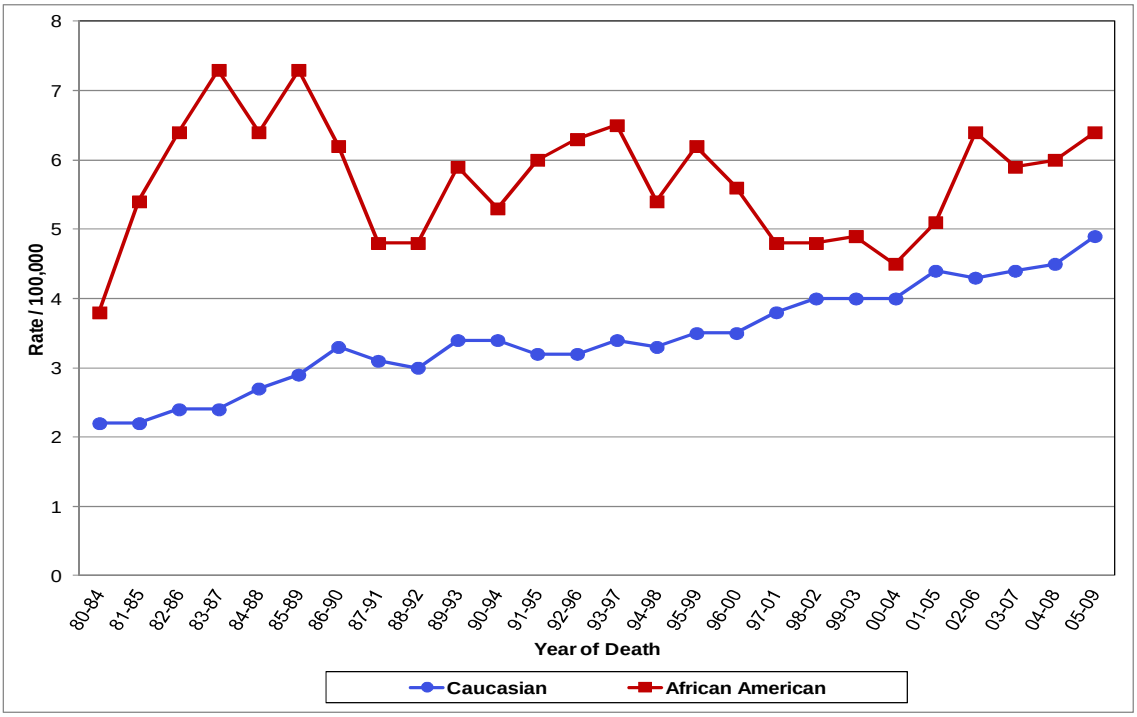
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 13.6. Five-Year Average Age-Adjusted Liver Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 13.7. Five-Year Average Age-Adjusted Liver Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 13.8. Age-Specific Liver Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	7.2	12.9	---	5.9	10.4	---	12.9	25.4	---
65-74	21.5	29.8	---	19.7	27.4	---	---	---	---
75-84	24.8	43.3	---	26.8	47.5	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 13.8. Age-Specific Liver Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 13.8 is not displayed because of the small number of deaths.

14. LUNG AND BRONCHUS CANCER [14]

Risk Factors and Early Detection

Lifestyle Risk Factors for Lung Cancer:

- tobacco use; an estimated 80 percent of lung cancers are caused by smoking cigarettes, cigars or pipes
- exposure to secondhand smoke
- diet low in fruits and vegetables
- diet high in cholesterol (suspected)
- heavy alcohol use (suspected)
- smoking marijuana (suspected)

Environmental and Medically-Related Causes of Lung Cancer:

- occupational exposure to:
  - asbestos
  - mustard gas
  - radioactive ores
  - certain metals such as chromium, cadmium and arsenic and
  - certain organic chemicals
  - paint
- environmental exposure to:
  - radon gas released from soil or building materials
  - asbestos, particularly among smokers
  - exposure to air pollution
  - high levels of arsenic in drinking water (suspected)
- radiation therapy to the chest, especially for people who smoke

Risk Factors for Lung Cancer that Cannot be Changed:

- family history of lung cancer
- personal history of tuberculosis

Factors Protective against Lung Cancer:

- avoid use of tobacco
- avoid secondhand exposure to smoke from tobacco products
- have a diet rich in fruits and vegetables
- engage in recommended levels of physical activity
- maintain a healthy weight

[14] "Lung cancer" is used instead of "lung and bronchus cancer" throughout this section.

Early Detection of Lung Cancer:

In January 2013 the American Cancer Society published new Lung Cancer Screening Guidelines[15] that recommend that doctors discuss lung cancer screening with patients who meet certain criteria that put them at high risk for developing the disease. These high risk patients must be:

- aged 55 to 74 years and in fairly good health,
- have a smoking history equivalent to a pack a day for 30 years, and
- currently smoke or have quit within the past 15 years.

If people decide to be screened, the recommendation specifies that testing should be done with a low dose computed tomography (CT) scan and take 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 Behavioral Risk Factor Survey (BRFS) collects data annually on tobacco use. 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), Delaware's smoking prevalence rates were among the highest in the country. Historical BRFS data show that in 1982, 30 percent of adult Delawareans smoked cigarettes. By the 1990s, Delaware's smoking rate among adults had declined to approximately 25 percent.

Based on the most recent data, 21.7 percent of adult Delawareans smoke cigarettes. This current smoking prevalence estimate cannot, however, be compared with earlier estimates since the survey methodology has improved and the trend line has been broken.

- In 2011, the prevalence of cigarette smoking in Delaware (21.7 percent) was comparable to the U.S. prevalence rate (21.2 percent).
- The smoking prevalence among Delaware males is significantly higher than among Delaware females (25.2 males vs. 18.3 percent females). The same pattern is seen for the U.S.
- In 2011, Hispanics were more likely to be smokers (26.6 percent) than either African Americans or Caucasians (21.5 percent and 21.2 percent, respectively) in Delaware.
- The highest prevalence of current smokers is among Delawareans ages 25-34 where 35.1 percent smoke. Their prevalence rate is significantly greater than the prevalence among individuals in all other age groups, with the exception of ages 35-44.
- Delaware college graduates were significantly less likely to be current smokers (8.3 percent) than Delawareans who did not complete their high school education (35.6 percent), those with a high school diploma or equivalent (26.0 percent) and those with some post-high school education (22.5 percent).
- More than 30 percent of Delawareans in each of the three income categories below $35,000 were current smokers, which is significantly greater than the 17.4 percent prevalence among current smokers with income between $50,000 and $74,999 and the 11.8 percent among those earning more than $75,000.

[15] Wender R, et al. American Cancer Society Lung Cancer Screening Guidelines. Published early online January 11, 2013 in *CA: A Cancer Journal for Clinicians*.

Data Highlights

Lung Cancer Incidence (Tables 14.1 – 14.3, Figures 14.1 – 14.3)

- In Delaware as well as nationally, lung cancer is the most-frequently diagnosed cancer overall and second-most common cancer in males and females separately.
- The total of 3,798 cases of lung cancer that were diagnosed in Delaware during 2005–2009 accounted for 15.2 percent (14.6 percent of male and 15.8 percent of female) of all cancer cases diagnosed during 2005–2009 in Delaware.
- During 2005–2009, lung cancer diagnoses were more prevalent among males than among females (51.2 percent vs. 48.8 percent, respectively).
- Caucasians comprised 84.9 percent (3,266 cases), African Americans comprised 13.8 percent (524 cases) and 48 cases were other or unknown race.
- Among Caucasians and for both sexes combined, Delaware's lung cancer incidence rate (77.3 per 100,000) is significantly higher than the U.S. rate (62.6 per 100,000) and this significant excess is seen in both males (89.9 per 100,000 Delaware vs. 76.0 per 100,000 U.S.) and females (68.2 per 100,000 Delaware vs. 52.7 per 100,000 U.S.).
- Among African Americans, lung cancer incidence in Delaware is lower than nationally in males (93.8 per 100,000 Delaware vs. 99.9 per 100,000 U.S.) and higher than nationally in females (61.7 per 100,000 Delaware vs. 52.6 per 100,000 U.S.) but neither of these differences is significant.
- In 2005–2009 lung cancer incidence rates for males were significantly higher than rates for females for both the U.S. and Delaware, and for Caucasians and for African Americans in Delaware.
- Among Caucasians, lung cancer incidence is significantly higher among males than females within each county.
- Among African Americans, lung cancer incidence is significantly higher among males than females only in Kent County.
- Nationally, African American males had a significantly higher lung cancer incidence rate than Caucasian males. Among females, however, Caucasians had a significantly higher lung cancer incidence rate than African Americans.
- In Delaware, African American males had a higher incidence rate than Caucasian males. Among females, however, Caucasians had a higher incidence rate than African Americans. Neither difference is statistically significant.
- From 1995–1999 through 2005–2009, Delaware's lung cancer incidence rate decreased 19.3 percent among males but increased 6.4 percent among females. The national rate decreased 12.5 percent among males and also increased 1.5 percent among females.
- Among Caucasians, lung cancer incidence decreased 18.0 percent among males and increased 9.4 percent among females. Among African Americans, lung cancer incidence decreased 30.3 percent among males and decreased 10.4 percent among females.
- The 2005–2009 age-specific lung cancer incidence rates increased from ages 40-64 through ages 75-84, but decreased among those ages 85 and older.
- During 2005–2009, Delaware ranked 10th highest in the U.S. for incidence of lung cancer. Females ranked third and males ranked 16th in lung cancer incidence (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Lung Cancer (Tables 14.4 – 14.5, Figures 14.4 – 14.5)

- For 2005–2009, 18.7 percent, 24.8 percent and 49.7 percent of lung cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 17.6 percent, 21.9 percent and 53.4 percent, respectively.
- In Delaware during 2005–2009, 2,832 lung cancer cases (74.5 percent) were diagnosed in the late stages (i.e., regional or distant stage) where prognosis is less favorable.
- African Americans were less likely than Caucasians to be diagnosed in the local stage of lung cancer (17.2 percent vs. 19.0 percent, respectively). It follows that they were more likely than Caucasians to be diagnosed at the regional and distant stages (77.7 percent vs. 74.1 percent).
- In Delaware, the percentage of lung cancer cases diagnosed in the local stage decreased from 21.2 percent in 1980–1984 to 18.7 percent in 2005–2009. Accordingly, there were increases in cases diagnosed in the regional stage (from 21.4 percent in 1980–1984 to 24.8 percent in 2005–2009) as well as in the distant stage (from 45.1 percent in 1980–1984 to 49.7 percent in 2005–2009.

Lung Cancer Mortality (Tables 14.6 – 14.8, Figures 14.6 – 14.8)

- In Delaware as well as nationally, lung cancer is the most common cause of cancer deaths.
- There were 2,751 deaths from lung cancer that accounted for 30.3 percent of all cancer deaths in Delaware during 2005–2009; 30.7 percent of deaths among males and 28.8 percent among females.
- Of Delaware residents who died from lung cancer, 52.8 percent were male and 47.2 percent female. By race category, 84.6 percent were Caucasian (2,326 deaths), 14.5 percent African American (394 deaths) and 31 deaths were other or unknown race.
- Delaware's 2005–2009 lung cancer mortality rate was significantly higher than the U.S. rate, both overall (56.0 per 100,000 Delaware vs. 50.6 per 100,000 U.S) and among females (47.3 per 100,000 Delaware vs. 39.6 per 100,000 U.S).
- For 2005–2009 at the state and national levels, lung cancer mortality was significantly higher among males than females. This significant male-to-female excess was seen both among Caucasians and African Americans.
- Although Delaware's lung cancer mortality rates have been higher than U.S. rates, the gap has narrowed. In 2005–2009, the mortality rate among Delaware males was only 3.2 percent higher than the U.S. male rate, compared with 19.2 percent higher in 1980-1984.
- Between 1995–1999 and 2005–2009, Delaware's lung cancer mortality rate dropped 16.8 percent while the U.S. rate dropped 11.5 percent.
- Over these past 10 five-year time periods Delaware's lung cancer death rate dropped 16.8 and 24.3 percent for males and females while the U.S. rate dropped 23.0 and 21.6 percent for males and females.
- Delaware's lung cancer mortality rates decreased by 25.6 and 2.9 percent among male and female Caucasians, respectively, and among African Americans, lung cancer mortality declined by 39.5 and 16.7 percent among males and females, respectively.
- Lung cancer mortality rates increased from ages 40-64 through ages 75-84 then declined among those ages 85 and over.
- In 2005–2009, Delaware ranked 13th highest in the nation for mortality from lung cancer. Delaware males ranked 19th in lung cancer mortality and Delaware females ranked fourth (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 14.1. Number of Lung Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	3,798	1,944	1,854	3,226	1,643	1,583	524	276	248
Kent	695	372	323	575	300	275	107	67	40
New Castle	1,911	931	980	1,568	758	810	324	160	164
Sussex	1,192	641	551	1,083	585	498	93	49	44

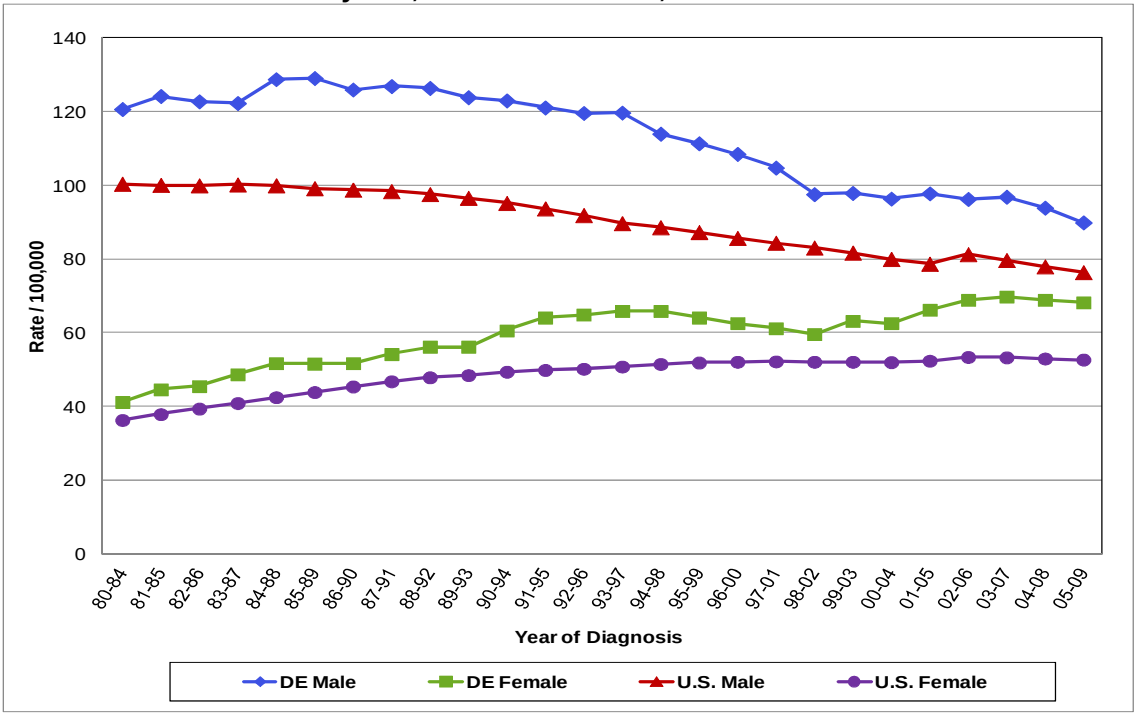
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 14.2. Five-Year Average Age-Adjusted Lung Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	62.6 (62.4 , 62.9)	76.4 (76.0 , 76.8)	52.7 (52.4 , 53.0)
Delaware	77.3 (74.9 , 79.8)	89.9 (85.9 , 94.1)	68.2 (65.1 , 71.4)
Kent	90.5 (83.9 , 97.5)	111.9 (100.6 , 124.1)	75.2 (67.2 , 83.9)
New Castle	71.3 (68.1 , 74.6)	80.7 (75.5 , 86.1)	64.9 (60.9 , 69.2)
Sussex	82.0 (77.4 , 86.9)	95.8 (88.4 , 103.6)	71.3 (65.3 , 77.7)
CAUCASIAN			
United States	64.1 (63.8 , 64.3)	76.4 (76.0 , 76.9)	55.1 (54.8 , 55.5)
Delaware	78.3 (75.6 , 81.0)	89.7 (85.4 , 94.2)	69.9 (66.5 , 73.5)
Kent	94.2 (86.7 , 102.3)	113.0 (100.4 , 126.8)	80.9 (71.5 , 91.1)
New Castle	72.5 (68.9 , 76.2)	80.8 (75.1 , 86.8)	66.9 (62.3 , 71.7)
Sussex	81.1 (76.3 , 86.2)	94.1 (86.5 , 102.4)	70.9 (64.6 , 77.7)
AFRICAN AMERICAN			
United States	71.3 (70.5 , 72.2)	99.9 (98.2 , 101.6)	52.6 (51.6 , 53.6)
Delaware	74.9 (68.4 , 81.7)	93.8 (82.4 , 106.2)	61.7 (54.1 , 70.0)
Kent	79.5 (64.8 , 96.3)	113.4 (86.9 , 144.9)	54.5 (38.7 , 74.4)
New Castle	70.8 (63.0 , 79.2)	83.6 (70.1 , 98.7)	61.9 (52.5 , 72.4)
Sussex	87.2 (70.2 , 107.0)	111.4 (81.8 , 147.7)	70.5 (51.1 , 94.7)

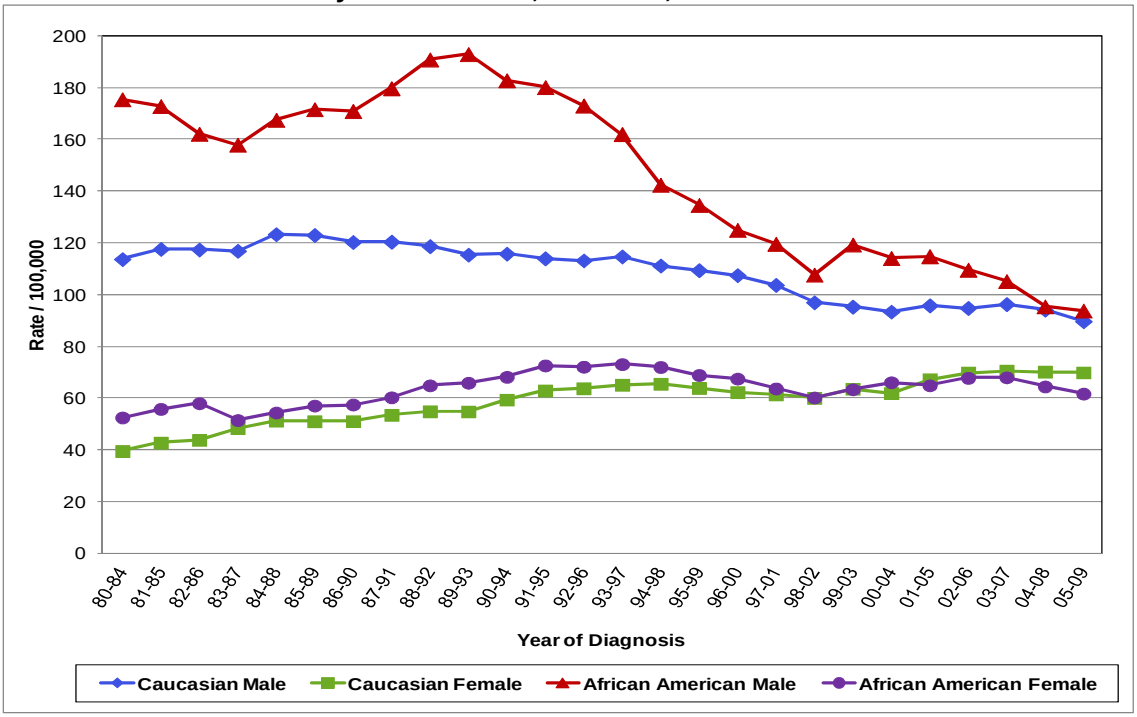
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 14.1. Five-Year Average Age-Adjusted Lung Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 14.2. Five-Year Average Age-Adjusted Lung Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



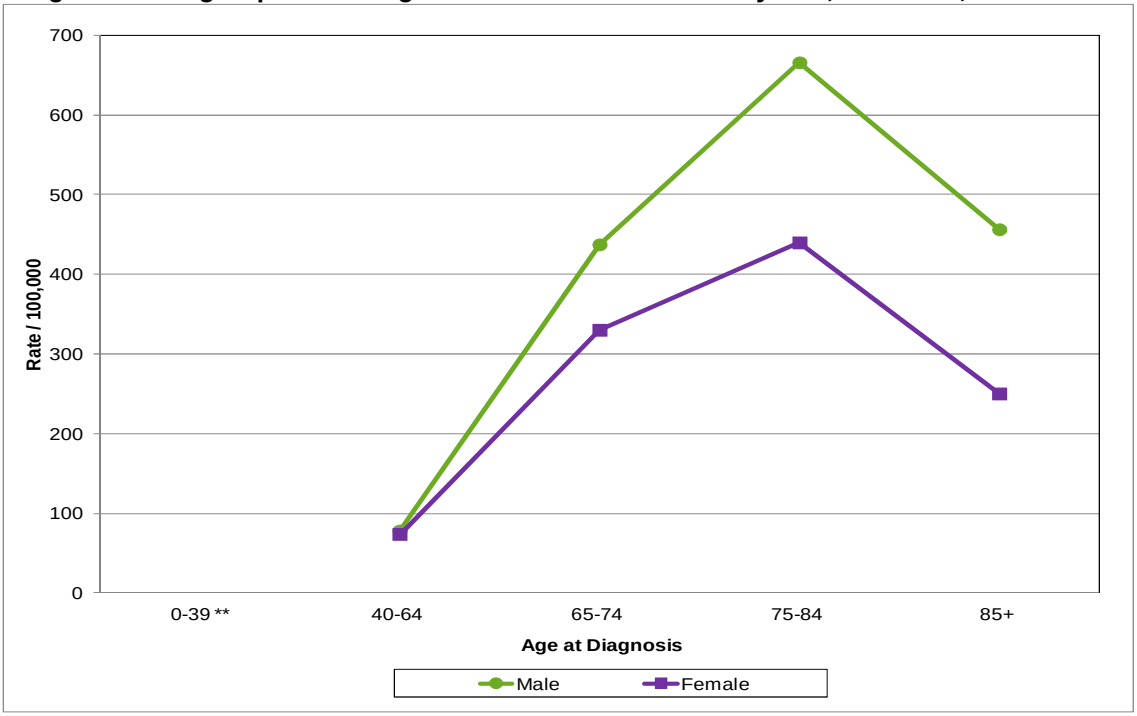
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 14.3. Age-Specific Lung Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	76.0	78.3	74.0	75.7	76.2	75.3	86.7	99.8	75.8
65-74	379.6	437.4	330.2	383.8	431.4	342.5	371.5	488.4	279.1
75-84	534.8	665.8	439.8	547.6	682.2	447.9	462.7	571.4	396.8
85+	314.0	456.3	250.3	327.4	461.8	266.3	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 14.3. Age-Specific Lung Cancer Incidence Rates* by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Lung Cancer by Stage

Table 14.4. Number of Lung Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	712	315	397	614	270	344	90	42	48
Regional	944	500	444	796	414	382	136	80	56
Distant	1,888	996	892	1,594	846	748	271	136	135
Unknown	256	134	122	224	114	110	27	18	9
Total	3,800	1,945	1,855	3,228	1,644	1,584	524	276	248

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 14.5. Percent of Lung Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	18.7	16.2	21.4	19.0	16.4	21.7	17.2	15.2	19.4
Regional	24.8	25.7	23.9	24.7	25.2	24.1	26.0	29.0	22.6
Distant	49.7	51.2	48.1	49.4	51.5	47.2	51.7	49.3	54.4
Unknown	6.7	6.9	6.6	6.9	6.9	6.9	5.2	6.5	3.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 14.4. Percent of Lung Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009

Figure 14.4a. Delaware: 2005–2009

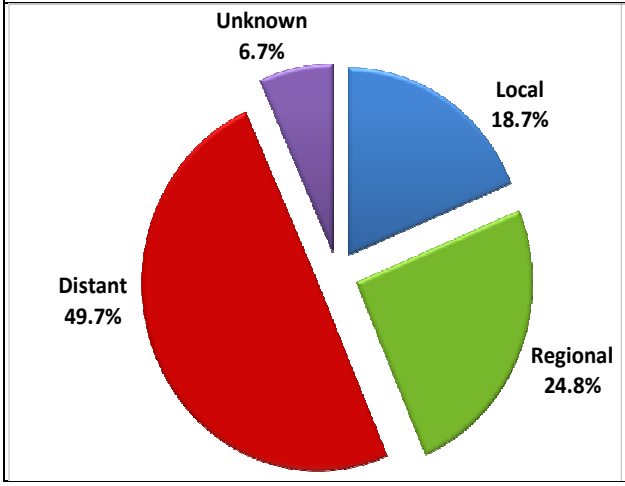
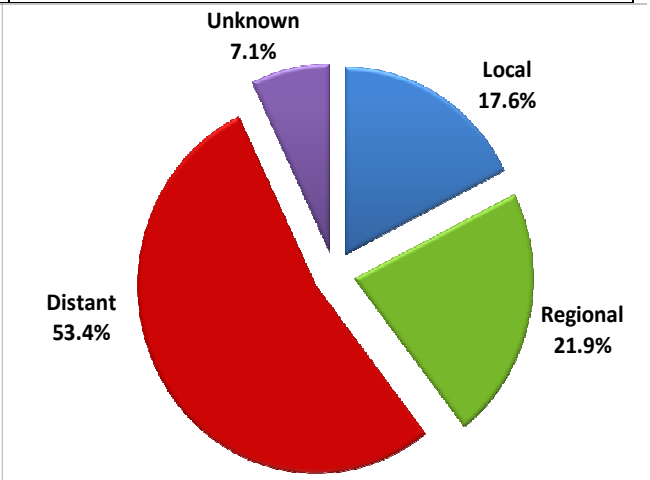
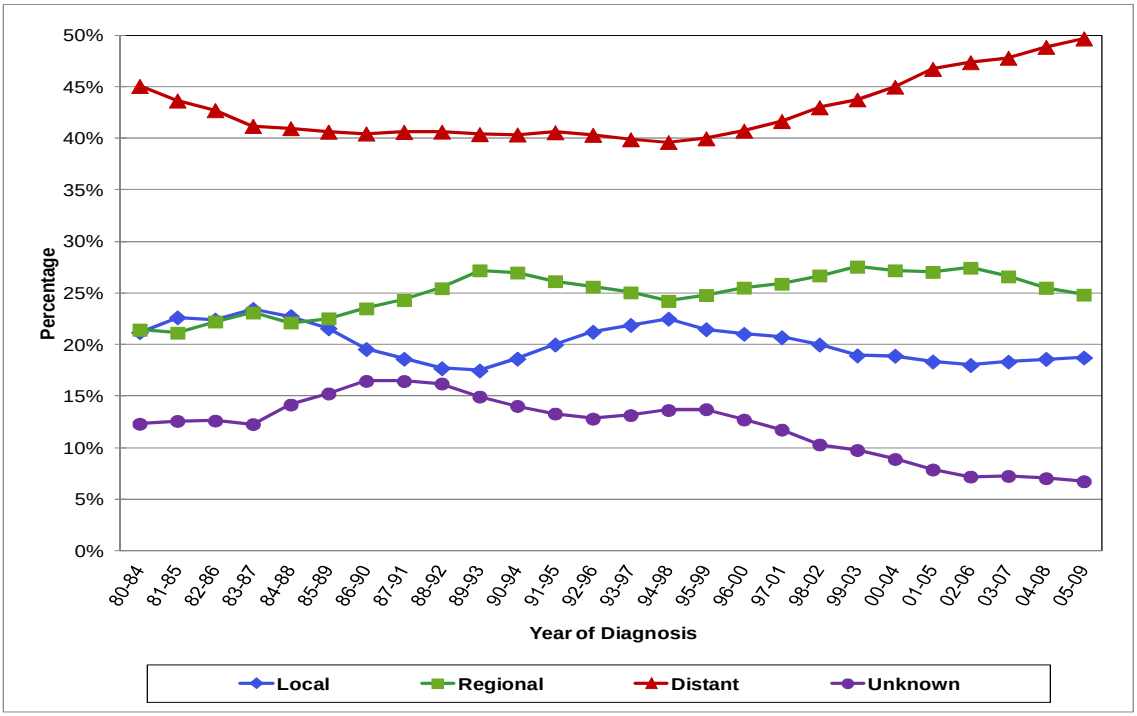


Figure 14.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 14.5. Percent of Lung Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Lung Cancer Mortality

Table 14.6. Number of Lung Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	2,751	1,453	1,298	2,326	1,230	1,096	394	208	186
Kent	476	263	213	398	221	177	71	40	31
New Castle	1,442	735	707	1,168	597	571	258	130	128
Sussex	833	455	378	760	412	348	65	38	27

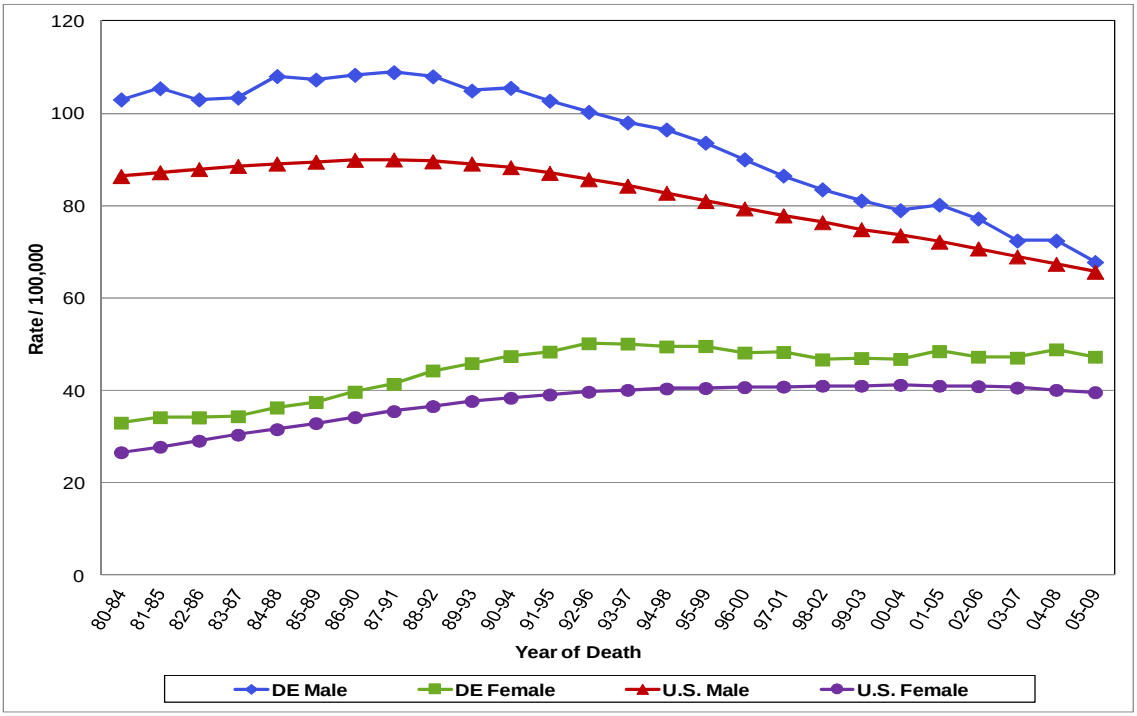
SOURCE: Delaware Health Statistics Center, 2012.

Table 14.7. Five-Year Average Age-Adjusted Lung Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	50.6 (50.5 , 50.7)	65.7 (65.5 , 65.8)	39.6 (39.5 , 39.8)
Delaware	56.0 (53.9 , 58.1)	67.8 (64.3 , 71.4)	47.3 (44.8 , 50.0)
Kent	62.5 (57.0 , 68.4)	80.2 (70.6 , 90.7)	49.8 (43.4 , 57.1)
New Castle	53.9 (51.2 , 56.8)	64.6 (59.9 , 69.5)	46.6 (43.2 , 50.3)
Sussex	56.5 (52.7 , 60.6)	68.0 (61.8 , 74.7)	47.1 (42.4 , 52.3)
CAUCASIAN			
United States	51.2 (51.1 , 51.3)	65.3 (65.1 , 65.5)	40.8 (40.6 , 40.9)
Delaware	56.1 (53.9 , 58.5)	67.5 (63.8 , 71.5)	47.6 (44.8 , 50.6)
Kent	65.6 (59.3 , 72.4)	83.9 (73.0 , 95.9)	52.3 (44.8 , 60.7)
New Castle	53.8 (50.7 , 57.0)	64.1 (59.0 , 69.5)	46.6 (42.8 , 50.7)
Sussex	55.9 (51.9 , 60.1)	66.3 (59.9 , 73.2)	47.3 (42.4 , 52.8)
AFRICAN AMERICAN			
United States	55.4 (55.0 , 55.8)	82.6 (81.8 , 83.3)	38.0 (37.6 , 38.4)
Delaware	58.0 (52.3 , 64.2)	73.1 (62.9 , 84.3)	47.4 (40.7 , 54.8)
Kent	53.8 (41.8 , 68.0)	69.0 (48.5 , 94.8)	43.2 (29.2 , 61.3)
New Castle	59.1 (51.8 , 67.0)	72.7 (59.8 , 87.4)	49.6 (41.2 , 59.2)
Sussex	61.3 (47.2 , 78.1)	84.4 (59.2 , 116.2)	44.3 (29.1 , 64.4)

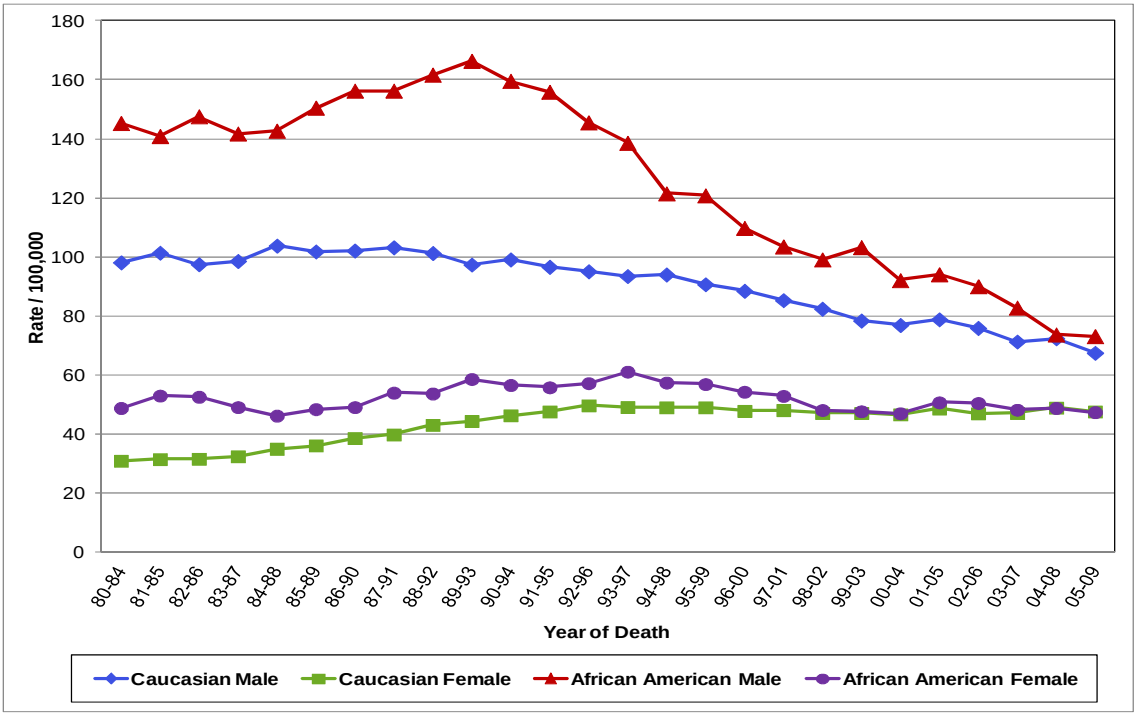
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 14.6. Five-Year Average Age-Adjusted Lung Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 14.7. Five-Year Average Age-Adjusted Lung Cancer Mortality Rates* by Race and Sex; Delaware, 1980–2009



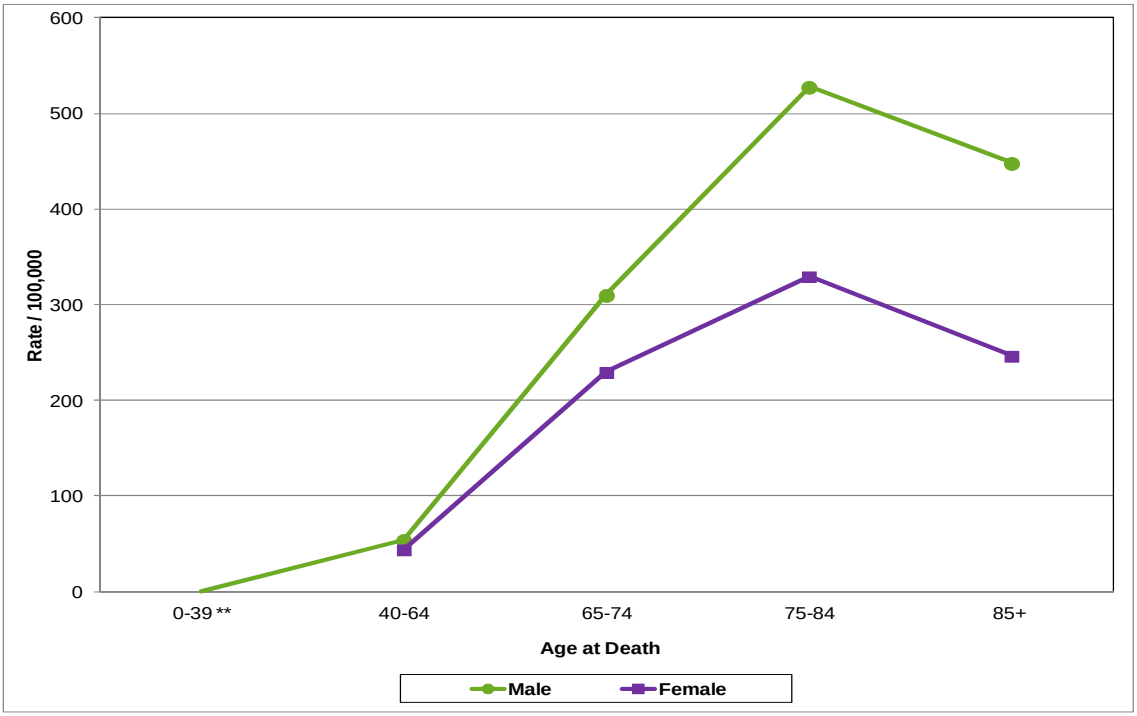
* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 14.8. Age-Specific Lung Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	48.9	53.9	44.2	48.5	53.1	44.1	56.4	66.4	48.0
65-74	266.9	310.2	229.6	266.0	303.9	232.9	295.9	379.7	228.1
75-84	412.8	527.7	329.7	420.4	536.8	334.1	377.9	491.2	310.4
85+	308.9	448.1	246.6	308.6	447.9	245.4	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 14.8. Age-Specific Lung Cancer Mortality Rates* by Sex; Delaware, 2005–2009



***** = Rates are per 100,000 population.
** = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center**,** 2012.

15. MALIGNANT MELANOMA OF THE SKIN

Risk Factors and Early Detection

Lifestyle Risk Factors for Malignant Melanoma:

- excessive ultraviolet (UV) light from the sun, tanning lamps or tanning beds
- history of frequent sunburns, especially before age 20

Environmental and Medically-Related Causes of Malignant Melanoma:

- weakened immune system; e.g. organ transplant patients

Risk Factors for Malignant Melanoma that Cannot be Changed:

- having many moles, especially abnormal moles
- light-colored skin, freckles, light hair and/or blue/green eyes
- Caucasian race – 10 times more likely to have melanoma than African Americans
- family history of malignant melanoma
- personal history of malignant melanoma
- increasing age
- gender – women have higher risk before age 40 and men have higher risk after age 40
- xeroderma pigmentosum – a rare, inherited condition

Factors Protective against Malignant Melanoma:

- removal of abnormal moles
- limiting exposure to the sun
- avoiding tanning beds and sun lamps
- protecting children from exposure to the sun

Early Detection of Malignant Melanoma:

- self-examination of skin monthly
- for high-risk individuals, thorough examination of skin by a healthcare professional

Data Highlights

Malignant Melanoma Incidence (Tables 15.1 – 15.3, Figures 15.1 – 15.3)

- A total of 1.233 cases of malignant melanoma were diagnosed in Delaware during 2005–2009 which accounted for 4.9 percent of all cancer cases during this time period.
- Newly-diagnosed cases were more common among males (60.8 percent) than among females (39.1 percent). Almost all cases were Caucasian (1,201 cases or 97.4 percent), nine cases were African American (0.7 percent) and 23 cases were other or unknown races.
- Delaware's 2005–2009 malignant melanoma incidence rate (25.8 per 100,000) was significantly higher than the U.S. rate (21.0 per 100,000) and this significant excess was seen among both males (34.3 vs. 27.2 per 100,000) and females (19.3 vs. 16.7 per 100,000).

- Although incidence rates were not available for African Americans in Delaware, incidence rates among Caucasians were higher than rates for all races combined. The same pattern was seen nationally.
- For 2005–2009 at all geographic levels, for all races combined, the malignant melanoma incidence rates for males were significantly higher than rates for females.
- Among Caucasians, incidence rates for males were significantly higher than for females in both New Castle and Sussex counties.
- Delaware's melanoma incidence rate was increasing at a greater rate than the U.S. (64.3 percent for Delaware vs. 20 percent for the U.S.) from 1995–1999 through 2005–2009.
- The rate of increase in melanoma incidence was greater for males than females both in Delaware (74.5 percent for males vs. 46.2 percent for females) and in the U.S. (25.3 percent for males vs. 14.4 and for females).
- The 2005–2009 malignant melanoma incidence rate increased from 5.8 per 100,000 for ages 0-39 to 166.8 per 100,000 for ages 75-85 and then decreased for ages 85 and over (72.5 per 100,000).
- Delawareans ranked fifth highest in the U.S. for incidence of malignant melanoma during 2005–2009; males ranked fourth and females ranked tenth (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Malignant Melanoma (Table 15.4, Figures 15.4 – 15.5)

- The majority of melanoma cases were diagnosed in the local stage. For 2005–2009, 82.4 percent, 10.0 percent and 3.1 percent of malignant melanomas were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 84.1 percent, 8.6 percent and 3.8 percent, respectively.
- In Delaware, the percentage of malignant melanoma cases diagnosed in the local stage remained relatively stable from 1980-1984 through 2005–2009, with an average of 81.4 percent of cases.
- The proportion of cases of malignant melanoma diagnosed in the regional stage, however, doubled from 1980-1984 (4.9 percent) to 2005–2009 (10.0 percent) most likely as a result of a 44 percent reduction in the number of cases with an unknown stage at diagnosis.
- The proportion of cases diagnosed in the distant stage decreased from 4.0 percent in 1980-1984 to 3.1 percent in 2005–2009.

Malignant Melanoma Mortality (Tables 15.5 – 15.7, Figure 15.6)

- During 2005–2009, there were 139 deaths from malignant melanoma that accounted for 0.6 percent of all cancer deaths in Delaware. All but one of the deaths was Caucasian.
- Of the Delaware residents who died from malignant melanoma, 50.6 percent were male and 49.4 percent female.
- Historically, Delaware's malignant melanoma mortality rate among males has been an average of 20.7 percent higher than the U.S. rate. Delaware females have had a melanoma mortality rate that was, on average, 12.5 percent higher than the U.S. rate.
- Delaware's 2005–2009 malignant melanoma mortality rate (2.9 per 100,000) was not significantly higher than the rate for the U.S. (2.7 per 100,000).
- For 2005–2009, at both the state and national levels, the malignant melanoma mortality rate was significantly higher for males than for females
- From 1995–1999 through 2005–2009, Delaware's malignant melanoma mortality rate dropped 6.1 percent and 23.8 percent for males and females, respectively. During that same time period the U.S. rate increased 2.5 percent among males and decreased 5.6 percent among females.
- Numbers of deaths were too small to calculate age-specific mortality rates either by sex or race.
- For 2005–2009, Delaware ranked 24th highest in the nation for mortality from malignant melanoma. Delaware males ranked ninth and females ranked 37th (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 15.1. Number of Malignant Melanoma Cases by Sex; Delaware and Counties, 2005–2009

	All Races		
	All	Male	Female
Delaware	1,233	750	483
Kent	161	91	70
New Castle	702	426	276
Sussex	370	233	137

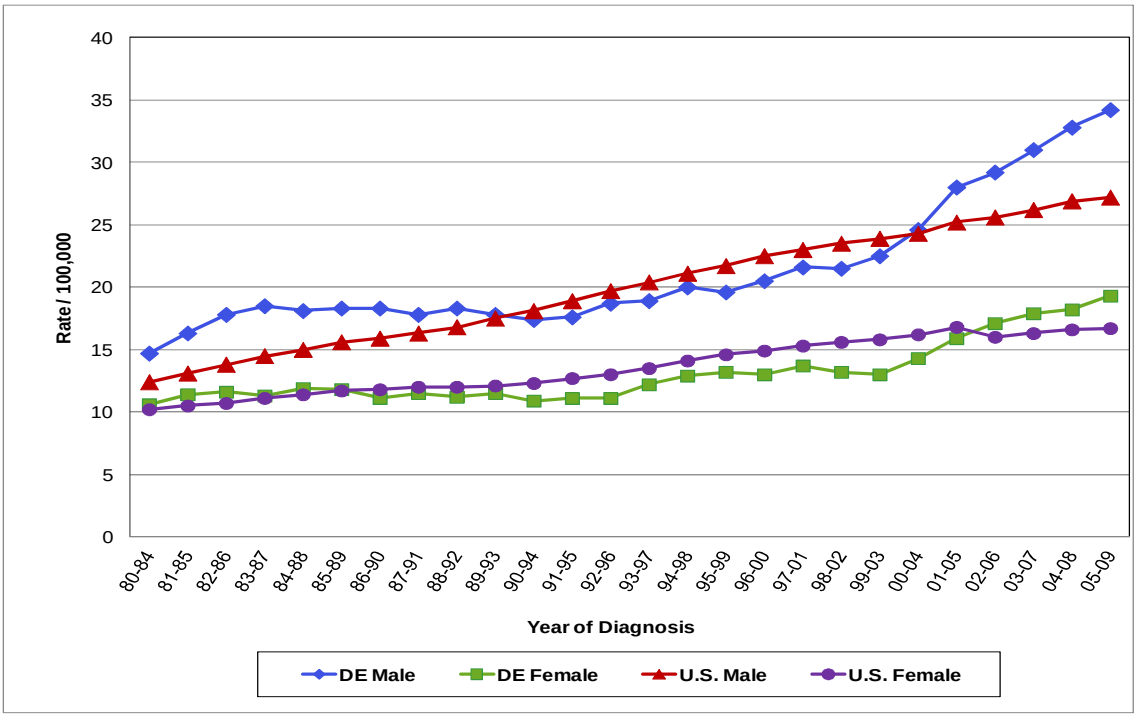
--- = Cell counts are not shown by race to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 15.2. Five-Year Average Age-Adjusted Malignant Melanoma Incidence Rates* and 95% Confidence Intervals by Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	21.0 (20.9 , 21.2)	27.2 (27.0 , 27.5)	16.7 (16.5 , 16.9)
Delaware	25.8 (24.4 , 27.3)	34.3 (31.9 , 36.9)	19.3 (17.6 , 21.2)
Kent	20.9 (17.7 , 24.4)	26.5 (21.3 , 32.7)	16.5 (12.9 , 20.9)
New Castle	25.8 (23.9 , 27.8)	35.2 (31.9 , 38.7)	19.0 (16.8 , 21.4)
Sussex	28.9 (25.9 , 32.1)	36.6 (31.9 , 41.8)	22.6 (18.7 , 27.1)
CAUCASIAN			
United States	24.7 (24.5 , 24.9)	31.6 (31.3 , 31.9)	19.9 (19.7 , 20.1)
Delaware	31.3 (29.5 , 33.2)	40.5 (37.6 , 43.6)	24.2 (22.0 , 26.6)
Kent	26.7 (22.7 , 31.2)	33.2 (26.6 , 41.0)	21.8 (16.9 , 27.7)
New Castle	32.5 (30.1 , 35.1)	42.9 (38.8 , 47.3)	24.8 (21.9 , 28.0)
Sussex	31.3 (27.9 , 35.0)	39.5 (34.3 , 45.4)	24.5 (20.1 , 29.7)
AFRICAN AMERICAN			
United States	---	---	---
Delaware	---	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

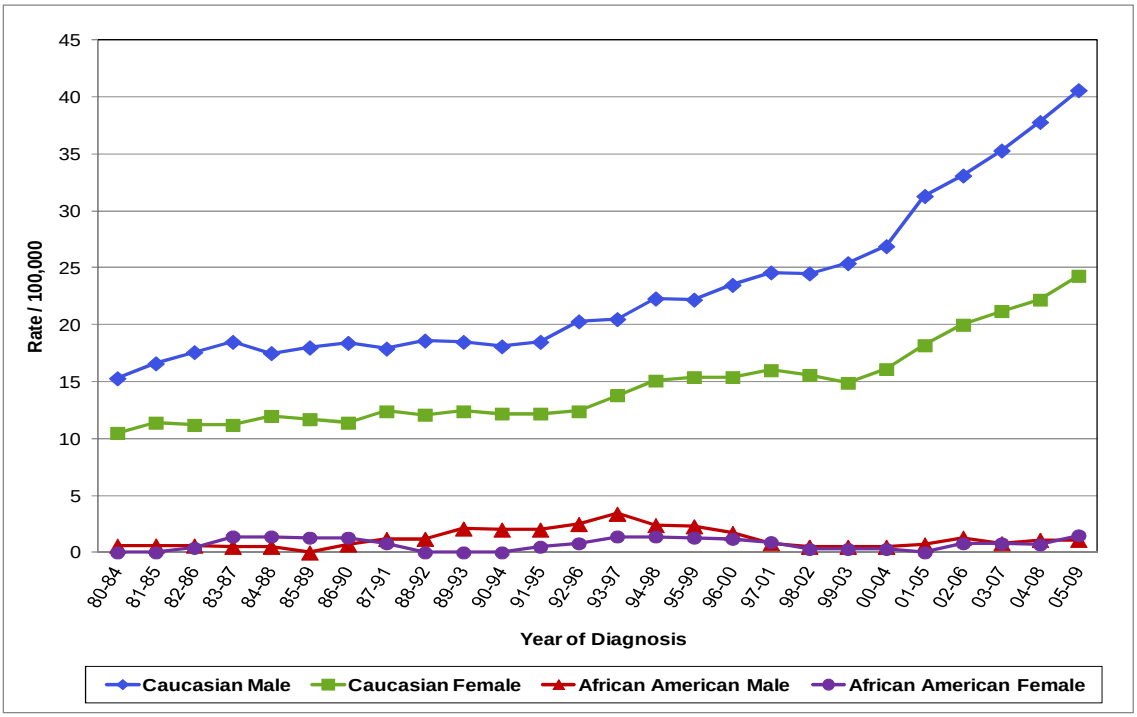
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 15.1. Five-Year Average Age-Adjusted Malignant Melanoma Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 15.2. Five-Year Average Age-Adjusted Malignant Melanoma Incidence Rates* by Race and Sex; Delaware, 1980–2009



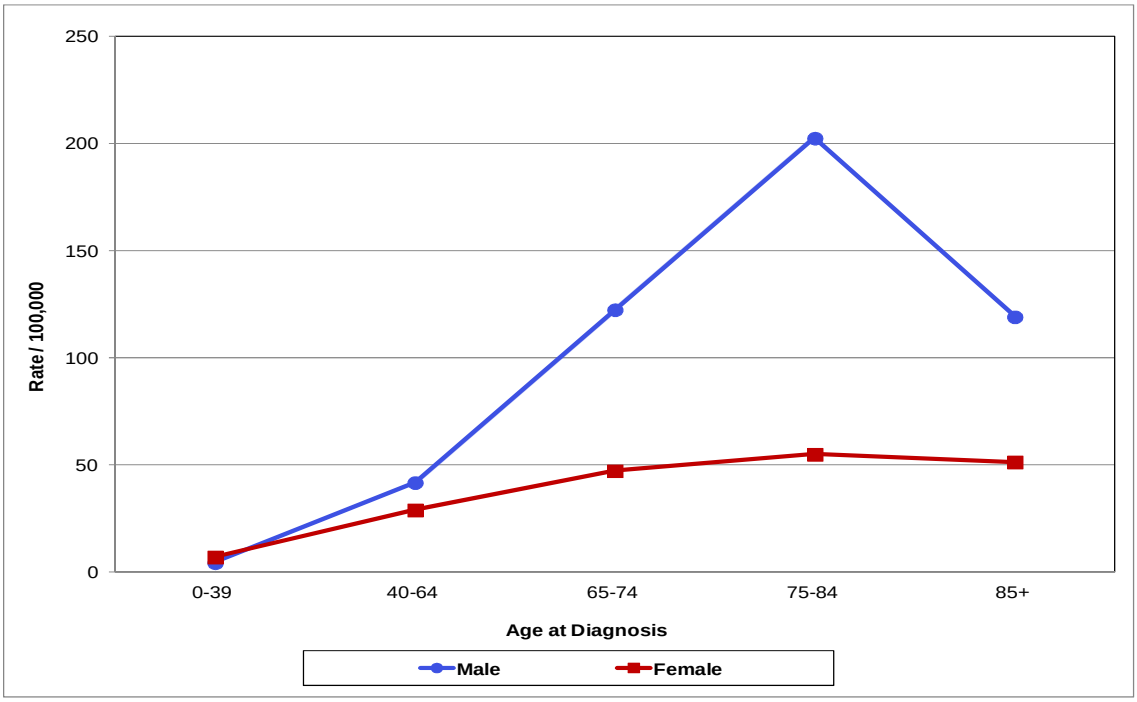
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 15.3. Age-Specific Malignant Melanoma Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	5.8	4.5	7.2	8.0	6.1	9.9	---	---	---
40-64	35.2	41.9	29.1	43.8	51.2	36.9	---	---	---
65-74	82.0	122.5	47.4	95.3	141.3	55.3	---	---	---
75-84	116.8	202.5	55.1	131.7	224.2	63.4	---	---	---
85+	72.5	119.2	51.5	77.9	133.9	52.4	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 15.3. Age-Specific Malignant Melanoma Incidence Rates* by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

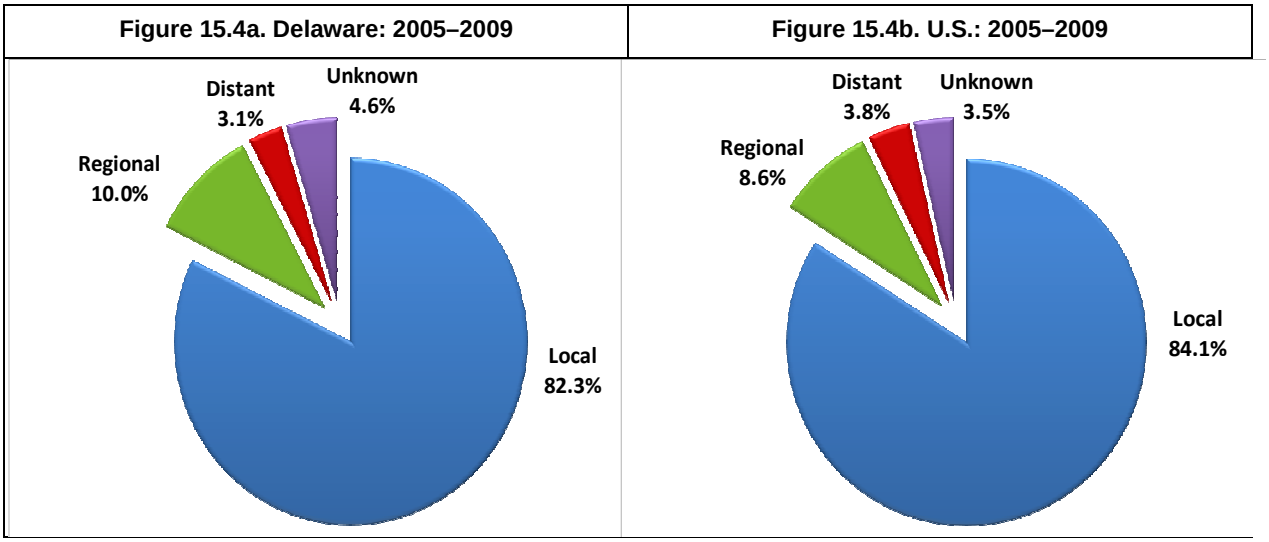
Malignant Melanoma by Stage

Table 15.4. Number and Percent of Malignant Melanoma Cases by Stage at Diagnosis and Sex; Delaware, 2005–2009*

Stage at Diagnosis	Number			Percent		
	All	Male	Female	All	Male	Female
Local	1,015	615	400	82.3	82.0	82.8
Regional	123	76	47	10.0	10.1	9.7
Distant	38	26	12	3.1	3.5	2.5
Unknown	57	33	24	4.6	4.4	5.0
Total	1,233	750	483	100.0	100.0	100.0

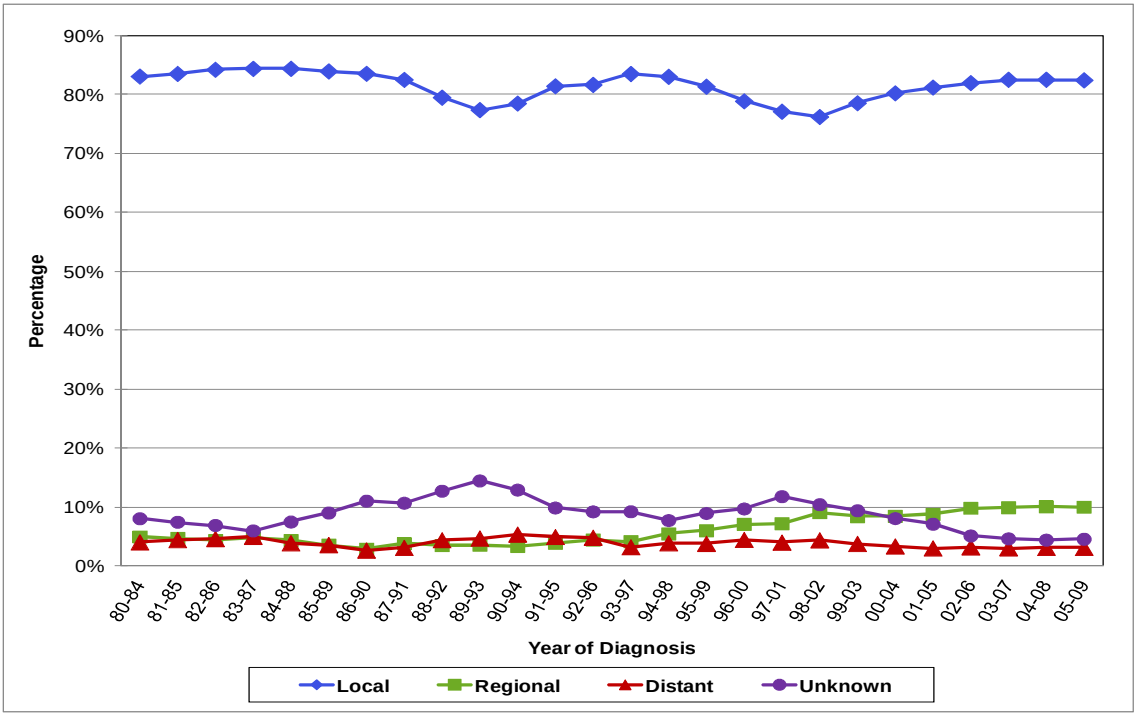
* = Cell counts are not shown by race due to patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 15.4. Percent of Malignant Melanoma Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 15.5. Percent of Malignant Melanoma Cases by Stage at Diagnosis; Delaware, 1980-2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 15.5. Number of Malignant Melanoma Deaths by Sex; Delaware and Counties, 2005–2009*

	All Races		
	All	Male	Female
Delaware	139	97	42
Kent	17	8	9
New Castle	80	60	20
Sussex	42	29	13

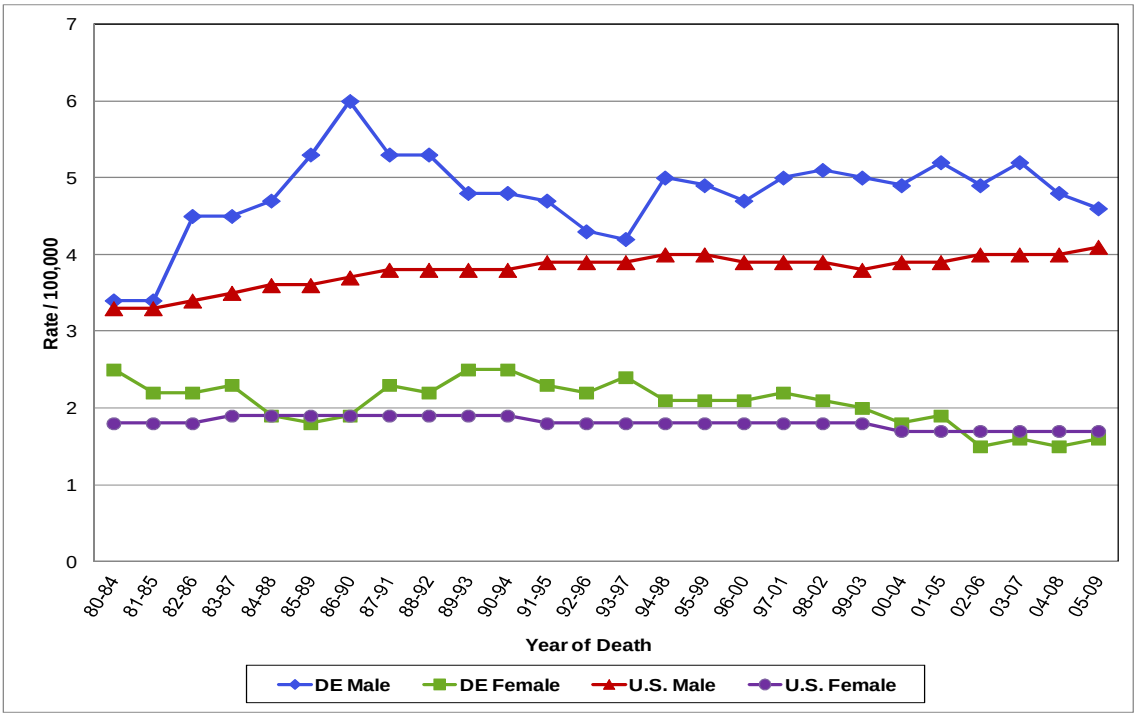
* = Cell counts are not shown by race due to patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 15.6. Five-Year Average Age-Adjusted Malignant Melanoma Mortality Rates* and 95% Confidence Intervals by Sex; U.S., Delaware and Counties, 2005–2009

REGION	All	Male	Female
United States	2.7 (2.7 , 2.8)	4.1 (4.0 , 4.1)	1.7 (1.7 , 1.8)
Delaware	2.9 (2.4 , 3.4)	4.7 (3.8 , 5.8)	1.6 (1.2 , 2.2)
Kent	---	---	---
New Castle	3.0 (2.3 , 3.7)	5.3 (4.0 , 6.9)	---
Sussex	3.0 (2.2 , 4.1)	4.6 (3.0 , 6.7)	---

***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 15.6. Five-Year Average Age-Adjusted Malignant Melanoma Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Table 15.7. Age-Specific Malignant Melanoma Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	3.0	4.1	---	3.8	4.9	---	---	---	---
65-74	11.8	19.3	---	14.0	22.8	---	---	---	---
75-84	14.5	28.4	---	16.5	31.9	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 15.7. Age-Specific Malignant Melanoma Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 15.7 is not displayed because of the small number of deaths.

16. MULTIPLE MYELOMA

Risk Factors and Early Detection

Lifestyle Risk Factors for Multiple Myeloma:

- being overweight or obese
- cigarette smoking (suspected)

Environmental and Medically-Related Causes of Multiple Myeloma:

- occupational exposures (e.g. benzene, other solvents, agricultural exposures)
- exposure to non-medical irradiation

Risk Factors for Multiple Myeloma that Cannot be Changed:

- increasing age – very low risk before age 35 and greatest risk for 65 and over
- race – African American
- family history of multiple myeloma
- gender – men slightly more likely to get multiple myeloma
- having monoclonal gammopathy (a non-malignant disorder involving plasma cells)

Factors Protective against Multiple Myeloma:

- There is no known way to prevent myeloma in persons who have other plasma cell diseases.
- Risk of multiple myeloma may be lowered by managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), physical activity and tobacco use.

Early Detection of Multiple Myeloma:

- There are no screening tests for multiple myeloma in asymptomatic individuals.

Data Highlights

Multiple Myeloma Incidence (Tables 16.1 – 16.3, Figures 16.1 – 16.2)

- Multiple myeloma accounted for 1.2 percent of all cancer cases diagnosed during 2005–2009 in Delaware.
- Newly-diagnosed cases were evenly split by sex: 150 cases (50.3 percent) were female and 148 cases (49.7 percent) were male. 68.8 percent (202 cases) were Caucasian, 28.9 percent (86 cases) were African American and 10 cases were other or unknown race.
- Delaware's 2005–2009 multiple myeloma incidence rate (6.1 per 100,000) was higher than the U.S. rate (5.8 per 100,000) but the difference was not significant. In Delaware, the highest incidence rate was in Kent County (6.8 per 100,000) and the lowest in Sussex County (5.5 per 100,000).
- Nationally, incidence of multiple myeloma was significantly higher among males than females, both among Caucasians and African Americans. The male-to-female excess seen in Delaware was not statistically significant in either racial category.
- The multiple myeloma incidence rate among males was higher nationally (7.4 per 100,000) than in Delaware (6.9 per 100,000). The opposite was true among females (5.6 percent per 100,000 Delaware vs. 4.7 per 100,000 U.S.).

- In Delaware, the multiple myeloma incidence rate among African Americans was significantly higher than among Caucasians in both males (13.1 per 100,000 African American vs. 5.7 per 100,000 Caucasian) and females (11.6 per 100,000 African American vs. 4.5 per 100,000 Caucasian).
- From 1995–1999 through 2005–2009, Delaware's multiple myeloma incidence rate increased 17.3 percent (7.8 percent for males and 33.3 percent for females) while the U.S. incidence rate remained the same.
- Among African American Delawareans, the multiple myeloma incidence rate increased 54.5 percent in females, but decreased 15.9 percent in males between 1995–1999 and 2005–2009. Among Caucasians, incidence increased 11.9 percent in males and 21.6 percent in females.
- Available 2005–2009 data have shown the incidence of multiple myeloma increased with age; from 7.2 per 100,000 in ages 40-64 to 42.0 per 100,000 in ages 75-84.
- During 2005–2009, Delawareans ranked tenth highest in the U.S. for incidence of multiple myeloma. Females ranked fourth and males ranked 36th (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Multiple Myeloma (Tables 16.4 – 16.5, Figures 16.4 – 16.5)

- In Delaware, almost all cases of multiple myeloma diagnosed during 2005–2009 were in the distant stage at time of diagnosis; 91.2 percent among males and 98.7 percent among females.
- 98.8 percent of multiple myeloma cases diagnosed among African American Delawareans were diagnosed in the distant stage compared with 93.6 percent of Caucasians.

Multiple Myeloma Mortality (Tables 16.6 – 16.8, Figures 16.6 – 16.7)

- The 174 deaths from multiple myeloma that occurred during 2005–2009 accounted for 1.9 percent of all cancer deaths in Delaware during that time period.
- Of the Delaware residents who died from multiple myeloma, 96 deaths (55.2 percent) were male and 78 deaths (44.8 percent) female; 133 deaths (76.4 percent) were Caucasian, 40 deaths (23.0 percent) were African American and one decedent was other or unknown race.
- Delaware's 2005–2009 overall multiple myeloma mortality rate (3.5 per 100,000) does not differ from the U.S. rate (3.4 per 100,000).
- For 2005–2009, at both the state and national levels, the multiple myeloma mortality rates were significantly higher for males than for females.
- Historically, Delaware's multiple myeloma mortality rate has been lower than the U.S. rate.
- Between 1995–1999 and 2005–2009, Delaware's multiple myeloma mortality rate dropped 16.4 and 12.5 percent for males and females, respectively, while the U.S. rate dropped 10.2 and 18.2 percent for males and females, respectively.
- The state's multiple myeloma mortality rates decreased by 8.6 percent among Caucasians and by 27.1 percent among African Americans between 1995–1999 and 2005–2009.
- Delaware's largest rate of decline occurred in African American females, with a decrease of 37.3 percent during the last 10 five-year time periods (1995–1999 through 2005–2009).
- Data were too sparse to examine multiple myeloma mortality rates by age.
- For 2005–2009, Delaware ranked 19th in the nation for mortality from multiple myeloma; males ranked 20th and females ranked 21st (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 16.1. Number of Multiple Myeloma Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	298	148	150	202	103	99	86	39	47
Kent	52	21	31	36	15	21	16	6	10
New Castle	168	83	85	115	58	57	47	22	25
Sussex	78	44	34	51	30	21	23	11	12

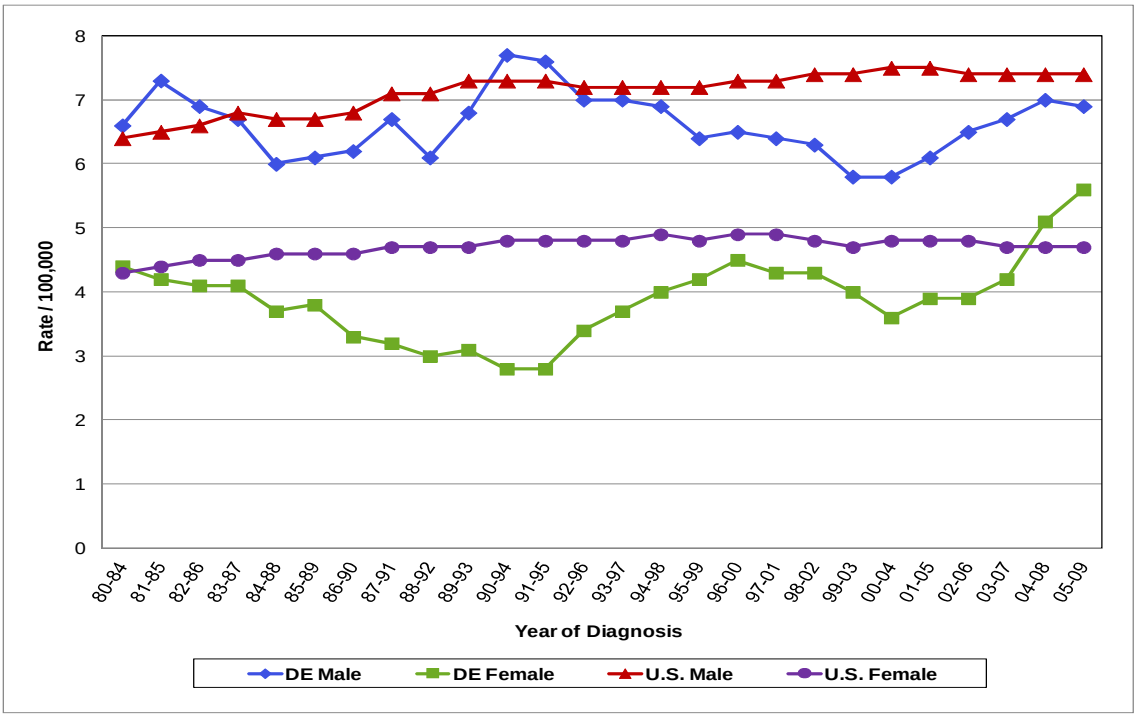
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 16.2. Five-Year Average Age-Adjusted Multiple Myeloma Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	5.8 (5.8 , 5.9)	7.4 (7.2 , 7.5)	4.7 (4.6 , 4.8)
Delaware	6.1 (5.4 , 6.9)	6.9 (5.8 , 8.1)	5.6 (4.7 , 6.6)
Kent	6.8 (5.1 , 9.0)	---	7.2 (4.9 , 10.2)
New Castle	6.2 (5.3 , 7.2)	7.1 (5.6 , 8.8)	5.6 (4.5 , 7.0)
Sussex	5.5 (4.3 , 6.9)	7.0 (5.0 , 9.5)	4.4 (3.0 , 6.4)
CAUCASIAN			
United States	5.3 (5.3 , 5.4)	6.9 (6.8 , 7.0)	4.1 (4.0 , 4.2)
Delaware	5.0 (4.3 , 5.7)	5.7 (4.7 , 7.0)	4.5 (3.6 , 5.5)
Kent	5.9 (4.1 , 8.2)	---	---
New Castle	5.3 (4.4 , 6.4)	6.2 (4.7 , 8.0)	4.8 (3.6 , 6.2)
Sussex	3.9 (2.9 , 5.2)	5.2 (3.5 , 7.7)	---
AFRICAN AMERICAN			
United States	11.7 (11.4 , 12.1)	14.3 (13.7 , 15.0)	10.1 (9.6 , 10.5)
Delaware	12.1 (9.6 , 15.0)	13.1 (9.0 , 18.2)	11.6 (8.5 , 15.5)
Kent	---	---	---
New Castle	9.8 (7.1 , 13.2)	---	8.9 (5.7 , 13.3)
Sussex	---	---	---

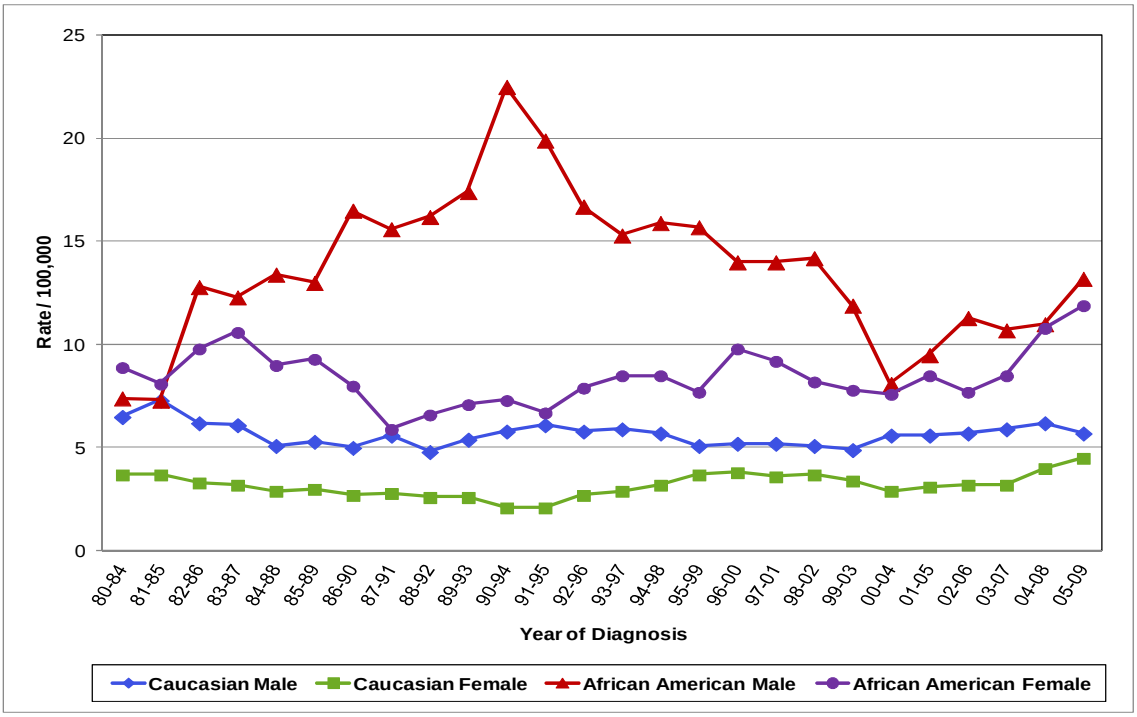
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 16.1. Five-Year Average Age-Adjusted Multiple Myeloma Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 16.2. Five-Year Average Age-Adjusted Multiple Myeloma Incidence Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 16.3. Age-Specific Multiple Myeloma Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	7.2	7.6	6.8	5.4	6.0	4.8	16.6	---	16.5
65-74	21.6	23.0	20.5	18.9	---	18.3	---	---	---
75-84	42.0	46.6	38.9	36.4	42.3	32.2	---	---	---
85+	---	---	---	---	---	---	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 16.3. Age-Specific Multiple Myeloma Incidence Rates by Sex; Delaware, 2005–2009

NOTE: Figure 16.3 is not shown because of the small number of cases.

Multiple Myeloma by Stage

Table 16.4. Number of Multiple Myeloma Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	15	---	---	13	---	---	---	---	---
Regional	---	---	---	---	---	---	---	---	---
Distant	283	135	148	189	92	97	85	38	47
Unknown	---	---	---	---	---	---	---	---	---
Total	298	148	150	202	103	99	86	39	47

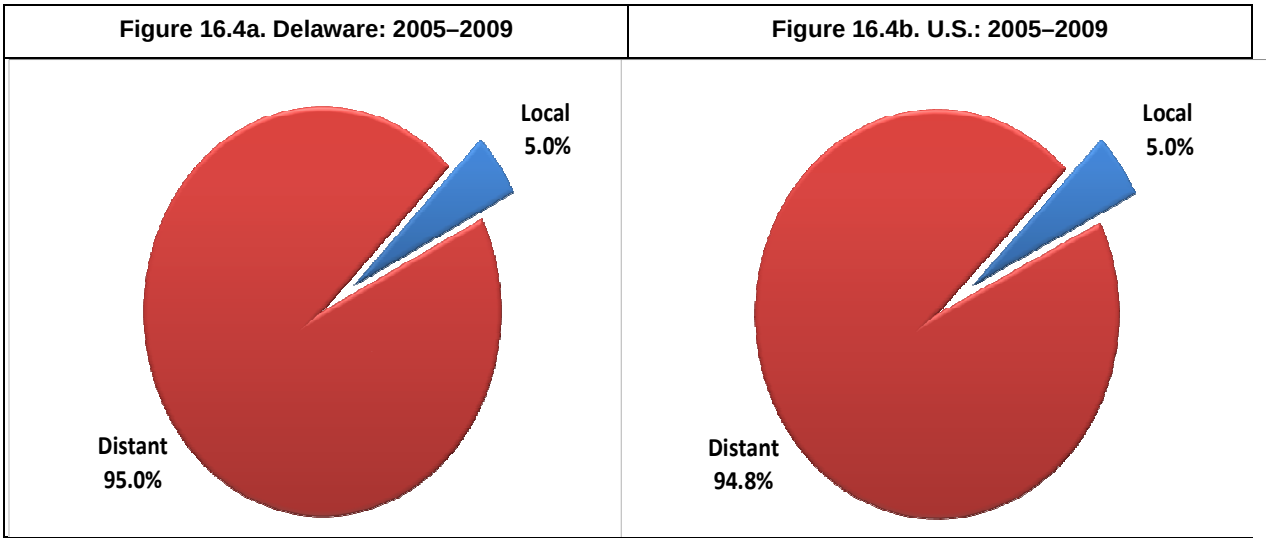
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 16.5. Percent of Multiple Myeloma Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	5.0	---	---	6.4	---	---	---	---	---
Regional	---	---	---	---	---	---	---	---	---
Distant	95.0	91.2	98.7	93.6	89.3	98.0	98.8	97.4	100.0
Unknown	---	---	---	---	---	---	---	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

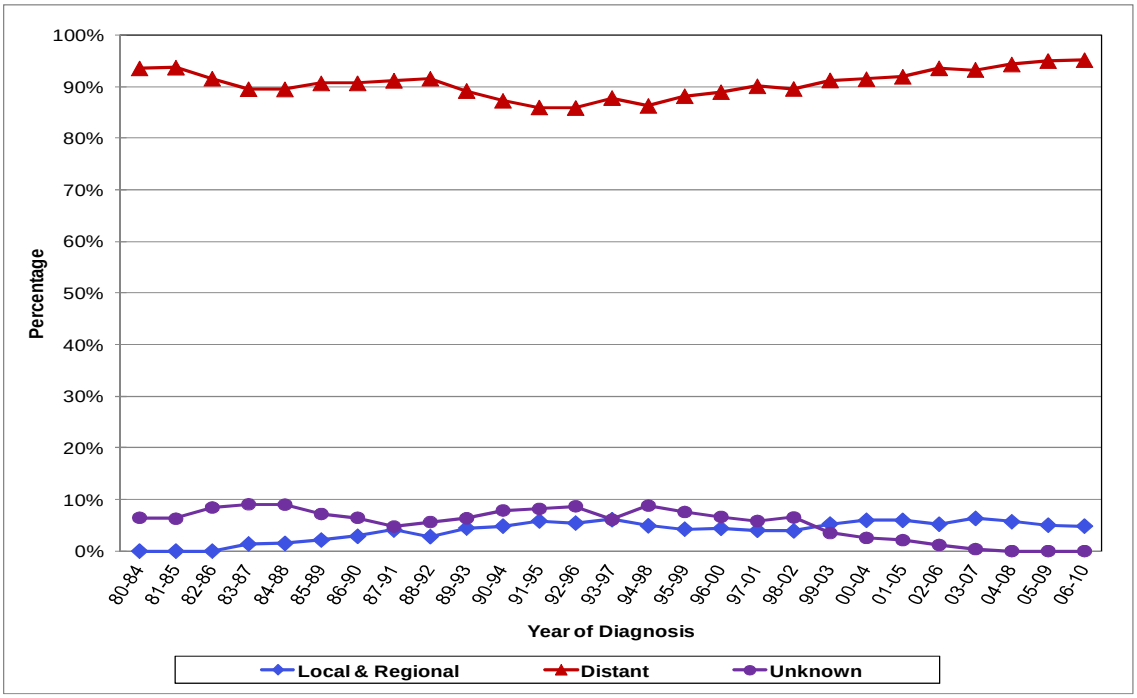
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 16.4. Percent of Multiple Myeloma Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 16.5. Percent of Multiple Myeloma Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 16.6. Number of Multiple Myeloma Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	174	96	78	133	74	59	40	22	18
Kent	25	11	14	25	11	14	---	---	---
New Castle	107	59	48	76	41	35	30	18	12
Sussex	42	26	16	32	22	10	---	---	---

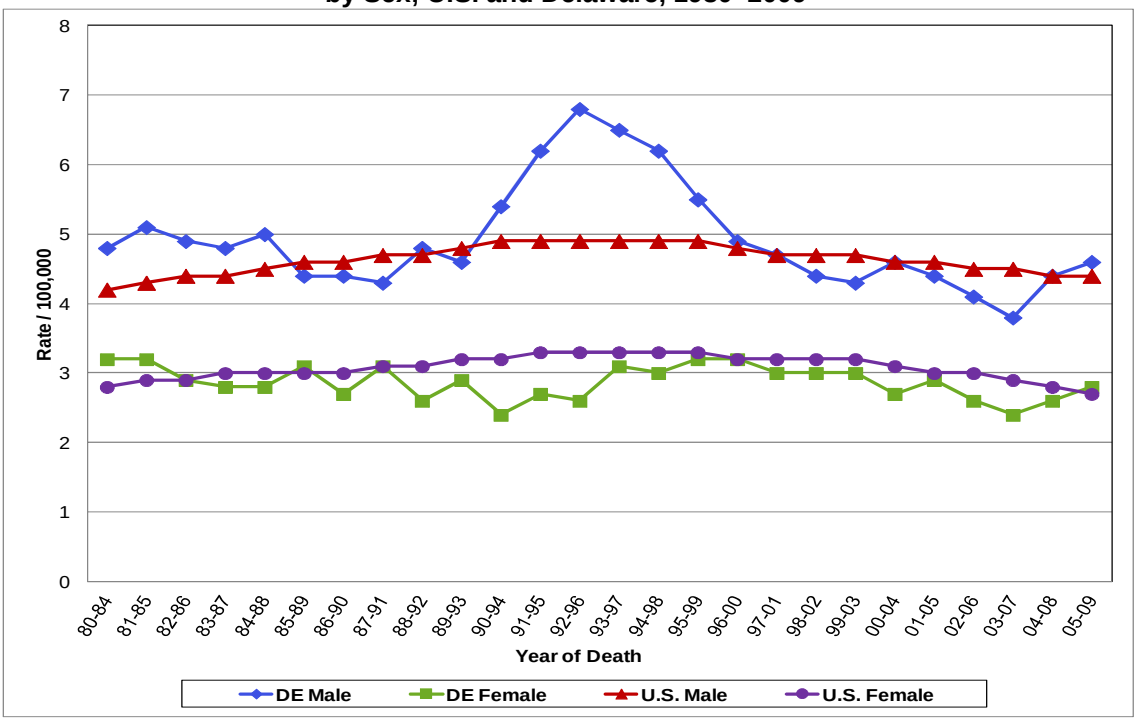
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 16.7. Five-Year Average Age-Adjusted Multiple Myeloma Mortality Rates* and 95% Confidence Intervals by Race and Sex; Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	3.4 (3.4 , 3.5)	4.4 (4.3 , 4.4)	2.7 (2.7 , 2.8)
Delaware	3.5 (3.0 , 4.1)	4.6 (3.7 , 5.7)	2.8 (2.2 , 3.5)
Kent	3.5 (2.3 , 5.1)	---	---
New Castle	3.9 (3.2 , 4.8)	5.2 (3.9 , 6.7)	3.1 (2.3 , 4.1)
Sussex	2.8 (2.0 , 3.8)	3.9 (2.5 , 5.8)	---
CAUCASIAN			
United States	3.2 (3.1 , 3.2)	4.1 (4.1 , 4.2)	2.5 (2.5 , 2.5)
Delaware	3.2 (2.6 , 3.8)	4.2 (3.3 , 5.2)	2.5 (1.9 , 3.2)
Kent	4.3 (2.8 , 6.3)	---	---
New Castle	3.4 (2.7 , 4.3)	4.4 (3.2 , 6.0)	2.7 (1.9 , 3.8)
Sussex	2.3 (1.5 , 3.3)	---	---
AFRICAN AMERICAN			
United States	6.4 (6.3 , 6.5)	8.0 (7.8 , 8.3)	5.4 (5.2 , 5.5)
Delaware	6.2 (4.4 , 8.5)	8.3 (5.0 , 12.7)	4.9 (2.9 , 7.8)
Kent	---	---	---
New Castle	7.2 (4.8 , 10.4)	---	---
Sussex	---	---	---

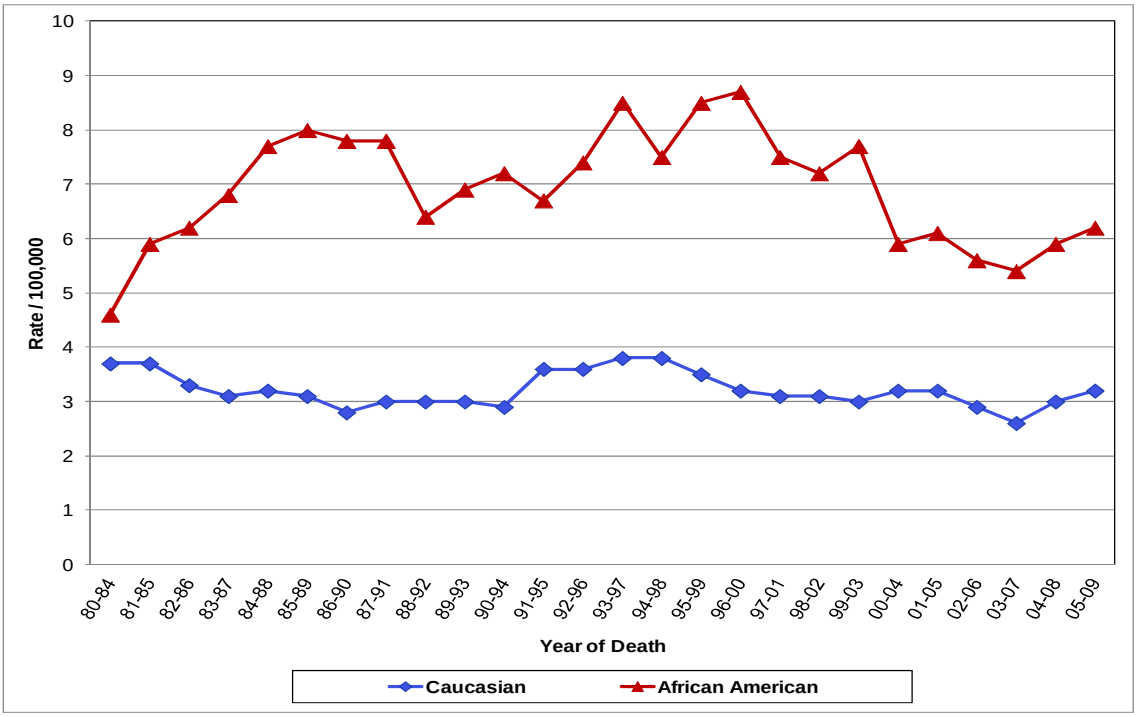
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE S: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 16.6. Five-Year Average Age-Adjusted Multiple Myeloma Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 16.7. Five-Year Average Age-Adjusted Multiple Myeloma Mortality Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 16.8. Age-Specific Multiple Myeloma Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---		---	---	---	---
40-64	2.5	---	---	2.3	---	---	---	---	---
65-74	13.4	17.5	---	10.4	---	---	---	---	---
75-84	31.9	39.7	26.3	29.9	38.3	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 16.8. Age-Specific Multiple Myeloma Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 16.8 is not displayed because of the small number of deaths.

17. NON-HODGKIN LYMPHOMA

Risk Factors and Early Detection

Lifestyle Risk Factors for Non-Hodgkin Lymphoma:

- diet high in fat and meats (suspected)
- overweight or obesity (suspected)
- cigarette smoking (suspected)

Environmental and Medically-Related Causes of Non-Hodgkin Lymphoma:

- exposure to benzene or ethylene oxide
- exposure to certain weed- and insect-killers
- chemotherapy, especially alkylating agents
- exposure to radiation – both medical and environmental
- exposure to electromagnetic fields (e.g. from power lines) (suspected)

Risk Factors for Non-Hodgkin Lymphoma that Cannot be Changed:

- increasing age – Most cases occur in 60's although some types are more common in younger people.
- gender – Generally risk is higher in men although some types are more common in women.
- race – Caucasians more likely than African Americans
- chemotherapy, especially alkylating agents
- weakened immune system; due to organ transplants or HIV infection
- infection with *Helicobacter pylori*
- autoimmune diseases; e.g. rheumatoid arthritis and lupus
- history of other infections:
    - human T-cell leukemia virus
    - Epstein-Barr virus
    - hepatitis C virus

Factors Protective against Non-Hodgkin Lymphoma:

- keeping at a healthy weight and eating a healthy diet
- avoiding behaviors that may spread HIV infection
- treatment of HIV infection
- treatment of infection from *Helicobacter pylori*

Early Detection of Non-Hodgkin Lymphoma:

- No tests are recommended for detection of NH lymphoma in the general population.
- Individuals with known risk factors for NH lymphoma should have regular check-ups.

Data Highlights

Non-Hodgkin Lymphoma (NH Lymphoma) Incidence (Tables 17.1 – 17.3, Figures 17.1 – 17.3)

- A total of 963 cases of NH lymphoma were diagnosed in Delaware during 2005–2009 that accounted for 3.8 percent of all cancer cases diagnosed during 2005–2009 in Delaware.
- Newly-diagnosed cases of NH lymphoma were slightly more prevalent among males than females; 517 cases (53.7 percent) male and 446 cases (46.3 percent) female.
- Delaware's 2005–2009 NH lymphoma incidence rate (20.1 per 100,000) does not differ from the U.S. rate (19.8 per 100,000).
- During 2005–2009, the NH lymphoma incidence rate was significantly higher for males than for females, both in Delaware (23.8 per 100,000 vs. 17.0 per 100,000, respectively) and the U.S. (23.8 per 100,000 vs. 16.3 per 100,000, respectively).
- The significant male-to-female difference in NH lymphoma incidence was also observed among Caucasians and African Americans nationally, and among Caucasians in Delaware.
- Nationally, the NH lymphoma incidence rate was significantly higher among Caucasians than African Americans for both sexes.
- From 1995–1999 through 2005–2009, Delaware's NH lymphoma incidence rate increased 8.1 percent (11.2 percent for males and 5.6 percent for females) while the U.S. incidence rate decreased by 0.5 percent.
- In Delaware, NH lymphoma incidence has been higher among Caucasians than among African Americans but the rate of increase was faster among African Americans than Caucasians; 35.0 percent among African Americans versus 6.3 percent among Caucasians from 1995–1999 through 2005–2009.
- The largest rate of increase in NH lymphoma incidence in Delaware occurred among female African Americans (38.5 percent from 1995–1999 through 2005–2009).
- During 2005–2009, age-specific NH lymphoma incidence increased from ages 0-39 (3.3 per 100,000) through ages 75-84 (101.6 per 100,000) and then decreased slightly for ages 85 and over (94.1 per 100,000).
- Delawareans ranked 15th overall in incidence of NH lymphoma during 2005–2009; males ranked 16th and females ranked 20th (U. S. Cancer Statistics Working Group).

Stage at Diagnosis of Non-Hodgkin Lymphoma (Tables 17.4 – 17.5, Figures 17.4 – 17.5)

- For 2005–2009, 29.8 percent, 18.4 percent and 44.9 percent of NH lymphoma cases in Delaware were diagnosed at the local, regional and distant stages, respectively. In the U.S., comparable percentages were 27.8 percent, 14.9 percent and 48.6 percent, respectively.
- Female Delawareans were more likely to be diagnosed with NH lymphoma in the distant stage than males (47.4 percent vs. 41.9 percent, respectively).
- African American males were the most likely to be diagnosed at the distant stage (52.8 percent) while African American females were the least likely (39.1 percent).
- The proportion of NH Lymphoma cases diagnosed in the distant stage decreased from 76.5 percent in 1980-1984 to 44.9 percent in 2005–2009. Over the same time period, the proportion of cases diagnosed in both local and regional cases increased.

Non-Hodgkin Lymphoma Mortality (Tables 17.6 – 17.8, Figures 17.6 – 17.7)

- There were 305 deaths from NH lymphoma during 2005–2009 that accounted for 9.5 percent of all cancer deaths in Delaware; 56.4 percent were male and 43.6 percent were female. By race group, 85.9 percent (262 deaths) were Caucasian, 12.5 percent (38 deaths) were African American and 5 deaths were other or unknown race.
- Delaware's 2005–2009 NH lymphoma mortality rate (6.3 per 100,000) was not significantly different from that of the U.S. (6.6 per 100,000).

- During 2005–2009 at both state and national levels, NH lymphoma mortality rates were significantly higher for males than for females. This significant excess was seen among both Caucasians and African Americans nationally, but was only seen among Caucasians in Delaware due to the small number of deaths among African Americans.
- From 1995–1999 through 2005–2009, Delaware's NH lymphoma mortality rate dropped 22.2 percent (12.6 among males and 30.4 percent among females) while the U.S. rate dropped 24.1 percent (22.2 percent among males and 26.8 percent among females).
- Delaware's NH lymphoma mortality rate declined 3.3 and 35.6 percent among male and female Caucasians, respectively. Among African Americans, mortality declined 58.4 percent among males but increased 13.6 percent among females. The wide variation in trends among African Americans, however, was most likely due to the small number of cases in that racial group.
- During 2005–2009 age-specific NH lymphoma mortality increased from ages 40-64 (4.5 per 100,000) through ages 85 and over (69.0 per 100,000).
- For 2005–2009, Delaware ranked 27th highest in the nation for mortality from NH lymphoma. Delaware males ranked 22nd and Delaware females ranked 37th (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Non-Hodgkin Lymphoma Incidence

Table 17.1. Number of Non-Hodgkin Lymphoma Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	963	517	446	805	434	371	141	72	69
Kent	152	84	68	127	68	59	23	16	7
New Castle	549	278	271	444	225	219	96	46	50
Sussex	262	155	107	234	141	93	22	10	12

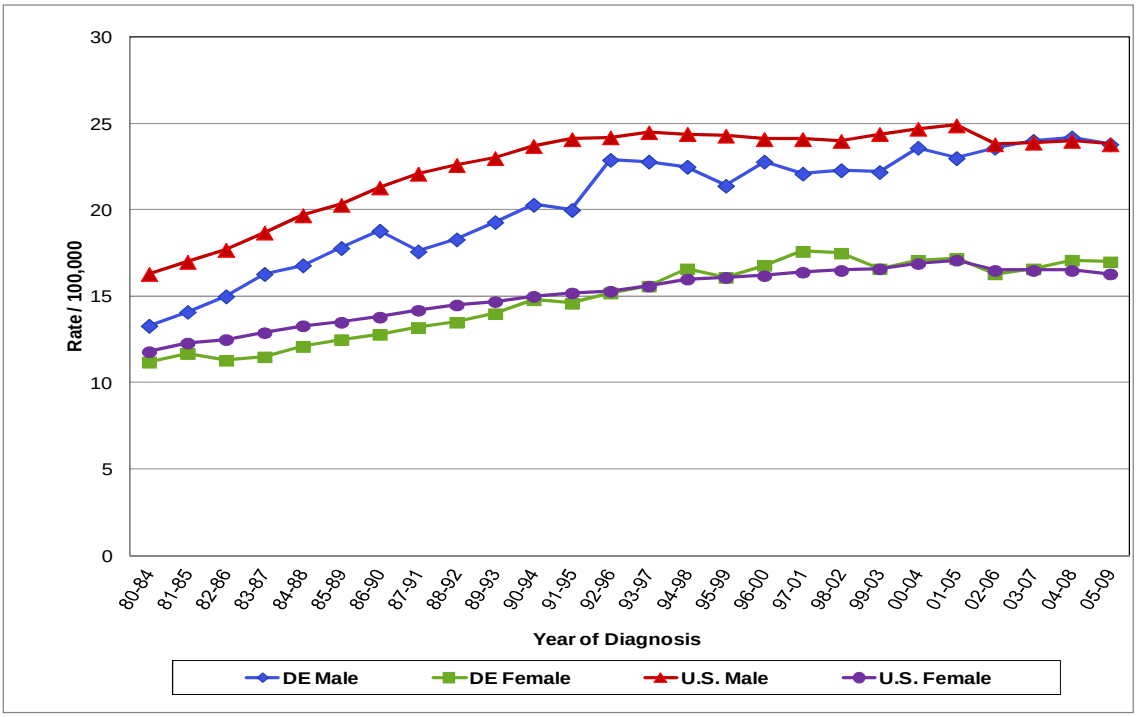
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 17.2. Five-Year Average Age-Adjusted Non-Hodgkin Lymphoma Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	19.6 (19.5 , 19.8)	23.8 (23.6 , 24.1)	16.3 (16.1 , 16.5)
Delaware	20.1 (18.8 , 21.4)	23.8 (21.8 , 26.0)	17.0 (15.4 , 18.7)
Kent	19.9 (16.9 , 23.4)	24.5 (19.4 , 30.5)	16.0 (12.4 , 20.4)
New Castle	20.3 (18.7 , 22.1)	23.2 (20.5 , 26.1)	18.2 (16.1 , 20.6)
Sussex	20.1 (17.6 , 22.9)	25.7 (21.7 , 30.4)	15.1 (12.2 , 18.5)
CAUCASIAN			
United States	20.5 (20.4 , 20.7)	24.8 (24.6 , 25.1)	17.1 (16.9 , 17.3)
Delaware	20.4 (19.0 , 21.9)	24.2 (22.0 , 26.6)	17.2 (15.4 , 19.1)
Kent	21.2 (17.7 , 25.3)	25.5 (19.7 , 32.5)	17.6 (13.3 , 22.8)
New Castle	20.8 (18.9 , 22.8)	23.5 (20.5 , 26.8)	18.8 (16.3 , 21.5)
Sussex	19.7 (17.1 , 22.7)	25.9 (21.6 , 31.0)	14.1 (11.2 , 17.7)
AFRICAN AMERICAN			
United States	14.3 (13.9 , 14.7)	17.5 (16.8 , 18.1)	11.8 (11.4 , 12.3)
Delaware	18.8 (15.7 , 22.3)	21.8 (16.8 , 27.8)	16.3 (12.6 , 20.7)
Kent	---	---	---
New Castle	19.6 (15.7 , 24.2)	21.5 (15.3 , 29.3)	17.8 (13.1 , 23.6)
Sussex	---	---	---

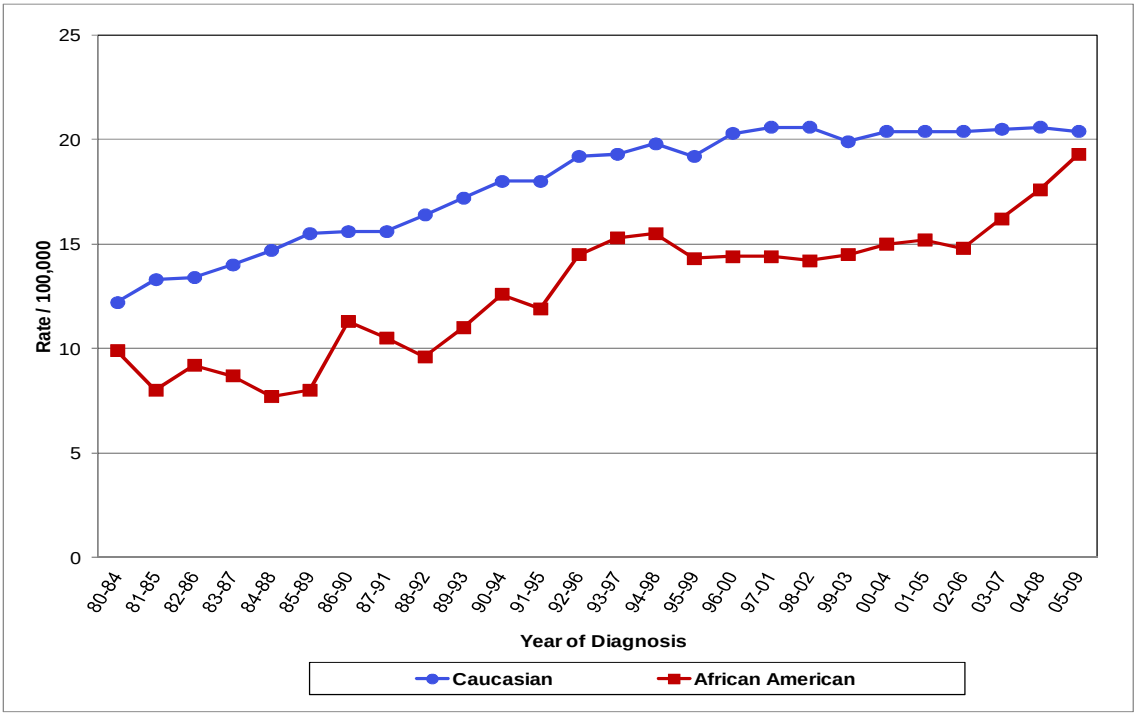
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 17.1. Five-Year Average Age-Adjusted Non-Hodgkin Lymphoma Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



***** = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 17.2. Five-Year Average Age-Adjusted Non-Hodgkin Lymphoma Incidence Rates* by Race and Sex; Delaware, 1980–2009



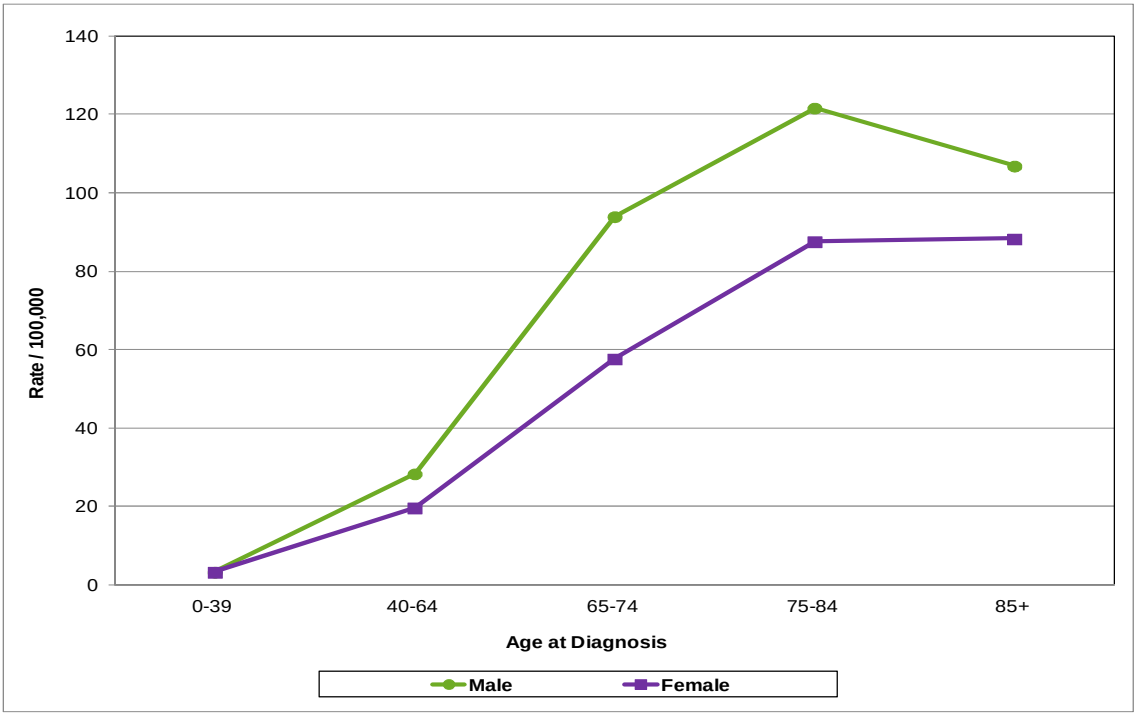
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 17.3. Age-Specific Non-Hodgkin Lymphoma Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	3.3	3.3	3.3	3.3	3.8	---	---	---	---
40-64	23.9	28.4	19.7	23.8	27.6	20.2	26.3	34.1	19.8
65-74	74.5	94.0	57.7	77.2	97.1	59.8	---	---	---
75-84	101.6	121.7	87.6	102.8	120.3	90.3	---	---	---
85+	94.1	106.9	88.3	98.1	120.1	88.1	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 17.3. Age-Specific Non-Hodgkin Lymphoma Incidence Rates by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Non-Hodgkin Lymphoma by Stage

Table 17.4. Number of Non-Hodgkin Lymphoma Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	288	139	149	243	120	123	41	15	26
Regional	177	100	77	148	85	63	26	13	13
Distant	432	245	187	358	202	156	65	38	27
Unknown	66	33	33	56	27	29	9	---	---
Total	963	517	446	805	434	371	141	72	69

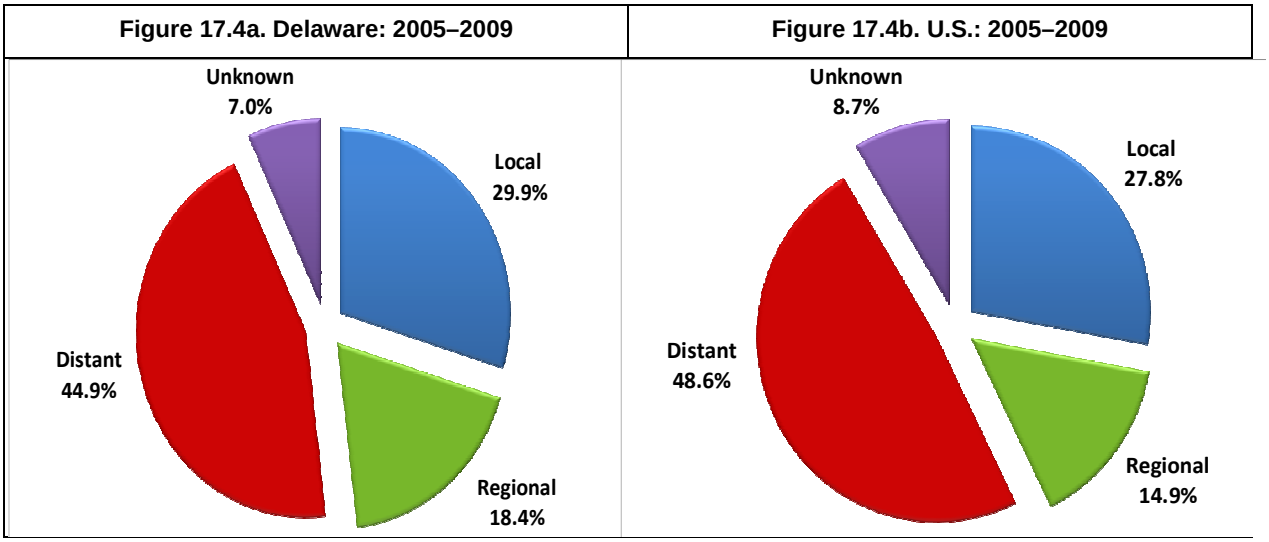
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 17.5. Percent of Non-Hodgkin Lymphoma Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	29.9	26.9	33.4	30.2	27.7	33.2	29.1	20.8	37.7
Regional	18.4	19.3	17.3	18.4	19.6	17.0	18.4	18.1	18.8
Distant	44.9	47.4	41.9	44.5	46.5	42.1	46.1	52.8	39.1
Unknown	6.9	6.4	7.4	7.0	6.2	7.8	6.4	8.3	4.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

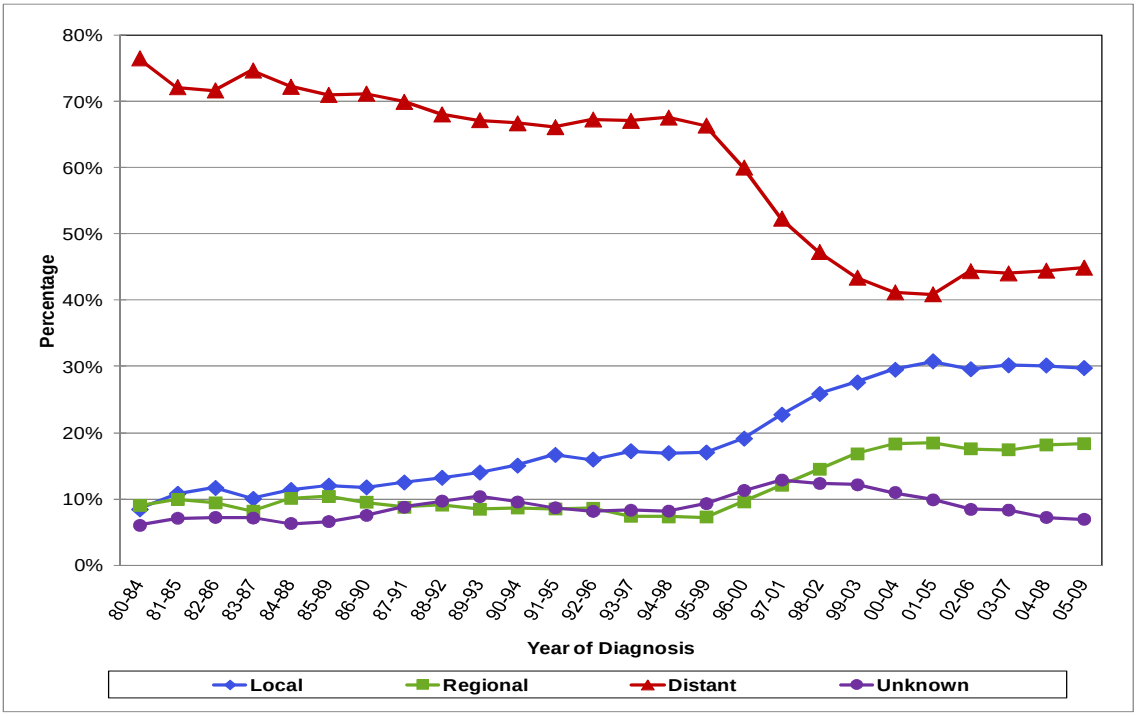
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 17.4. Percent of Non-Hodgkin Lymphoma Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 17.5. Percent of Non-Hodgkin Lymphoma Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 17.6. Number of Non-Hodgkin Lymphoma Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	305	172	133	262	152	110	38	18	20
Kent	62	39	23	54	---	---	---	---	---
New Castle	160	83	77	130	67	63	27	14	13
Sussex	83	50	33	78	---	---	---	---	---

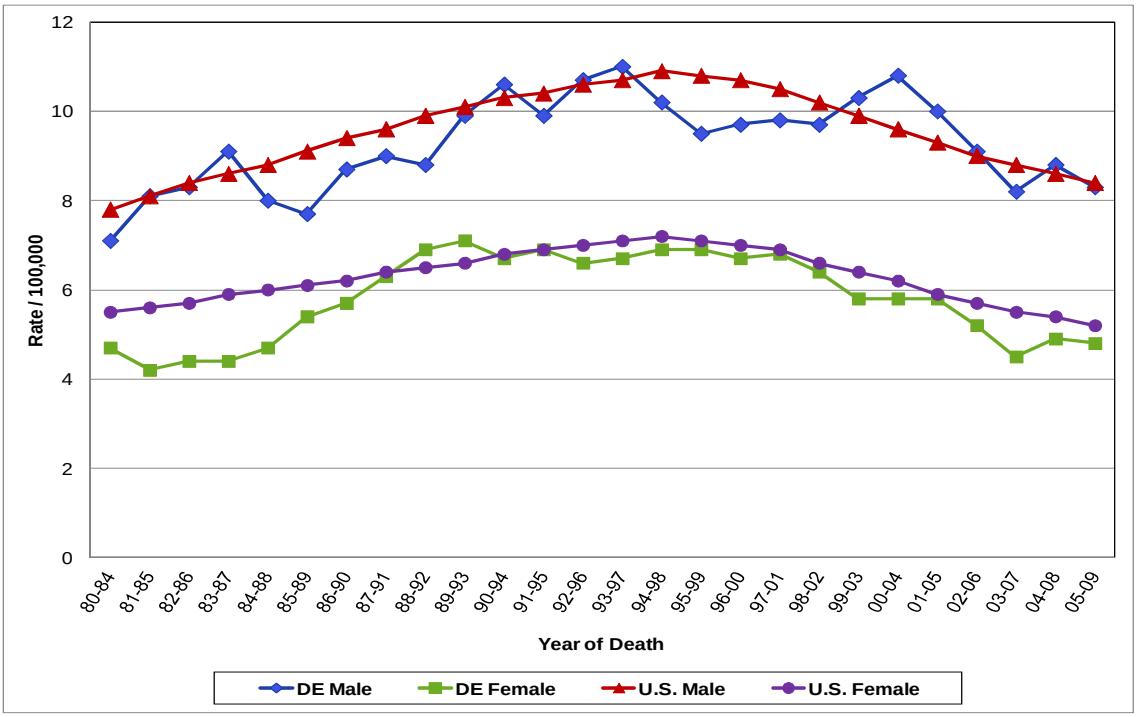
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 17.7. Five-Year Average Age-Adjusted Non-Hodgkin Lymphoma Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	6.6 (6.5 , 6.6)	8.4 (8.3 , 8.5)	5.2 (5.1 , 5.2)
Delaware	6.3 (5.6 , 7.1)	8.3 (7.1 , 9.7)	4.8 (4.0 , 5.7)
Kent	8.3 (6.4 , 10.7)	12.7 (9.0 , 17.5)	---
New Castle	6.0 (5.1 , 7.0)	7.2 (5.7 , 9.0)	4.9 (3.9 , 6.2)
Sussex	5.8 (4.6 , 7.2)	7.8 (5.8 , 10.5)	4.1 (2.8 , 6.0)
CAUCASIAN			
United States	6.8 (6.8 , 6.9)	8.7 (8.6 , 8.8)	5.4 (5.4 , 5.5)
Delaware	6.4 (5.7 , 7.3)	8.7 (7.3 , 10.2)	4.7 (3.8 , 5.7)
Kent	9.2 (6.9 , 12.0)	14.8 (10.2 , 20.6)	---
New Castle	5.9 (4.9 , 7.1)	7.2 (5.6 , 9.2)	4.9 (3.8 , 6.4)
Sussex	5.9 (4.6 , 7.5)	8.3 (6.1 , 11.3)	4.1 (2.7 , 6.1)
AFRICAN AMERICAN			
United States	4.6 (4.5 , 4.7)	6.1 (5.9 , 6.3)	3.6 (3.5 , 3.8)
Delaware	5.5 (3.8 , 7.5)	---	---
Kent	---	---	---
New Castle	5.9 (3.8 , 8.7)	---	---
Sussex	---	---	---

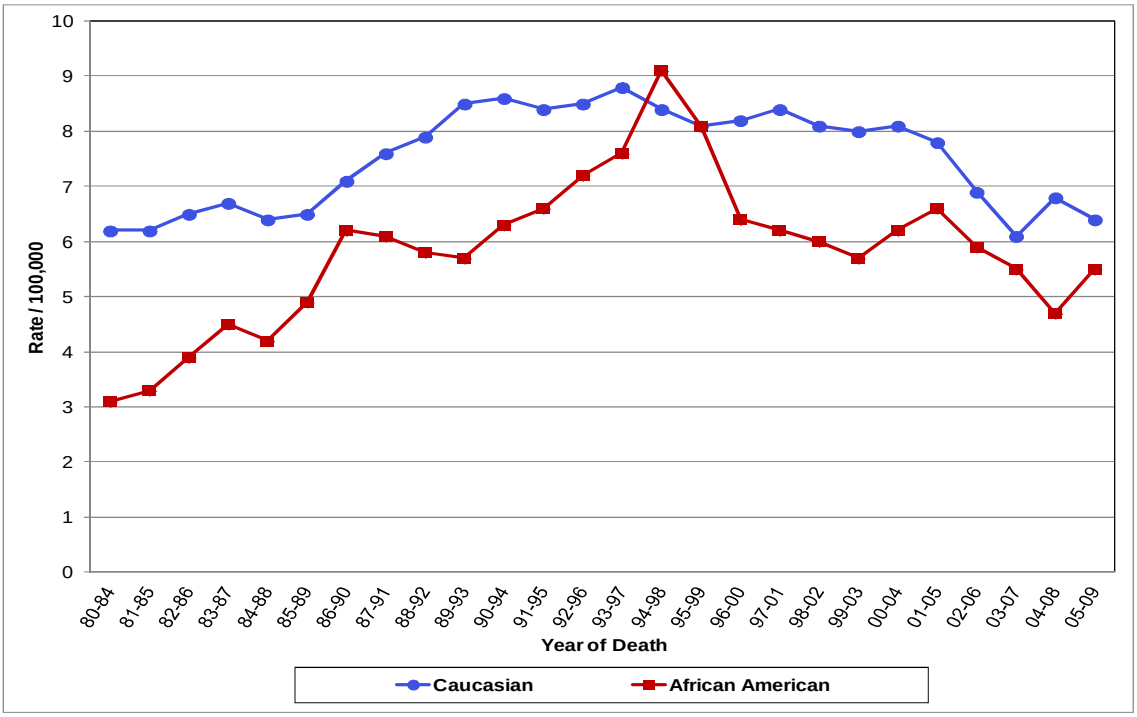
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 17.6. Five-Year Average Age-Adjusted Non-Hodgkin Lymphoma Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 17.7. Five-Year Average Age-Adjusted Non-Hodgkin Lymphoma Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 17.8. Age-Specific Non-Hodgkin Lymphoma Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	4.5	6.2	---	4.3	6.5	---	---	---	---
65-74	24.9	29.2	21.2	24.7	27.5	22.4	---	---	---
75-84	47.1	66.5	33.5	49.1	70.7	33.7	---	---	---
85+	69.0	---	60.4	70.5	---	57.6	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 17.8. Age-Specific Non-Hodgkin Lymphoma Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 17.8 is not displayed because of the small number of deaths.

18. ORAL CAVITY AND PHARYNX CANCER[16]

Risk Factors and Early Detection

Lifestyle Risk Factors for Cancers of the Oral Cavity and Pharynx:

- smoking cigarettes, cigars or pipes
- use of snuff or chewing tobacco
- alcohol abuse – 70 percent of people with oral cancer abuse alcohol
- heavy drinking and heavy smoking – Risk may be as much as 100 more than among those who don't smoke or drink.
- chewing betel quid and gutka (mostly South and Southeast Asia)
- human papilloma virus (HPV) infection (especially HPV 16) – HPV DNA is found in about two of three oropharyngeal cancers
- exposure to ultraviolet light – cancer of the lip
- diet low in fruits and vegetables
- use of mouthwash (suspected)

Environmental and Medically-Related Causes of Cancers of the Oral Cavity and Pharynx:

- improperly fitted dentures (suspected)

Risk Factors for Cancers of the Oral Cavity and Pharynx that Cannot be Changed:

- gender – twice as common in men
- age – mostly age 55 and over
- genetic syndromes such as Fanconi anemia and Dyskeratosis congenita
- having a weakened immune system

Factors Protective against Cancers of the Oral Cavity and Pharynx:

- avoid use of tobacco
- limit alcohol use
- limit exposure to ultraviolet light
- maintain diet high in fruits, vegetables and whole grains
- have precancerous growths treated

Early Detection of Cancers of the Oral Cavity and Pharynx:

- Most pre-cancers of the oral cavity and pharynx can be found early during routine screening exams by a dentist, doctor, dental hygienist, or by self-exam.

[16] "Oral cancer" is often substituted for "oral cavity and pharynx cancer" throughout this section.

Data Highlights

Oral Cancer Incidence (Tables 18.1 – 18.3, Figures 18.1 – 18.2)

- Oral cancer accounted for 2.2 percent of all cancer cases diagnosed during 2005–2009 in Delaware.
- Newly-diagnosed cases were more common among males (69.6 percent) than among females (30.4 percent).
- The majority of cases were Caucasian (83.2 percent or 466), 14.3 percent (80 cases) were African American and 10 were other or unknown race.
- Delaware's 2005–2009 oral cancer incidence rate (11.3 per 100,000) was not statistically significantly higher than the U.S. rate (10.8 per 100,000).
- For 2005–2009 the oral cancer incidence rate for males was significantly higher than the rate for females in Delaware and nationally. This significant difference was seen within each of Delaware's three counties.
- The significant male-to-female excess was also observed among Caucasians in Delaware and among Caucasians and African Americans in the U.S. There were too few cases among African Americans in Delaware to allow for a comparison by sex.
- Nationally, the oral cancer incidence rate for Caucasians was significantly higher than the rate for African Americans in both sexes. In Delaware, oral cancer incidence was higher among Caucasians than African Americans, but the difference was not significant.
- The incidence rate for cancers of the oral cavity and pharynx was highest in Sussex County males (21.4 per 100,000) and lowest in New Castle County females (6.0 per 100,000).
- From 1995–1999 through 2005–2009, Delaware's oral cancer incidence rate increased 3.0 percent for males and decreased 5.9 percent for females. During the same time period, the U.S. oral cancer incidence rate decreased 4.7 percent for males and 8.8 percent for females.
- Delaware's oral cancer incidence rate increased among Caucasians (6.3 and 4.6 percent for males and females, respectively) Caucasians and decreased among African Americans (17.3 and 48.8 percent for males and females, respectively) from 1995–1999 through 2005–2009.
- Other than a peak incidence among Caucasian males ages 65-74, age-specific rates of oral cancer were too sparse to examine age-related patterns.
- During 2005–2009, Delawareans ranked 18th highest in the U.S. for incidence of cancers of the oral cavity. Males ranked 18th and females ranked 14th (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Oral Cavity and Pharynx Cancer (Table 18.4, Figures 18.4 – 18.5)

- For 2005–2009, 30.0 percent, 50.9 percent and 15.0 percent of oral cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 32.6 percent, 44.8 percent and 16.5 percent, respectively.
- In Delaware during for 2005–2009, 65.9 percent (369 cases) of oral cancers were diagnosed in the late stages (i.e., regional or distant stage) compared with 61.3 percent nationally.
- In Delaware, males were less likely than females to have had their oral cancer diagnosed in the local stage (25.1 percent vs. 41.2 percent, respectively).
- In Delaware, the percentage of oral cancer cases diagnosed in the local stage decreased slightly, from 34.1 percent in 1980–1984 to 30.0 percent in 2005–2009. The percentage of cases diagnosed in the regional stage increased from 44.1 percent in 1980–1984 to 50.9 percent in 2005–2009. The percentage of cases diagnosed in the distant stage, however, remained the same.

Oral Cavity and Pharynx Cancer Mortality (Tables 18.5 – 18.7, Figures 18.6 – 18.7)

- There were 118 deaths from oral cancer during 2005–2009 that accounted for 1.3 percent of all cancer deaths in Delaware.
- Of the Delaware residents who died from oral cancer, 70.3 percent were male and 29.7 percent female; 85.6 percent were Caucasian, 12.7 percent were African American and two decedents were other or unknown race.
- Delaware's 2005–2009 oral cancer mortality rate (2.4 per 100,000) was not different from that of the U.S. (2.5 per 100,000).
- For 2005–2009, the oral cancer mortality rate was significantly higher for Caucasian males than for Caucasian females in Delaware (3.6 per 100,000 Caucasian vs. 1.4 per 100,000 African Americans) as well as nationally. Sex- and race-specific oral cancer mortality rates could not be computed for African Americans due to the small number of deaths (15 deaths total).
- From 1995–1999 through 2005–2009, Delaware's oral cancer mortality rate decreased 35.1 percent among males and remained the same among females. During the same time period the U.S. rate declined 15.6 percent among males and 17.5 percent among females.
- In Delaware from 1995–1999 through 2005–2009, oral cancer mortality decreased 33.3 percent among Caucasian males but increased 50.0 percent among Caucasian females. Among African Americans, mortality declined 51.8 percent among males and 93.1 percent among females.
- Age-specific patterns in oral cancer mortality could not be determined due to small numbers of deaths in most age-sex-race categories.
- During 2005–2009, Delaware ranked 23rd highest in the nation for mortality from cancers of the oral cavity and pharynx. Delaware males ranked 19th in oral cavity and pharynx cancer mortality and Delaware females ranked 31st (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Oral Cavity and Pharynx Cancer Incidence

Table 18.1. Number of Oral Cavity and Pharynx Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	560	390	170	466	320	146	80	61	19
Kent	95	69	26	74	---	---	---	---	---
New Castle	274	183	91	215	138	77	52	40	12
Sussex	191	138	53	177	---	---	---	---	---

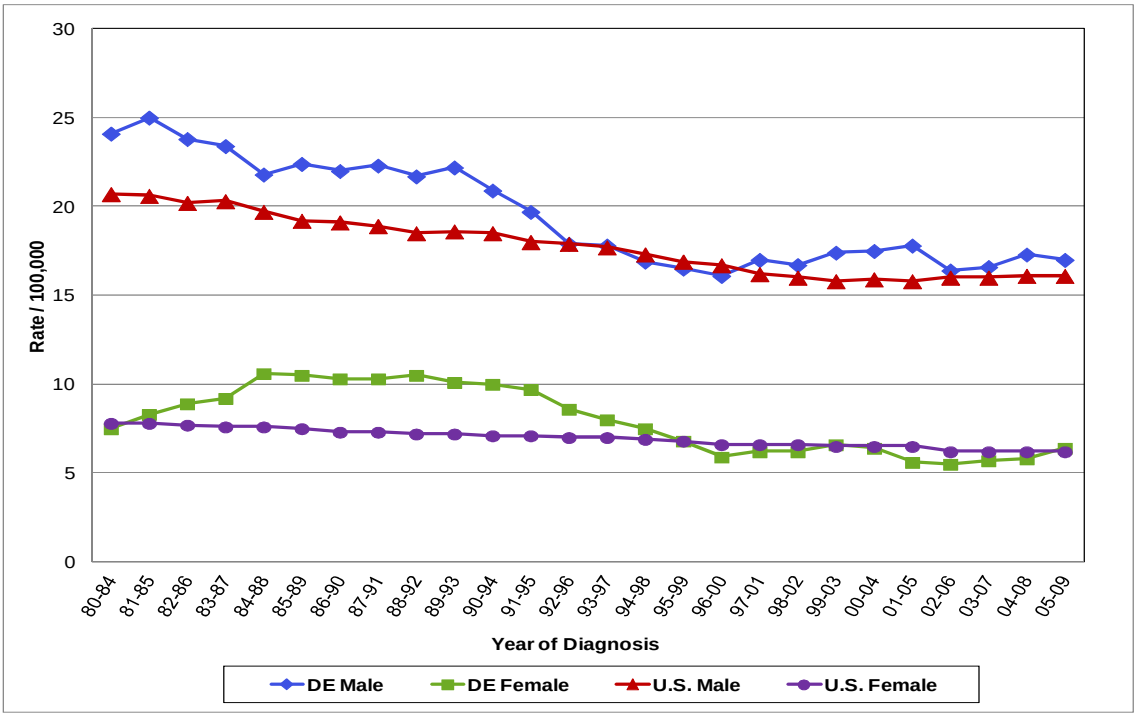
--- = Cell counts less than six are not shown to3 protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 18.2. Five-Year Average Age-Adjusted Oral Cavity and Pharynx Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	10.8 (10.7 , 10.9)	16.1 (15.9 , 16.3)	6.2 (6.1 , 6.3)
Delaware	11.3 (10.4 , 12.3)	17.0 (15.4 , 18.8)	6.4 (5.5 , 7.4)
Kent	11.8 (9.6 , 14.5)	18.8 (14.6 , 24.0)	6.1 (4.0 , 8.9)
New Castle	9.8 (8.6 , 11.0)	14.3 (12.3 , 16.6)	6.0 (4.9 , 7.4)
Sussex	14.2 (12.1 , 16.4)	21.4 (17.9 , 25.5)	7.6 (5.6 , 10.2)
CAUCASIAN			
United States	11.0 (10.9 , 11.1)	16.5 (16.3 , 16.7)	6.3 (6.2 , 6.4)
Delaware	11.5 (10.4 , 12.6)	16.9 (15.1 , 18.9)	6.8 (5.7 , 8.0)
Kent	11.8 (9.3 , 14.9)	19.3 (14.4 , 25.3)	---
New Castle	9.7 (8.5 , 11.2)	13.6 (11.4 , 16.2)	6.5 (5.1 , 8.2)
Sussex	14.5 (12.3 , 17.0)	21.6 (17.9 , 26.0)	8.1 (5.9 , 11.0)
AFRICAN AMERICAN			
United States	9.8 (9.5 , 10.1)	15.4 (14.8 , 16.0)	5.6 (5.3 , 5.9)
Delaware	9.9 (7.8 , 12.4)	16.7 (12.7 , 21.7)	---
Kent	---	---	---
New Castle	9.4 (7.0 , 12.5)	16.7 (11.7 , 23.2)	
Sussex	---	---	---

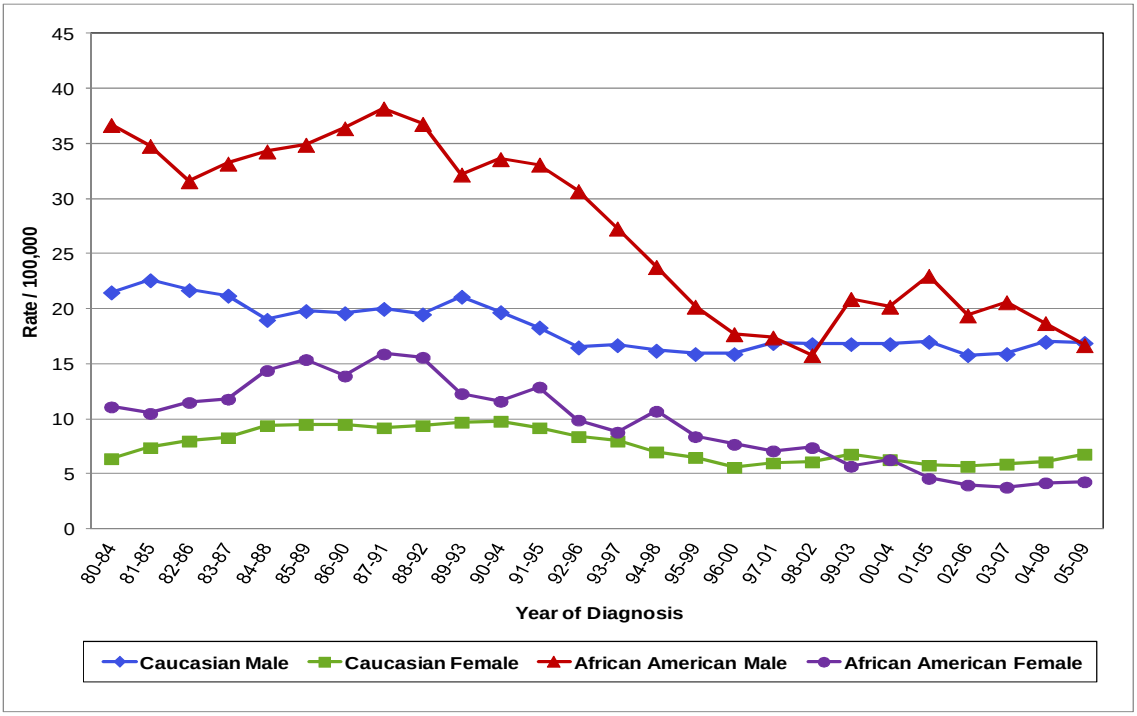
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 18.1. Five-Year Average Age-Adjusted Oral Cavity and Pharynx Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 18.2. Five-Year Average Age-Adjusted Oral Cavity and Pharynx Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 18.3. Age-Specific Oral Cavity and Pharynx Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	0.9	---	---	---	---	---	---	---	---
40-64	19.3	29.8	9.6	19.8	29.9	10.3	17.4	30.0	---
65-74	40.4	62.9	21.0	39.6	60.0	21.7	---	---	---
75-84	35.6	43.2	30.6	37.5	44.8	32.6	---	---	---
85+	40.7	78.1	---	44.7	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 18.3. Age-Specific Oral Cavity & Pharynx Cancer Incidence Rates; Delaware, 2005–2009

NOTE: Figure 18.3 is not displayed because of the small number of cases.

Table 18.4. Number and Percent of Oral Cavity and Pharynx Cancer Cases by Stage at Diagnosis and Sex; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All	Male	Female	All	Male	Female
Local	168	98	70	30.0	25.1	41.2
Regional	285	216	69	50.9	55.4	40.6
Distant	84	58	26	15.0	14.9	15.3
Unknown	23	---	---	4.1	---	---
Total	560	390	170	100.0	100.0	100.0

--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 18.4. Percent of Oral Cavity and Pharynx Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009

Figure 18.4a. Delaware: 2005–2009

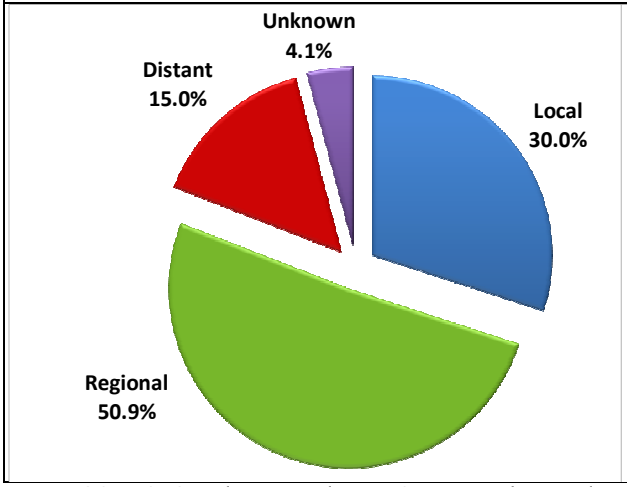
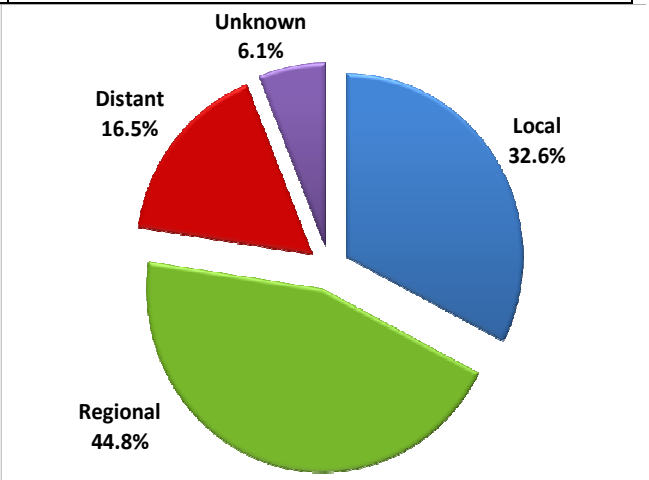
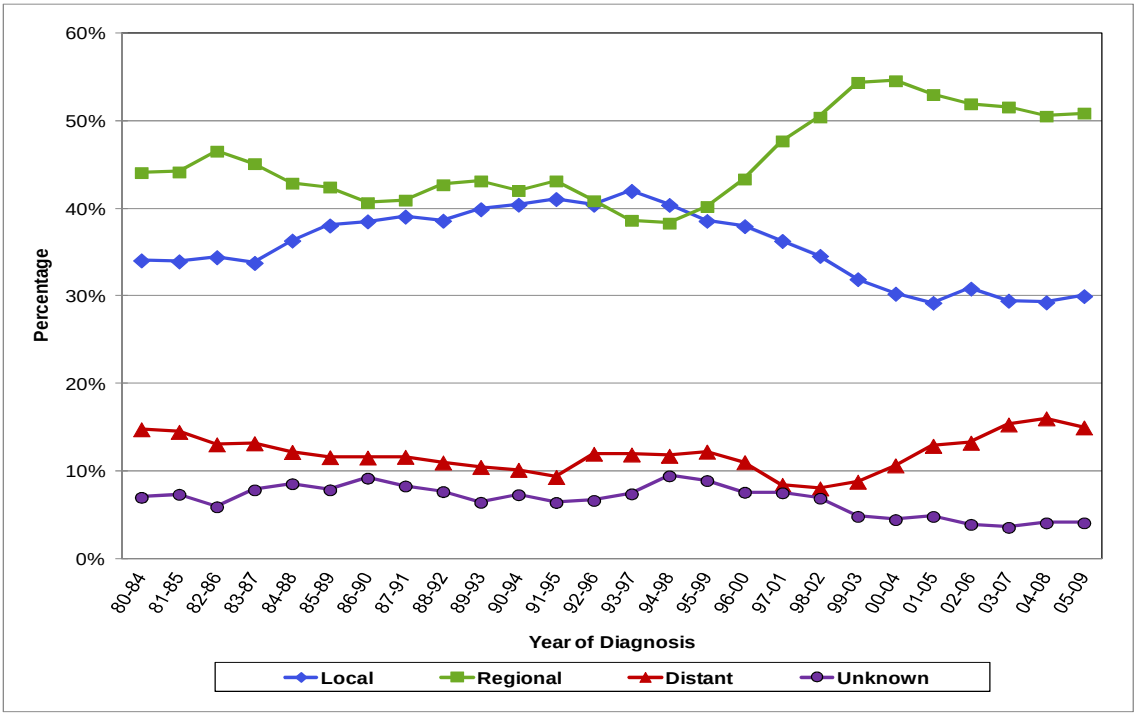


Figure 18.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 18.5. Percent of Oral Cavity and Pharynx Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Oral Cavity and Pharynx Cancer Mortality

Table 18.5. Number of Oral Cavity and Pharynx Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	118	83	35	101	67	34	15	---	---
Kent	16	---	---	14	---	---	---	---	---
New Castle	56	36	20	46	---	---	9	---	---
Sussex	46	34	12	41	---	---	---	---	---

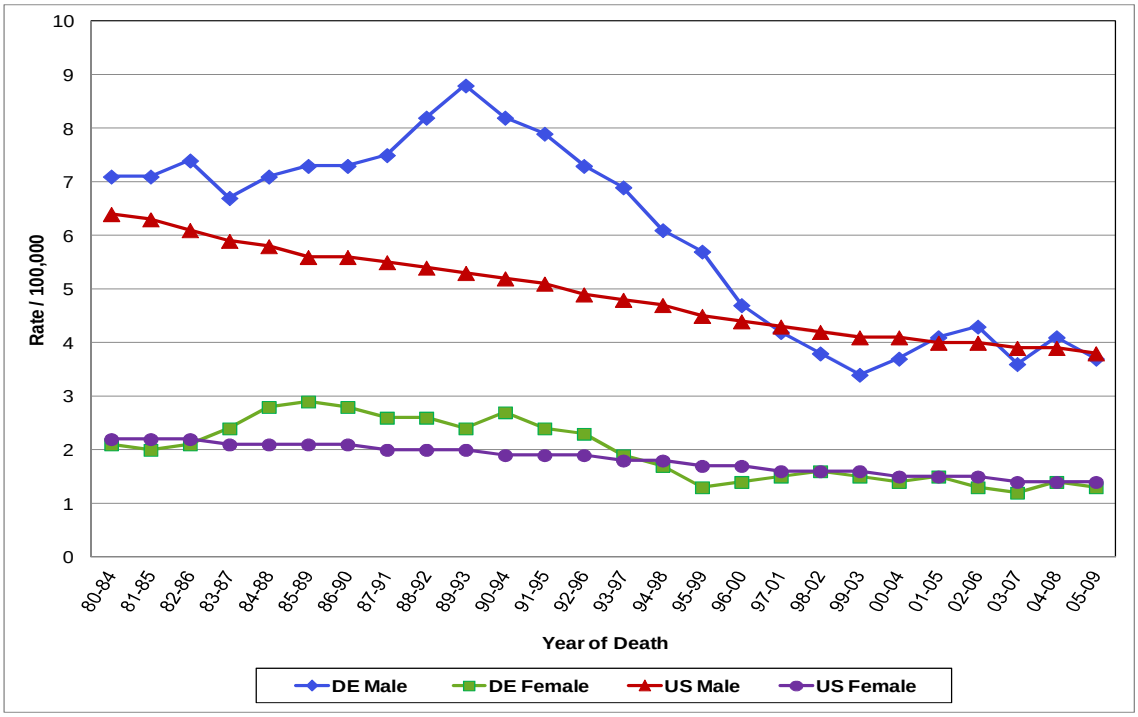
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 18.6. Five-Year Average Age-Adjusted Oral Cavity and Pharynx Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	2.5 (2.4 , 2.5)	3.8 (3.7 , 3.8)	1.4 (1.4 , 1.4)
Delaware	2.4 (2.0 , 2.9)	3.7 (3.0 , 4.6)	1.3 (0.9 , 1.8)
Kent	---	---	---
New Castle	2.0 (1.5 , 2.7)	3.0 (2.1 , 4.1)	---
Sussex	3.4 (2.5 , 4.6)	5.6 (3.8 , 8.0)	---
CAUCASIAN			
United States	2.4 (2.4 , 2.4)	3.6 (3.6 , 3.7)	1.4 (1.3 , 1.4)
Delaware	2.5 (2.0 , 3.0)	3.6 (2.8 , 4.6)	1.5 (1.0 , 2.1)
Kent	---	---	---
New Castle	2.1 (1.5 , 2.8)	2.8 (1.8 , 4.1)	---
Sussex	3.3 (2.3 , 4.6)	5.2 (3.4 , 7.7)	---
AFRICAN AMERICAN			
United States	3.2 (3.1 , 3.3)	5.7 (5.5 , 5.8)	1.4 (1.4 , 1.5)
Delaware	---	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

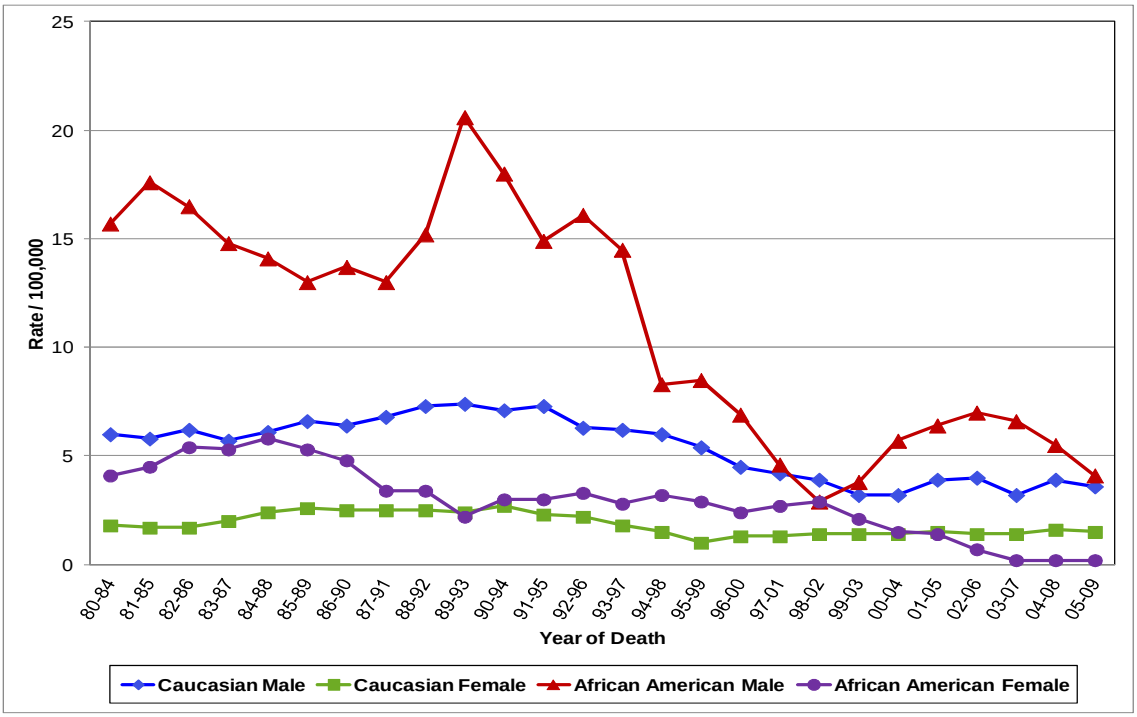
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 18.6. Five-Year Average Age-Adjusted Oral Cavity and Pharynx Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 18.7. Five-Year Average Age-Adjusted Oral Cavity and Pharynx Cancer Mortality Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 18.7. Age-Specific Oral Cavity and Pharynx Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	3.1	5.3	---	3.0	5.0	---	---	---	---
65-74	12.6	18.4	---	13.5	---	---	---	---	---
75-84	---	---	---	---	---	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 18.8. Age-Specific Oral Cavity & Pharynx Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 18.8 is not displayed because of the small number of deaths.

19. OVARIAN CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Ovarian Cancer:

- obesity
- never giving birth; risk decreases as number of children increases
- exposure to talcum powder (suspected)
- high-fat diet (suspected)
- smoking and alcohol use (mucinous type of ovarian cancer) (suspected)

Environmental and Medically-Related Causes of Ovarian Cancer:

- estrogen therapy after menopause – higher for taking estrogen alone for at least 5 or 10 years

Ovarian Cancer Risk Factors that Cannot be Changed:

- increasing age; half of ovarian cancers are found in women over age 63
- family history of ovarian, breast or colorectal cancer
- personal history of breast cancer
- inherited mutation in BRCA1 or BRCA2 genes
- certain other genetic changes and syndromes
- early start to menses or late menopause
- polycystic ovary syndrome (PCOS) (suspected)

Factors Protective against Ovarian Cancer:

- having a hysterectomy or tubal ligation
- low-fat diet for a long period of time
- taking birth control pills for five or more years
- genetic counseling

Early Detection of Ovarian Cancer:

- Currently there is no screening test that is reliable enough to screen for ovarian cancer in the general population.
- Women at high risk of ovarian cancer can be screened with ultrasound and blood tests.

Data Highlights

Incidence of Ovarian Cancer (Tables 19.1 – 19.3, Figures 19.1 – 19.2)

- Ovarian cancer is the fifth most common cancer in women and the most common cause of gynecologic cancer deaths.
- The 314 cases of ovarian cancer diagnosed in Delaware during 2005–2009 accounted for 2.7 percent of the total cancer cases diagnosed among women.
- More than 80 percent of cases (82.2 percent or 258 cases) were Caucasian, 13.7 percent (43 cases) were African American and 4.1 percent (13 cases) were other or unknown race.

- The 2005–2009 ovarian cancer incidence rate for Delaware (12.0 per 100,000) was not statistically different from the U.S. rate (12.7 per 100,000).
- Delaware's 2005–2009 ovarian cancer incidence rate does not differ significantly from the U.S. rate among Caucasians (12.2 per 100,000 Delaware vs. 13.4 per 100,000 U.S.) nor among African Americans (9.9 per 100,000 Delaware vs. 9.8 per 100,000 U.S.).
- At the national level, the 2005–2009 ovarian cancer incidence rate for Caucasian females was significantly higher than the rate for African American females (13.4 per 100,000 vs. 9.8 per 100,000, respectively). However, no significant difference between Caucasians and African Americans was observed in Delaware.
- From 1995–1999 through 2005–2009, Delaware's ovarian cancer incidence rate decreased 31.4 percent while the U.S. rate decreased 12.4 percent. The rate of decline in Delaware was steeper among Caucasians (33.7 percent) than among African Americans (15.8 percent).
- Age-specific data were too sparse to examine any association with age.
- Female Delawareans ranked 31st highest in the U.S. for incidence of ovarian cancer during 2005–2009 (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Ovarian Cancer (Table 19.4, Figures 19.4 – 19.5)

- The majority of cancers of the ovary were diagnosed in the distant stage (63.6 percent in Delaware vs. 60.1 percent nationally).
- For 2005–2009, 10.2 percent and 19.2 percent of ovarian cancer cases in Delaware were diagnosed at the local and regional stages, respectively. Comparable percentages for the U.S. were 14.6 percent and 18.1 percent, respectively
- During 2005–2009, 259 cases of ovarian cancer (82.7 percent of all ovarian cancers diagnosed during this period) were late-stage diagnoses (i.e., either regional or distant stage). The percentage of late-stage ovarian cancer diagnoses was higher among Caucasians (83.3 percent) than among African Americans (79.1 percent).
- In Delaware since 1980–1984, the proportion of ovarian cancers diagnosed at the local stage has decreased from 19.3 percent to 10.7 percent. Accordingly, over this same time, the proportion of regional stage ovarian cancers more than doubled; from 7.8 percent in 1980-1984 to 19.2 percent in 2005–2009.

Ovarian Cancer Mortality (Tables 19.5 – 19.7, Figures 19.6 – 19.7)

- For 2005–2009, the 217 ovarian cancer deaths accounted for 5.0 percent of all cancer deaths among Delaware women during this time period.
- Eighty percent of ovarian cancer deaths (174 deaths) were Caucasian, 17.1 percent (37 deaths) were African American and 2.8 percent (six deaths) were other or unknown race.
- In 2005–2009, Delaware's ovarian cancer mortality rate does not differ significantly from the U.S. rate (8.0 per 100,000 vs. 8.2 per 100,000).
- In the U.S., the 2005–2009 ovarian cancer mortality rate for Caucasian females was significantly higher than for African American women (8.6 per 100,000 vs. 6.8 per 100,000, respectively). In Delaware, the ovarian cancer mortality rate was higher among African American than Caucasian females (9.5 per 100,000 vs. 7.7 per 100,000, respectively), but the difference was not significant.
- Historically, Delaware's ovarian cancer mortality rates were similar to those for the U.S.
- From 1995–1999 through 2005–2009, Delaware's ovarian cancer mortality rate decreased 17.5 percent, while the U.S. rate fell 7.9 percent.
- From 1995–1999 through 2005–2009, Delaware's ovarian cancer mortality rate decreased 23.0 percent among Caucasian females but increased 17.3 percent among African American females
- Age-specific ovarian cancer mortality rates could not be compared due to the small number of deaths.
- During 2005–2009, Delaware females ranked 31st highest in the nation for mortality from ovarian cancer (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 19.1. Number of Ovarian Cancer Cases by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	314	258	43
Kent	50	---	---
New Castle	171	134	30
Sussex	93	---	---

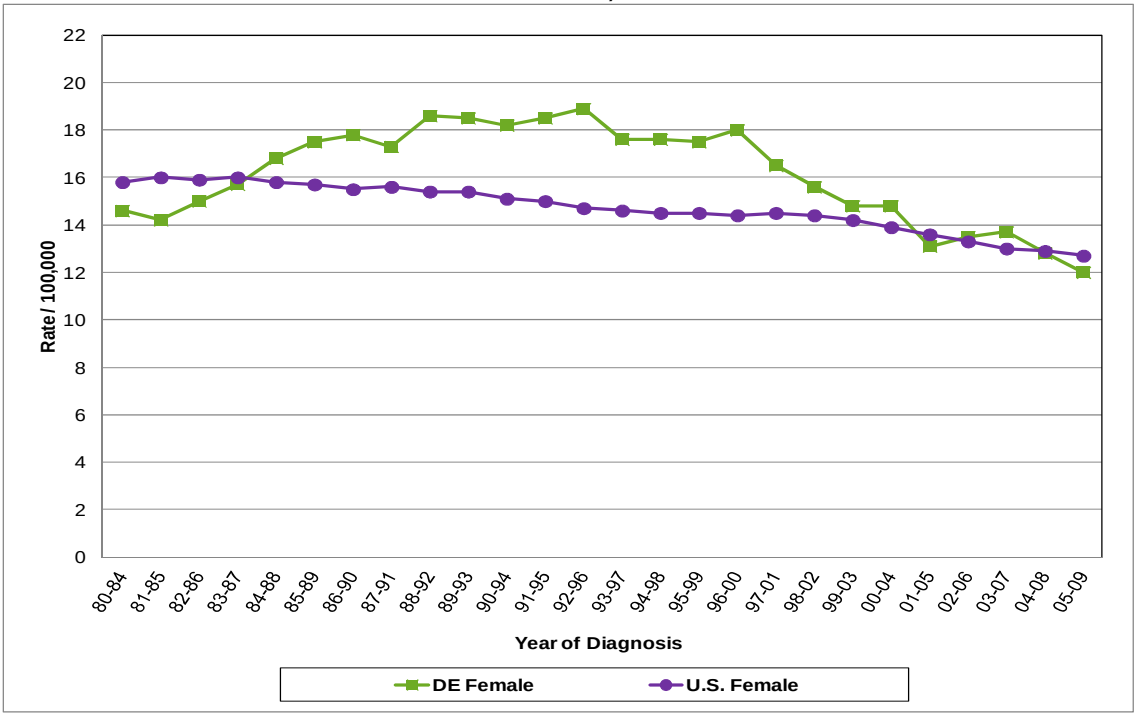
SOURCE: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.
--- = Cell counts less than six are not shown to protect patient confidentiality.

Table 19.2. Five-Year Average Age-Adjusted Ovarian Cancer Incidence Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
United States	12.7 (12.6 , 12.9)	13.4 (13.2 , 13.6)	9.8 (9.4 , 10.2)
Delaware	12.0 (10.7 , 13.5)	12.2 (10.7 , 13.8)	9.9 (7.1 , 13.4)
Kent	11.6 (8.6 , 15.4)	12.3 (8.8 , 16.8)	---
New Castle	11.5 (9.8 , 13.4)	11.5 (9.6 , 13.7)	9.9 (6.6 , 14.3)
Sussex	13.7 (10.8 , 17.0)	13.6 (10.6 , 17.4)	---

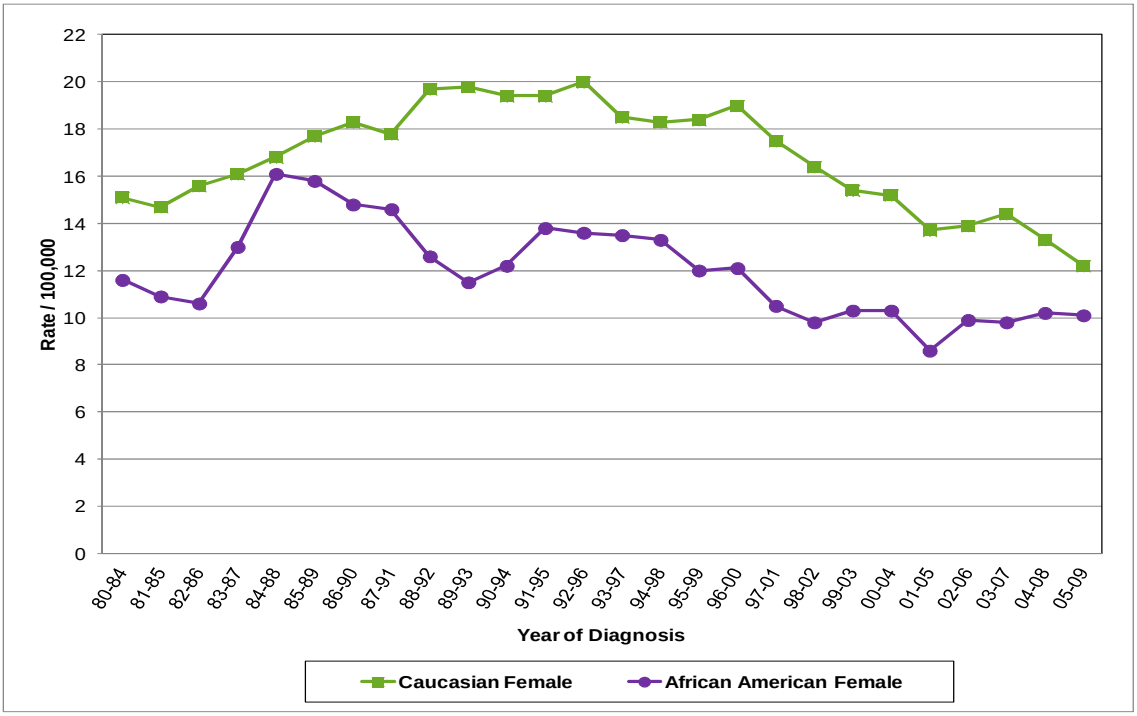
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 19.1. Five-Year Average Age-Adjusted Ovarian Cancer Incidence Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 19.2. Five-Year Average Age-Adjusted Ovarian Cancer Incidence Rates* by Race; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 19.3. Age-Specific Ovarian Cancer Incidence Rates* by Race; Delaware, 2005–2009

Age at Diagnosis	All Female	Caucasian Female	African American Female
0-39	2.4	---	---
40-64	16.9	18.3	---
65-74	46.1	45.2	---
75-84	45.3	48.3	---
85+	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 19.3 Age-Specific Ovarian Cancer Incidence Rates* by Race; Delaware, 2005–2009

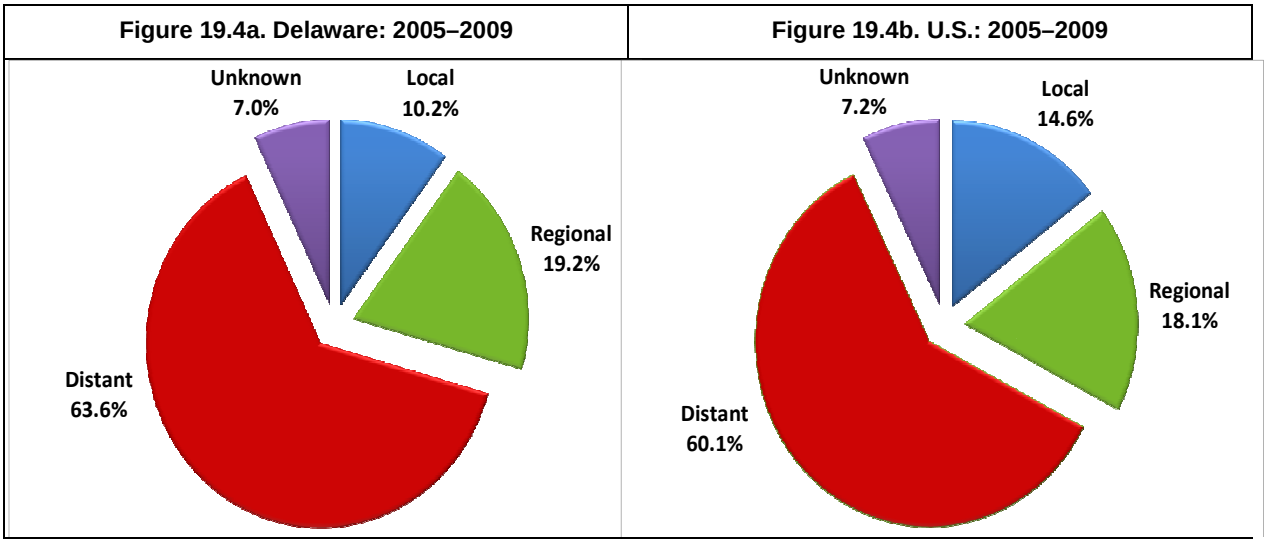
NOTE: Figure 19.3 is not displayed because of the small number of cases.

Table 19.4. Number and Percent of Ovarian Cancer Cases by Stage at Diagnosis and Race; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All Female	Caucasian	African American	All Female	Caucasian	African American
Local	32	---	---	10.2	---	---
Regional	60	49	8	19.2	19.1	18.6
Distant	199	165	26	63.6	64.2	60.5
Unknown	22	---	---	7.0	---	---
Total	313	257	43	100.0	100.0	100.0

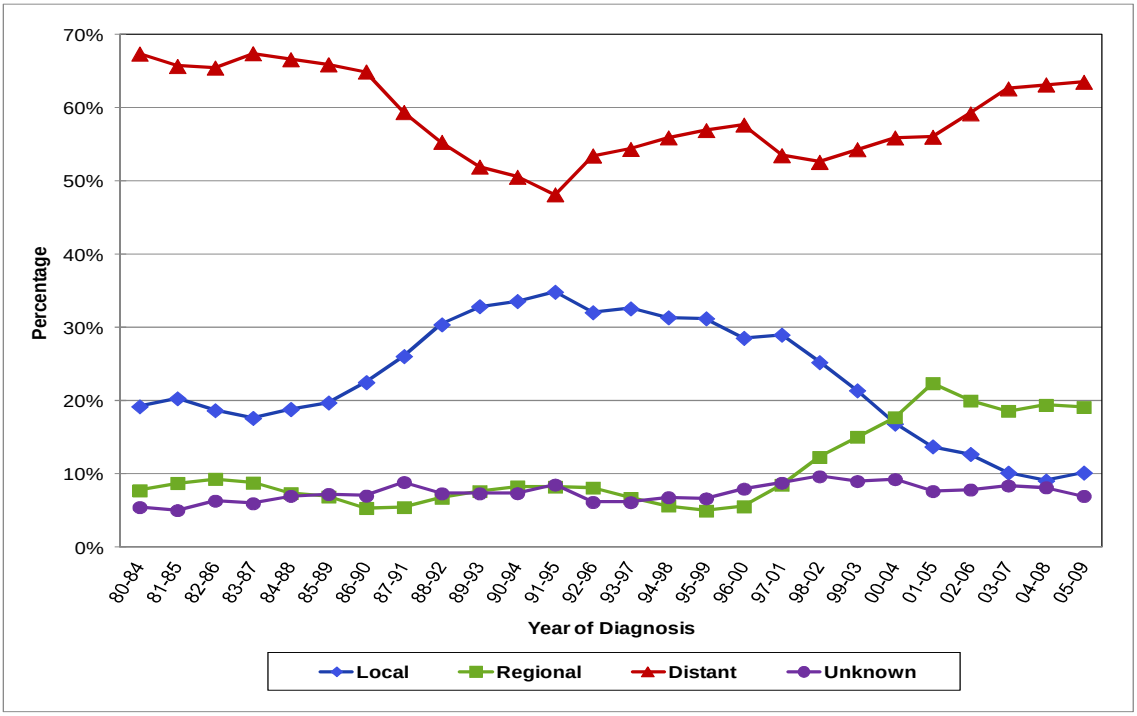
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 19.4. Percent of Ovarian Cancer Cases by Stage at Diagnosis and Race; U.S. and Delaware, 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 19.5. Percent of Ovarian Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Ovarian Cancer Mortality

Table 19.5. Number of Ovarian Cancer Deaths by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	217	174	37
Kent	38	29	9
New Castle	121	96	22
Sussex	58	49	6

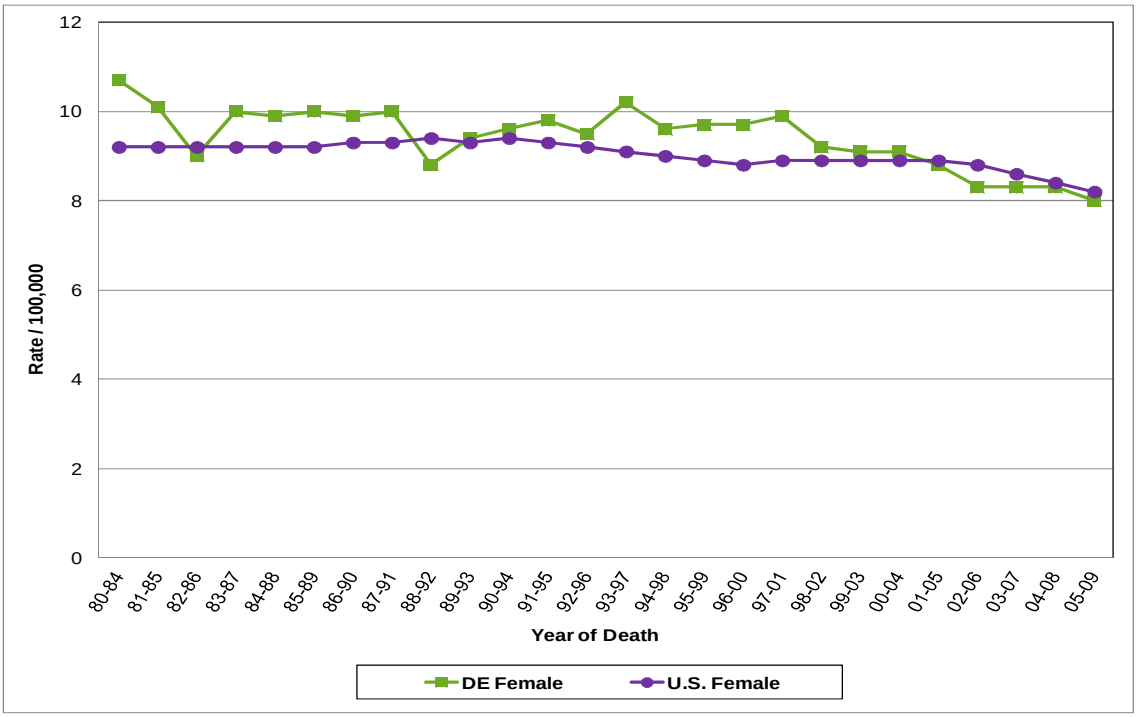
SOURCE: Delaware Health Statistics Center, 2012.

Table 19.6. Five-Year Average Age-Adjusted Ovarian Cancer Mortality Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

Region	All Female	Caucasian Female	African American Female
United States	8.2 (8.2 , 8.3)	8.6 (8.5 , 8.6)	6.8 (6.7 , 7.0)
Delaware	8.0 (7.0 , 9.2)	7.7 (6.6 , 9.0)	9.5 (6.6 , 13.1)
Kent	8.9 (6.3 , 12.2)	8.5 (5.7 , 12.3)	---
New Castle	8.1 (6.7 , 9.6)	8.0 (6.4 , 9.8)	---
Sussex	7.4 (5.6 , 9.7)	6.9 (5.0 , 9.3)	---

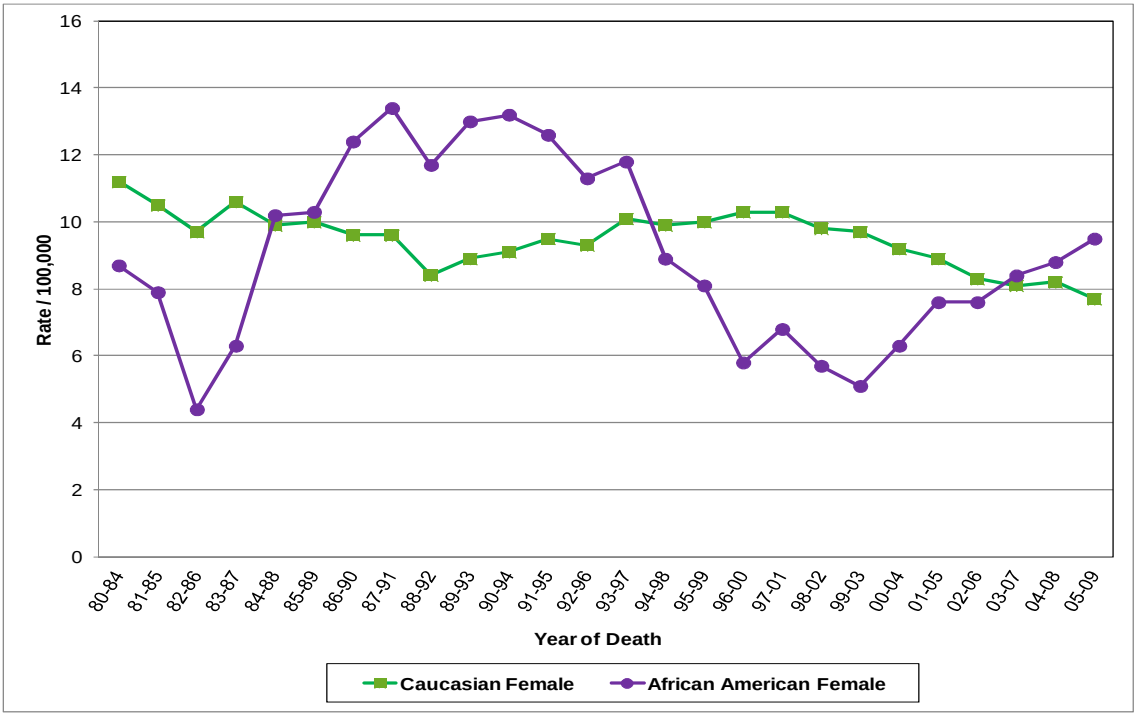
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown
SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 19.6. Five-Year Average Age-Adjusted Ovarian Cancer Mortality Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 19.7. Five-Year Average Age-Adjusted Ovarian Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 19.7. Age-Specific Ovarian Cancer Mortality Rates* by Race; Delaware, 2005–2009

Age At Death	All Female	Caucasian Female	African American Female
0-39	---	---	---
40-64	8.1	7.9	---
65-74	34.6	33.5	---
75-84	52.8	50.3	---
85+	46.0	---	---

***** = Rates are per 100,000 population.

--- = Rates based on fewer than 25 deaths are not shown.

SOURCE: Delaware Health Statistics Center, 2012.

Figure 19.8. Age-Specific Ovarian Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 19.8 is not displayed because of the small number of deaths.

20. PANCREATIC CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Pancreatic Cancer:

- cigarette smoking – risk is two to three times higher among smokers
- obesity
- lack of physical activity
- type 2 diabetes
- diet high in fat and meat and/or low in fruits and vegetables (suspected)
- heavy alcohol use (suspected)
- cirrhosis of the liver (suspected)

Environmental and Medically-Related Causes of Pancreatic Cancer:

- heavy occupational exposure to petroleum and certain chemicals, pesticides and dyes
- stomach problems; e.g., *Helicobacter pylori* infection, excess stomach acid (suspected)

Pancreatic Cancer Risk Factors that Cannot be Changed:

- increasing age – almost all patients are older than 45
- male gender
- race – African American
- family history
- chronic pancreatitis, particularly in smokers
- certain hereditary conditions, such as hereditary pancreatitis, hereditary breast and ovarian cancer syndrome, multiple endocrine neoplasia type 1 syndrome, etc. (suspected)

Factors Protective against Pancreatic Cancer:

- Currently, there is no sure way to prevent pancreatic cancer.
- Risk of pancreatic cancer can be lowered by managing lifestyle risk factors such as diet (high in fruits, vegetables and whole grains), tobacco use and physical activity.
- weight management

Early Detection of Pancreatic Cancer:

- There is currently no recommended test for screening for pancreatic cancer in the general population.
- People with a strong family history of pancreatic cancer may want to consider genetic screening.

Data Highlights

Pancreatic Cancer Incidence (Tables 20.1 – 20.3, Figures 20.1 – 20.3)

- A total of 617 cases of pancreatic cancer diagnosed in Delaware during 2005–2009 accounted for 2.5 percent of all cancer cases diagnosed during 2005–2009 in Delaware.
- Newly-diagnosed cases were fairly evenly split by sex: 330 cases (53.5 percent) were male and 287 cases (46.5 percent) were female. 82.7 percent (510 cases) were Caucasian, 16.2 percent (100 cases) were African American and seven cases were other or unknown race.
- Delaware's 2005–2009 pancreatic cancer incidence rate (12.6 per 100,000) does not differ statistically from the U.S. rate (12.1 per 100,000).
- For 2005–2009 in the U.S., Delaware and New Castle County, the pancreatic cancer incidence rate for males was significantly higher than the rate for females.
- Among Caucasians in Delaware, the incidence rate for males was significantly higher than for females for the entire state (15.4 per 100,000 male vs. 9.9 per 100,000 female) as well as in New Castle and Sussex Counties.
- Among African Americans, the incidence rate for males was higher than for females for the entire state (26.9 per 100,000 male vs. 10.4 per 100,000 female) as well as New Castle County, but the differences were not significant.
- For the U.S. and in Delaware, the 2005–2009 pancreatic cancer incidence rate for African Americans was higher than for Caucasians, but in each instance the rate does not differ statistically.
- From 1995–1999 through 2005–2009, Delaware's pancreatic cancer incidence rate increased 18.9 percent while the U.S. incidence rate increased 7.1 percent.
- From 1980-1984 through 2005–2009, the pancreatic cancer incidence rate for African Americans was, on average, nearly 50 percent (47.7 percent) higher than the incidence rate for Caucasians. As of 2005–2009, however, the gap between the two groups had narrowed to 19.5 percent.
- Between 1995–1999 and 2005–2009, Delaware's pancreatic cancer incidence rates increased 27.3 and 5.3 percent for male and female Caucasians, respectively, and increased 36.6 and 10.3 percent for male and female African Americans, respectively.
- The 2005–2009 pancreatic cancer incidence rate increased with age; males had a higher incidence rate than females in each age category.
- Age-specific rates could not be compared by race category because of the smaller number of cases among African Americans.
- Delawareans ranked eighth highest overall for incidence of pancreatic cancer during 2005–2009; males ranked third and females ranked 21st (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Pancreatic Cancer (Tables 20.4 – 20.5, Figures 20.4 – 20.5)

- During 2005–2009, 7.8 percent, 28.7 percent and 51.7 percent of pancreatic cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 9.2 percent, 27.2 percent and 50.5 percent, respectively.
- In Delaware during 2005–2009 four of every five cases of pancreatic cancer (496 cases or 80.4 percent) were diagnosed in the late stages (i.e., regional or distant stage). Nationally, the percentage of late stage cancers of the pancreas was 77.7 percent.
- Among African Americans, females were less likely to have had their cancer diagnosed in the regional stage than males (18.0 percent vs. 36.0 percent, respectively).
- In Delaware, the percentage of pancreatic cancer cases diagnosed in the local stage increased from 31.7 percent in 1980–1984 to 39.3 percent in 2005–2009. Accordingly, there was a decrease in cases diagnosed in the regional stage, from 41.9 percent in 1980–1984 to 37.4 percent in 2005–2009, as well as a decrease in cases diagnosed in the distant stage, from 20.0 percent in 1980–1984 to 17.1 percent in 2005–2009.

Pancreatic Cancer Mortality (Tables 20.6 – 20.8, Figures 20.6 – 20.7)

- Pancreatic cancer is the fourth most common cause of cancer-related death in Delaware and the U.S. The 536 deaths from pancreatic cancer accounted for 5.8 percent of all cancer deaths in Delaware during 2005–2009.
- Of Delaware residents who died from pancreatic cancer, 49.0 percent were male and 51.0 percent female. By race category, 83.7 percent were Caucasian (440 deaths), 16.0 percent African American (84 deaths) and two decedents were other or unknown race.
- Delaware's 2005–2009 pancreatic cancer mortality rate (10.7 per 100,000) did not differ from the U.S. rate (10.8 per 100,000).
- Historically, Delaware's pancreatic cancer mortality rate has been similar to the U.S. rate.
- For 2005–2009, at both the state (12.1 per 100,000 male vs. 9.5 per 100,000 female) and national levels (12.5 per 100,000 male vs. 9.5 per 100,000 female) the pancreatic cancer mortality rate was significantly higher for males than for females.
- This male-to-female significant excess was also seen among Caucasians in Delaware (12.2 per 100,000 male vs. 9.2 per 100,000 female) and nationally (12.4 per 100,000 male vs. 9.3 per 100,000 female).
- Between 1995–1999 and 2005–2009, Delaware's pancreatic cancer mortality rate dropped 5.5 percent among males and increased 3.3 percent among females. During this same time period, the U.S. rate increased 2.5 and 3.3 percent for males and females respectively.
- Among African Americans in Delaware, the pancreatic cancer mortality rate decreased by 21.4 percent among males and remained the same among females between 1995–1999 and 2005–2009.
- For all races combined, the 2005–2009 age-specific mortality rates increased with age. Data were too sparse for comparisons by race category.
- During 2005–2009, Delaware ranked 29th highest overall for mortality from cancer of the pancreas. Delaware males ranked 33rd and Delaware females ranked 22nd (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Pancreatic Cancer Incidence

Table 20.1. Number of Pancreatic Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	617	330	287	510	278	232	100	50	50
Kent	120	57	63	93	41	52	24	16	8
New Castle	333	180	153	272	152	120	59	27	32
Sussex	164	93	71	145	85	60	17	7	10

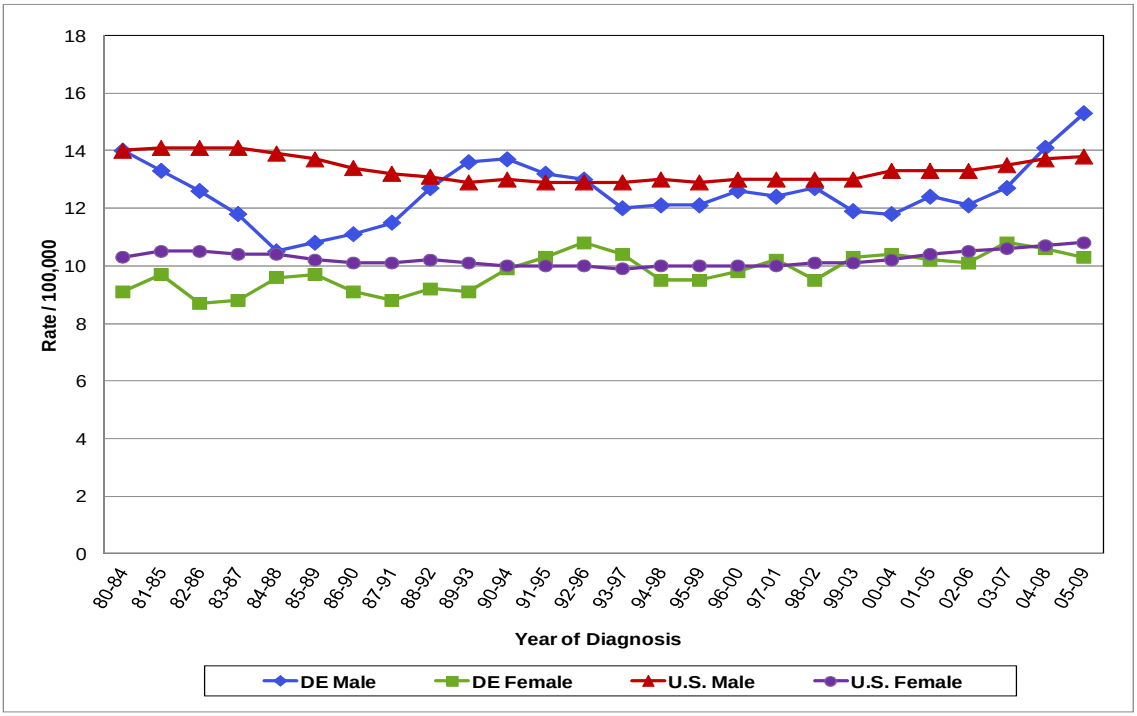
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 20.2. Five-Year Average Age-Adjusted Pancreatic Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	12.1 (12.0 , 12.3)	13.8 (13.6 , 14.0)	10.8 (10.7 , 10.9)
Delaware	12.6 (11.6 , 13.6)	15.3 (13.7 , 17.1)	10.3 (9.2 , 11.6)
Kent	15.8 (13.1 , 18.9)	17.5 (13.2 , 22.8)	14.7 (11.3 , 18.8)
New Castle	12.4 (11.1 , 13.8)	15.7 (13.4 , 18.2)	9.9 (8.4 , 11.6)
Sussex	11.2 (9.5 , 13.1)	13.8 (11.1 , 17.0)	8.9 (6.9 , 11.4)
CAUCASIAN			
United States	12.0 (11.9 , 12.1)	13.7 (13.5 , 13.9)	10.6 (10.4 , 10.7)
Delaware	12.3 (11.3 , 13.5)	15.4 (13.6 , 17.3)	9.9 (8.7 , 11.3)
Kent	15.5 (12.5 , 19.0)	16.1 (11.4 , 22.0)	15.4 (11.4 , 20.2)
New Castle	12.4 (11.0 , 14.0)	16.3 (13.8 , 19.1)	9.4 (7.8 , 11.3)
Sussex	10.7 (9.0 , 12.7)	13.7 (10.9 , 17.2)	8.0 (6.1 , 10.5)
AFRICAN AMERICAN			
United States	14.7 (11.9 , 18.0)	16.8 (12.2 , 22.4)	12.9 (9.5 , 17.1)
Delaware	17.9 (11.4 , 26.7)	26.9 (15.1 , 43.9)	10.4 (4.4 , 20.5)
Kent	---	---	---
New Castle	15.7 (9.1 , 25.0)	14.2 (5.6 , 29.3)	15.8 (7.5 , 29.2)
Sussex	---	---	---

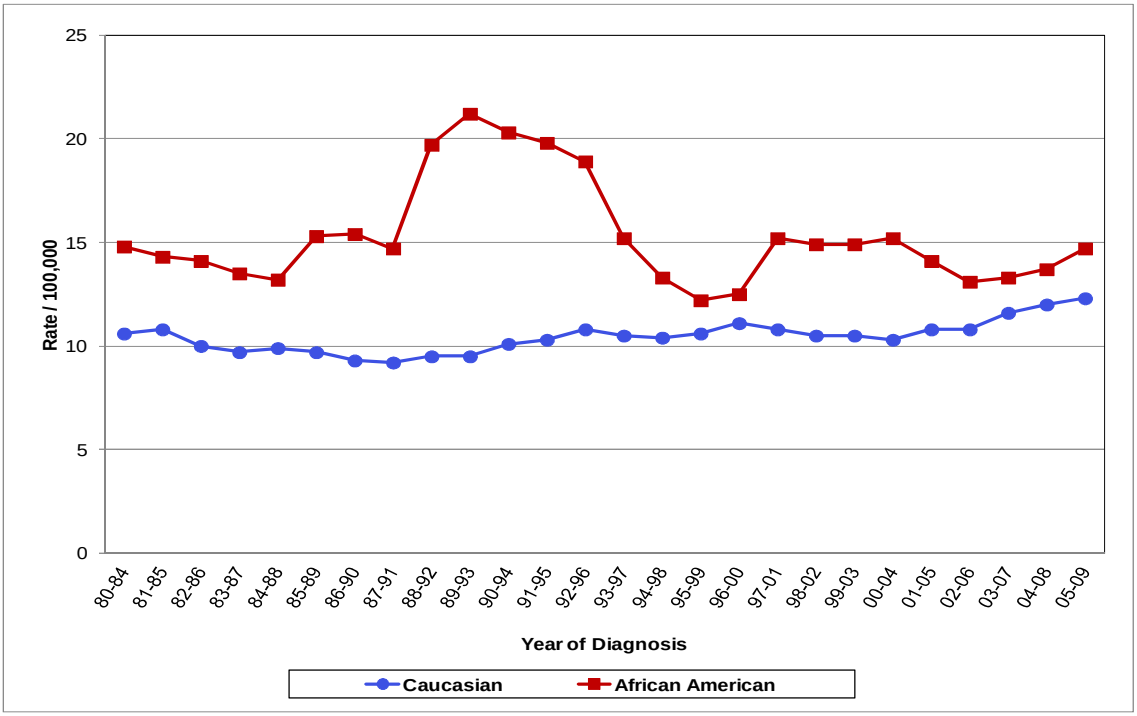
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 20.1. Five-Year Average Age-Adjusted Pancreatic Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



***** = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 20.2. Five-Year Average Age-Adjusted Pancreatic Cancer Incidence Rates* by Race; Delaware, 1980–2009



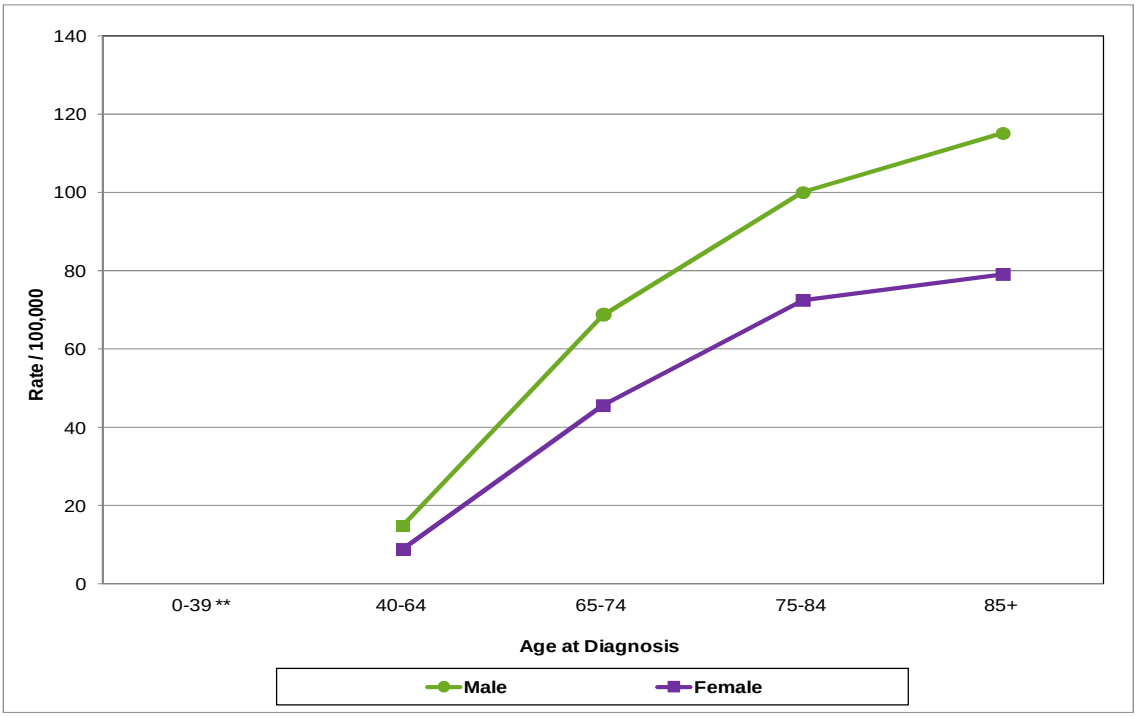
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 20.3. Age-Specific Pancreatic Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	11.7	14.8	8.9	11.4	14.6	8.3	14.5	---	---
65-74	56.2	68.6	45.6	54.0	66.4	43.2	75.3	---	---
75-84	84.2	100.0	72.5	83.5	101.1	70.2	---	---	---
85+	90.3	115.1	79.1	93.7	124.7	79.7	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 20.3. Age-Specific Pancreatic Cancer Incidence Rates by Sex; Delaware, 2005–2009



** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Pancreatic Cancer by Stage

Table 20.4. Number of Pancreatic Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	48	22	26	40	---	---	8	---	---
Regional	177	103	74	146	84	62	27	18	9
Distant	319	172	147	266	150	116	51	21	30
Unknown	73	33	40	58	---	---	14	---	---
Total	617	330	287	510	278	232	100	50	50

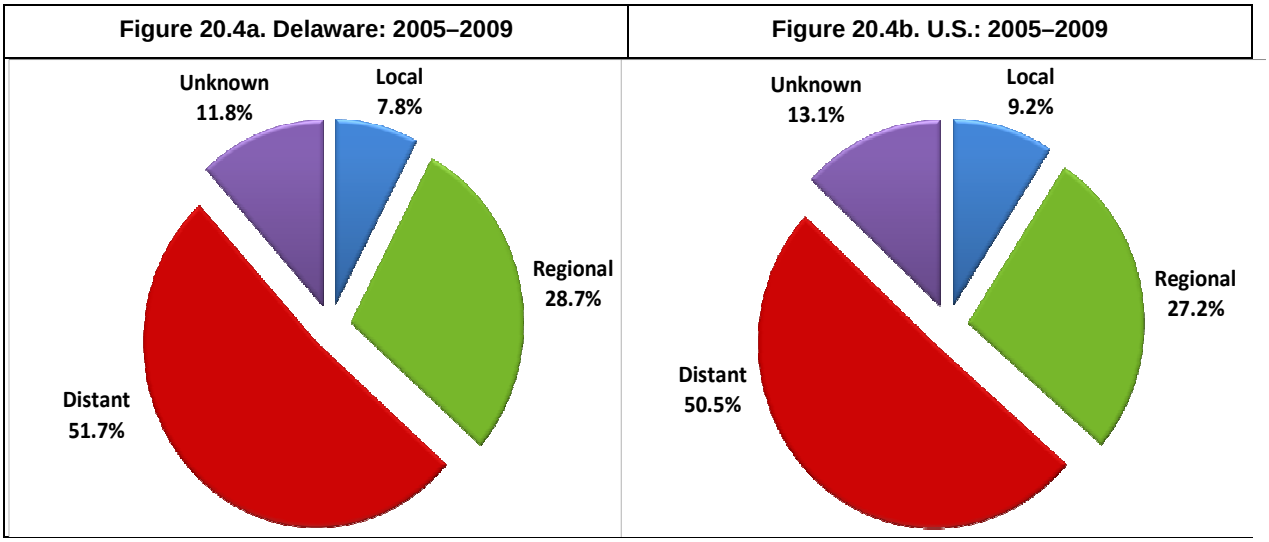
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 20.5. Percent of Pancreatic Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	7.8	6.7	9.1	7.8	---	---	8.0	---	---
Regional	28.7	31.2	25.8	28.6	30.2	26.7	27.0	36.0	18.0
Distant	51.7	52.1	51.2	52.2	54.0	50.0	51.0	42.0	60.0
Unknown	11.8	10.0	13.9	11.4	---	---	14.0	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

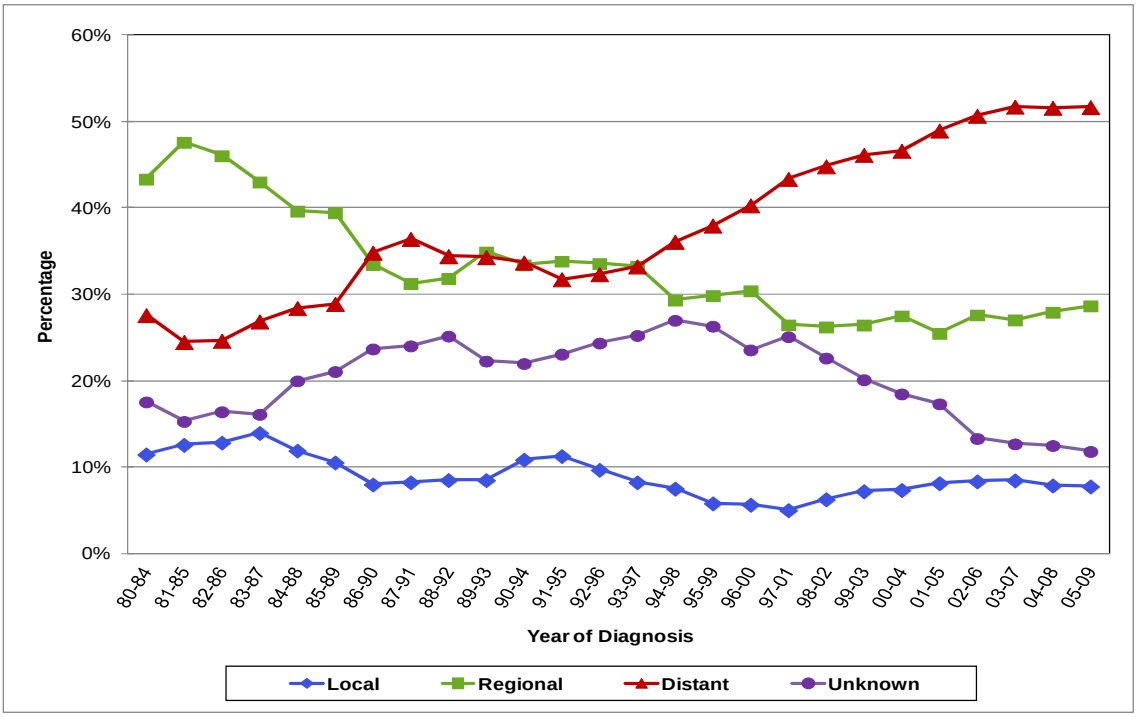
--- = Percentages based on cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 20.4. Percent of Pancreatic Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 20.5. Percent of Pancreatic Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 20.6. Number of Pancreatic Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	526	258	268	440	221	219	84	37	47
Kent	90	44	46	70	---	---	19	---	---
New Castle	301	143	158	246	122	124	54	21	33
Sussex	135	71	64	124	---	---	11	---	---

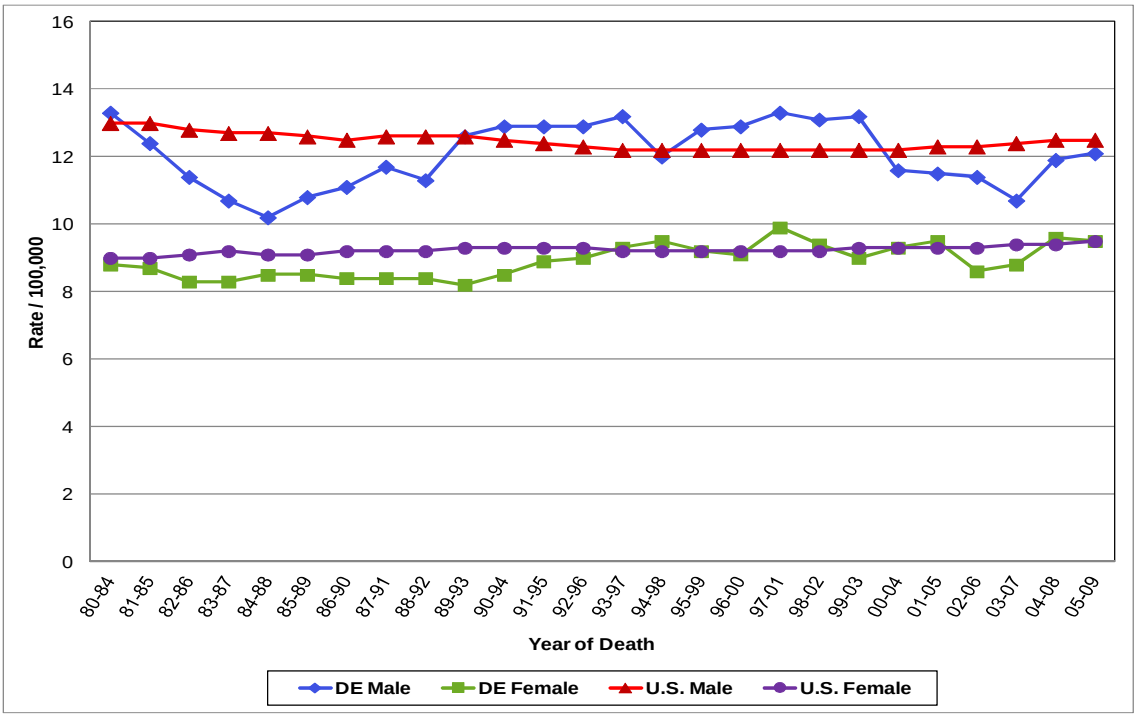
--- = Cell counts less than six are not shown to protect patient confidentiality
SOURCE: Delaware Health Statistics Center, 2012.

Table 20.7. Five-Year Average Age-Adjusted Pancreatic Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	10.8 (10.8 , 10.9)	12.5 (12.4 , 12.6)	9.5 (9.4 , 9.5)
Delaware	10.7 (9.8 , 11.7)	12.1 (10.6 , 13.7)	9.5 (8.4 , 10.7)
Kent	11.8 (9.4 , 14.5)	13.2 (9.5 , 17.9)	10.5 (7.7 , 14.1)
New Castle	11.3 (10.0 , 12.6)	12.5 (10.5 , 14.8)	10.2 (8.7 , 12.0)
Sussex	9.2 (7.7 , 10.9)	10.7 (8.3 , 13.6)	7.8 (6.0 , 10.1)
CAUCASIAN			
United States	10.7 (10.6 , 10.7)	12.4 (12.3 , 12.5)	9.3 (9.2 , 9.3)
Delaware	10.6 (9.6 , 11.6)	12.2 (10.6 , 14.0)	9.2 (8.0 , 10.5)
Kent	11.6 (9.0 , 14.7)	12.6 (8.6 , 17.9)	10.8 (7.6 , 15.0)
New Castle	11.2 (9.8 , 12.7)	13.1 (10.8 , 15.6)	9.7 (8.0 , 11.6)
Sussex	9.2 (7.6 , 11.1)	10.8 (8.3 , 13.9)	7.7 (5.8 , 10.2)
AFRICAN AMERICAN			
United States	13.8 (13.6 , 14.0)	15.5 (15.1 , 15.8)	12.6 (12.3 , 12.8)
Delaware	12.8 (10.1 , 15.9)	12.5 (8.6 , 17.4)	12.5 (9.2 , 16.7)
Kent	---	---	---
New Castle	13.2 (9.8 , 17.3)	---	14.1 (9.6 , 19.8)
Sussex	---	---	---

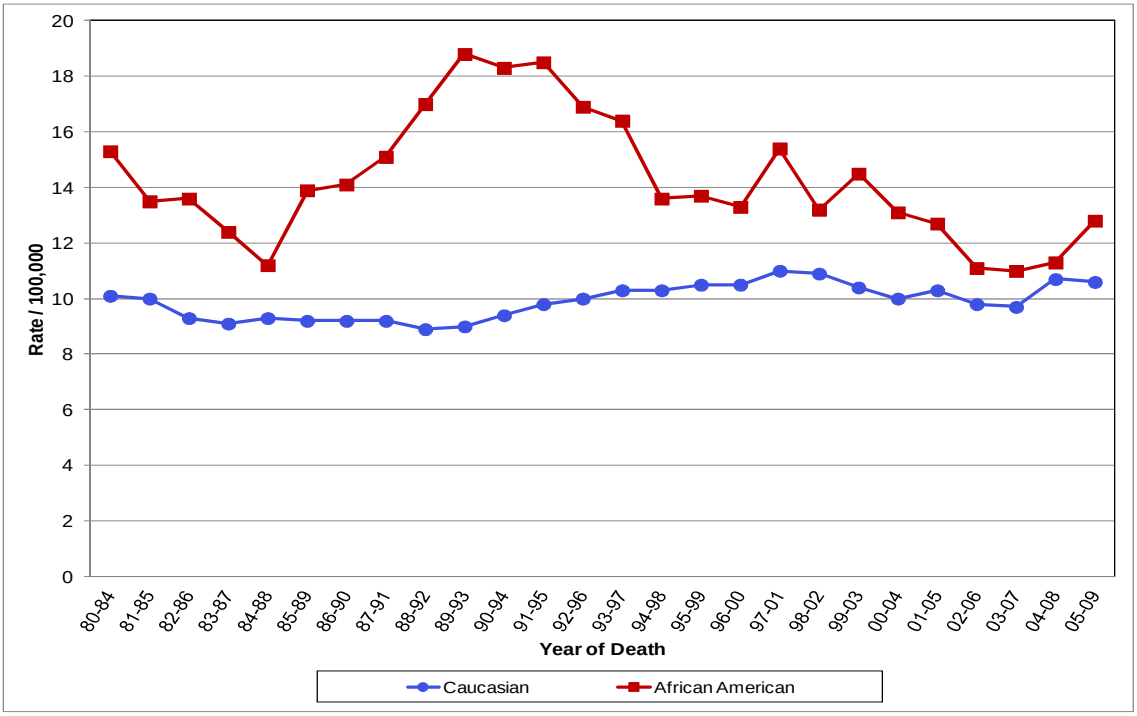
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 20.6. Five-Year Average Age-Adjusted Pancreatic Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 20.7. Five-Year Average Age-Adjusted Pancreatic Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 20.8. Age-Specific Pancreatic Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	8.5	11.1	6.0	8.5	11.5	5.7	9.4	---	---
65-74	46.2	48.6	44.2	43.1	43.9	42.4	73.9	---	---
75-84	80.1	90.9	72.1	80.3	95.9	68.5	---	---	---
85+	91.5	---	92.0	93.7	---	92.3	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 20.8. Age-Specific Pancreatic Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 20.8 is not displayed because of the small number of deaths.

21. PROSTATE CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Prostate Cancer:

- diet high in red meat or high fat dairy products
- diet low in fruits and vegetables
- diet high in calcium and dairy foods
- obesity (suspected)
- tobacco usage (suspected)
- heavy alcohol use (suspected)

Environmental and Medically-Related Causes of Prostate Cancer:

- employment in certain industries (all suspected)
    - welders
    - battery manufacturers
    - rubber workers
    - workers exposed to cadmium

Risk Factors for Prostate Cancer that Cannot be Changed:

- increasing age – risk rises rapidly after age 50.
- race – African American
- ethnicity – non-Hispanic
- nationality – North America, northwestern Europe
- family history of prostate cancer
- inherited DNA changes; e.g. HPC1 (hereditary prostate cancer gene 1)
- gene mutations that occur during a man's life
- higher levels of certain male hormones such as testosterone (suspected)
- infection and inflammation of the prostate gland (prostatitis) (suspected)
- certain genes, such as the BRCA 1 and BRCA 2 genes (suspected)

Factors Protective against Prostate Cancer:

- maintain a healthy weight
- diet high in fruits, vegetables and whole grains
- physical activity
- limit calcium intake

Early Detection of Prostate Cancer:

The American Cancer Society recommends that men have a chance to make an informed decision with their health care provider about whether to be screened for prostate cancer. They should first get information about what is known and what is not known about the risks and possible benefits of prostate cancer screening. Men should not be screened unless they have received this information.[17]

The Delaware Cancer Consortium recommends the following guidelines:

Prostate Cancer Screening Recommendations:

- No mass screening.
- Promote education for informed decision-making.
- Screening men older than 75 years is less desirable but can be individualized.
- Screening not recommended for men with life expectancy less than 10 years.
- Offer average-risk individuals screening at age 50 and older with informed decision process.
- High-risk individuals should be encouraged to be screened starting at the following:
    - 40 years of age (with risk factor = several 1st degree relatives);
    - 40 years of age (with risk factor = African American, 1st degree relative, family or personal history of BRCA1 and BRCA2 gene and/or
    - younger than 65 years of age.
- Prostate specific antigen (PSA) test with or without digital rectal exam (DRE) and screening at one- to two-year intervals are acceptable.

Prostate Cancer Screening among Delawareans:

Data from the Behavioral Risk Factor Survey (BRFS) for 2010 provide information on the prevalence of prostate cancer screening among Delaware men:

- In 2010, 59.7 percent of Delaware men ages 40 and older reported having had a PSA blood test in the past two years, compared to 53.2 percent at the national level. This difference did not reach significance.
- The proportion of men who received a PSA test within the past two years increased with age. 33.4 percent of men ages 40-49 were tested as compared to 79.0 percent of men ages 65 and older.
- Data were too sparse to examine difference in screening by race. The percentage of Delawarean men who reported having had a PSA blood test in the past two years did not significantly differ by education or income level.

Data Highlights

Prostate Cancer Incidence (Tables 21.1 – 21.3, Figures 21.1 – 21.3)

- Prostate cancer is the most frequently diagnosed cancer among men in Delaware and the U.S. From 2005 through 2009, 4,132 new cases of prostate cancer were diagnosed in Delaware, accounting for 31.0 percent of all new newly-diagnosed cases.
- Seventy-six percent of the prostate cancer cases were Caucasian (3,142 cases), 22.1 percent African American (914 cases) and 1.8 percent (76 cases) were other or unknown race.
- More than half of the prostate cancer cases (54.2 percent) were residents of New Castle County, 25.7 percent were from Sussex County and 20.1 percent were Kent County residents.
- The 2005–2009 prostate cancer incidence rate for Delaware (181.4 per 100,000) was significantly higher than the U.S. rate (154.8 per 100,000).
- The 2005–2009 prostate cancer incidence rate for African American men in Delaware (289.5 per 100,000) was significantly higher than the U.S. rate (236.0 per 100,000).

[17] American Cancer Society; Prostate Cancer: Early Detection. http://www.cancer.org/cancer/prostatecancer/moreinformation/prostatecancerearlydetection/prostate-cancer-early-detection-acs-recommendations

- Delaware's prostate cancer incidence rate for Caucasian males (164.4 per 100,000) was also significantly higher than the U.S. rate (146.9 per 100,000).
- The 2005–2009 prostate cancer incidence rate for African American males was significantly lower than the rate for Caucasian males, both in Delaware and nationally.
- In each of Delaware's counties, the prostate cancer incidence rate was significantly higher among African Americans than among Caucasians.
- Prostate cancer incidence peaked during the early 1990's with the introduction of the prostate-specific antigen (PSA) blood test. Prostate cancer incidence reached 219.2 per 100,000 in Delaware in 1991-1995 and reached 202.1 per 100,000 nationally during 1990-1994.
- Delaware's prostate cancer incidence rate increased 5.0 percent from 1995–1999 through 2005–2009. During this same period, the U.S. prostate cancer incidence rate decreased 10.7 percent.
- From 1995–1999 through 2005–2009, Delaware's prostate cancer incidence rate increased 2.9 percent among Caucasians and increased 9.4 percent among African Americans.
- In Delaware the 2005–2009 incidence of prostate cancer peaked at ages 65-74 in both races.
- Delaware men ranked second highest in the U.S. for prostate cancer incidence during 2005–2009 (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Prostate Cancer (Table 21.4, Figures 21.4 – 21.5)

- In 2005–2009, 86.0 percent, 8.6 percent and 2.7 percent of prostate cancer cases in Delaware were diagnosed at the local, regional and distant stages, respectively. In the U.S., comparable percentages were 80.4 percent, 11.2 percent and 4.1 percent.
- During 2005–2009, the proportion of late stage diagnoses (i.e., either regional or distant cancer at the time of diagnosis) was slightly higher among Caucasian (11.5 percent) than African American men (10.8 percent).
- In Delaware since 1980–1984, the proportion of prostate cancers diagnosed at the local stage increased dramatically; from 49.6 percent to 86.0 percent, an increase of 73.5 percent.
- Concurrently, the proportion of distant stage prostate cancers decreased from 27.3 percent in 1980-1984 to 2.7 percent in 2005–2009; a decline of 90.0 percent.
- During the same time period, the proportion of regional stage prostate cancers decreased from 13.9 percent to 8.6 percent, a decrease of 37.9 percent.

Prostate Cancer Mortality (Tables 21.5 – 21.7, Figures 21.6 – 21.7)

- Prostate cancer was the second leading cause of cancer death among males. The 462 deaths from prostate cancer accounted for 9.8 percent of cancer deaths among Delaware males during 2005–2009.
- Of the 462 decedents, 76.6 percent (354 deaths) were Caucasian, 22.5 percent (104 deaths) were African American and four deaths were other or unknown race.
- In contrast to prostate cancer incidence, mortality from prostate cancer was not significantly higher in Delaware (24.3 per 100,000) than nationally (23.6 per 100,000).
- The 2005–2009 prostate cancer mortality rate for African American males was significantly higher than for Caucasian males both in Delaware (48.5 per 100,000 African American vs. 21.5 per 100,000 Caucasian) and nationally (53.1 per 100,000 African American vs. 21.7 per 100,000 Caucasian). This pattern was also seen in New Castle County but there were insufficient data for both Kent and Sussex Counties.
- From 1995–1999 through 2005–2009, Delaware's prostate cancer mortality rate decreased 26.4 percent, while the U.S. rate fell 31.2 percent.
- During these 10 five-year time periods, Delaware's prostate cancer mortality rate decreased 34.0 percent among Caucasians and 51.5 percent among African Americans.
- Prostate cancer mortality is known to increase with increasing age, but Delaware's age-specific rates by race category were too sparse to show an association.
- During 2005–2009, Delaware men ranked 20th highest in the nation for mortality from prostate cancer (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 21.1. Number of Prostate Cancer Cases by Race; Delaware and Counties, 2005–2009

	All Male	Caucasian Male	African American Male
Delaware	4,132	3,142	914
Kent	830	596	225
New Castle	2,241	1,637	565
Sussex	1,061	909	124

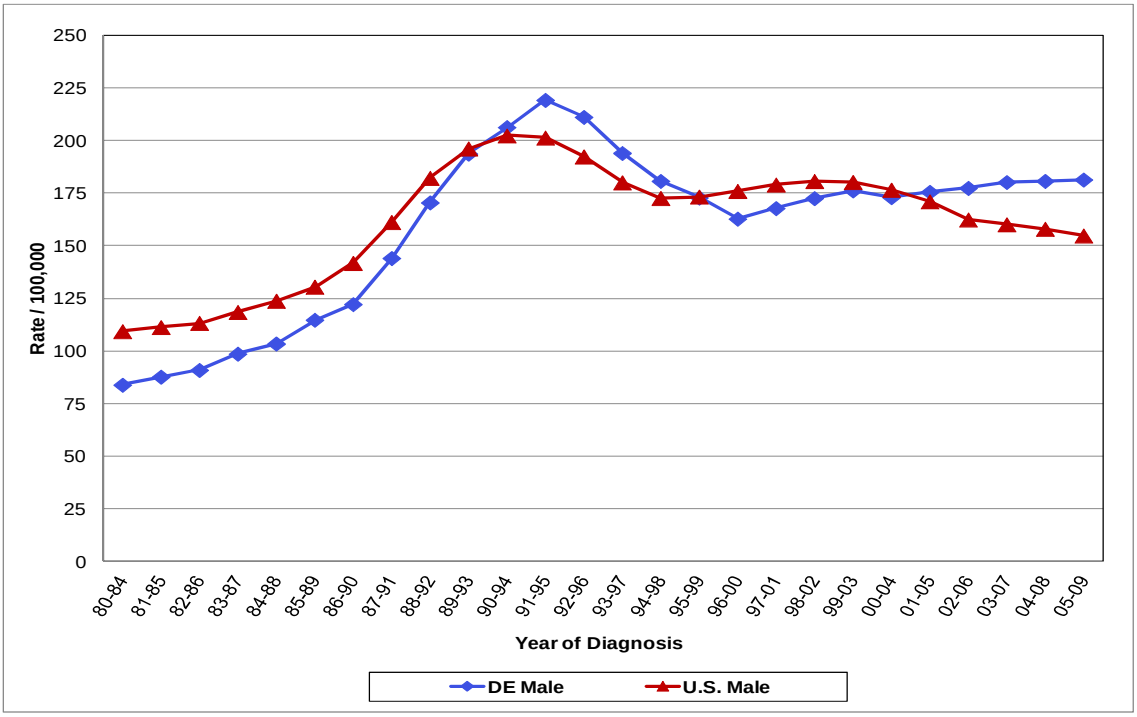
SOURCE: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 21.2. Five-Year Average Age-Adjusted Prostate Cancer Incidence Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

	All Male	Caucasian Male	African American Male
United States	154.8 (154.3 , 155.4)	146.9 (146.3 , 147.5)	236.0 (233.5 , 238.5)
Delaware	181.4 (175.9 , 187.1)	164.4 (158.6 , 170.3)	289.5 (270.0 , 309.9)
Kent	230.6 (214.9 , 247.1)	208.3 (191.7 , 226.0)	352.1 (306.5 , 402.4)
New Castle	182.6 (174.9 , 190.4)	166.5 (158.5 , 174.9)	271.7 (248.2 , 296.7)
Sussex	152.7 (143.6 , 162.4)	140.4 (131.3 , 150.0)	278.2 (230.2 , 332.7)

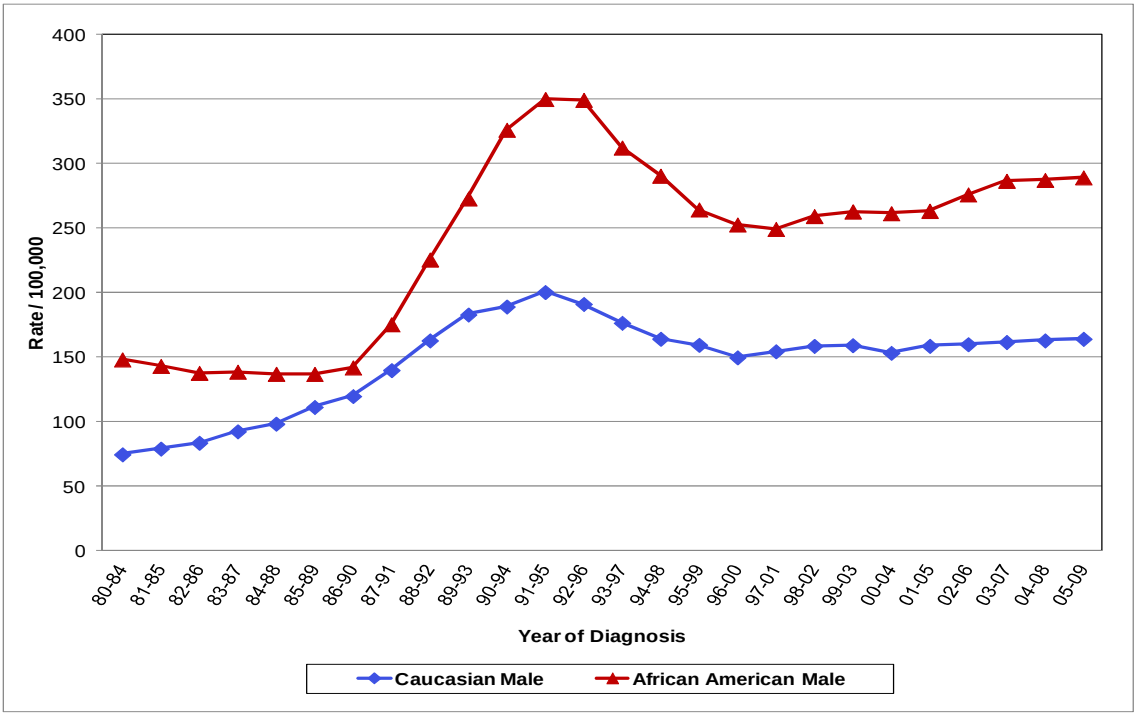
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 21.1. Five-Year Average Age-Adjusted Prostate Cancer Incidence Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 21.2. Five-Year Average Age-Adjusted Prostate Cancer Incidence Rates* by Race; Delaware, 1980–2009



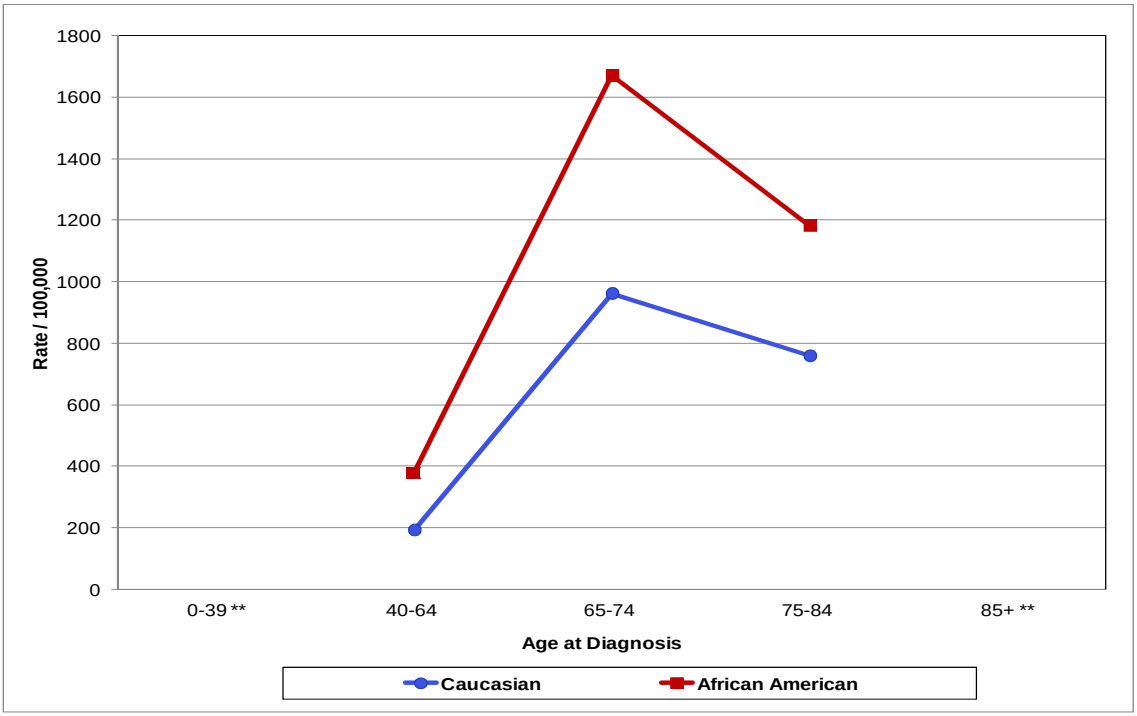
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 21.3. Age-Specific Prostate Cancer Incidence Rates* by Race; Delaware, 2005–2009

Age at Diagnosis	All Male	Caucasian Male	African American Male
0-39	---	---	---
40-64	222.4	193.5	378.5
65-74	1053.5	962.2	1670.2
75-84	801.4	759.5	1183.3
85+	530.3	512.6	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 21.3 Age-Specific Prostate Cancer Incidence Rates* by Race; Delaware, 2005–2009



* = Rates are per 100,000 population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

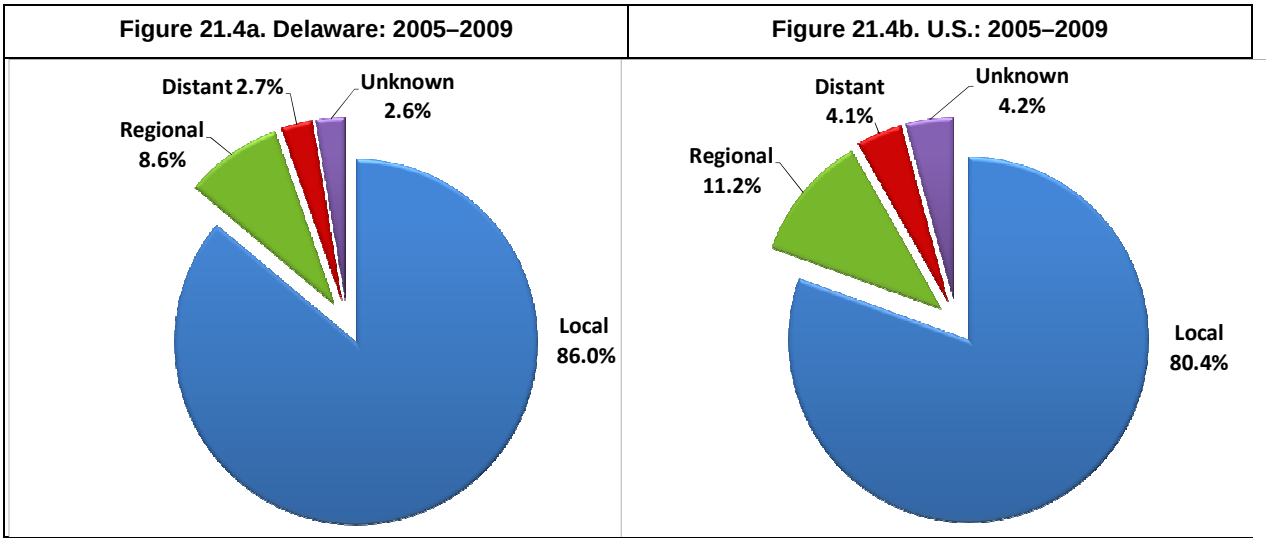
Prostate Cancer by Stage

Table 21.4. Number and Percent of Prostate Cancer Cases by Stage at Diagnosis and Race; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All Male	Caucasian	African American	All Male	Caucasian	African American
Local	3,555	2,703	788	86.0	86.0	86.2
Regional	357	280	68	8.6	8.9	7.4
Distant	113	82	31	2.7	2.6	3.4
Unknown	107	77	27	2.6	2.5	3.0
Total	4,132	3,142	914	100.0	100.0	100.0

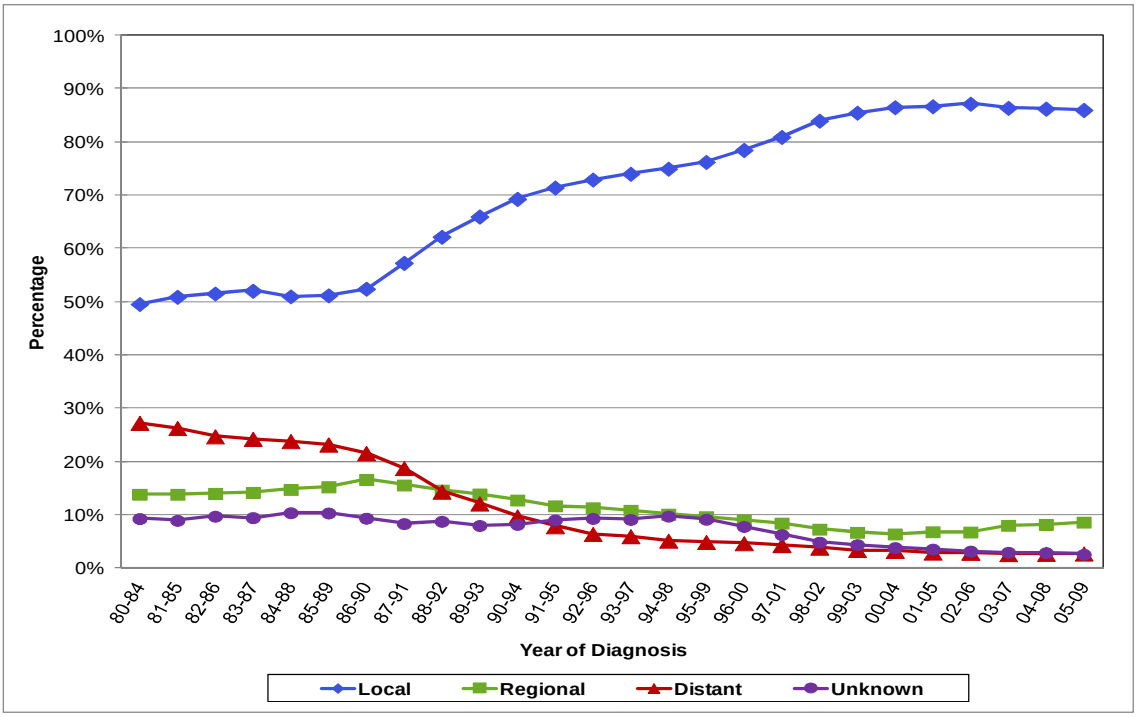
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 21.4. Percent of Prostate Cancer Cases by Stage at Diagnosis and Race; U.S. and Delaware, 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 21.5. Percent of Prostate Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 21.5. Number of Prostate Cancer Deaths by Race; Delaware and Counties, 2005–2009

	All Male	Caucasian Male	African American Male
Delaware	462	354	104
Kent	74	54	20
New Castle	272	207	63
Sussex	116	93	21

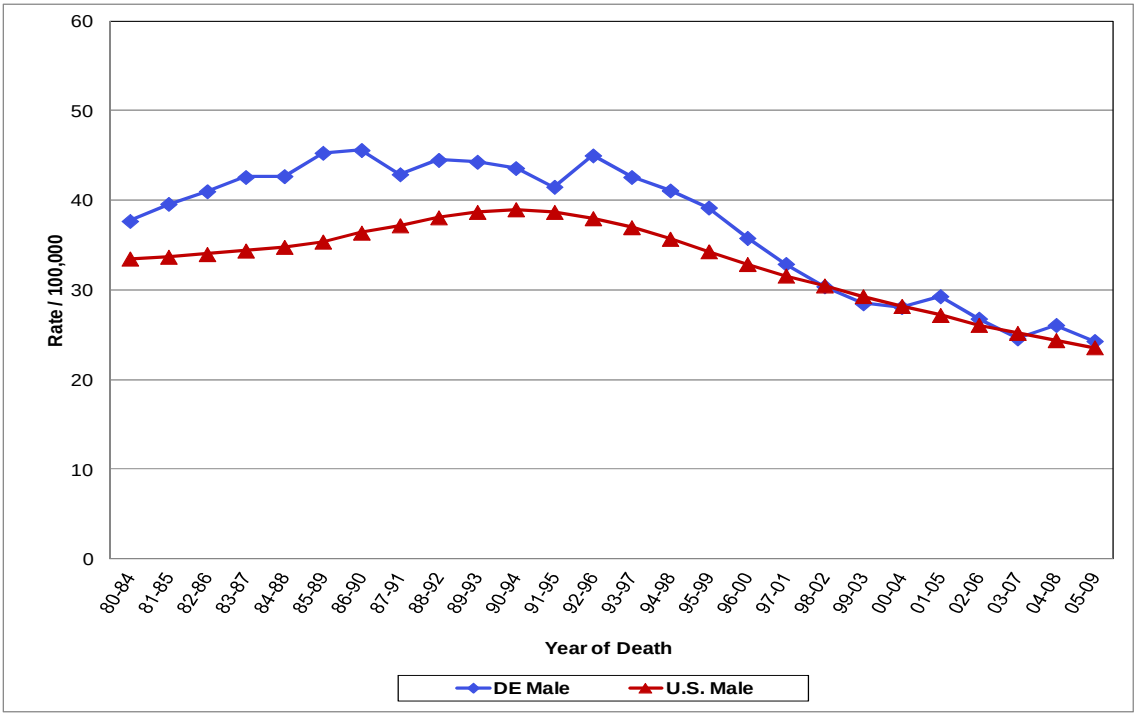
SOURCE: Delaware Health Statistics Center, 2012.

Table 21.6. Five-Year Average Age-Adjusted Prostate Cancer Mortality Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

Region	All Male	Caucasian Male	African American Male
United States	23.6 (23.5 , 23.7)	21.7 (21.6 , 21.8)	53.1 (52.4 , 53.8)
Delaware	24.3 (22.1 , 26.7)	21.5 (19.3 , 23.9)	48.5 (39.3 , 59.1)
Kent	27.1 (21.1 , 34.2)	24.6 (18.4 , 32.3)	---
New Castle	27.3 (24.1 , 30.8)	24.6 (21.3 , 28.2)	48.9 (37.0 , 63.0)
Sussex	18.6 (15.3 , 22.5)	15.9 (12.8 , 19.7)	---

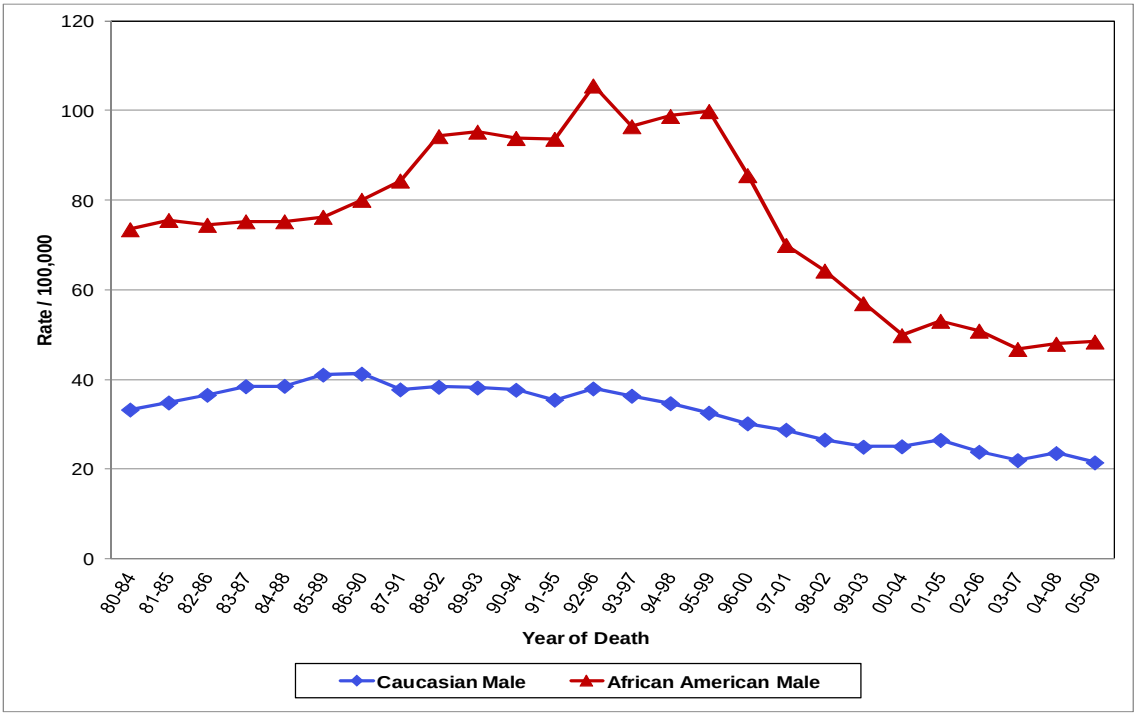
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown
SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 21.6. Five-Year Average Age-Adjusted Prostate Cancer Mortality Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 21.7. Five-Year Average Age-Adjusted Prostate Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 21.7. Age-Specific Prostate Cancer Mortality Rates* by Race; Delaware, 2005–2009

Age at Death	All Male	Caucasian Male	African American Male
0-39	---	---	---
40-64	5.3	3.7	---
65-74	68.2	57.8	145.0
75-84	204.5	176.5	490.9
85+	583.8	558.7	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 21.8. Age-Specific Prostate Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 21.8 is not displayed because of the small number of deaths

22. STOMACH CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Stomach Cancer:

- diet high in smoked foods, salted fish and meats and pickled vegetables
- low intake of fresh fruits and vegetables
- tobacco use – doubles risk of stomach cancer
- obesity
- heterocyclic amines in cooked meats (suspected)

Environmental and Medically-Related Causes of Stomach Cancer:

- living in Japan, China, Southern and Eastern Europe, and South and Central America
- Epstein-Barr virus (suspected)
- workplace exposures in the coal, metal and in the rubber industry (all suspected)

Stomach Cancer Risk Factors that Cannot be Changed:

- infection with certain bacteria (e.g. *Helicobacter pylori*)
- male gender
- increasing age – especially after age 50
- ethnicity – Hispanic
- race – African American or Asian/Pacific Islander
- family history of stomach cancer
- personal history of stomach lymphoma
- pernicious anemia (leads to shortage of red blood cells)
- type A blood

Factors Protective against Stomach Cancer:

- diet high in fruits, vegetables and whole grains
- physical activity
- weight control
- avoiding tobacco use

Early Detection of Stomach Cancer:

- There is no screening test recommended to detect stomach cancer in the general population.
- There are tests that can be used to diagnose stomach cancer among persons with known risk factors.

Data Highlights

Stomach Cancer Incidence (Tables 22.1 – 22.3, Figures 22.1 – 22.2)

- A total of 326 cases of stomach cancer were diagnosed in Delaware during 2005–2009 that accounted for 1.3 percent of all cancer cases diagnosed during 2005–2009 in Delaware.
- Nearly two of three stomach cancer cases were male; 64.1 percent (209 cases) male and 35.9 percent (117 cases) female. Seventy-two percent (236 cases) were Caucasian, 24.5 percent (80 cases) African American and 3.1 percent (10 cases) were other or unknown race.
- Delaware's 2005–2009 stomach cancer incidence rate (6.8 per 100,000) was lower than the U.S. rate (7.6 per 100,000) but the two rates were not statistically significantly different.
- For 2005–2009, the stomach cancer incidence rate for males was significantly higher than the rate for females in Delaware (9.8 per 100,000 vs. 4.4 per 100,000, respectively) as well as nationally (10.5 per 100,000 vs. 5.3 per 100,000, respectively)
- Among Caucasians, the stomach cancer incidence rate for males was significantly higher than for females nationally as well as for Delaware and New Castle County, the only county with data available for females.
- In Delaware and the U.S., stomach cancer incidence among African Americans was significantly higher than among Caucasians. This significant disparity was seen among both males and females nationally and in female Delawareans (9.4 per 100,000 African American vs. 3.3 per 100,000 Caucasian).
- The incidence of stomach cancer was highest in New Castle County (7.3 per 100,000) but the incidence rate was not significantly higher than the overall Delaware rate.
- From 1995–1999 through 2005–2009, Delaware's stomach cancer incidence rate decreased 15.0 percent while the U.S. rate decreased 10.6 percent.
- From 1995–1999 through 2005–2009, Delaware's stomach cancer incidence rate decreased 9.3 percent for males and 22.8 percent for females.
- Although the overall incidence rate for African Americans was significantly higher than for Caucasians, the stomach cancer incidence rate was decreasing more rapidly among African Americans (32.2 percent decline) than among Caucasians (11.9 percent decline) in Delaware from 1995–1999 through 2005–2009.
- Stomach cancer incidence increased with age but age-specific incidence data on Delawareans were insufficient.
- During 2005–2009, Delaware ranked 16th highest in the U.S. for incidence of stomach cancer. Men ranked 15th and women ranked 18th (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Stomach Cancer (Tables 22.4 – 22.5, Figures 22.4 – 22.5)

- For 2005–2009, 20.6 percent, 32.8 percent and 33.4 percent of stomach cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 26.3 percent, 28.7 percent and 33.1 percent, respectively.
- In Delaware, African Americans were more likely than Caucasians to be diagnosed with stomach cancer in the local stage (25.0 percent vs. 19.1 percent, respectively).
- Males were more likely to be diagnosed with stomach cancer in the distant stage than females (36.4 percent of males vs. 28.2 percent of females).
- The difference was more pronounced among African Americans, where 37.2 percent of males compared with 24.3 percent of females were diagnosed in the distant stage.
- Among African Americans in Delaware, females were more likely to be diagnosed with a regional stage of stomach cancer than males (45.9 percent and 25.6 percent, respectively).

Stomach Cancer Mortality (Tables 22.6 – 22.8, Figures 22.6 – 22.7)

- During 2005–2009, there were 188 deaths from stomach cancer that accounted for 2.1 percent of all cancer deaths in Delaware.
- As with stomach cancer incidence, nearly two of three stomach cancer deaths were male; 63.8 percent (120 deaths) male and 36.2 percent (68 deaths) female.
- Of the Delaware residents who died from stomach cancer, 71.8 percent (135 deaths) were Caucasian, 25.0 percent (47 deaths) African American and 3.2 percent (six deaths) were other or unknown race.
- Delaware's 2005–2009 stomach cancer mortality rate (3.8 per 100,000) was not different from the U.S. rate (3.6 per 100,000).
- In Delaware during 2005–2009, the stomach cancer mortality rate was more than twice as high among males than females (5.5 per 100,000 vs. 2.4 per 100,000) and the difference was significant. This significant difference persisted among Caucasian Delawareans (5.0 per 100,000 male vs. 1.8 per 100,000 female) but the mortality rate could not be computed for African American females.
- Nationally, stomach cancer mortality was significantly higher among males than females for both Caucasians and African Americans.
- Delaware's stomach cancer mortality rate declined 25.5 percent from 1995–1999 through 2005–2009 while the U.S. rate declined 28.0 percent.
- From 1995–1999 through 2005–2009, Delaware's stomach cancer mortality rate declined 35.1 percent among females and 19.1 percent among males.
- Delaware's stomach cancer mortality rate dropped 49.6 percent among African Americans and only 13.2 percent among Caucasians between 1995–1999 and 2005–2009.
- Delaware's 2005–2009 age-specific mortality rates for stomach cancer could not be calculated due to the small number of deaths.
- During 2005–2009, Delaware ranked 13th highest in the nation for mortality from cancer of the stomach. Delaware males ranked 12th in stomach cancer mortality and Delaware females ranked 19th (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

7

Stomach Cancer Incidence

Table 22.1. Number of Stomach Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	326	209	117	236	162	74	80	43	37
Kent	46	27	19	32	---	---	12	---	---
New Castle	194	119	75	138	92	46	51	25	26
Sussex	86	63	23	66	---	---	17	---	---

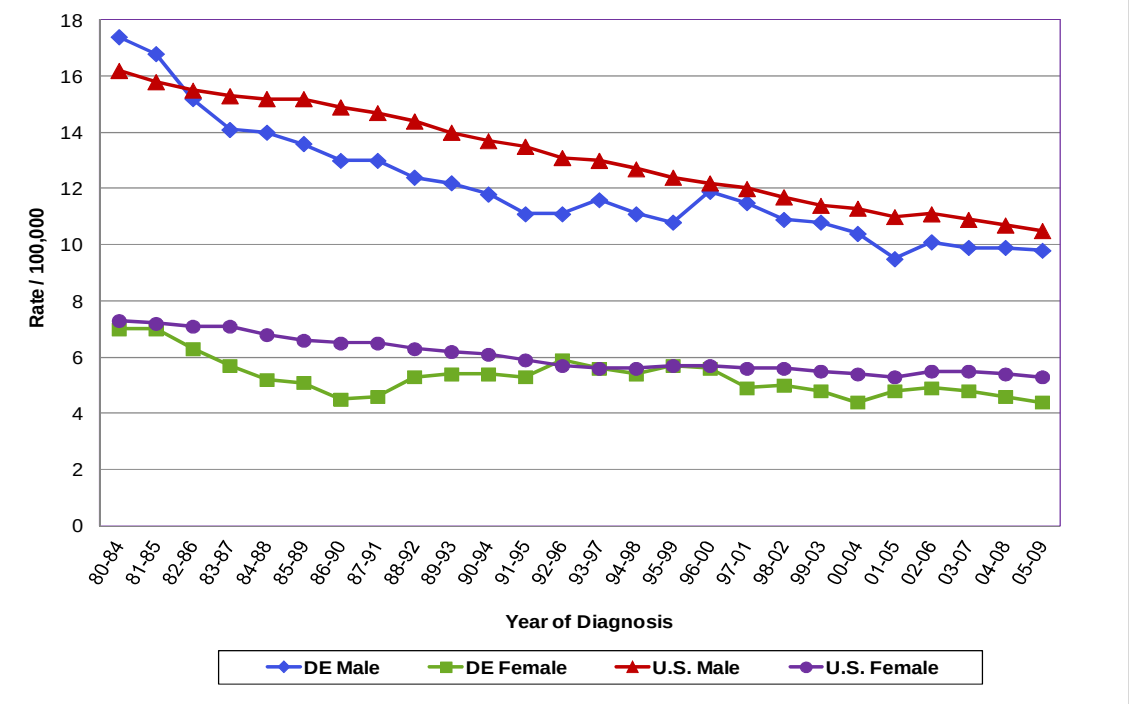
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 22.2. Five-Year Average Age-Adjusted Stomach Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION ALL RACES	All	Male	Female
United States	7.6 (7.5 , 7.7)	10.5 (10.4 , 10.7)	5.3 (5.2 , 5.4)
Delaware	6.8 (6.1 , 7.6)	9.8 (8.5 , 11.2)	4.4 (3.6 , 5.2)
Kent	6.0 (4.4 , 8.0)	7.9 (5.1 , 11.5)	---
New Castle	7.3 (6.3 , 8.4)	10.3 (8.5 , 12.3)	5.0 (3.9 , 6.3)
Sussex	6.1 (4.9 , 7.6)	10.0 (7.6 , 12.9)	---
CAUCASIAN			
United States	6.6 (6.5 , 6.6)	9.3 (9.1 , 9.4)	4.4 (4.3 , 4.5)
Delaware	5.9 (5.1 , 6.7)	9.1 (7.7 , 10.6)	3.3 (2.5 , 4.1)
Kent	5.3 (3.6 , 7.6)	---	---
New Castle	6.5 (5.4 , 7.6)	9.9 (8.0 , 12.2)	3.8 (2.7 , 5.1)
Sussex	5.1 (3.9 , 6.6)	8.5 (6.2 , 11.5)	---
AFRICAN AMERICAN			
United States	11.9 (11.6 , 12.3)	17.0 (16.3 , 17.7)	8.7 (8.3 , 9.1)
Delaware	11.6 (9.1 , 14.5)	14.4 (10.2 , 19.6)	9.4 (6.6 , 13.0)
Kent	---	---	---
New Castle	11.3 (8.3 , 15.0)	12.0 (7.5 , 18.0)	10.3 (6.7 , 15.2)
Sussex	---	---	---

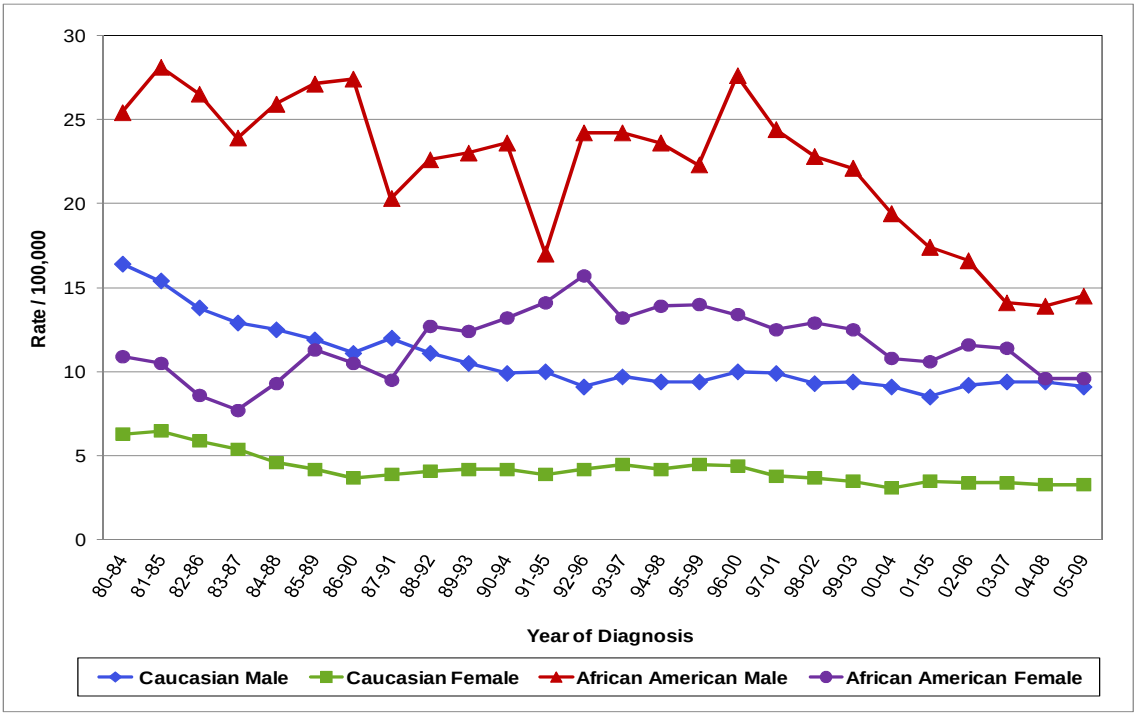
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 22.1. Five-Year Average Age-Adjusted Stomach Cancer Incidence Rates* by Sex; U.S and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 22.2. Five-Year Average Age-Adjusted Stomach Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 22.3. Age-Specific Stomach Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	7.1	---	---	---	---	---	---	---	---
40-64	28.3	10.1	4.2	5.7	9.2	11.4	---	---	---
65-74	41.7	40.6	17.7	24.2	36.1	---	---	---	---
75-84	43.2	62.5	26.9	38.9	60.1	23.5	---	---	---
85+	7.1	---	---	40.4	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 22.3. Age-Specific Stomach Cancer Incidence Rates by Race; Delaware, 2005–2009

NOTE: Figure 22.3 is not displayed because of the small number of cases.

Table 22.4. Number of Stomach Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	67	41	26	45	29	16	20	11	9
Regional	107	67	40	74	54	20	28	11	17
Distant	109	76	33	82	59	23	25	16	9
Unknown	43	25	18	35	---	---	7	---	---
Total	326	209	117	236	162	74	80	43	37

--- = Cell counts less than six are not shown to protect patient confidentiality
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 22.5. Percent of Stomach Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	20.6	19.6	22.2	19.1	17.9	21.6	25.0	25.6	24.3
Regional	32.8	32.1	34.2	31.4	33.3	27.0	35.0	25.6	45.9
Distant	33.4	36.4	28.2	34.7	36.4	31.1	31.3	37.2	24.3
Unknown	13.2	12.0	15.4	14.8	12.3	20.3	8.8	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

--- = Percentages based on cell counts less than six are not shown to protect patient confidentiality
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 22.4. Percent of Stomach Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009

Figure 22.4a. Delaware: 2005–2009

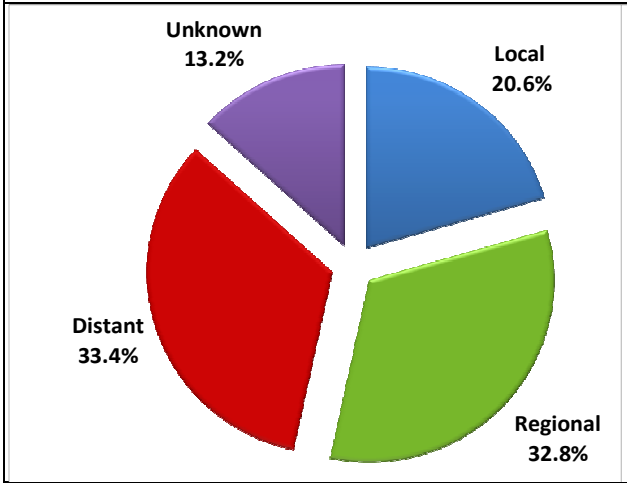
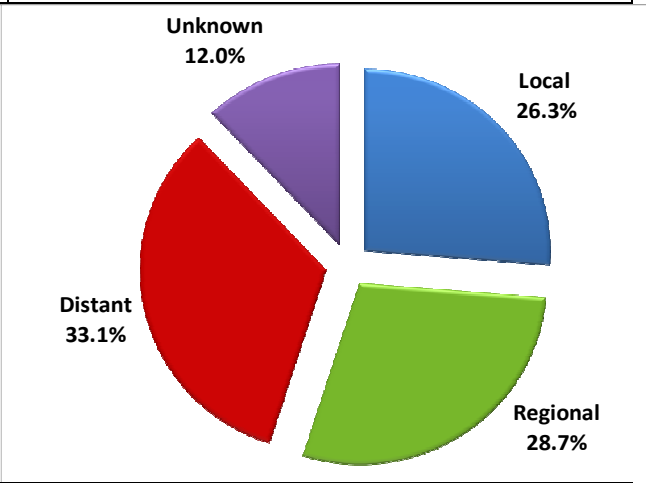
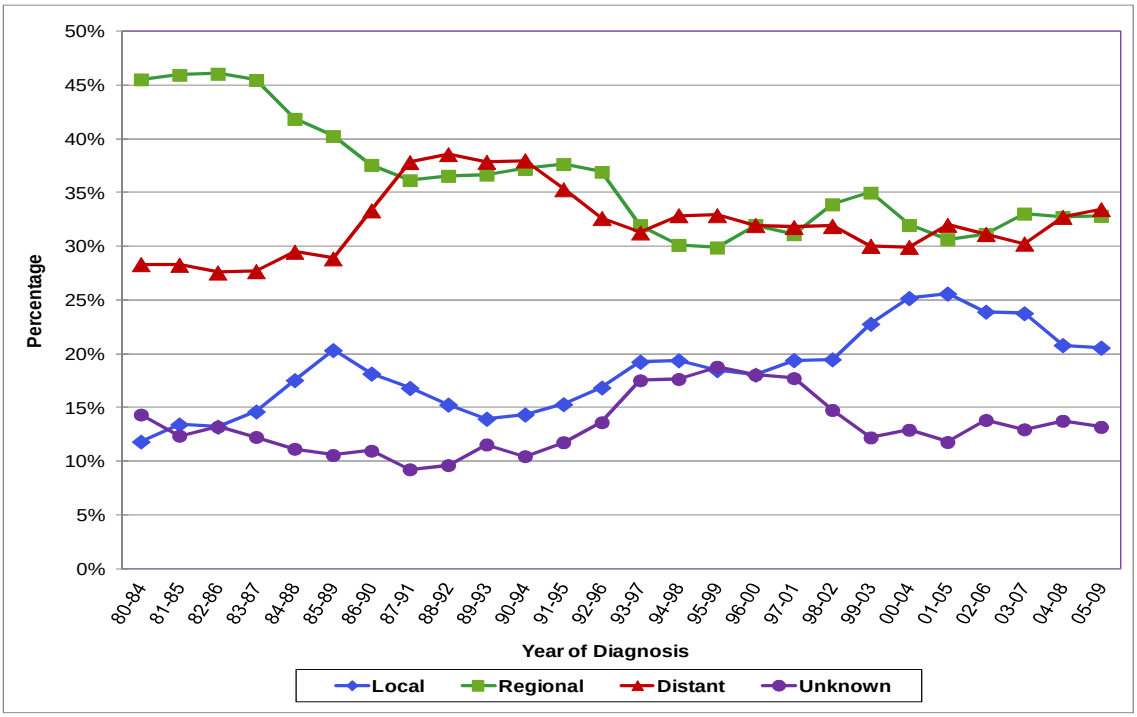


Figure 22.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 22.5. Percent of Stomach Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Stomach Cancer Mortality

Table 22.6. Number of Stomach Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	188	120	68	135	90	45	47	29	18
Kent	33	20	13	24	---	---	8	---	---
New Castle	105	66	39	76	52	24	26	13	13
Sussex	50	34	16	35	---	---	13	---	---

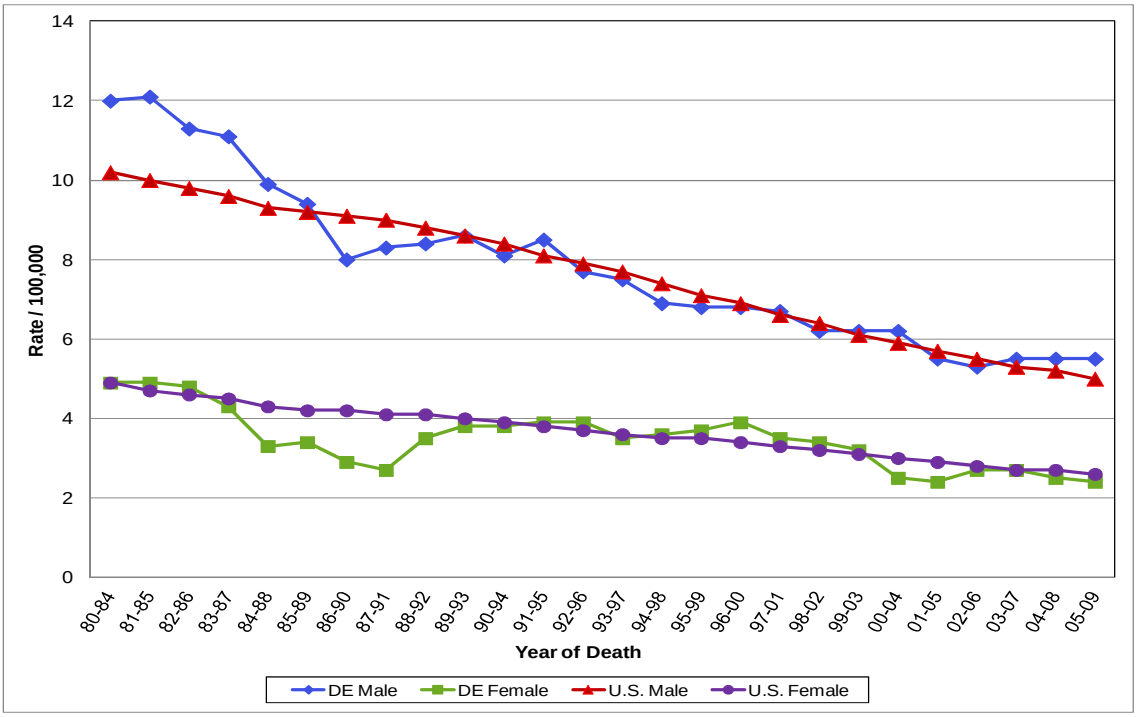
SOURCE: Delaware Health Statistics Center, 2012.

Table 22.7. Five-Year Average Age-Adjusted Stomach Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	3.6 (3.6 , 3.6)	5.0 (4.9 , 5.1)	2.6 (2.5 , 2.6)
Delaware	3.8 (3.3 , 4.4)	5.5 (4.6 , 6.6)	2.4 (1.9 , 3.1)
Kent	4.3 (2.9 , 6.0)	---	---
New Castle	3.9 (3.2 , 4.8)	5.7 (4.4 , 7.3)	2.5 (1.8 , 3.5)
Sussex	3.4 (2.5 , 4.6)	5.2 (3.6 , 7.4)	---
CAUCASIAN			
United States	3.1 (3.1 , 3.2)	4.3 (4.3 , 4.4)	2.2 (2.2 , 2.2)
Delaware	3.3 (2.7 , 3.9)	5.0 (4.0 , 6.2)	1.8 (1.3 , 2.5)
Kent	---	---	---
New Castle	3.5 (2.8 , 4.4)	5.6 (4.2 , 7.4)	---
Sussex	2.6 (1.8 , 3.7)	---	---
AFRICAN AMERICAN			
United States	6.9 (6.8 , 7.1)	10.3 (10.0 , 10.6)	4.8 (4.6 , 4.9)
Delaware	6.7 (4.8 , 8.9)	9.1 (5.9 , 13.2)	---
Kent	---	---	---
New Castle	5.7 (3.6 , 8.4)	---	---
Sussex	---	---	---

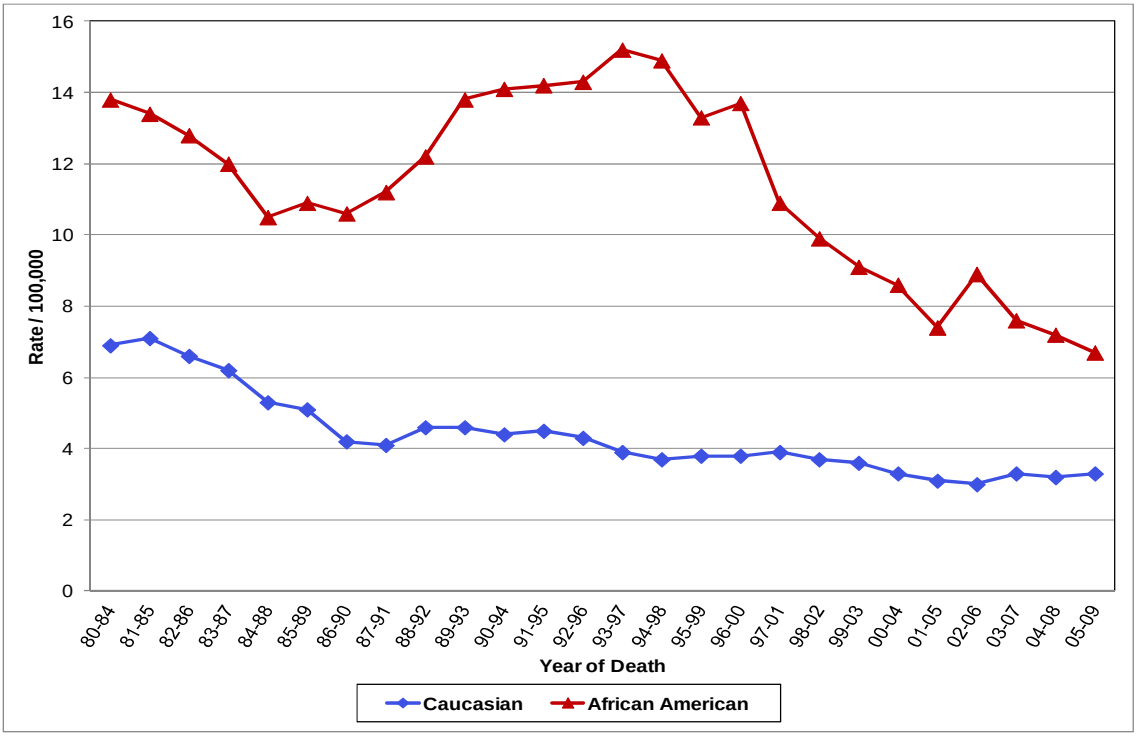
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 22.6. Five-Year Average Age-Adjusted Stomach Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 22.7. Five-Year Average Age-Adjusted Stomach Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.
Note: Rate for African American females in 1984-1988 not calculated because less than 10 deaths.

Table 22.8. Age-Specific Stomach Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	3.6	5.5	---	2.6	4.6	---	---	---	---
65-74	14.9	25.9	---	11.7	20.4	---	---	---	---
75-84	26.8	34.1	21.6	25.7	35.9	---	---	---	---
85+	33.1	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 22.8. Age-Specific Stomach Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 22.8 is not displayed because of the small number of deaths.

23. TESTICULAR CANCER

Risk Factors and Early Detection

Risk Factors for Testicular Cancer

- infection with HIV (human immunodeficiency virus) (suspected)

Environmental and Medically-Related Causes of Testicular Cancer:

- inguinal hernia (suspected)
- testicular trauma (suspected)
- occupational exposures in leather processing (suspected)

Risk Factors for Testicular Cancer that Cannot be Changed:

- cryptorchidism (undescended testicle)
- age – half of testicular cancers occur from ages 20 – 34
- family history of testicular cancer
- personal history of testicular cancer
- race – Caucasians have five times higher risk than African Americans

Factors Protective against **Testicular Cancer:**

- testicular self-exam among men with risk factors

Early Detection of Testicular Cancer:

- regular testicular self-exam

Data Highlights

Testicular Cancer Incidence (Tables 23.1 – 23.2, Figures 23.1 – 23.2)

- From 2005–2009, there were 110 newly-diagnosed cases of testicular cancer in Delaware, accounting for 0.8 percent of all cancer cases diagnosed among males.
- Of the 110 testicular cancer cases, 89.1 percent (98 cases) were Caucasian, 7.3 percent (8 cases) African American and four cases were other or unknown race.
- Delaware's 2005–2009 testicular cancer incidence rate (5.4 per 100,000) was the same as the U.S. rate.
- At the national level, the 2005–2009 testicular cancer incidence rate for African American males was significantly lower than the rate for Caucasian males (1.3 per 100,000 vs. 6.4 per 100,000, respectively).
- Since there were only eight cases of testicular cancer among African Americans, rates could not be compared by race or by age group.
- Delaware males ranked 31st in the U.S. for testicular cancer incidence during 2005–2009 (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Testicular Cancer (Table 23.4, Figures 23.4 – 23.5)

- For 2005–2009, 66.4 percent, 21.8 percent and 10.0 percent of testicular cancer cases in Delaware were diagnosed at the local, regional and distant stages, respectively. In the U.S., comparable percentages were 68.8 percent, 18.0 percent and 12.1 percent, respectively.

- During 2005–2009, 35 cases of testicular cancer (32.4 percent of all testicular cancers diagnosed during this period) were late-stage diagnoses (i.e., either regional or distant cancer at the time of diagnosis) compared with 30.0 percent nationally.
- In Delaware, since 1980–1984, the proportion of testicular cancers diagnosed at the local stage has increased from 51.9 percent to 66.7 percent and the proportion of late stage cancers has decreased from 46.3 percent to 32.4 percent.

Testicular Cancer Mortality

- No results are available on testicular cancer mortality since only two deaths occurred during 2005–2009.

Testicular Cancer Incidence

Table 23.1. Number of Testicular Cancer Cases by Race; Delaware and Counties, 2005–2009

	All Male	Caucasian Male	African American Male
Delaware	110	98	8
Kent	19	---	---
New Castle	69	---	---
Sussex	22	---	---

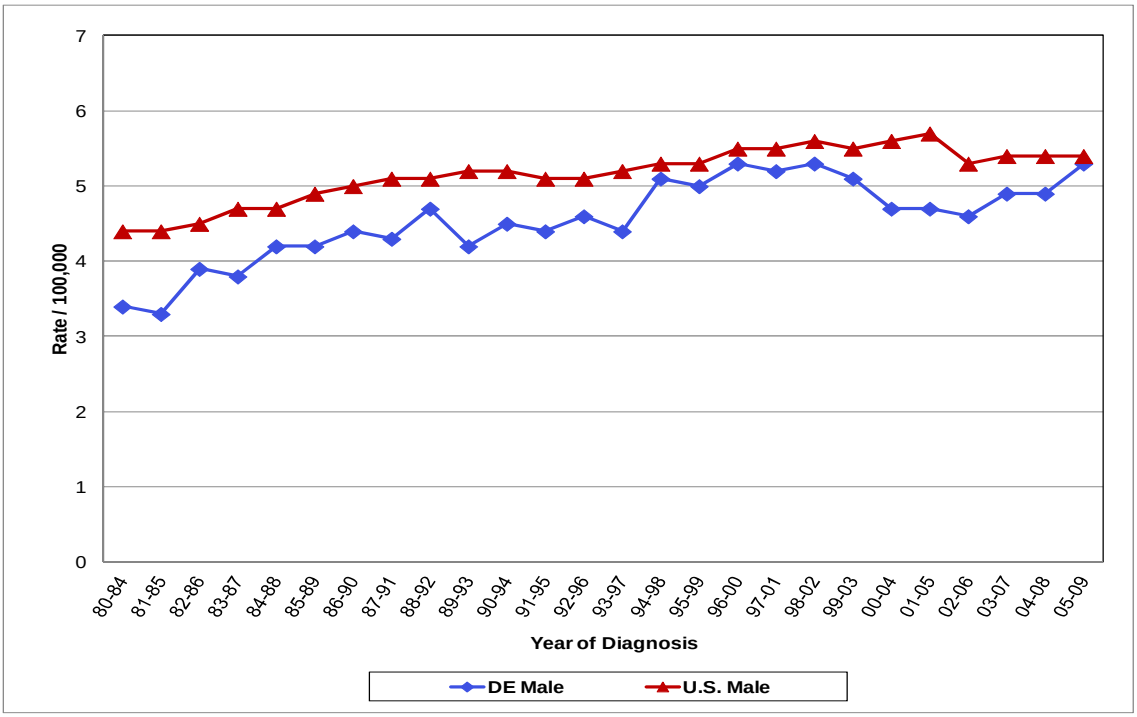
--- = Cell counts less than six are not shown to protect patient confidentiality
SOURCE: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 23.2. Five-Year Average Age-Adjusted Testicular Cancer Incidence Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

	All Male	Caucasian Male	African American Male
United States	5.4 (5.3 , 5.5)	6.4 (6.3 , 6.5)	1.3 (1.1 , 1.4)
Delaware	5.4 (4.4 , 6.5)	6.6 (5.4 , 8.1)	---
Kent	---	---	---
New Castle	5.4 (4.2 , 6.8)	6.6 (5.0 , 8.5)	---
Sussex	---	---	---

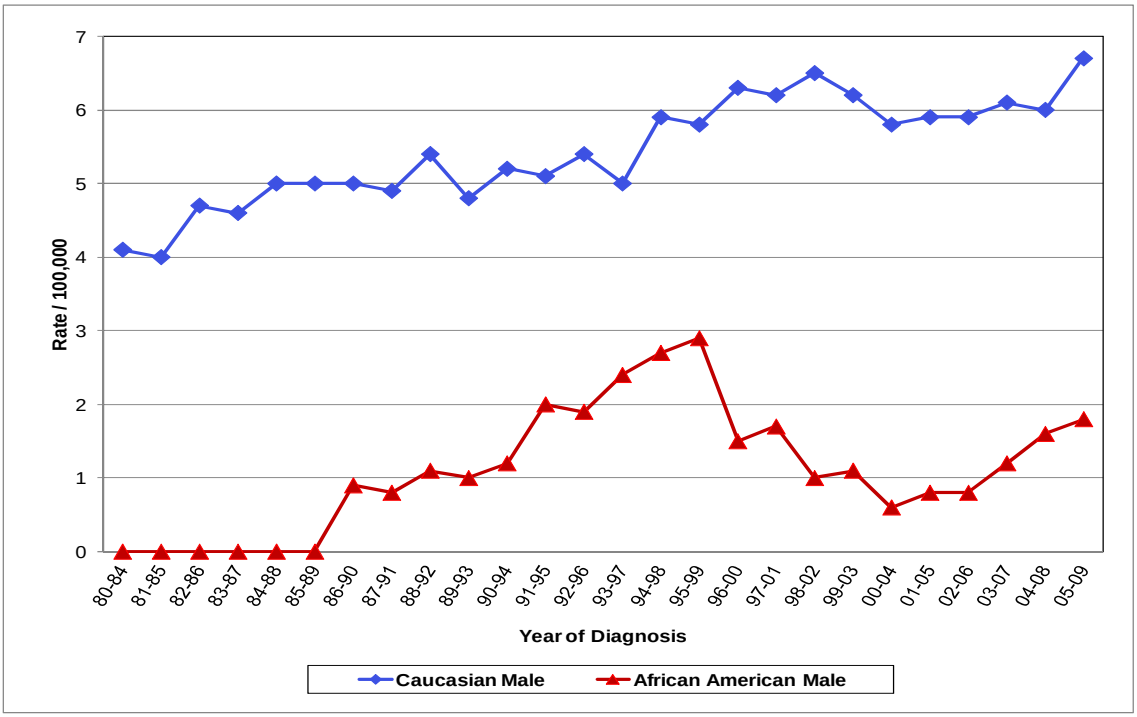
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 23.1. Five-Year Average Age-Adjusted Testicular Cancer Incidence Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 23.2. Five-Year Average Age-Adjusted Testicular Cancer Incidence Rates* by Race; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 23.3. & Figure 23.3. Age-Specific Testicular Cancer Incidence Rates*; Delaware, 2005–2009

NOTE: Table 23.3 and Figure 23.3 are not displayed because of the small number of cases.

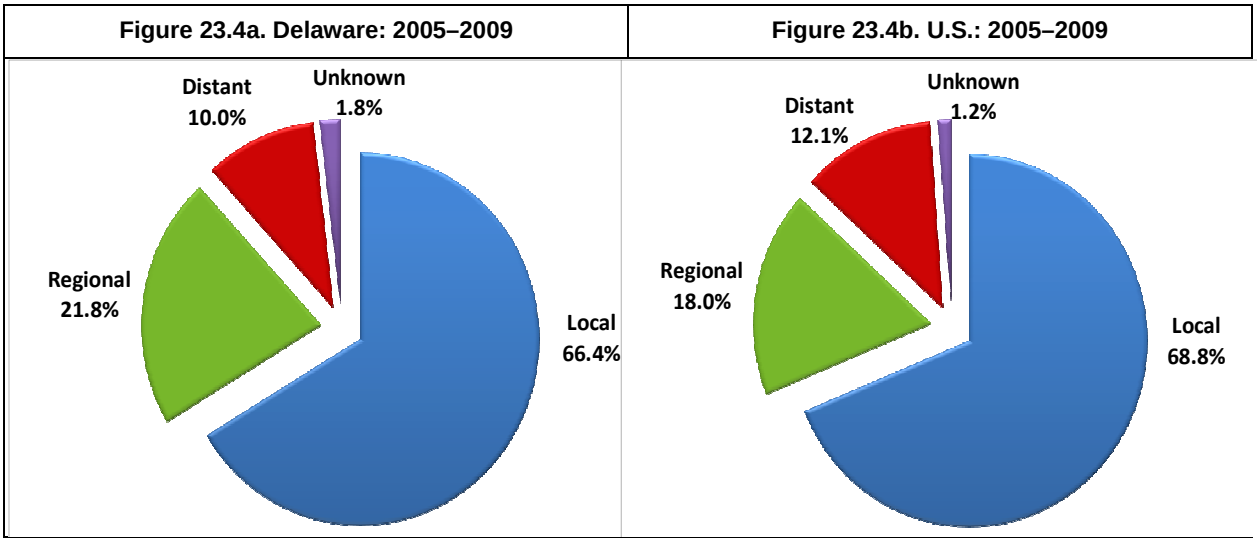
Testicular Cancer by Stage

Table 23.4. Number and Percent of Testicular Cancer Cases by Stage at Diagnosis; Delaware, 2005–2009

Stage at Diagnosis	Number	Percent
Local	73	66.4
Regional	24	21.8
Distant	11	10.0
Unknown	---	---
Total	110	100.0

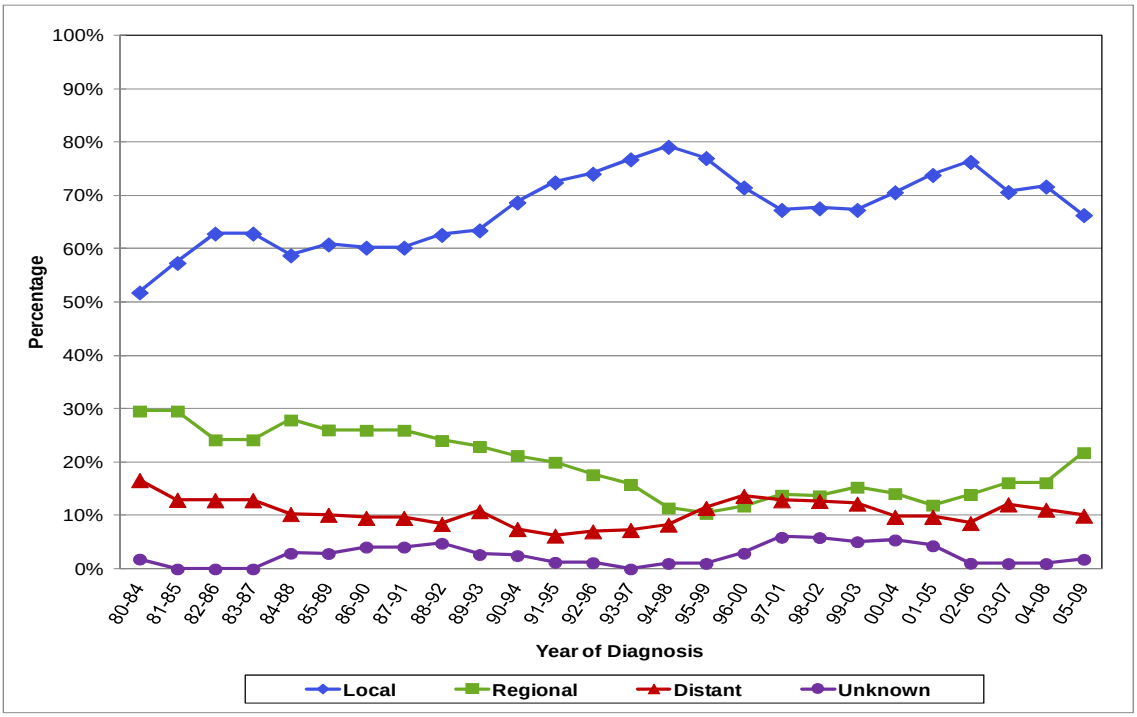
--- = Cell counts less than six are not shown to protect patient confidentiality
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 23.4. Percent of Testicular Cancer Cases by Stage at Diagnosis and Race; U.S. and Delaware, 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 23.5. Percent of Testicular Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Testicular Cancer Mortality

NOTE: Results are not presented for testicular cancer mortality since only two deaths occurred during 2005–2009 in Delaware.

24. THYROID CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Thyroid Cancer:

- diet low in iodine

Environmental and Medically-Related Causes of Thyroid Cancer:

- radiation fallout from power plant accidents or nuclear weapons
- exposure to radiation, particularly in childhood
- history of head or neck radiation treatments in childhood – risk increases with larger doses of radiation and with younger ages at treatment

Risk Factors for Thyroid Cancer that Cannot be Changed:

- gender – three times more frequent in women than in men
- age – risk peaks earlier for women (most often in 40s or 50s when diagnosed) than for men (usually in their 60s or 70s)
- race – Caucasian
- several inherited conditions – For example, about one of three medullary thyroid carcinomas (MTCs) arise from inheriting an abnormal gene.

Factors Protective against Thyroid Cancer:

- avoid x-rays that aren't necessary
- genetic counseling for persons with family history
- removal of thyroid gland in children with abnormal gene

Early Detection of Thyroid Cancer:

- routine checkups by health care provider
- detection of neck lump or bump by an individual
- diagnostic tests for persons at high risk

Data Highlights

Thyroid Cancer Incidence (Tables 24.1 – 24.3, Figures 24.1 – 24.2)

- A total of 513 cases of thyroid cancer were diagnosed in Delaware during 2005–2009 that accounted for 2.0 percent of all cancer cases diagnosed during 2005–2009 in Delaware.
- Three of four thyroid cancer cases were female. The majority of cases were Caucasian (83.2 percent, 427 cases), 13.6 percent African American (70 cases) and 16 cases were other or unknown race.
- Delaware's 2005–2009 thyroid cancer incidence rate (11.3 per 100,000) does not differ statistically from the U.S. rate (11.6 per 100,000).
- For 2005–2009 in Delaware and nationally, the thyroid cancer incidence rate for females was significantly higher than the rate for males.
- In Delaware, the incidence rate for females was significantly higher than for males in each county.

- In Delaware and at the national level, thyroid cancer was significantly higher among Caucasians than among African Americans.
- From 1995–1999 through 2005–2009, Delaware's thyroid cancer incidence rate increased 56.9 percent while the national incidence rate increased 70.6 percent.
- In Delaware, the thyroid cancer incidence rate increased 78.8 percent among males and 49.1 percent among females between 1995–1999 and 2005–2009.
- From 1995–1999 through 2005–2009, Delaware's thyroid cancer incidence rate increased 69.4 percent among Caucasians and 24.6 percent among African Americans.
- The greatest change from 1995–1999 through 2005–2009 in Delaware was a 91.4 percent increase among Caucasian males.
- Due to the relatively small number of cases, incidence rates could not be calculated for all age groups.
- Delawareans ranked 30th highest in the U.S. for thyroid cancer incidence during 2005–2009. Males ranked 26th and females ranked 33rd (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Thyroid Cancer (Tables 24.4 – 24.5, Figures 24.4 – 24.5)

- For 2005–2009, 73.9 percent, 21.2 percent and 3.7 percent of thyroid cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 68.2 percent, 25.5 percent and 4.4 percent, respectively.
- Since 1980-1984, the proportion of thyroid cancers diagnosed in the local stage has increased dramatically (40.8 percent increase) while the proportion of cases diagnosed in the regional and distant stages has decreased 39.1 percent.

Thyroid Cancer Mortality

Results on mortality from thyroid cancer were not presented here since there were only 23 deaths due to thyroid cancer during 2005–2009; 11 were male and 12 female (19 Caucasian and four African American).

- National data show that during 2005–2009, Delawareans ranked 28th highest in the nation for mortality from thyroid cancer. Rankings are not available by sex due to the low number of deaths (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Thyroid Cancer Incidence

Table 24.1. Number of Thyroid Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	513	128	385	427	116	311	70	9	61
Kent	92	15	77	78	---	---	13	---	---
New Castle	319	85	234	260	74	186	48	8	40
Sussex	102	28	74	89	---	---	9	---	---

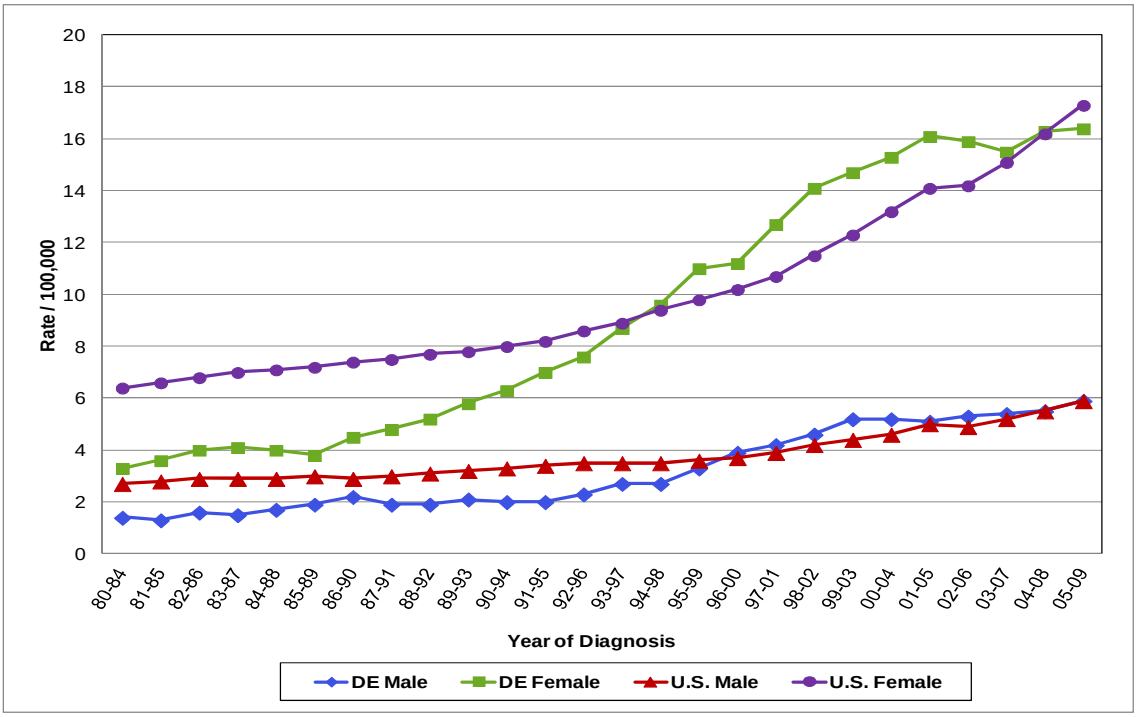
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 24.2. Five-Year Average Age-Adjusted Thyroid Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	11.6 (11.5 , 11.7)	5.9 (5.7 , 6.0)	17.3 (17.1 , 17.5)
Delaware	11.3 (10.3 , 12.3)	5.9 (4.9 , 7.0)	16.4 (14.8 , 18.2)
Kent	12.3 (9.9 , 15.1)	4.7 (2.6 , 7.8)	19.4 (15.3 , 24.3)
New Castle	11.7 (10.5 , 13.1)	6.6 (5.3 , 8.2)	16.5 (14.4 , 18.8)
Sussex	9.6 (7.8 , 11.8)	4.9 (3.2 , 7.3)	14.2 (11.0 , 18.1)
CAUCASIAN			
United States	12.2 (12.1 , 12.3)	6.2 (6.1 , 6.3)	18.3 (18.0 , 18.5)
Delaware	12.2 (11.0 , 13.4)	6.7 (5.5 , 8.0)	17.5 (15.6 , 19.6)
Kent	13.9 (11.0 , 17.4)	---	22.0 (16.9 , 28.2)
New Castle	12.8 (11.3 , 14.5)	7.5 (5.9 , 9.5)	17.9 (15.4 , 20.7)
Sussex	9.6 (7.6 , 12.1)	5.6 (3.6 , 8.4)	13.5 (10.0 , 17.7)
AFRICAN AMERICAN			
United States	6.9 (6.7 , 7.2)	3.3 (3.0 , 3.6)	10.1 (9.7 , 10.5)
Delaware	8.1 (6.3 , 10.3)	---	12.8 (9.8 , 16.6)
Kent	---	---	---
New Castle	8.3 (6.1 , 11.1)	---	12.5 (8.9 , 17.2)
Sussex	---	---	---

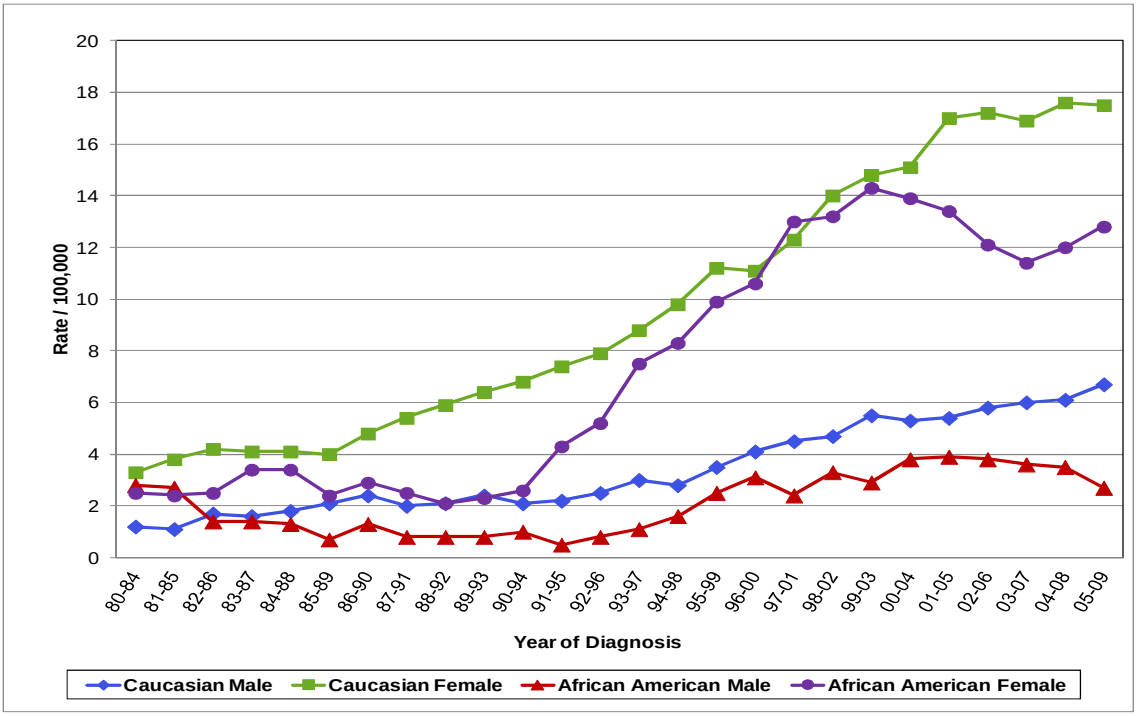
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 24.1. Five-Year Average Age-Adjusted Thyroid Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



***** = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 24.2. Five-Year Average Age-Adjusted Thyroid Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 24.3. Age-Specific Thyroid Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	5.4	1.7	9.0	5.7	---	9.5	---	---	---
40-64	19.0	9.6	27.7	20.6	11.2	29.7	14.0	---	22.4
65-74	23.8	---	31.2	25.2	---	33.1	---	---	---
75-84	17.0	---	---	---	---	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 24.3. Age-Specific Thyroid Cancer Incidence Rates by Race; Delaware, 2005–2009

NOTE: Figure 24.3 is not displayed because of the small number of cases.

Table 24.4. Number of Thyroid Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	379	83	296	313	73	240	56	8	48
Regional	109	40	69	94	---	---	10	---	---
Distant	19	---	---	---	---	---	---	---	---
Unknown	6	---	---	---	---	---	---	---	---
Total	513	128	385	427	116	311	70	9	61

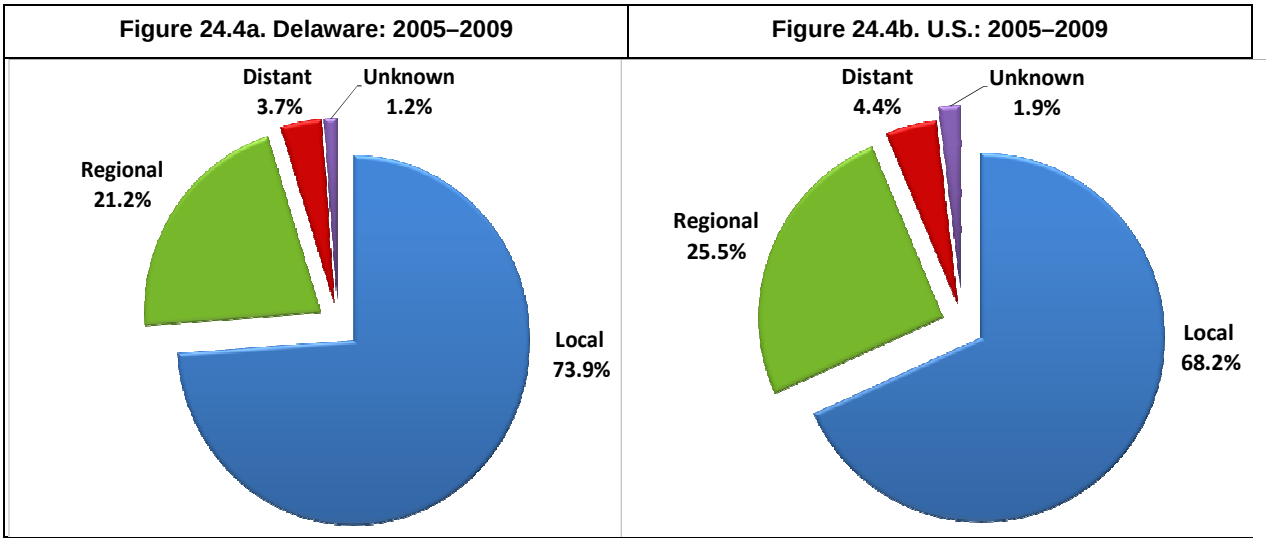
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012

Table 24.5. Percent of Thyroid Cancer Cases by Stage at Diagnosis, Race and Sex; Delaware, 2005–2009

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	73.9	64.8	76.9	73.3	62.9	77.2	80.0	88.9	78.7
Regional	21.2	31.3	17.9	22.0	33.6	17.7	14.3	---	---
Distant	3.7	---	---	3.7	---	---	---	---	---
Unknown	1.2	---	---	---	---	---	---	---	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

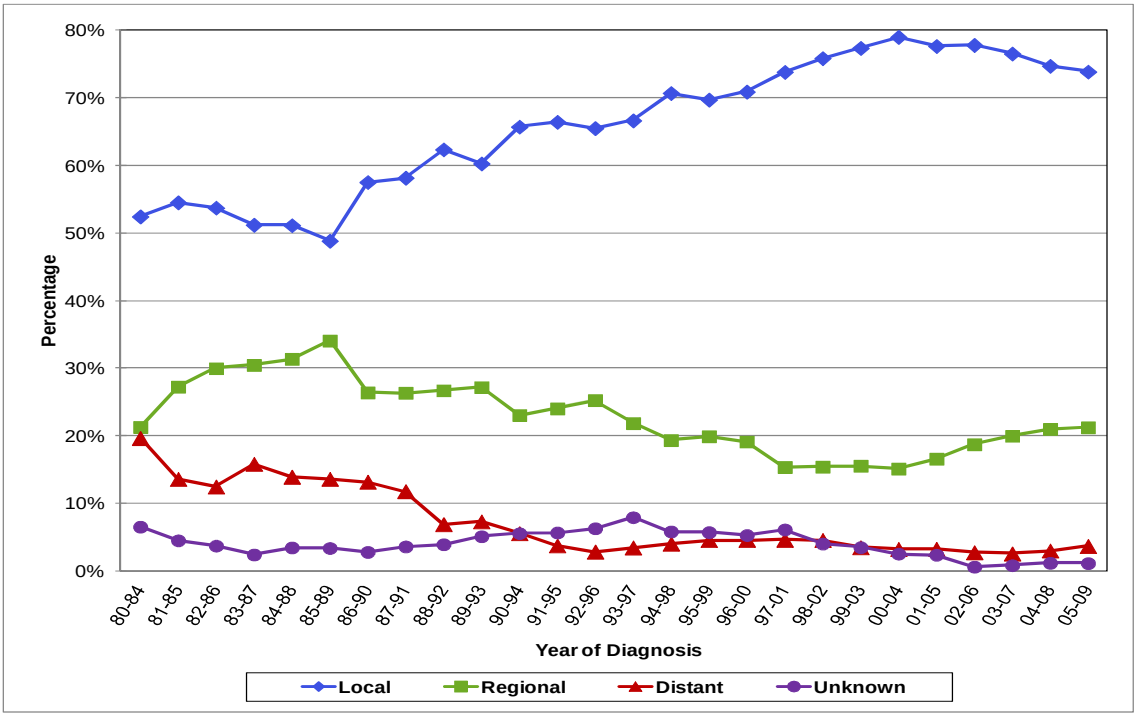
--- = Percentages based on cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012

Figure 24.4. Percent of Thyroid Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 24.5. Percent of Thyroid Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Thyroid Cancer Mortality

NOTE: Results on mortality from thyroid cancer are not presented here since there were only 23 deaths due to thyroid cancer during 2005–2009; 11 were male and 12 female (19 Caucasian and four African American).

25. URINARY BLADDER CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Urinary Bladder Cancer:

- cigarette smoking – three times risk
- low fluid consumption
- excessive use of certain pain medications such as those containing phenacetin

Environmental and Medically-Related Causes of Urinary Bladder Cancer:

- workplace exposures to aromatic amines used in dye industry (benzidine and beta-naphthylamine)
- employment in rubber or leather industries and as painters, machinists, printers and truck drivers
- arsenic in drinking water
- treatment with alkylating agent chemotherapy drugs such as Cytoxan (cyclophosphamide)
- radiation therapy to the bladder
- exposure to combustion gases and soot from coal (suspected)

Urinary Bladder Cancer Risk Factors that Cannot be Changed:

- race – Caucasians (twice as likely as African Americans), Asian and American Indians
- ethnicity – Hispanic
- age – 9 of 10 cases are over age 55
- gender – more common in men than in women
- personal history of bladder cancer
- family history of bladder cancer
- certain gene syndromes6

Factors Protective against Urinary Bladder Cancer:

- avoidance of tobacco

Early Detection of Urinary Bladder Cancer:

- Routine screening of the general public for bladder cancer is not recommended by any major professional organization at this time.
- Bladder cancer screening is recommended for people at very high risk, such as having a history of heavy work-related exposure to certain chemicals.

Data Highlights

Urinary Bladder Cancer Incidence (Tables 25.1 – 25.3, Figures 25.1 – 25.3)

- There were 1,228 cases of urinary bladder cancer cases diagnosed during 2005–2009 in Delaware and they accounted for 4.9 percent of all cancer cases.
- A total of 920 urinary bladder cancer cases (74.9 percent) were male and 308 cases (25.1 percent) were female during 2005–2009.
- Caucasian residents comprised 91.8 percent (1,127 cases) of all urinary bladder cancer cases in 2005–2009, 6.8 percent (83 cases) were African Americans and 18 cases were other or unknown race.
- During 2005–2009, the majority of urinary bladder cancer cases were New Castle County residents (610 or 49.7 percent), 380 (30.9 percent) Sussex County residents and 238 (19.4 percent) Kent County residents (one unknown county of residence).
- Urinary bladder cancer incidence was four times higher among males (43.6 per 100,000) than females (11.1 per 100,000) in 2005–2009. This difference was statistically significant.
- Kent County has the highest urinary bladder cancer incidence rate among both males (56.3 per 100,000) and females (14.0 per 100,000).
- Delaware's urinary bladder cancer incidence rates were significantly higher than the U.S. rates for both males (43.6 per 100,000 Delaware vs. 37.0 per 100,000 U.S.) and females (11.1 per 100,000 Delaware vs. 8.9 per 100,000 U.S.).
- In 2005–2009, Caucasian males in Delaware had a significantly higher urinary bladder cancer incidence rate (47.3 per 100,000) than African American males (20.2 per 100,000).
- In Delaware from 1995–1999 through 2005–2009, incidence of urinary bladder cancer increased 8.6 percent (10.4 percent increase in males but a 5.1 percent decline in females). Nationally during the same time period, bladder cancer incidence has declined 1.9 percent (1.1 percent in males and 7.3 percent in females).
- Urinary bladder cancer incidence peaked at ages 85 and over among both males and females.
- Delawareans ranked seventh in the U.S. for urinary bladder cancer incidence during 2005–2009; males eighth and females ninth (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Urinary Bladder Cancer (Table 25.4, Figures 25.4 – 25.5)

- For 2005–2009, 56.4 percent, 31.3 percent, 5.7 percent and 3.3 percent of bladder cancer cases were diagnosed at the in situ, local, regional and distant stages, respectively. In the U.S., comparable percentages were 49.7 percent, 36.0 percent and 7.3 percent and 3.8 percent, respectively.
- During 2005–2009, males were more likely to be diagnosed in the advanced stages (regional and distant) at time of diagnosis than were females (40.0 percent for males and 34.1 percent for females)
- The proportion of bladder cancer cases diagnosed as in situ has increased dramatically; from 1.2 percent in 1980-1984 to 55.2 percent in 2005–2009. During the same time, the proportion of cases diagnosed as local decreased from 78.1 percent to 33.2 percent; a 57.4 percent decline.

Urinary Bladder Cancer Mortality (Tables 25.5 – 25.7, Figures 25.6 – 25.7)

- During 2005–2009, 243 Delawareans died from urinary bladder cancer: 175 males (72.0 percent) and 68 females. These deaths accounted for 2.7 percent of all cancer deaths in Delaware during 2005–2009.
- Caucasians comprised 88.5 percent of decedents (215 deaths), African Americans 11.1 percent (27 deaths) and one death was other or unknown race.
- A total of 136 (56.0 percent) decedents were from New Castle, 69 (28.4 percent) from Sussex and 38 (15.6 percent) from Kent County.
- Delaware’s 2005–2009 urinary bladder cancer mortality rate (4.9 per 100,000) was not statistically different from the U.S. rate (4.4 per 100,000).

- In Delaware, the 2005–2009 urinary bladder cancer mortality rate was nearly four times higher among males (8.6 per 100,000) than females (2.3 per 100,000) and the difference was statistically significant.
- Urinary bladder cancer mortality was higher among Caucasians (5.1 per 100,000) than among African American (4.4 per 100,000) Delawareans during 2005–2009 but the difference was not significant.
- National data have shown that Caucasian males have a significantly higher mortality rate than African American males but in Delaware, mortality data were not available to make a comparison.
- Urinary bladder cancer mortality was highest in Kent County during 2005–2009 but differences between counties were not significant.
- From 1995–1999 through 2005–2009, mortality from bladder cancer declined 18.2 percent in Delaware (17.1 percent among males and 32.6 percent among females) and has remained stable in the U.S.
- The greatest decline in mortality from 1995–1999 through 2005–2009 was among African American females (56.1 percent decline) followed by African American males (19.3 percent decline).
- U.S. data have shown that mortality from urinary bladder cancer peaked at ages 85+ in men and ages 75-79 in women.
- During 2005–2009, Delaware ranked fifth highest in the nation for mortality from cancer of the urinary bladder. Delaware men ranked eighth and Delaware women ranked 14th (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Urinary Bladder Cancer Incidence

Table 25.1. Number of Urinary Bladder Cancer Cases by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	1,228	920	308	1,127	852	275	83	55	28
Kent	238	178	60	219	---	---	15	---	---
New Castle	610	452	158	551	413	138	53	35	18
Sussex	380	290	90	357	---	---	15	---	---

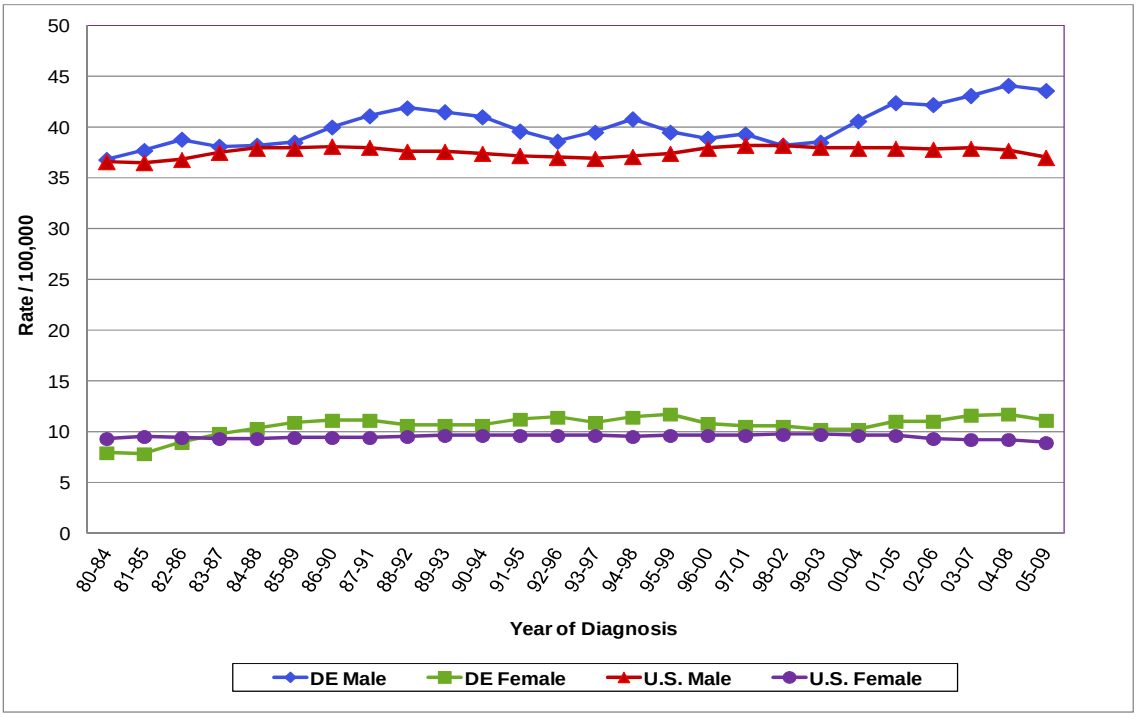
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 25.2. Five-Year Average Age-Adjusted Urinary Bladder Cancer Incidence Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	20.8 (20.6 , 20.9)	37.0 (36.7 , 37.3)	8.9 (8.8 , 9.1)
Delaware	25.2 (23.8 , 26.6)	43.6 (40.8 , 46.5)	11.1 (9.9 , 12.4)
Kent	31.7 (27.8 , 36.0)	56.3 (48.2 , 65.4)	14.0 (10.7 , 18.1)
New Castle	23.0 (21.2 , 24.9)	40.6 (36.8 , 44.5)	10.1 (8.6 , 11.9)
Sussex	26.3 (23.6 , 29.1)	44.1 (39.1 , 49.6)	11.3 (9.1 , 14.1)
CAUCASIAN			
United States	22.5 (22.3 , 22.7)	40.0 (39.7 , 40.3)	9.6 (9.4 , 9.7)
Delaware	27.3 (25.8 , 29.0)	47.3 (44.1 , 50.6)	11.8 (10.4 , 13.3)
Kent	36.3 (31.6 , 41.5)	63.8 (54.2 , 74.7)	16.6 (12.5 , 21.6)
New Castle	25.5 (23.4 , 27.7)	45.0 (40.7 , 49.6)	10.9 (9.1 , 12.9)
Sussex	26.9 (24.1 , 30.0)	45.6 (40.3 , 51.6)	10.9 (8.6 , 13.8)
AFRICAN AMERICAN			
United States	12.6 (12.2 , 13.0)	21.2 (20.4 , 22.1)	7.1 (6.7 , 7.4)
Delaware	12.7 (10.1 , 15.8)	20.2 (14.9 , 26.5)	7.3 (4.8 , 10.6)
Kent	---	---	---
New Castle	12.5 (9.2 , 16.4)	20.5 (13.8 , 29.1)	---
Sussex	---	---	---

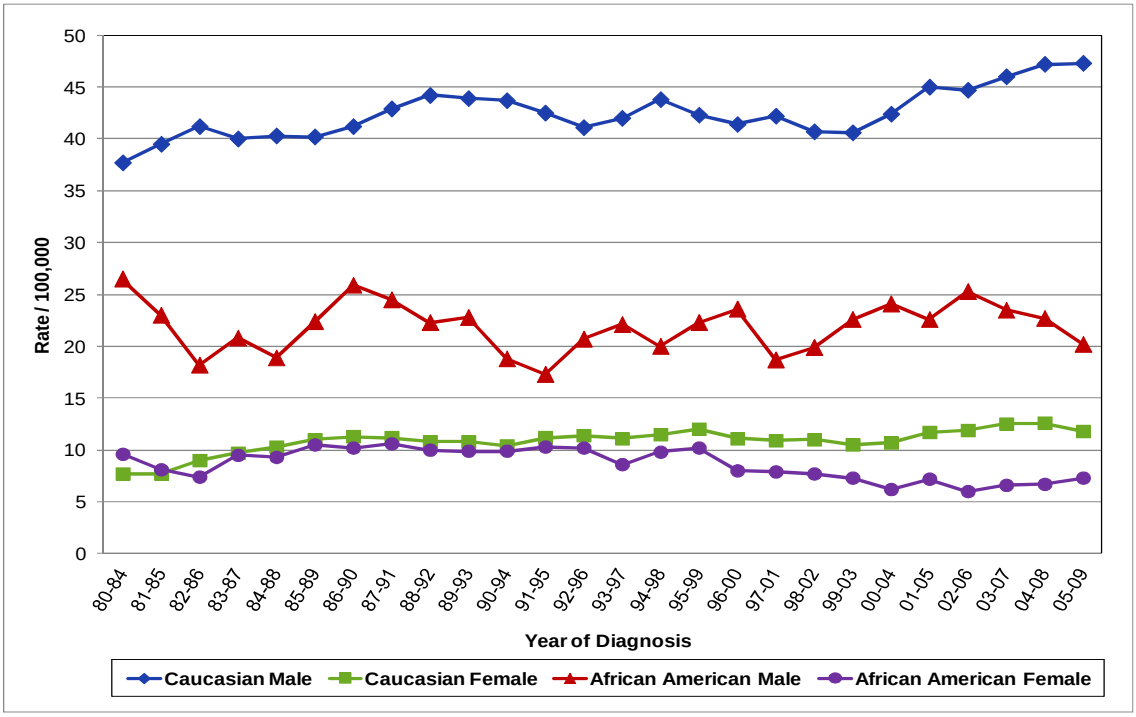
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 25.1. Five-Year Average Age-Adjusted Urinary Bladder Cancer Incidence Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 25.2. Five-Year Average Age-Adjusted Urinary Bladder Cancer Incidence Rates* by Race and Sex; Delaware, 1980–2009



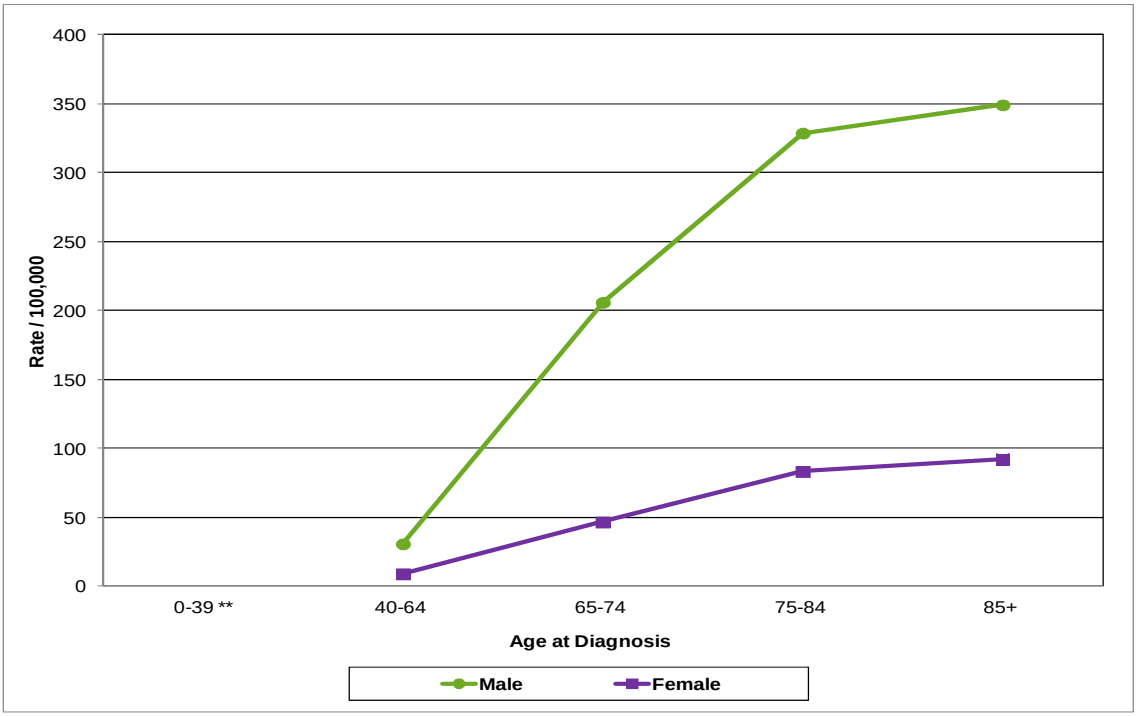
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 25.3. Age-Specific Urinary Bladder Cancer Incidence Rates* by Race and Sex; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	19.7	31.0	9.2	22.2	35.3	9.8	9.9	---	---
65-74	120.5	206.2	46.9	131.6	223.5	51.8	57.6	---	---
75-84	186.9	328.9	83.5	197.4	350.0	83.8	101.5	---	---
85+	171.6	349.4	92.0	184.6	374.0	98.6	---	---	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 25.3. Age-Specific Urinary Bladder Cancer Incidence Rates by Sex; Delaware, 2005–2009



* = Rates are per 100,000 population.
** = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

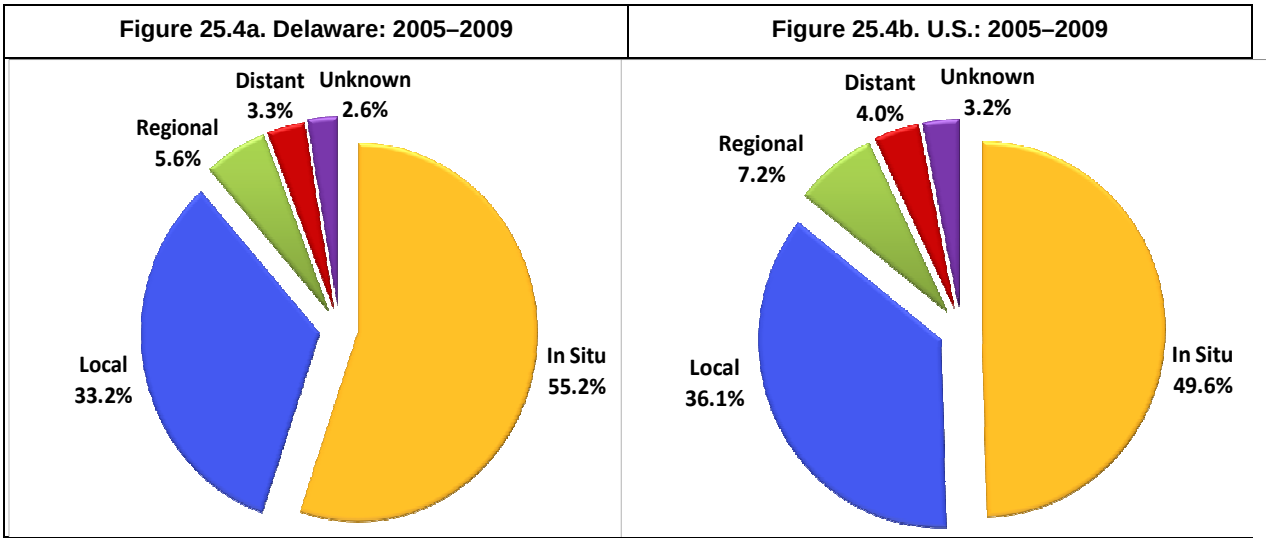
Urinary Bladder Cancer by Stage

Table 25.4. Number and Percent of Urinary Bladder Cancer Cases by Stage at Diagnosis, Sex; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All	Male	Female	All	Male	Female
In Situ	678	503	175	55.2	54.7	56.8
Local	408	324	84	33.2	35.2	27.3
Regional	69	48	21	5.6	5.2	6.8
Distant	41	24	17	3.3	2.6	5.5
Unknown	32	21	11	2.6	2.3	3.6
Total	1228	920	308	100.0	100.0	100.0

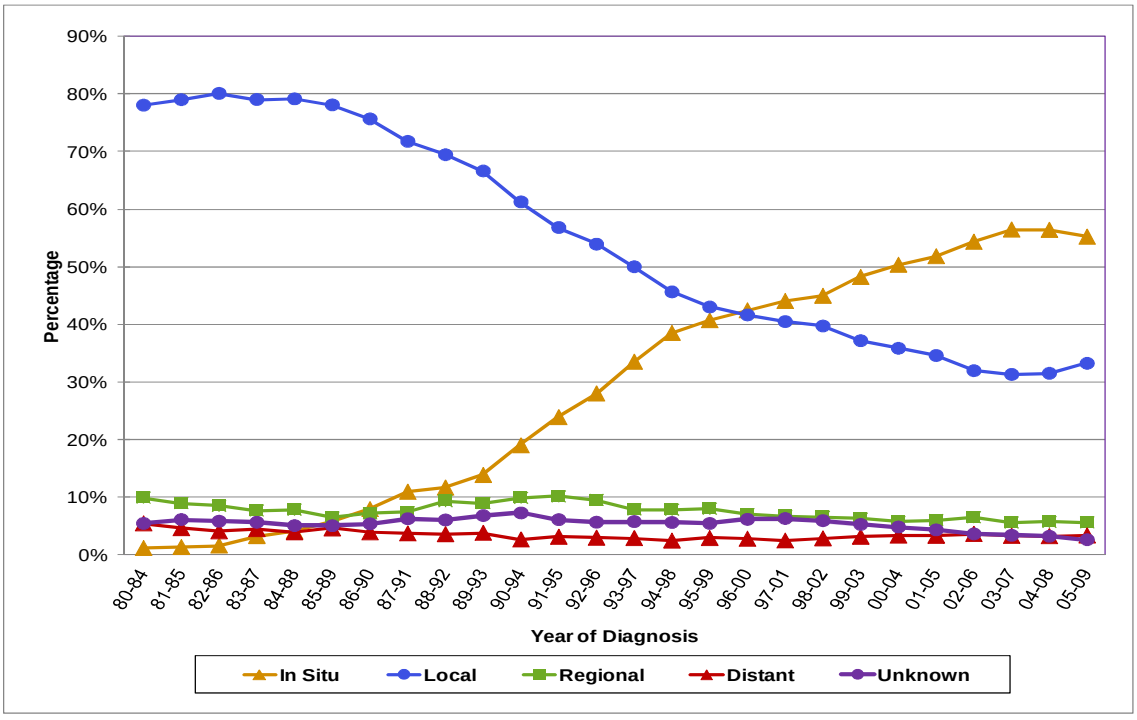
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 25.4. Percent of Urinary Bladder Cancer Cases by Stage at Diagnosis; Delaware and U.S., 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 25.5. Percent of Urinary Bladder Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 25.5. Number of Urinary Bladder Cancer Deaths by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	243	175	68	215	158	57	27	17	10
Kent	38	26	12	---	---	---	---	---	---
New Castle	136	97	39	116	85	31	20	12	8
Sussex	69	52	17	---	---	---	---	---	---

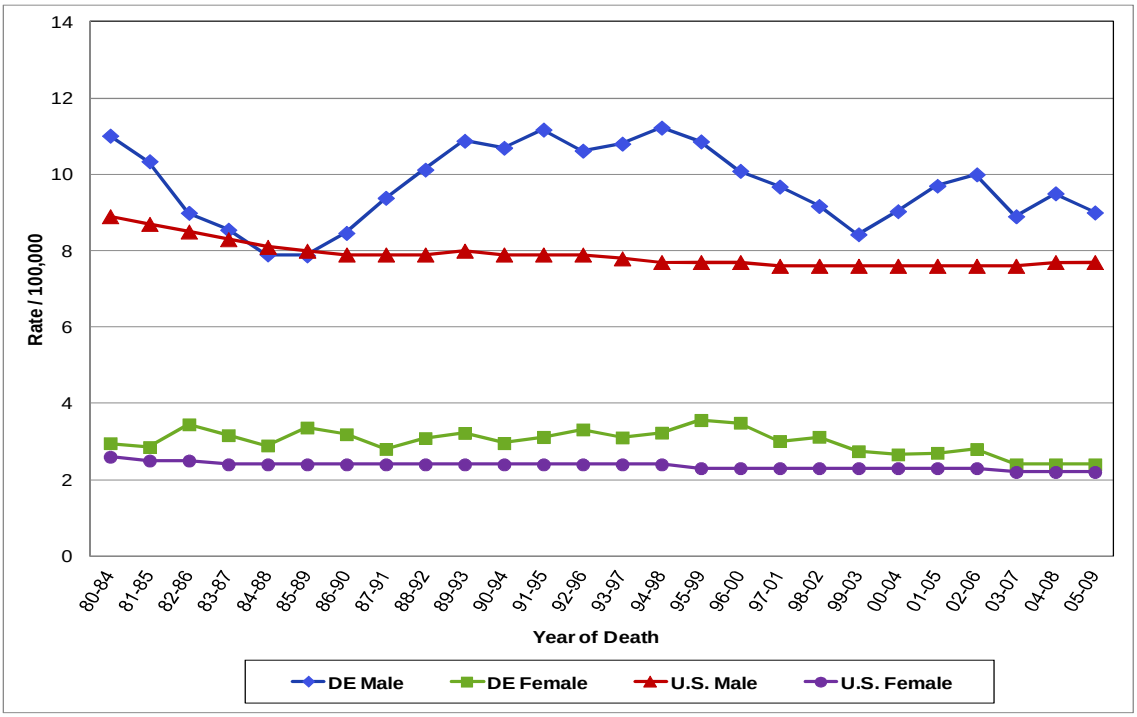
SOURCE: Delaware Health Statistics Center, 2012.
--- = Cell counts less than six are not shown to protect patient confidentiality.

Table 25.6. Five-Year Average Age-Adjusted Urinary Bladder Cancer Mortality Rates* and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	4.4 (4.3 , 4.4)	7.7 (7.6 , 7.7)	2.2 (2.2 , 2.2)
Delaware	4.9 (4.3 , 5.6)	8.6 (7.4 , 10.0)	2.3 (1.8 , 2.9)
Kent	5.2 (3.6 , 7.1)	8.6 (5.5 , 12.6)	---
New Castle	5.1 (4.3 , 6.0)	9.0 (7.3 , 11.0)	2.4 (1.7 , 3.3)
Sussex	4.7 (3.6 , 6.0)	8.2 (6.1 , 10.8)	---
CAUCASIAN			
United States	4.5 (4.5 , 4.6)	8.0 (8.0 , 8.1)	2.2 (2.2 , 2.2)
Delaware	5.1 (4.4 , 5.8)	9.0 (7.6 , 10.5)	2.2 (1.7 , 2.9)
Kent	6.0 (4.2 , 8.3)	10.1 (6.5 , 15.0)	---
New Castle	5.2 (4.3 , 6.3)	9.4 (7.5 , 11.7)	2.3 (1.5 , 3.3)
Sussex	4.6 (3.5 , 6.0)	8.2 (6.0 , 11.1)	---
AFRICAN AMERICAN			
United States	3.7 (3.6 , 3.8)	5.6 (5.4 , 5.8)	2.6 (2.5 , 2.7)
Delaware	4.4 (2.9 , 6.5)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

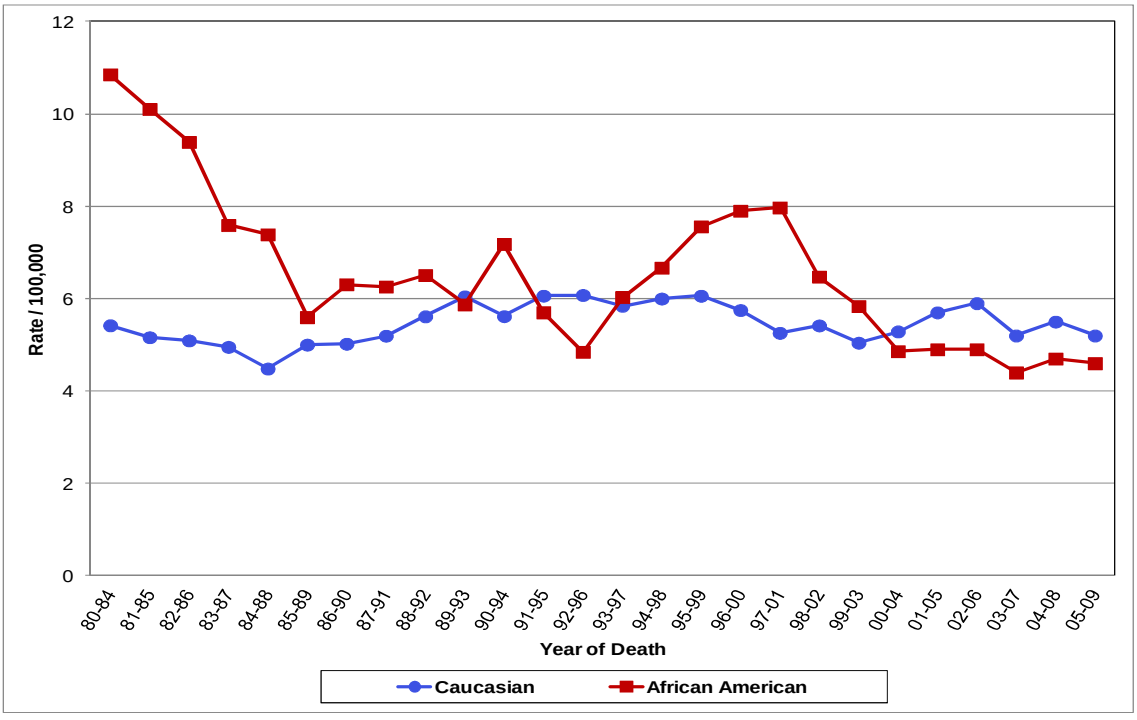
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 25.6. Five-Year Average Age-Adjusted Urinary Bladder Cancer Mortality Rates* by Sex; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 25.7. Five-Year Average Age-Adjusted Urinary Bladder Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 25.7. Age-Specific Urinary Bladder Cancer Mortality Rates* by Race and Sex; Delaware, 2005–2009

Age at Death	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	2.6	4.7	---	2.7	4.9	---	---	---	---
65-74	17.8	30.3	---	19.7	33.4	---	---	---	---
75-84	41.2	69.3	21.0	41.4	70.3	---	---	---	---
85+	71.2	131.6	---	70.7	138.5	---	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 25.8. Age-Specific Urinary Bladder Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 25.8 is not displayed because of the small number of deaths.

26. UTERINE CANCER

Risk Factors and Early Detection

Lifestyle Risk Factors for Uterine Cancer:

- obesity
- diet high in animal fat

Environmental and Medically-Related Causes of Uterine Cancer:

- treatment with the drug Tamoxifen
- never having children, especially if due to infertility issues
- high levels of estrogen, via natural occurrence or hormone therapy
- prior radiation therapy to the pelvic region (suspected)

Risk Factors for Uterine Cancer that Cannot be Changed:

- increasing age
- personal history of any of the following:
    - diabetes
    - breast cancer
    - ovarian cancer
    - benign ovarian tumors
    - granulosa-theca cell ovarian tumors
    - polycystic ovarian syndrome (PCOS)
    - atypical endometrial hyperplasia
- family history of endometrial and colorectal cancers (Lynch syndrome or hereditary nonpolyposis colorectal cancer)
- having a higher number of menstrual cycles throughout a woman's life

Factors Protective against Uterine Cancer:

- multiple pregnancies
- use of oral contraceptives
- use of an intrauterine device that does not contain hormones
- use of combination hormone therapy (addition of progesterone)
- Women who have had a complete hysterectomy will not develop uterine cancer.

Early Detection of Uterine Cancer:

- There is currently no recommended screening test for uterine cancer.

Data Highlights

Incidence of Uterine Cancer (Tables 26.1 – 26.3, Figures 26.1 – 26.2)

- From 2005–2009, 751 cases of uterine cancer were newly-diagnosed in Delaware, accounting for 6.4 percent of all cancer cases diagnosed among females.
- Caucasians comprised 83.5 percent (627 cases) of the uterine cancer cases, 14.5 percent (109 cases) were African American and 15 cases were other or unknown race.

- The 2005–2009 uterine cancer incidence rate for Caucasian females in Delaware (29.1 per 100,000) was about 10 percent higher than the rate for African American females (20.6 per 100,000) but the difference between the two rates was not statistically significant.
- In Kent County, however, the incidence rate among Caucasians (38.0 per 100,000) was significantly higher than the rate among African Americans (21.8 per 100,000).
- The 2005–2009 uterine cancer incidence rate for Delaware (28.1 per 100,000) was significantly higher than the U.S. rate (23.5 per 100,000).
- Both Caucasian and African American females in Delaware had a significantly higher uterine cancer incidence rate that their counterparts nationally.
- Delaware's uterine cancer incidence rate increased 16.9 percent from 1995–1999 through 2005–2009 while the U.S. uterine cancer incidence rate decreased 5.6 percent.
- From 1995–1999 through 2005–2009, Delaware's uterine cancer incidence rate increased 16.9 percent among Caucasians but increased 40.0 percent among African Americans.
- In Delaware, the 2005–2009 incidence of uterine cancer peaked during ages 65-74 (113.8 per 100,000) and declined to 60.7 per 100,000 among those ages 65 and older.
- Female Delawareans ranked 13th highest in the U.S. for incidence of uterine cancer during 2005–2009 (U.S. Cancer Statistics Working Group).

Stage at Diagnosis of Uterine Cancer (Table 26.4, Figures 26.4 – 26.5)

- For 2005–2009, 68.5 percent, 19.7 percent and 8.6 percent of uterine cancer cases in Delaware were diagnosed at the local, regional and distant stages, respectively. In the U.S., comparable percentages were 67.0 percent, 20.6 percent and 8.3 percent, respectively.
- During 2005–2009, 213 cases of uterine cancer (28.3 percent of all uterine cancers diagnosed during this period) were late-stage diagnoses (i.e., either regional or distant cancer at the time of diagnosis). The percentage of late-stage uterine cancer diagnoses was higher among African Americans (31.2 percent) than among Caucasians (28.5 percent).
- In Delaware since 1980–1984, the proportions of uterine cancers diagnosed by stage have remained relatively constant.

Uterine Cancer Mortality (Tables 26.5 – 26.7, Figures 26.6 – 26.7)

- During 2005–2009, the 138 deaths from uterine cancer in Delaware accounted for 3.2 percent of cancer deaths among Delaware females.
- Caucasians comprised 73.2 percent (101 deaths) of uterine cancer deaths, 26.1 percent (36 deaths) were African American and one death was other or unknown race.
- Delaware's 2005–2009 uterine cancer mortality rate (5.0 per 100,000) was higher than the U.S. rate (4.2 per 100,000) but the difference between the two rates was not significant.
- The uterine cancer mortality rate for African Americans was significantly higher than Caucasians in both Delaware (9.1 per 100,000 African American vs. 4.3 per 100,000 Caucasian) and the U.S. (7.3 per 100,000 African American vs. 3.9 per 100,000 Caucasian).
- Historically, Delaware's uterine cancer mortality rate has been about 12 percent higher than the U.S. rate.
- From 1995–1999 through 2005–2009, Delaware's uterine cancer mortality rate increased 18.2 percent, while the U.S. rate increased only 2.4 percent.
- The rates of increase from 1995–1999 through 2005–2009 did not differ by race category. There was a 12.8 percent increase among Caucasians and a 14.5 percent increase among African Americans.
- Delaware's uterine cancer mortality rate increased with age, based on data limited to only three of the five age categories.
- During 2005–2009, Delaware's mortality rate for cancers of the corpus uterus was the third highest in the nation (U.S. Mortality Files, National Center for Health Statistics, Centers for Disease Control and Prevention).

Table 26.1. Number of Uterine Cancer Cases by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	751	627	109
Kent	161	125	33
New Castle	389	320	60
Sussex	201	182	16

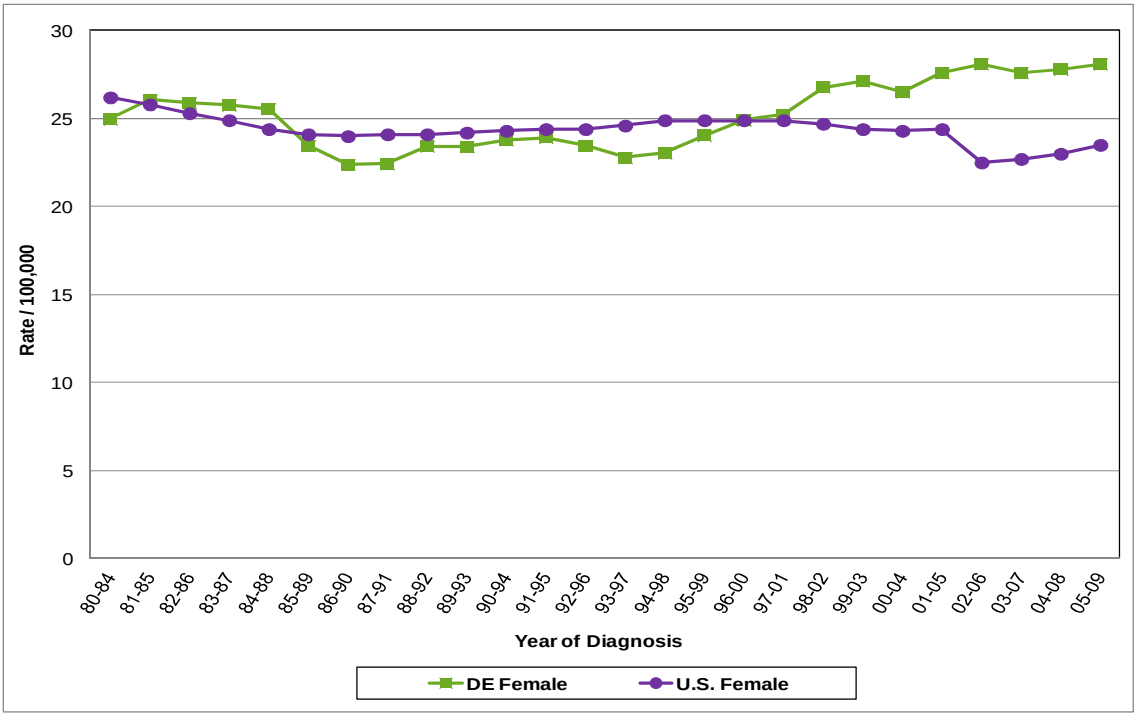
SOURCE: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 26.2. Five-Year Average Age-Adjusted Uterine Cancer Incidence Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
United States	23.5 (23.3 , 23.7)	24.3 (24.1 , 24.5)	20.6 (20.0 , 21.2)
Delaware	28.1 (26.2 , 30.3)	29.1 (26.9 , 31.5)	26.6 (21.7 , 32.1)
Kent	37.6 (32.0 , 43.9)	38.0 (31.6 , 45.4)	43.5 (29.8 , 61.1)
New Castle	25.6 (23.1 , 28.3)	27.1 (24.1 , 30.3)	21.8 (16.5 , 28.1)
Sussex	28.5 (24.5 , 33.0)	28.6 (24.3 , 33.5)	25.3 (14.4 , 41.2)

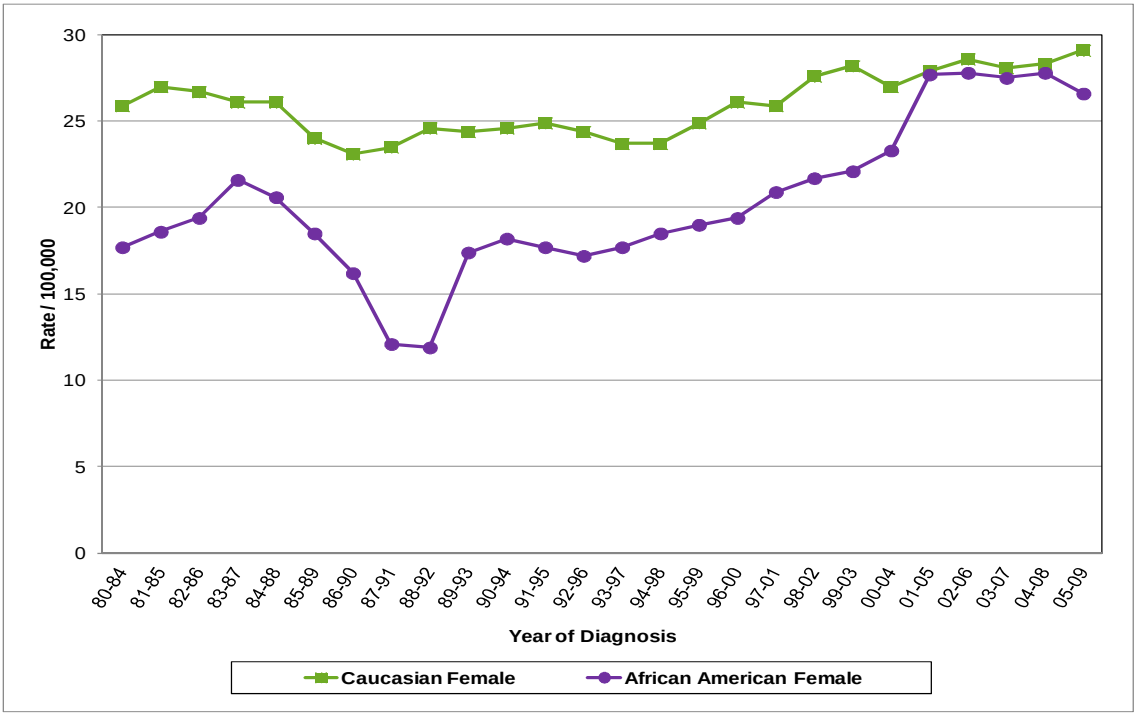
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 26.1. Five-Year Average Age-Adjusted Uterine Cancer Incidence Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 26.2. Five-Year Average Age-Adjusted Uterine Cancer Incidence Rates* by Race; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 26.3. Age-Specific Uterine Cancer Incidence Rates* by Race; Delaware, 2005–2009

Age at Diagnosis	All Female	Caucasian Female	African American Female
0-39	---	---	---
40-64	47.5	51.0	34.7
65-74	113.8	116.1	110.9
75-84	88.5	81.4	----
85+	60.7	58.7	---

* = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 26.3 Age-Specific Uterine Cancer Incidence Rates* by Race; Delaware, 2005–2009

Figure 26.3 is not shown because of the small number of cases.

Table 26.4. Number of Uterine Cancer Cases by Stage at Diagnosis and Race; Delaware, 2005–2009

Stage at Diagnosis	Number			Percent		
	All Female	Caucasian	African American	All Female	Caucasian	African American
Local	515	433	68	68.5	68.9	62.4
Regional	148	128	20	19.7	20.4	18.3
Distant	65	51	14	8.6	8.1	12.8
Unknown	24	16	7	3.2	2.5	6.4
Total	752	628	109	100.0	100.0	100.0

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 26.4. Percent of Uterine Cancer Cases by Stage at Diagnosis; U.S. and Delaware, 2005–2009

Figure 26.4a. Delaware: 2005–2009

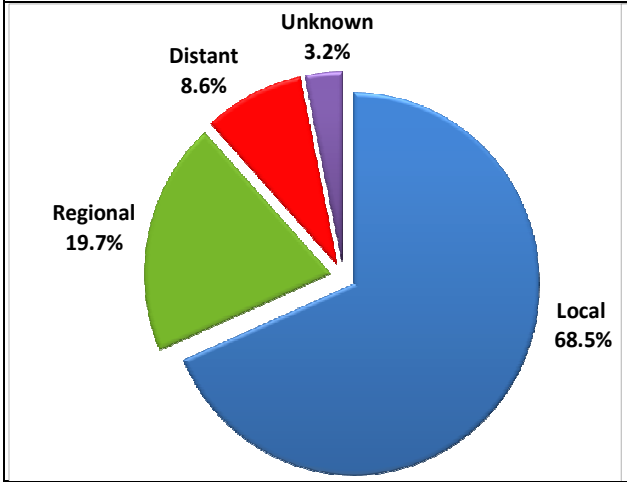
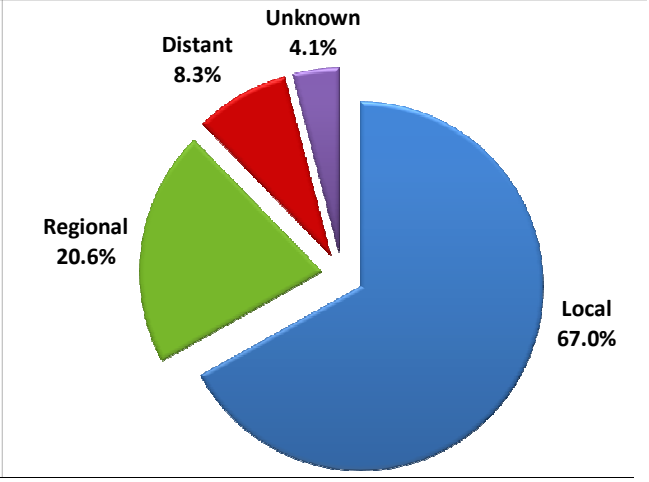
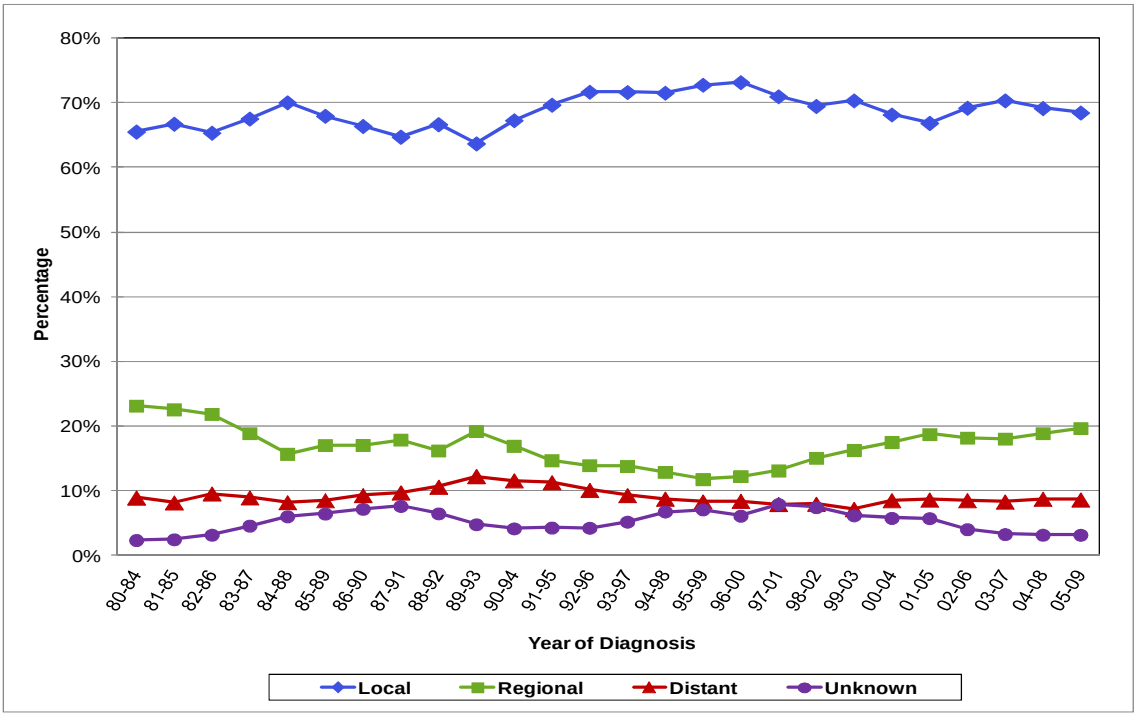


Figure 26.4b. U.S.: 2005–2009



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 26.5. Percent of Uterine Cancer Cases by Stage at Diagnosis; Delaware, 1980–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Uterine Cancer Mortality

Table 26.5. Number of Uterine Cancer Deaths by Race; Delaware and Counties, 2005–2009

	All Female	Caucasian Female	African American Female
Delaware	138	101	36
Kent	18	9	9
New Castle	78	57	20
Sussex	42	35	7

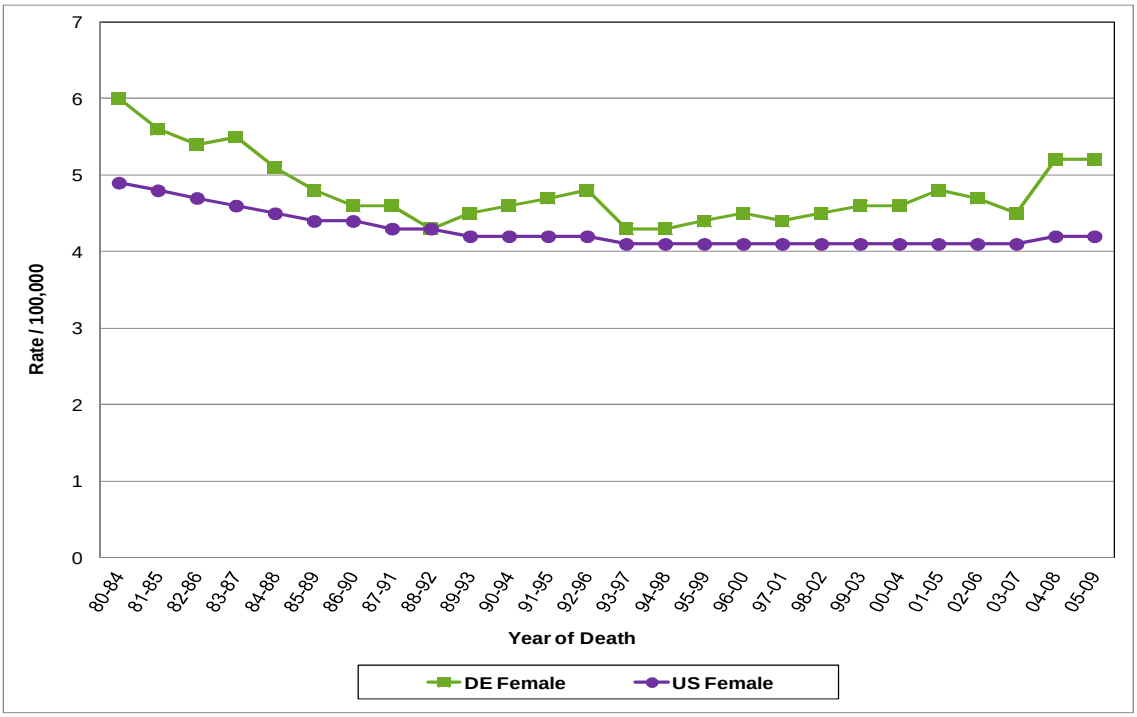
SOURCE: Delaware Health Statistics Center, 2012.

Table 26.6. Five-Year Average Age-Adjusted Uterine Cancer Mortality Rates* and 95% Confidence Intervals by Race; U.S., Delaware and Counties, 2005–2009

Region	All Female	Caucasian Female	African American Female
United States	4.2 (4.1, 4.2)	3.9 (3.8, 3.9)	7.3 (7.1, 7.5)
Delaware	5.0 (4.2 , 5.9)	4.3 (3.5 , 5.3)	9.1 (6.3 , 12.6)
Kent	4.3 (2.5 , 6.8)	2.6 (1.2 , 5.1)	12.6 (5.7 , 23.7)
New Castle	5.0 (4.0 , 6.3)	4.5 (3.4 , 5.9)	7.5 (4.5 , 11.6)
Sussex	5.4 (3.8 , 7.4)	4.9 (3.3 , 7.1)	11.2 (4.5 , 23.1)

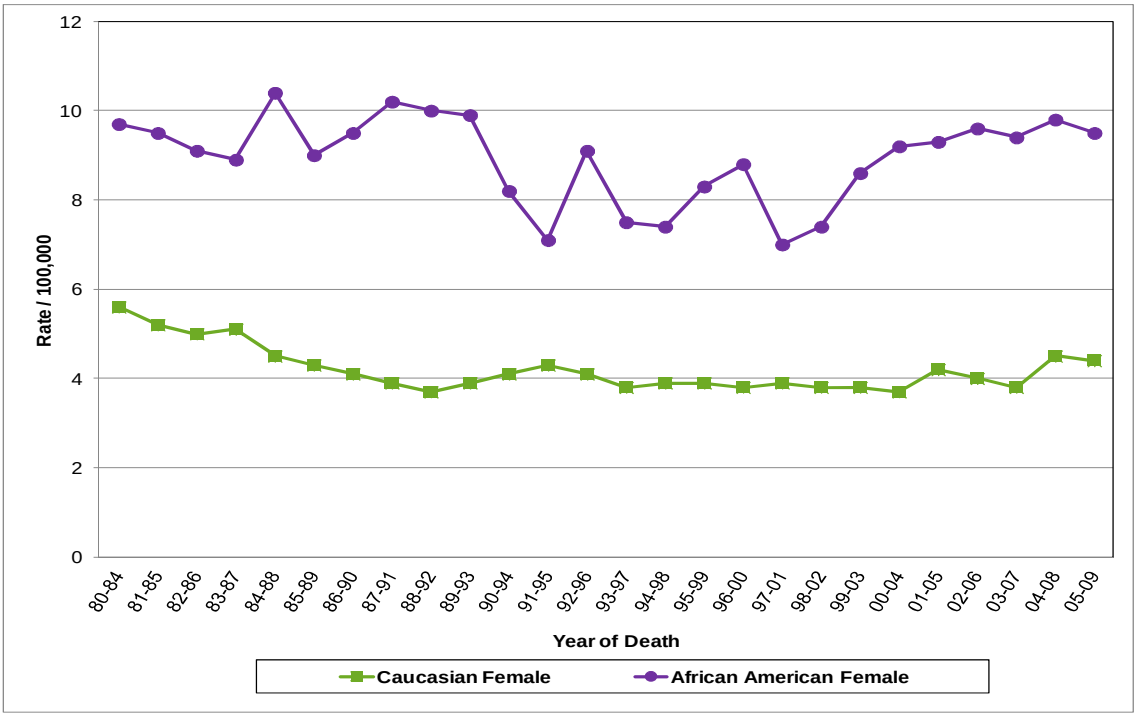
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 26.6. Five-Year Average Age-Adjusted Uterine Cancer Mortality Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Health Statistics Center, 2012;
U.S.: National Center for Health Statistics, 2012.

Figure 26.7. Five-Year Average Age-Adjusted Uterine Cancer Mortality Rates* by Race; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2012.

Table 26.7. Age-Specific Uterine Cancer Mortality Rates* by Race; Delaware, 2005–2009

Age at Death	All Female	Caucasian Female	African American Female
0-39	---	---	---
40-64	2.5	---	---
65-74	12.9	10.4	---
75-84	19.8	18.5	---
85+	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCE: Delaware Health Statistics Center, 2012.

Figure 26.8. Age-Specific Uterine Cancer Mortality Rates by Race; Delaware, 2005–2009

NOTE: Figure 26.8 is not displayed because of the small number of deaths.

27. CANCER AMONG CHILDREN AND ADOLESCENTS

Risk Factors and Early Detection

Risk Factors for Cancer among Children and Adolescents (Ages 0-19):

- The causes of childhood cancers are largely unknown.

Risk Factors That Account for a Small Percentage of Cases:

- clinical conditions, such as Down syndrome
- specific chromosomal and genetic abnormalities
- ionizing radiation exposure

Suspected Environmental Causes of Childhood Cancer:

- early-life exposures to infectious agents
- parental, fetal, or childhood exposures to environmental toxins such as pesticides, solvents or other household chemicals
- parental occupational exposures to radiation or chemicals

Possible Risk Factors for Childhood Cancer:

- parental medical conditions during pregnancy or before conception
- maternal diet during pregnancy
- early postnatal feeding patterns and diet
- maternal reproductive history.
- maternal exposures to oral contraceptives, fertility drugs, and other medications
- familial and genetic susceptibility
- exposure to the human immunodeficiency virus (HIV)

Major Categories of Childhood Cancers:[18]

- Leukemia (34 percent of all childhood cancers)
- Brain and other nervous system (27 percent)
- Neuroblastoma (7 percent) – cancer of the nervous system
- Wilms tumor (5 percent) – of the kidney
- Non-Hodgkin lymphoma (4 percent) and Hodgkin lymphoma (4 percent)
- Rhabdomyosarcoma (3 percent) – cancer of the soft tissue
- Retinoblastoma (3 percent) – an eye cancer
- Osteosarcoma (3 percent) – a bone cancer
- Ewing sarcoma (1 percent) – usually arises in bone

[18] The site groupings used here are not as appropriate for children as they are for adults, but they are necessary in order to be able to compare incidence to mortality. Benign brain tumors (2004+) and myelodysplastic syndromes (2001+) are not included. Childhood cancer is better categorized by groupings based on histologic type and site rather than primary site alone (Childhood Cancer by the International Classification of Childhood Cancer (ICCC)). For the leukemias and lymphomas, the categories are similar, but for solid tumors the categories can be quite different and the different terminology confusing. For example, 'soft tissue' here refers to any type of tumor that arises in connective or soft tissue in contrast to 'soft tissue sarcomas' (ICCC) which refers to soft tissue sarcomas in any primary site.

Data Highlights

Cancer Incidence among Children and Adolescents (Ages 0-19) in Delaware: (Tables 27.1 – 27.4, Figures 27.1 – 27.5)

- Cancer is relatively rare among children and adolescents. Although persons younger than 20 comprised 26.6 percent of Delaware's population during 2005–2009, cancers in this age group accounted for less than one percent (0.8%) of the total case count for Delaware in 2005–2009.
- A total of 213 cancer cases were reported among Delaware children and adolescents during 2005–2009; 125 male (58.7 percent) and 88 female.
- The majority of cancer cases among children and adolescents (2005–2009) were New Castle County residents (130 or 61.0 percent), 49 (23.0 percent) Kent County and 34 (16.0 percent) Sussex County.
- Seventy-one percent (152) of cancer cases among children and adolescents in 2005–2009 were Caucasian, 24.4 percent (52) were African American and nine cases were other or unknown race.
- Childhood/adolescent cancer incidence has been higher among males than females since 2002-2006 and currently was 37.7 percent higher among male (21.1 per 100,000) than among female (15.4 per 100,000) children/adolescents.
- Cancer incidence among children and adolescents was highest in Kent County and lowest in Sussex County (22.4 per 100,000 vs. 16.2 per 100,000).
- In Delaware during 2005–2009, Caucasians had a 16.1 percent higher cancer incidence rate than African Americans (19.3 per 100,000 vs. 17.0 per 100,000).
- Cancer incidence was highest in the 15-19 age category and second highest in ages 0-4.
- By five-year age categories, the only decline in cancer incidence was in the 0-4 year age group (12.6 percent) from 1995–1999 through 2005–2009 while cancer incidence among 15-19 year olds has increased 23.5 percent.
- Delaware's cancer incidence rate among children and adolescents was higher than the U.S. rate in both Caucasians and African Americans but neither difference was statistically significant.
- From 1995–1999 through 2005–2009 in Delaware, the incidence of cancer among children and adolescents increased 9.6 percent overall while the U.S. rate increased 6.9 percent.
- Cancer incidence increased 18.2 percent among male children and decreased 0.8 percent among female children from 1995–1999 through 2005–2009 in Delaware.
- The greatest increase in incidence from 1995–1999 through 2005–2009 was among African American male children (29.5 percent increase) while the largest decline was seen among female Caucasian children (4.1 percent decline).

Cancer Mortality Among Children and Adolescents (Tables 27.5 – 27.6 and Figures 27.6 – 27.7)

- In Delaware during 2005–2009, unintentional injuries and homicide were the two most common causes of mortality among children and adolescents; cancer ranked third and suicide fourth.[19]
- During 2005–2009, 28 of Delaware's children and adolescents died from cancer; 12 male (42.9 percent) and 16 female. These deaths comprised 0.3 percent of the total cancer deaths and 9.7 percent of deaths among children during 2005–2009.
- Twenty (71.4 percent) decedents were Caucasian; seven deaths (25.0 percent) were African American; and one death was other or unknown race.
- Eighteen deaths (64.3 percent) were from New Castle County; numbers of deaths were too small to report for Kent and Sussex Counties.

[19] Delaware Health Statistics Center. *Delaware Vital Statistics Annual Report, 2009*. Delaware Department of Health and Social Services, Division of Public Health: 2011.

- For 2005–2009, Delaware's cancer mortality rate among children and adolescents (2.4 per 100,000) was statistically the same as the U.S. mortality rate (2.5 per 100,000). Nationally, mortality was significantly higher among boys (2.7 per 100,000) than girls (2.2 per 100,000), but in Delaware the number of deaths was too small to calculate rates by sex.
- From 1995–1999 through 2005–2009 in Delaware, mortality from cancer among children and adolescents decreased 14.3 percent overall while the U.S. rate decreased 13.8 percent.
- Eleven deaths (39.3 percent) among children and adolescents in 2005–2009 were due to brain and central nervous system tumors. Two were lymphomas (one Hodgkin lymphoma and one non-Hodgkin lymphoma) and eight were leukemias (two acute lymphocytic leukemia, two acute myeloid leukemia, one acute monocytic leukemia and one leukemia unspecified).
- The remaining deaths were from cancers of the bones and joints (two deaths), soft tissue, including heart (two deaths), kidney and renal pelvis (one death), endocrine system (one death) and one death due to a cancer in the miscellaneous category.

Cancer Incidence Among Children and Adolescents

Table 27.1. Number of Cancer Cases Among Children & Adolescents by Race; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	213	125	88	152	91	61	52	29	23
Kent	49	35	14	39	30	9	8	---	---
New Castle	130	71	59	90	48	42	35	21	14
Sussex	34	19	15	23	13	10	9	---	---

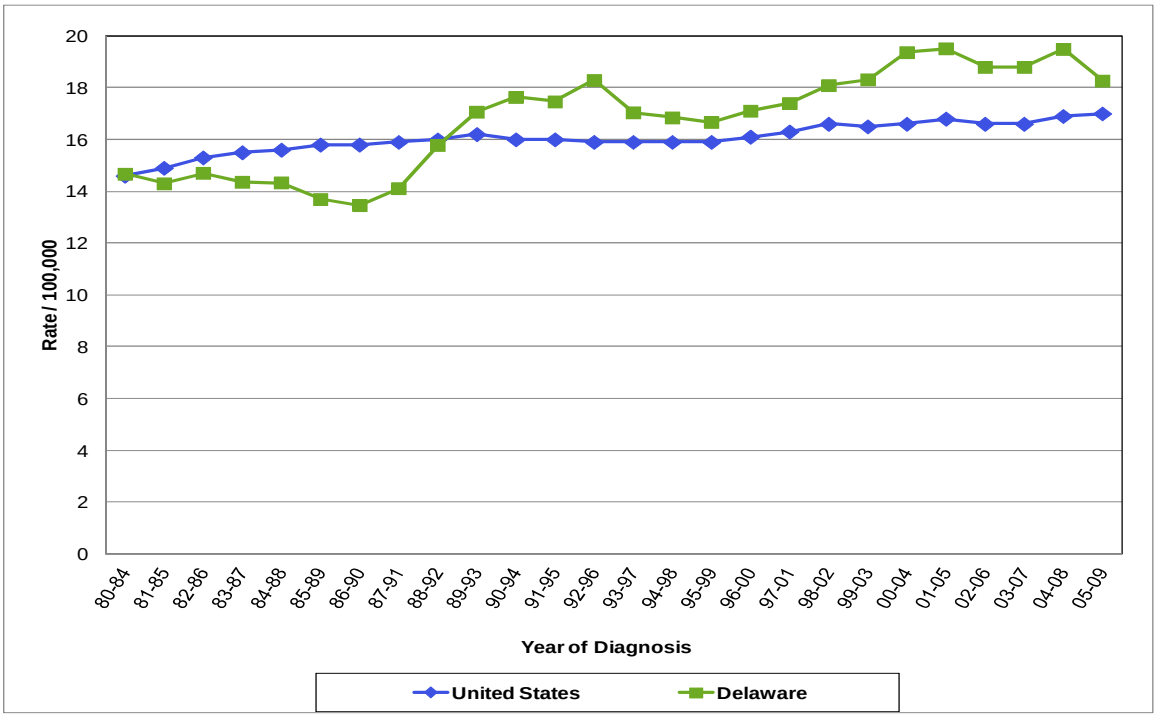
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 27.2. Five-Year Average Age-Adjusted Cancer Incidence Rates* Among Children and Adolescents, and 95% Confidence Intervals by Race and Sex; U.S., Delaware and Counties, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	16.8 (16.6 , 16.9)	17.8 (17.5 , 18.0)	15.8 (15.5 , 16.0)
Delaware	18.5 (16.1 , 21.1)	21.4 (17.8 , 25.5)	15.5 (12.4 , 19.1)
Kent	22.4 (16.5 , 29.6)	31.4 (21.9 , 43.7)	---
New Castle	18.0 (15.0 , 21.3)	19.4 (15.1 , 24.4)	16.5 (12.6 , 21.4)
Sussex	16.2 (11.2 , 22.7)	---	---
CAUCASIAN			
United States	17.8 (17.6 , 18.0)	19.0 (18.7 , 19.3)	16.6 (16.4 , 16.9)
Delaware	19.3 (16.3 , 22.6)	22.7 (18.3 , 27.9)	15.8 (12.1 , 20.3)
Kent	25.7 (18.3 , 35.2)	38.8 (26.2 , 55.5)	---
New Castle	18.9 (15.2 , 23.2)	19.8 (14.6 , 26.3)	17.9 (12.9 , 24.2)
Sussex	---	---	---
AFRICAN AMERICAN			
United States	12.4 (12.0 , 12.8)	12.8 (12.2 , 13.3)	12.0 (11.5 , 12.5)
Delaware	17.0 (12.7 , 22.3)	18.9 (12.6 , 27.1)	---
Kent	---	---	---
New Castle	17.2 (12.0 , 23.9)	---	---
Sussex	---	---	---

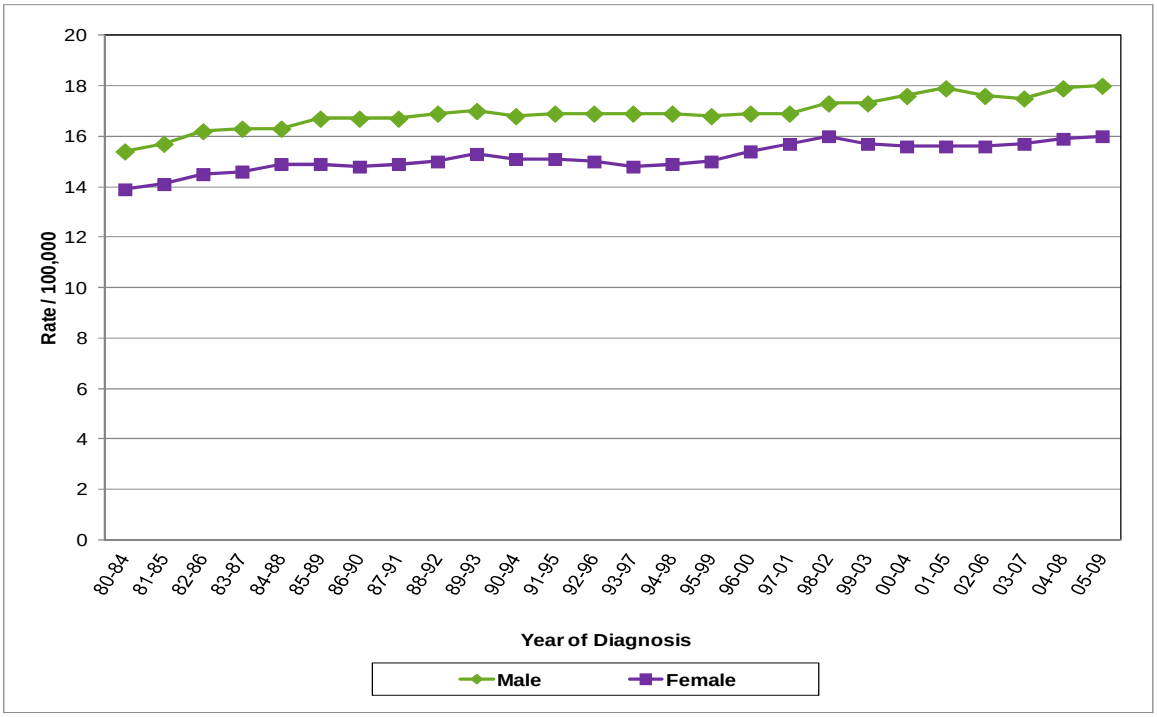
***** = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCES: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 27.1. Five-Year Average Age-Adjusted Cancer Incidence Rates* Among Children and Adolescents; U.S. and Delaware, 1980–2009



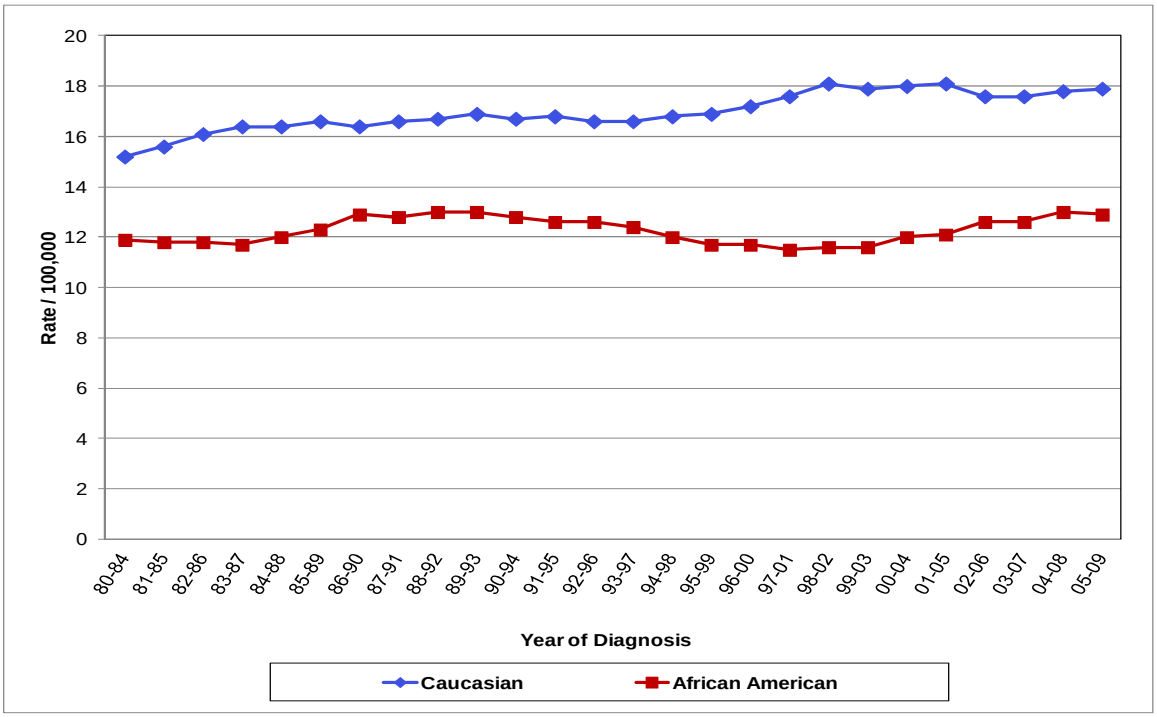
* = Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2012;
U.S.: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Figure 27.2. Five-Year Average Age-Adjusted Cancer Incidence Rates* Among Children and Adolescents by Sex; Delaware, 1980–2009



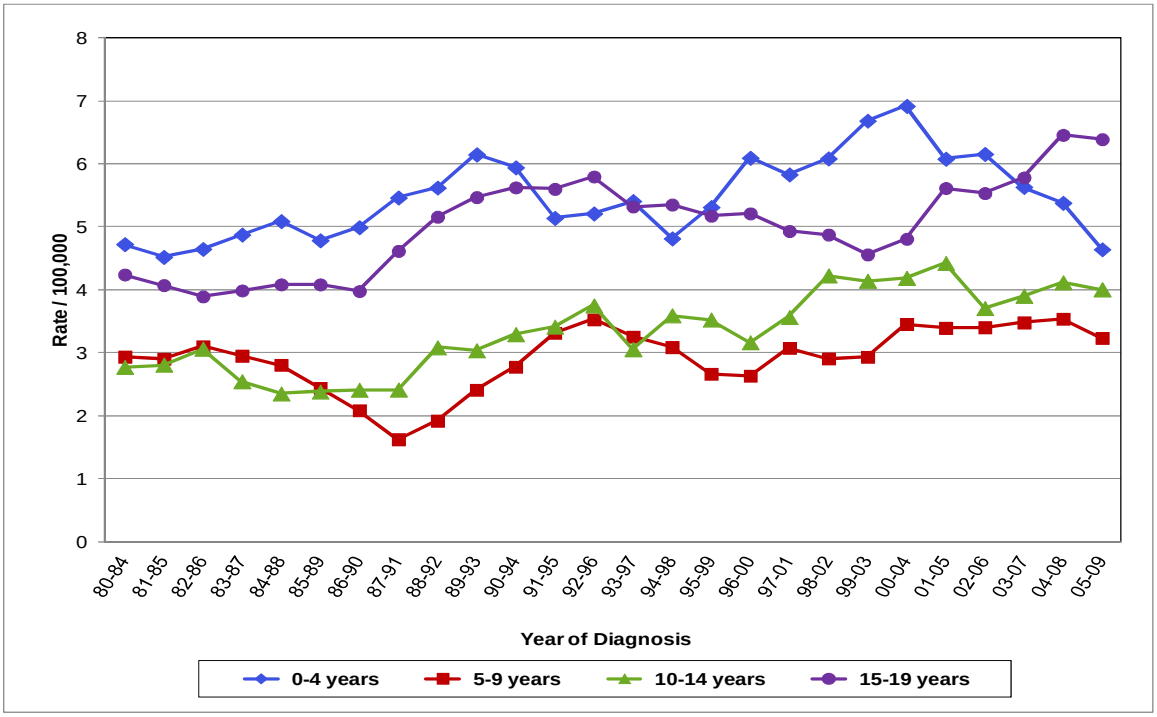
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 27.3. Five-Year Average Age-Adjusted Cancer Incidence Rates* Among Children and Adolescents by Race; Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 27.4. Five-Year Average Age-Specific Cancer Incidence Rates* Among Children and Adolescents by Age Group; Delaware, 1980–2009



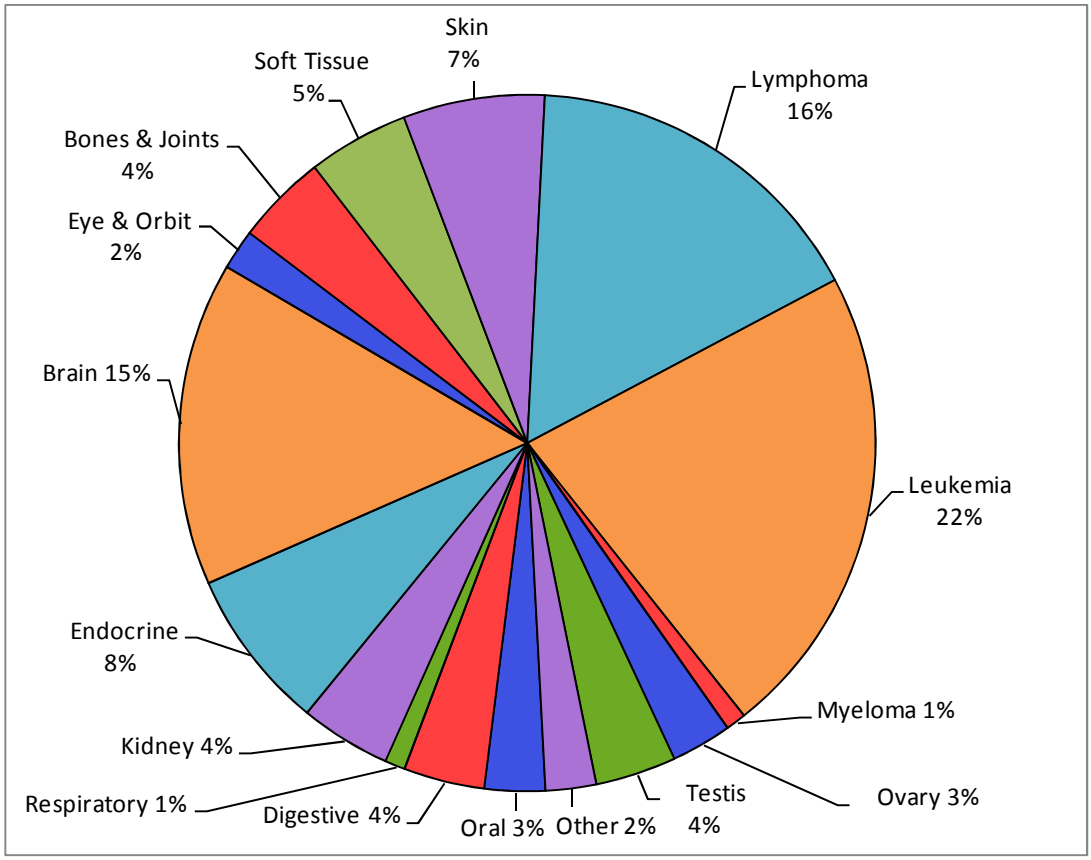
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 27.3. Age-Specific Cancer Incidence Rates* Among Children and Adolescents by Race; Delaware, 2005–2009

Age at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-4	19.5	25.1	---	20.4	27.8	---	---	---	---
5-9	13.0	---	---	---	---	---	---	---	---
10-14	15.9	17.9	---	16.9	---	---	---	---	---
15-19	25.6	26.3	24.8	28.3	31.0	25.4	---	---	---

***** = Rates are per 100,000 population.
--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Figure 27.5. Distribution of Cancer Cases Among Children and Adolescents by Anatomic Site; Delaware 2005–2009



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Table 27.4. Five-Year Average Age-Adjusted Cancer Incidence Rates* Among Children and Adolescents for Selected Cancer Sites; U.S. and Delaware, 2005–2009

Cancer Site	Number of Cases	Delaware Age-Adjusted Incidence Rate	U.S. Age-Adjusted Incidence Rate
Acute leukemia	39	3.4 (2.4 , 4.6)	4.2 (4.1 , 4.2)
Bone and joint	9	---	0.9 (0.9 , 1.0)
Brain and central nervous system	32	2.8 (1.9 , 4.9)	3.0 (2.9 , 3.1)
Hodgkin lymphoma	19	---	1.2 (1.2 , 1.3)
Non-Hodgkin lymphoma	16	---	1.1 (1.1 , 1.2)
Kidney and renal	9	---	0.6 (0.6 , 0.7)
Melanoma of skin	12	---	0.5 (0.5 , 0.6)

--- = Rates based on fewer than 25 cases are not shown.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2012.

Cancer Mortality Among Children and Adolescents

Table 27.5. Number of Cancer Deaths Among Children and Adolescents by Race and Sex; Delaware and Counties, 2005–2009

	All Races			Caucasian			African American		
	All	**Male**	**Female**	**All**	**Male**	**Female**	**All**	**Male**	**Female**
Delaware	28	12	16	20	9	11	7	---	---
Kent	6	---	---	6	---	---	---	---	---
New Castle	18	9	9	12	---	---	---	---	---
Sussex	---	---	---	---	---	---	---	---	---

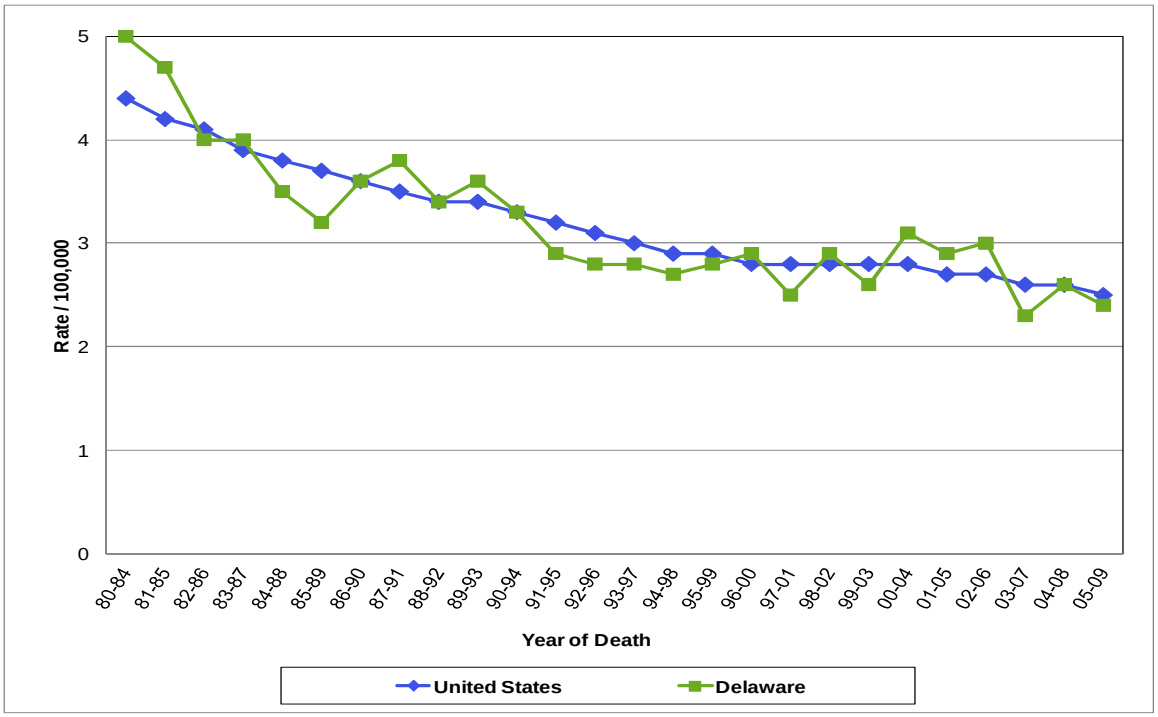
--- = Cell counts less than six are not shown to protect patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2012.

Table 27.6. Five-Year Average Age-Adjusted Cancer Mortality Rates* Among Children and Adolescents and 95% Confidence Intervals by Race and Sex; U.S. and Delaware, 2005–2009

RACE AND REGION	All	Male	Female
ALL RACES			
United States	2.5 (2.4 , 2.5)	2.7 (2.6 , 2.8)	2.2 (2.2 , 2.3)
Delaware	2.5 (1.7 , 3.6)	---	---
CAUCASIAN			
United States	2.5 (2.5 , 2.6)	2.8 (2.7 , 2.8)	2.3 (2.2 , 2.4)
Delaware	---	---	---
AFRICAN AMERICAN			
United States	2.5 (2.3 , 2.6)	2.7 (2.5 , 2.8)	2.2 (2.1 , 2.4)
Delaware	---	---	---

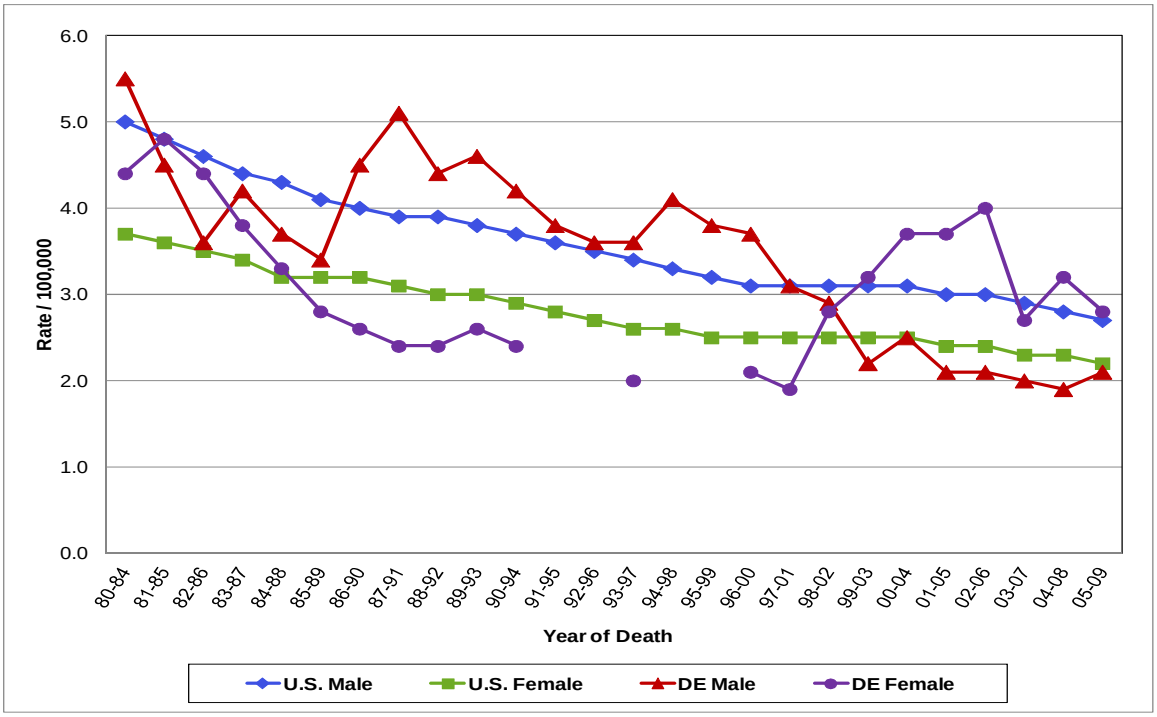
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 25 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012; U.S.: National Center for Health Statistics, 2012.

Figure 27.6. Five-Year Average Age-Adjusted Childhood/Adolescent Cancer Mortality Rates*; U.S. and Delaware, 1980–2009



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCES: Delaware: Delaware Health Statistics Center, 2012;
U.S.: National Center for Health Statistics, 2012.

Figure 27.7. Five-Year Average Age-Adjusted Cancer Mortality Rates* Among Children and Adolescents by Sex; Delaware, 1980–2009



* = Rates are age-adjusted to the 2000 U.S. standard population.
--- = Rates based on fewer than 11 deaths are not shown.
SOURCES: Delaware Health Statistics Center, 2012, DE before 2003-2007: National Center for Health Statistics, 2012.

28. CANCER INCIDENCE BY CENSUS TRACT

Background

As required by Title 16, Chapter 292 of the *Delaware Code* (Appendix F), the Delaware Division of Public Health (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 track. 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

Methods are described in detail in Appendix G.

Cancer Cases

- For 2004–2008 there were 24,383 cancer cases eligible for analysis.
- For 2005–2009, there were 25,068 cancer cases eligible for analysis.

Census Tracts

- Delaware is divided into 214 census tracts as of the 2010 Census.
- In 2005–2009, the least populated census tract (511.01) had an average of 694 residents annually. The most populous census tract (402.02) had 10,048 residents. The average number of residents per census tract was 4,073.

Results of Census Tract Analyses

Cancer incidence rates by census tract along with their confidence intervals are shown in Appendix I for both 2004–2008 and 2005–2009. Census tracts having rates that are significantly higher or lower than the state average are noted in yellow and blue shading, respectively.

Results for 2004–2008 show that:

- In 11 of Delaware's 214 census tracts, the overall cancer incidence rate was statistically significantly higher than Delaware's average 2004–2008 incidence rate (515.6 per 100,000)[20],
- In 17 census tracts, the overall cancer incidence rate was significantly lower than Delaware's average incidence rate (515.6 per 100,000).
- Incidence rates for the remaining 186 census tracts are not significantly different from the state's average rate.

[20] 515.6 is average 2004–2008 Delaware incidence rate calculated by Excel rather than SEER*Stat (515.4).

For 2004–2008, maps showing cancer incidence rates by census tract grouped by quintile are in Appendix J and maps indicating census tracts that had either a significantly high or significantly low incidence rate are in Appendix K.

Results for 2005–2009 show that:

- In nine of Delaware's 214 census tracts, the overall cancer incidence rate was statistically significantly higher than Delaware's average 2005–2009 incidence rate (516.0 per 100,000)[21],
- In 16 census tracts, the overall cancer incidence rate was significantly lower than Delaware's average incidence rate (516.0 per 100,000).
- Incidence rates for the remaining 189 census tracts are not significantly different from the state's average rate.

For 2005–2009, maps showing cancer incidence rates by census tract grouped by quintile are in Appendix L and maps indicating census tracts that had either a significantly high or significantly low incidence rate are in Appendix M.

Discussion of Results of Census Tract Analyses

When assessing cancer incidence data by census tract, it should be kept in mind that 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 five percent of all comparisons will be significantly different due to chance alone.

Additional caution is needed when comparing results from the 2004–2008 and 2005–2009 census tract analyses with results for 2003-2007 and earlier time periods. Because of the change in the configuration of census tracts in Delaware; i.e. changing from 197 census tracts in the 2000 Census to 214 in the 2010 Census, results using the two different census tract analyses would be expected to differ due to various reasons, some of which can be characterized. Despite population growth in the intervening decade, the average population size of each census tract did decrease; from an average of 4,257 residents (using the 197 tracts from the 2000 Census) to 4,073 for the 214 census tracts (using the 2010 Census).

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 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) in the following time period.

The all-site cancer incidence fluctuations in census tract 513.02 illustrate this key point. For the 2003-2007 time period, 134 cancer cases were diagnosed and the all-site cancer incidence rate of 823.3 per 100,000 in census tract 513.02 was significantly elevated compared to the all-site cancer incidence rate for Delaware as a whole. In 2004–2008, the number of cancer cases decreased by 11 and there were 123 cancer cases.

[21] 516.0 is average 2005–2009 Delaware incidence rate calculated by Excel rather than SEER*Stat (515.3).

However, despite the decrease in the number of cases, the all-site cancer incidence rate of 649.2 per 100,000 for this time remained significantly elevated compared to the all-site cancer incidence rate for Delaware as a whole. For the most recent time period, 2005–2009, the number of cancer cases diagnosed in this census tract decreased by two to 121 and the all-site cancer incidence rate of 621.6 per 100,000 was not significantly different compared to the all-site cancer incidence rate for Delaware. A small change in the estimated population of a census tract can also have a dramatic effect on the calculation of an incidence rate.

Inaccurate data on the population at risk in small geographic areas continues to complicate epidemiologic studies in community settings. "Census data are less accurate for cities or counties than for states:

> *The uncertainty is greatest for demographic subgroups of the population during the 10-year interval between national census counts.*" [22]

Since population estimates for census tracts in the previous three analyses (2001-2005, 2002-2006, 2003-2007) relied solely on Census 2000 population data to project census tract populations for these three five-year time periods, there is the possibility of major fluctuations in the rate when comparing data using the 2000 Census and data from the 2010 Census. A further complication is the fact that before 2004–2008, there was less accuracy because geocoding was not yet complete.

[22] Thun M. Sinks T. Understanding Cancer Clusters. Cancer: A Cancer Journal for Clinicians, 54(5), 273-280 (2004)

APPENDICES

Appendix A: Data Sources and Methodology

Cancer Incidence Data

Delaware Cancer Registry

This report covers data on cancer cases diagnosed among Delawareans during two five-year time periods; from January 1, 2004 to December 31, 2008 and from January 1, 2005 to December 31, 2009 that were reported to the Delaware Cancer Registry (DCR) by August 2012. Trends in incidence rates are based on cancers diagnosed from January 1, 1980, to December 31, 2009.

During 2004–2008, a total of 24.383 cases of malignant cancer were diagnosed among Delawareans and during 2005–2009, 25,068 cases were diagnosed among Delawareans. These totals include individuals with cancers diagnosed at more than one site, known as multiple primaries. With the exception of bladder cancer, only malignant tumors are included in the analyses. *In situ* 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).[23] 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 publication of the Centers for Disease Control and Prevention's (CDC) 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 are used as the comparison for Delaware's cancer incidence and mortality rates. These incidence 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 were Connecticut, Iowa, New Mexico, Utah, and Hawaii; the metropolitan areas of Detroit, Michigan, and San Francisco-Oakland, California; and the Commonwealth of Puerto Rico (through 1989). 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. [24]

Historically, Delaware's cancer incidence rates have been compared to cancer incidence rates calculated using data from the original nine registries (SEER-9) that provided data to SEER beginning in 1974-1975. In 2009, Delaware's Division of Public Health (DPH) and the Delaware Cancer Consortium 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 percent 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 sub-sample 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.

[23] 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.

[24] 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 in a data file compiled from all death certificates filed in Delaware from 1980 through 2009. Five-year average annual age-adjusted cancer mortality rates are based on deaths that occurred in each of two five-year time periods: from January 1, 2004 to December 31, 2008 and from January 1, 2005 to December 31, 2009. Trends in cancer mortality are presented for deaths that occurred from 1980 through 2009.

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. 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 from the National Center for Health Statistics are used for comparison with Delaware's cancer mortality rates and were accessed using SEER*Stat.[25] U.S. death data are compiled from all death certificates filed in the 50 states and the District of Columbia between 1980 and 2009. Causes of death are coded 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.

Population Data

Population Estimates, 2004–2008 and 2005–2009

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 Delaware Population Consortium (DPC) in March 2012. Population estimates for Delaware are presented in Appendix D.

Risk Factors and Early Detection

Data on known and suspected cancer risk factors and prevention options are at the beginning of each site-specific section of this report, where available. The primary resources for this information are: (1) the American Cancer Society (www.cancer.org) and (2) the National Cancer Institute (www.cancer.gov).

Behavioral Risk Factor Surveillance (BRFS) System

The Behavioral Risk Factor Surveillance (BRFS) system provides estimates of the prevalence of risk factors across Delaware and nationally. The most recently available risk factor data from BRFSS are from 2011 and in instances where items are not included in the survey each year, data from 2010 are presented. Risk factor data are included in appropriate chapters for site-specific cancers; supplemental data on obesity, physical inactivity and diet are presented in Appendix E.

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 point in time or one population at two or more points in time.[26,27] 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

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

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

[27] Klein RJ, Schoenborn CA. Age Adjustment Using the 2000 Projected U.S. Population. Healthy People statistical notes, no. 20.

appropriate 2000 U.S. Standard Population (Table B-1). Individual age-specific rates are then summed to obtain the overall age-adjusted rate.[28]

Table B-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

Age-adjusted death rates are calculated using the direct method of age-adjustment in this report. This involves weighting age-specific death rates by a standard set of weights (table A). The weights represent the proportion by age in a standard population. The formula for an age-adjusted rate can be presented as follows:

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

- 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 were expressed per 100,000 of the population.

Age-Specific Incidence and Mortality Rates

Age-related differences in risk of cancer incidence and mortality are assessed using age-specific rates. These age-specific rates are calculated by dividing the number of cancer cases / deaths reported during a specific time period by five age groups (0–39, 40–64, 65–74, 75–84 and 85 and older). The total number of cases or deaths within each of the five age groups is then divided by the total population of the age group in Delaware during the same time period. Rates are expressed per 100,000 of the population.

Race- and Sex-Specific Incidence and Mortality Rates

Race- 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 and/or sex group by the total population in the corresponding race and/or sex group over the same time period. As with other rates, these rates were adjusted to the 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-percent confidence interval.

When incidence rates are based on more than 100 cases, lower and upper limits of the 95 percent confidence intervals for an age-adjusted (AA) incidence or mortality rate are calculated using SEER*Stat [29] by methodology shown here: [30]

[28] 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

[29] Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute. SEER*Stat Software, Latest Release: Version 7.1.0 – July 17, 2012. http://seer.cancer.gov/seerstat/index.html

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

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

$$\text{Upper Confidence Limit} = \text{AA Rate} + 1.96\left(\frac{(\text{AA Rate})}{\sqrt{\#\text{ Cases}}}\right),$$

- 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:

Lower Confidence Limit (LCL) = AA Rate x L

Upper Confidence Limit (LCL) = AA Rate x 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 cases.[31]

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 and 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:

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

Additional Technical Information

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[32, 33] Furthermore, a cancer rate based on a very small number of cases is inherently unstable and cannot be reliably interpreted.

Definition of Race

Race-specific statistics in this report are limited to Caucasians and African Americans and do not take into account a resident's ethnicity. Incidence and mortality rates for the total population, however, do include residents of all race categories or unknown race regardless of Hispanic ethnicity status.

31 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.

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

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

Appendix B: Primary Cancer Site Definitions[34]

Cancer Site Group	ICD-O-3 Site	ICD-O-3 Histology
All malignant cancers	C000–C809	
Brain and other nervous system	Brain: C710-C719	excludes 9530-9539, 9050-9055, 9140, 9590-9989
	Other nervous system: C710-C719	9530-9539
	Other nervous system: C700-C709, C720-C729	excludes 9050–9055, 9140 and 9590–9989
Female breast	C500–C509	excludes 9050–9055, 9140 and 9590–9989
Cervix	C530–C539	excludes 9050–9055, 9140 and 9590–9989
Colon and rectum	C180–C189, C260	excludes 9050–9055, 9140 and 9590–9989
Esophagus	C150–C159	excludes 9050–9055, 9140 and 9590–9989
Hodgkin lymphoma	C024, C098–C099, C111, C142, C379, C422, C770-C779	9650-9667
Kidney and renal pelvis	C649, C659	excludes 9050–9055, 9140 and 9590–9989
Larynx	C320-C329	excludes 9050–9055, 9140 and 9590–9989
Leukemia	C420, C421, C424	9733, 9742, 9800, 9801, 9805, 9831, 9820, 9823, 9826-9827, 9832-9837, 9840, 9851, 9855, 9860, 9863, 9870-9876, 9891, 9895-9897, 9910, 9920, 9931, 9945-9946, 9948, 9963-9964
Liver, intrahepatic bile ducts and other biliary	C220, C221, C239, C240-C249	excludes 9050–9055, 9140 and 9590–9989
Lung and bronchus	C340–C349	excludes 9050–9055, 9140 and 9590–9989
Malignant melanoma of the skin	C440-C449	8720-8790
Myeloma		9731-9732, 9734
Non-Hodgkin lymphoma	C000–C809	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729, 9823, 9827
Oral cavity and pharynx	C000–C09, C019–C069, C079–C119, C129–C140, C142–C148	excludes 9050–9055, 9140 and 9590–9989
Ovary	C569	excludes 9050–9055, 9140 and 9590–9989
Pancreas	C250–C259	excludes 9050–9055, 9140 and 9590–9989
Prostate	C619	excludes 9050–9055, 9140 and 9590–9989
Stomach	C160-C169	excludes 9050–9055, 9140 and 9590–9989
Testis	C620-C629	excludes 9050–9055, 9140 and 9590–9989
Thyroid	C739	excludes 9050–9055, 9140 and 9590–9989
Urinary bladder*	C670–C679*	excludes 9050–9055, 9140 and 9590–9989
Uterus	C540–C549, C559	excludes 9050–9055, 9140 and 9590–9989

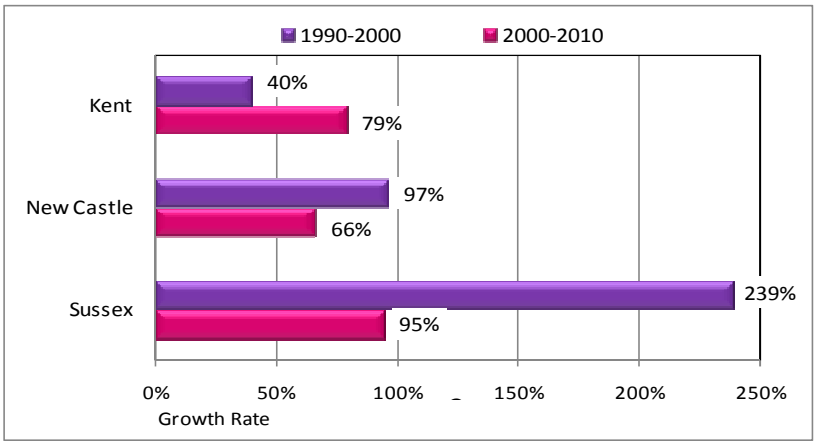
* The category “urinary bladder” includes *in situ* bladder cancers.

[34] SEER Site Recode ICD-O-3 (1/27/2003) Definition. http://seer.cancer.gov/siterecode/icdo3_d01272003/# – accessed 11/13/2012.

Appendix C: Cancer Incidence and Mortality among Persons of 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."[35] In 1990, persons of Hispanic ethnicity comprised 2.4% of Delaware's population. Delaware's Hispanic population doubled to 4.8% by 2000 and then increased by 71% during 2000-2010. As of the 2010 U.S. Census, persons of Hispanic origin comprise 8.4% of the State's population. The largest growth is seen in Sussex County, where the number of persons of Hispanic ethnicity grew by 240% in the decade 1990-2000 (from 1.3% to 4.4%) and then increased by 95% more during 2000-2010 (from 4.4% to 8.6%) (Figure A-1). New Castle County has had the largest percentage of persons of Hispanic ethnicity since 1990, the first Census when data on Hispanic ethnicity were collected separately. The Hispanic population in New Castle County grew from 2.7% in 1990 to 5.3% in 2000 and to 8.7% in 2010. Kent County had the second largest relative increase in the proportion of Hispanics during the most recent decade (2.3% in 1990, 3.2% in 2000 and 5.8% in 2010).

Figure A-1. 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/

Hispanic cancer rates are calculated for the time period 2005–2009. Incidence and mortality frequencies of fewer than six cases and incidence and mortality rates based on less than 25 cases are not shown according to the Division of Public Health Policy Memorandum 49. Cancer rates are calculated by dividing the number of cancer cases (numerator) by a population (denominator); therefore, cancer rates are heavily influenced by changes or uncertainties in the number of cancer cases and the size of the population. Specific issues that suggest that Hispanic cancer rates would be subject to misinterpretation are presented below:

- **Uncertain estimate of Delaware's Hispanic population —** Estimates of Delaware's population are derived from a census performed every 10 years by the U.S. Census Bureau. The Delaware Population Consortium (DPC) uses Census data to estimate the Delaware population between Census years. In preparation for the post 2010 Census benchmarking when the race categories will shift to white non-Hispanic, black non-Hispanic, other non-Hispanic, and Hispanic, a separate projection for Hispanics is provided by the DPC. This projection is made by using the overall age structure of the total population and applying the current percentage of a given age-sex category measured in the American Community Survey for years 2005–2009 combined. A final adjustment was made based on projections from the US Census Bureau as to the overall rate of growth for the Hispanic population in both the state and the nation. A more conventional methodology will be used for the 2012 Delaware Population Consortium release.

- **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 Delaware Cancer Registry, in accordance

[35] Grieco, EM, Cassidy RC. (2001-03). "Overview of Race and Hispanic Origin: Census 2000 Brief" U.S. Census Bureau. http://www.census.gov/prod/2001pubs/cenbr01-1.pdf Accessed May 26, 2011.

with guidelines from the federal Office of Management and Budget. However, there is the potential that the 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) computerized and released for use by central cancer registries in 2003. NHIA is used for identification of Hispanic origin in this report. The expert panel continues to evaluate NHIA considering the possibility of under- or over-estimation of Hispanic cancer incidence using this algorithm due to misclassification.

- **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 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.

  As shown in the following tables, the small numerators and denominators for the Hispanic population produce wider confidence intervals than those for Caucasian and African American populations in corresponding sections of the report.

Table C-1. Cancer Cases, Population and Age-Adjusted Cancer Incidence Rates in Delaware, Hispanic Population: 2005–2009

Cancer Site	Total Cases (2005–2009)	Total Population (2005–2009)	Age-Adjusted Incidence Rate per 100,000	95% Confidence Interval	
				Lower	Upper
All site (all)	533	317,149	411.9	370.1	456.7
All site (male)	252	168,638	396.4	338.6	460.3
All site (female)	281	148,511	452.1	384.9	526.2
Female breast	97	148,511	143.5	108.6	184.9
Colorectal (all)	44	317,149	38.5	26	54.2
Colorectal (male)	23	168,638	---	---	---
Colorectal (female)	21	148,511	---	---	---
Lung (all)	45	317,149	47.3	32.8	65.1
Lung (male)	20	168,638	---	---	---
Lung (female)	25	148,511	55.0	31.9	85.9
Prostate	78	168,638	145.8	111.7	185.9

--- = Rate based on fewer than 25 cases
Source: Delaware Cancer Registry, Delaware's Division of Public Health, 2012

Table C-2. Cancer Deaths, Population and Age-Adjusted Cancer Mortality Rates in Delaware, Hispanic Population: 2005–2009

Cancer Site	Total Deaths (2005–2009)	Total Population (2005–2009)	Age-Adjusted Mortality Rate per 100,000	95% Confidence Interval	
				Lower	Upper
All site (all)	132	317,149	130.9	106.4	158.5
All site (male)	72	168,638	141.5	105.4	184.5
All site (female)	60	148,511	125.2	89.9	167.9
Female breast	8	148,511	---	---	---
Colorectal (all)	10	317,149	---	---	---
Lung (all)	29	317,149	28.8	18.4	42.1
Lung (male)	17	168,638	---	---	---
Lung (female)	12	148,511	---	---	---
Prostate	8	168,638	---	---	---

--- = Rate based on fewer than 25 deaths

Source: Delaware Health Statistics Center, 2012

Appendix D: Delaware Population Estimates by Sex, Race, 5-Year Time Period & Age Group, 1980–2010

TOTAL POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	214,207	215,224	238,510	284,928	287,504	257,448	240,373	198,978	169,336	160,852	159,719	157,164	137,314	112,545	82,140	56,216	35,859	27,646	3,035,963
1981-85	218,519	217,674	235,624	278,183	285,957	262,204	247,217	205,957	176,370	163,939	158,955	156,135	138,915	115,869	84,762	58,120	36,884	28,312	3,069,596
1982-86	222,918	220,151	232,773	271,597	284,419	267,048	254,255	213,182	183,696	167,085	158,194	155,112	140,534	119,290	87,468	60,088	37,938	28,995	3,104,743
1983-87	227,406	222,657	229,956	265,167	282,889	271,982	261,493	220,660	191,326	170,291	157,437	154,097	142,173	122,813	90,260	62,123	39,023	29,694	3,141,447
1984-88	231,983	225,191	227,174	258,889	281,367	277,007	268,938	228,400	199,273	173,559	156,684	153,088	143,831	126,440	93,141	64,227	40,139	30,410	3,179,741
1985-89	236,653	227,754	224,425	252,761	279,854	282,125	276,595	236,411	207,551	176,889	155,935	152,086	145,508	130,174	96,115	66,402	41,286	31,143	3,219,667
1986-90	241,417	230,346	221,710	246,778	278,349	287,338	284,469	244,704	216,172	180,283	155,189	151,090	147,204	134,018	99,184	68,651	42,467	31,894	3,261,263
1987-91	247,002	233,344	221,422	239,937	277,915	290,859	292,199	253,305	226,107	183,991	155,843	150,234	148,777	137,280	102,762	70,853	43,848	33,044	3,308,722
1988-92	252,939	237,039	222,907	234,247	276,897	292,805	298,751	262,638	234,402	190,346	158,034	149,705	149,883	139,752	106,802	73,121	45,335	34,445	3,360,048
1989-93	258,679	241,198	226,409	230,132	275,530	292,343	303,805	272,267	241,848	198,345	162,375	149,809	150,596	141,613	110,952	75,571	46,885	36,158	3,414,515
1990-94	263,575	245,976	231,812	228,278	273,079	289,734	307,523	281,967	248,810	207,578	168,638	150,931	150,828	142,664	115,253	78,238	48,501	38,109	3,471,495
1991-95	267,276	251,644	238,648	229,237	269,266	285,672	309,672	291,351	255,795	218,395	176,552	152,922	150,922	142,984	119,406	81,230	50,469	40,220	3,531,662
1992-96	268,230	257,884	244,332	234,502	262,602	282,623	309,916	300,043	261,684	230,929	184,172	156,088	150,842	143,580	122,749	84,821	52,337	42,224	3,589,559
1993-97	267,318	264,096	249,956	241,269	256,251	279,379	309,039	307,035	269,684	240,209	193,595	160,553	150,922	144,422	125,162	88,785	54,357	44,091	3,646,121
1994-98	265,318	270,063	255,087	249,306	251,098	276,614	306,836	312,437	278,979	247,970	203,452	166,464	151,575	145,375	127,290	92,731	56,609	45,874	3,703,078
1995-99	263,097	275,155	259,963	257,829	248,402	273,725	303,060	316,753	288,783	254,999	213,433	173,368	153,324	146,388	128,811	96,676	59,072	47,686	3,760,523
1996-00	260,887	278,384	265,330	265,682	248,998	269,598	298,611	319,891	298,156	261,724	224,182	181,016	155,416	147,743	130,117	100,350	61,687	49,464	3,817,237
1997-01	260,222	279,236	271,171	270,361	254,617	262,938	294,526	321,205	306,718	267,541	236,586	188,557	158,410	148,605	131,729	103,494	64,856	51,192	3,871,965
1998-02	261,182	278,111	276,995	273,420	262,695	255,987	290,542	320,747	314,036	275,407	246,059	197,923	162,941	149,202	133,595	106,149	68,385	53,284	3,926,663
1999-03	263,147	275,728	282,716	276,063	270,531	250,646	286,717	318,458	319,534	284,720	253,936	208,082	168,894	150,079	135,437	108,913	72,185	55,811	3,981,596
2000-04	264,703	270,578	285,718	277,493	277,587	245,714	280,543	313,374	325,255	296,648	262,791	219,919	176,929	152,903	138,167	112,027	76,375	58,800	4,035,524
2001-05	269,887	268,661	288,360	279,988	283,773	248,988	276,405	308,047	328,334	306,127	269,536	230,755	184,250	154,074	138,993	113,367	79,463	61,847	4,090,855
2002-06	273,561	266,320	287,414	281,487	285,131	255,158	267,835	301,717	329,046	314,723	275,669	243,574	191,992	156,630	139,720	115,194	82,202	65,434	4,132,807
2003-07	278,085	268,768	286,896	287,332	285,412	267,557	262,491	298,299	329,386	323,070	284,463	253,878	201,691	161,040	140,063	116,993	84,512	69,443	4,199,379
2004-08	282,158	271,446	284,427	292,326	285,180	278,529	257,724	294,273	327,326	329,443	294,912	262,525	212,468	167,073	140,958	118,929	87,071	73,892	4,260,660
2005-09	290,706	281,357	285,927	299,434	287,888	292,698	260,768	293,349	323,638	333,892	304,844	270,096	223,256	173,751	142,100	119,924	88,963	79,217	4,351,808

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009).
http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

TOTAL MALE POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	109,306	109,805	121,585	141,190	140,621	126,224	117,528	96,927	82,646	78,388	77,061	74,473	65,132	50,443	33,955	21,202	11,611	7,269	1,465,366
1981-85	111,544	111,121	120,157	137,931	140,086	128,782	121,035	100,443	86,114	79,862	76,725	74,084	65,854	51,973	35,246	22,030	11,988	7,332	1,482,307
1982-86	113,828	112,453	118,745	134,748	139,553	131,392	124,646	104,086	89,727	81,364	76,391	73,698	66,584	53,549	36,586	22,890	12,378	7,395	1,500,013
1983-87	116,159	113,801	117,350	131,638	139,021	134,054	128,365	107,861	93,492	82,895	76,058	73,314	67,322	55,173	37,976	23,784	12,780	7,458	1,518,501
1984-88	118,537	115,165	115,971	128,600	138,491	136,771	132,195	111,773	97,415	84,454	75,727	72,931	68,068	56,846	39,420	24,712	13,196	7,522	1,537,794
1985-89	120,964	116,546	114,608	125,632	137,964	139,543	136,139	115,827	101,503	86,043	75,397	72,551	68,823	58,570	40,919	25,677	13,625	7,587	1,557,918
1986-90	123,441	117,943	113,261	122,733	137,438	142,371	140,201	120,028	105,762	87,662	75,069	72,173	69,585	60,346	42,474	26,679	14,068	7,652	1,578,887
1987-91	126,361	119,575	113,147	119,415	137,266	144,393	144,160	124,332	110,654	89,453	75,440	71,791	70,326	61,932	44,245	27,669	14,586	7,935	1,602,682
1988-92	129,420	121,562	113,881	116,683	136,734	145,559	147,517	129,015	114,657	92,613	76,507	71,522	70,884	63,213	46,211	28,723	15,182	8,316	1,628,201
1989-93	132,392	123,724	115,770	114,714	136,060	145,319	150,055	133,884	118,210	96,587	78,550	71,575	71,327	64,282	48,108	29,921	15,851	8,786	1,655,113
1990-94	134,893	126,195	118,659	113,863	134,793	143,882	151,941	138,762	121,554	101,108	81,480	72,141	71,505	65,105	49,980	31,199	16,567	9,376	1,683,004
1991-95	136,777	129,054	122,259	114,510	132,759	141,725	152,970	143,435	124,882	106,389	85,222	73,078	71,636	65,589	51,812	32,650	17,462	10,031	1,712,240
1992-96	137,127	132,227	125,389	117,153	129,509	139,932	153,216	147,705	127,627	112,514	88,790	74,649	71,602	66,183	53,329	34,376	18,327	10,620	1,740,276
1993-97	136,560	135,384	128,537	120,476	126,511	138,066	152,850	151,106	131,610	116,796	93,387	76,842	71,604	66,898	54,471	36,193	19,279	11,215	1,767,785
1994-98	135,513	138,493	131,217	124,569	124,021	136,681	151,765	153,614	136,352	120,327	98,249	79,630	71,829	67,657	55,678	37,857	20,366	11,836	1,795,655
1995-99	134,370	141,136	133,699	128,994	122,710	135,375	149,777	155,661	141,353	123,570	103,159	82,833	72,633	68,311	56,850	39,503	21,522	12,507	1,823,964
1996-00	133,161	142,939	136,383	132,978	123,174	133,430	147,574	157,118	146,142	126,696	108,399	86,446	73,549	69,158	57,860	41,098	22,776	13,252	1,852,133
1997-01	132,716	143,337	139,243	135,903	125,672	130,319	145,374	157,968	150,411	129,323	114,470	90,033	74,975	69,650	59,001	42,519	24,294	13,961	1,879,169
1998-02	133,022	142,634	142,083	138,230	129,134	127,095	143,248	157,865	153,944	133,336	118,785	94,643	77,147	69,924	60,295	43,821	25,892	14,804	1,905,901
1999-03	133,607	141,297	144,922	139,954	132,619	124,625	141,349	156,805	156,439	138,155	122,341	99,690	79,962	70,284	61,539	45,363	27,474	15,850	1,932,275
2000-04	133,866	138,540	146,752	141,377	136,179	121,992	138,334	154,139	159,016	144,235	126,427	105,497	83,734	71,511	62,883	47,165	29,106	16,901	1,957,654
2001-05	135,892	137,371	148,268	142,997	139,739	123,643	136,421	151,602	160,384	149,058	129,508	110,787	87,274	71,935	63,444	48,149	30,422	18,095	1,984,989
2002-06	137,265	135,917	147,704	144,139	141,449	126,110	132,225	148,261	160,868	153,322	132,263	117,033	91,054	73,119	63,851	49,302	31,590	19,437	2,004,909
2003-07	139,171	136,900	147,313	147,028	143,192	131,716	129,886	146,495	161,209	157,300	136,676	121,717	95,850	75,248	63,964	50,487	32,691	20,951	2,037,794
2004-08	140,985	137,783	145,940	149,651	144,305	136,594	127,772	144,536	160,287	160,168	142,024	125,638	101,206	78,122	64,309	51,673	34,049	22,555	2,067,597
2005-09	145,099	142,459	146,688	153,359	146,181	143,411	129,428	144,505	158,663	162,448	147,261	129,262	106,696	81,500	65,027	52,477	35,404	24,612	2,114,480

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009).
http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

TOTAL FEMALE POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	104,902	105,418	116,924	143,736	146,881	131,220	122,842	102,049	86,690	82,462	82,657	82,688	72,182	62,100	48,170	35,008	24,246	20,361	1,570,536
1981-85	106,976	106,551	115,467	140,250	145,868	133,416	126,178	105,512	90,256	84,074	82,228	82,047	73,061	63,894	49,496	36,082	24,893	20,959	1,587,208
1982-86	109,091	107,697	114,028	136,848	144,862	135,649	129,604	109,093	93,968	85,718	81,802	81,411	73,950	65,739	50,858	37,188	25,557	21,574	1,604,637
1983-87	111,248	108,855	112,607	133,529	143,863	137,919	133,123	112,795	97,833	87,394	81,378	80,780	74,851	67,638	52,258	38,328	26,239	22,208	1,622,846
1984-88	113,447	110,025	111,203	130,290	142,871	140,227	136,738	116,623	101,857	89,102	80,956	80,154	75,763	69,592	53,696	39,503	26,940	22,861	1,641,848
1985-89	115,689	111,208	109,817	127,130	141,885	142,574	140,451	120,581	106,047	90,844	80,536	79,533	76,686	71,602	55,174	40,714	27,659	23,533	1,661,663
1986-90	117,976	112,404	108,448	124,046	140,906	144,961	144,264	124,673	110,409	92,620	80,119	78,917	77,620	73,670	56,692	41,962	28,398	24,224	1,682,310
1987-91	120,640	113,769	108,274	120,523	140,646	146,461	148,036	128,971	115,454	94,537	80,402	78,442	78,453	75,346	58,505	43,178	29,261	25,098	1,705,994
1988-92	123,518	115,476	109,025	117,564	140,161	147,244	151,232	133,623	119,745	97,732	81,525	78,181	79,000	76,537	60,585	44,395	30,153	26,123	1,731,819
1989-93	126,286	117,475	110,640	115,418	139,469	147,023	153,749	138,383	123,639	101,757	83,825	78,235	79,270	77,330	62,842	45,649	31,034	27,370	1,759,392
1990-94	128,683	119,782	113,153	114,415	138,286	145,852	155,582	143,205	127,256	106,470	87,157	78,790	79,324	77,559	65,273	47,039	31,934	28,733	1,788,491
1991-95	130,498	122,590	116,390	114,727	136,507	143,947	156,702	147,916	130,913	112,005	91,330	79,843	79,287	77,395	67,594	48,581	33,007	30,190	1,819,422
1992-96	131,103	125,658	118,943	117,349	133,093	142,691	156,700	152,338	134,056	118,415	95,382	81,439	79,241	77,397	69,420	50,445	34,010	31,604	1,849,283
1993-97	130,758	128,712	121,419	120,793	129,740	141,313	156,188	155,930	138,074	123,412	100,207	83,711	79,318	77,523	70,691	52,591	35,079	32,877	1,878,336
1994-98	129,805	131,570	123,871	124,736	127,077	139,933	155,071	158,823	142,627	127,643	105,203	86,834	79,746	77,718	71,612	54,874	36,243	34,037	1,907,423
1995-99	128,726	134,019	126,264	128,834	125,692	138,350	153,282	161,092	147,431	131,428	110,275	90,535	80,691	78,077	71,961	57,173	37,550	35,178	1,936,559
1996-00	127,727	135,445	128,948	132,704	125,824	136,169	151,037	162,773	152,014	135,028	115,783	94,570	81,867	78,585	72,257	59,252	38,911	36,212	1,965,104
1997-01	127,506	135,899	131,928	134,457	128,945	132,619	149,152	163,237	156,307	138,218	122,117	98,525	83,436	78,955	72,728	60,976	40,562	37,231	1,992,796
1998-02	128,161	135,478	134,912	135,190	133,561	128,892	147,294	162,882	160,092	142,071	127,274	103,281	85,794	79,278	73,300	62,328	42,493	38,481	2,020,762
1999-03	129,539	134,430	137,794	136,109	137,912	126,022	145,368	161,653	163,095	146,566	131,594	108,392	88,931	79,795	73,898	63,550	44,712	39,962	2,049,321
2000-04	130,837	132,038	138,966	136,116	141,408	123,722	142,209	159,235	166,239	152,413	136,364	114,422	93,195	81,392	75,284	64,862	47,269	41,899	2,077,870
2001-05	133,995	131,290	140,092	136,991	144,034	125,345	139,984	156,445	167,950	157,069	140,028	119,968	96,976	82,139	75,549	65,218	49,041	43,752	2,105,866
2002-06	136,296	130,403	139,710	137,348	143,682	129,048	135,610	153,456	168,178	161,401	143,406	126,541	100,938	83,511	75,869	65,892	50,612	45,997	2,127,898
2003-07	138,914	131,868	139,583	140,304	142,220	135,841	132,605	151,804	168,177	165,770	147,787	132,161	105,841	85,792	76,099	66,506	51,821	48,492	2,161,585
2004-08	141,173	133,663	138,487	142,675	140,875	141,935	129,952	149,737	167,039	169,275	152,888	136,887	111,262	88,951	76,649	67,256	53,022	51,337	2,193,063
2005-09	145,607	138,898	139,239	146,075	141,707	149,287	131,340	148,844	164,975	171,444	157,583	140,834	116,560	92,251	77,073	67,447	53,559	54,605	2,237,328

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009).
http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

TOTAL CAUCASIAN POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	161,578	164,018	181,424	224,599	233,283	209,496	197,457	164,950	140,805	135,974	137,745	137,055	121,128	98,211	72,417	49,295	32,140	24,892	2,486,467
1981-85	165,108	165,832	179,045	218,700	231,353	213,038	202,745	170,315	146,500	138,347	136,602	135,821	122,426	101,259	74,803	51,006	33,035	25,460	2,511,395
1982-86	168,715	167,666	176,697	212,956	229,439	216,640	208,175	175,855	152,425	140,762	135,468	134,598	123,738	104,402	77,268	52,776	33,955	26,041	2,537,576
1983-87	172,401	169,520	174,380	207,363	227,541	220,304	213,750	181,575	158,590	143,218	134,344	133,386	125,064	107,642	79,814	54,607	34,901	26,635	2,565,035
1984-88	176,168	171,395	172,093	201,917	225,659	224,029	219,474	187,481	165,005	145,717	133,229	132,185	126,404	110,983	82,444	56,502	35,873	27,244	2,593,802
1985-89	180,017	173,291	169,836	196,614	223,792	227,817	225,351	193,578	171,679	148,260	132,123	130,995	127,758	114,428	85,161	58,463	36,872	27,866	2,623,901
1986-90	183,950	175,207	167,609	191,451	221,941	231,670	231,386	199,873	178,624	150,847	131,026	129,816	129,127	117,980	87,967	60,492	37,899	28,503	2,655,366
1987-91	187,894	177,153	166,863	185,435	220,429	233,668	236,950	206,300	186,376	153,654	131,079	128,661	130,340	120,965	91,201	62,536	39,077	29,527	2,688,106
1988-92	191,482	179,322	167,125	180,133	217,986	233,865	241,209	213,099	192,430	158,654	132,454	127,698	131,049	123,163	94,871	64,638	40,365	30,776	2,720,317
1989-93	194,527	181,518	168,606	175,680	215,064	231,556	243,878	219,891	197,450	164,885	135,647	127,228	131,291	124,781	98,560	66,965	41,688	32,322	2,751,535
1990-94	196,541	183,858	171,241	172,627	211,065	227,003	245,006	226,480	201,837	171,857	140,503	127,525	130,982	125,640	102,304	69,478	43,072	34,075	2,781,094
1991-95	197,412	186,426	174,732	171,429	205,735	220,756	244,418	232,502	205,982	179,838	146,738	128,525	130,397	125,760	105,836	72,293	44,756	35,969	2,809,504
1992-96	196,651	189,133	177,569	173,360	198,474	215,370	242,035	237,686	209,264	188,958	152,691	130,589	129,548	126,041	108,655	75,544	46,418	37,738	2,835,726
1993-97	194,914	191,522	180,524	176,197	191,712	209,970	238,546	241,328	214,237	194,942	160,089	133,824	128,769	126,460	110,586	79,153	48,220	39,380	2,860,373
1994-98	192,142	193,572	183,087	180,113	185,796	205,241	233,844	243,436	220,158	199,443	167,649	138,299	128,457	126,835	112,312	82,600	50,327	40,896	2,884,205
1995-99	188,932	194,765	185,366	184,555	181,700	200,659	227,822	244,375	226,303	203,325	174,928	143,676	129,091	127,140	113,534	85,979	52,617	42,427	2,907,193
1996-00	184,527	194,549	187,688	188,692	180,124	195,312	221,186	244,155	231,860	206,909	182,487	149,683	130,063	127,584	114,588	89,037	55,043	43,903	2,927,389
1997-01	181,606	192,937	190,124	190,745	182,626	188,335	215,368	242,431	236,668	209,906	191,266	155,510	131,973	127,505	115,785	91,683	57,891	45,339	2,947,698
1998-02	180,206	190,281	192,184	191,812	187,218	181,454	210,062	239,373	240,546	214,723	197,260	162,833	135,299	127,174	117,089	93,824	61,061	47,125	2,969,523
1999-03	180,280	186,740	193,974	192,646	191,680	176,071	205,224	235,036	242,929	220,703	201,862	170,609	139,929	127,053	118,258	96,126	64,358	49,368	2,992,844
2000-04	186,835	187,987	200,127	198,216	200,774	177,758	205,887	234,912	250,735	233,093	210,952	182,185	148,499	130,262	121,191	99,448	68,324	52,255	3,089,440
2001-05	190,276	184,030	199,279	197,701	202,464	177,487	199,949	227,159	250,088	238,326	214,137	189,424	153,961	130,197	120,959	100,382	70,818	54,891	3,101,528
2002-06	195,026	183,540	198,829	198,403	203,751	183,106	194,303	222,343	250,207	244,876	218,648	199,551	160,632	132,348	121,164	101,960	73,201	58,065	3,139,953
2003-07	197,043	183,209	195,767	199,561	200,958	189,524	186,790	216,225	246,580	248,580	223,352	205,485	167,690	135,128	120,296	103,007	74,955	61,453	3,155,603
2004-08	199,668	185,425	192,933	201,413	199,535	196,618	181,918	211,716	242,820	251,970	230,422	210,867	176,053	139,925	120,248	104,301	77,096	65,276	3,188,204
2005-09	198,677	184,844	187,081	198,847	194,343	199,966	177,216	205,021	234,280	251,342	235,846	214,806	183,644	144,800	120,013	104,444	78,564	69,899	3,183,633

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009). http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

CAUCASIAN MALE POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	82,959	83,837	93,237	111,461	115,453	104,632	98,145	81,339	69,237	66,809	66,667	65,197	57,578	44,196	29,758	18,440	10,352	6,397	1,205,694
1981-85	84,785	84,833	92,019	108,599	114,559	106,506	100,888	84,155	72,123	67,961	66,144	64,724	58,206	45,589	30,962	19,201	10,689	6,443	1,218,386
1982-86	86,651	85,841	90,817	105,811	113,673	108,413	103,707	87,068	75,129	69,132	65,625	642,55	58,841	47,026	32,215	19,993	11,037	6,490	1,23,1724
1983-87	88,558	86,861	89,631	103,095	112,793	110,354	106,606	90,082	78,261	70,324	65,110	63,789	59,484	48,508	33,519	20,818	11,396	6,537	1,245,726
1984-88	90,507	87,893	88,459	100,448	111,919	112,330	109,586	93,200	81,523	71,537	64,600	63,327	60,133	50,037	34,875	21,677	11,766	6,584	1,260,401
1985-89	92,499	88,937	87,303	97,869	111,053	114,341	112,649	96,427	84,921	72,771	64,094	62,868	60,789	51,615	36,286	22,572	12,149	6,632	1,275,775
1986-90	94,536	89,993	86,162	95,356	110,193	116,388	115,797	99,764	88,461	74,025	63,592	62,412	61,453	53,243	37,755	23,503	12,544	6,680	1,291,859
1987-91	96,603	91,084	85,801	92,401	109,365	117,553	118,677	103,103	92,377	75,404	63,670	61,899	62,058	54,702	39,395	24,463	12,993	6,954	1,308,504
1988-92	98,415	92,299	85,916	89,772	108,060	117,753	120,867	106,617	95,377	77,933	64,379	61,412	62,459	55,871	41,201	25,486	13,518	7,317	1,324,653
1989-93	99,976	93,496	86,759	87,553	106,568	116,515	122,185	110,104	97,882	81,089	65,921	61,169	62,693	56,848	42,907	26,655	14,105	7,762	1,340,188
1990-94	100,944	94,755	88,204	86,059	104,476	114,058	122,732	113,431	100,104	84,572	68,261	61,295	62,616	57,611	44,554	27,878	14,727	8,326	1,354,604
1991-95	101,316	96,062	90,063	85,584	101,649	110,756	122,359	116,385	102,202	88,543	71,293	61,697	62,429	58,057	46,110	29,235	15,517	8,943	1,368,200
1992-96	100,728	97,455	91,652	86,573	98,014	107,767	121,224	118,867	103,867	93,072	74,142	62,694	62,034	58,543	47,411	30,791	16,313	9,468	1,380,616
1993-97	99,722	98,630	93,312	87,994	94,667	104,786	119,500	120,558	106,495	95,906	77,803	64,290	61,582	59,097	48,364	32,446	17,187	10,003	1,392,341
1994-98	98,201	99,623	94,637	90,036	91,660	102,343	117,163	121,394	109,608	98,028	81,613	66,398	61,292	59,607	49,390	33,899	18,212	10,551	1,403,657
1995-99	96,518	100,126	95,789	92,340	89,600	100,026	114,113	121,704	112,789	99,912	85,260	68,933	61,495	59,930	50,431	35,331	19,290	11,134	1,414,720
1996-00	94,269	99,975	96,920	94,357	88,932	97,325	110,832	121,464	115,584	101,719	88,998	71,844	61,777	60,338	51,357	36,685	20,435	11,787	1,424,600
1997-01	92,809	98,925	98,067	95,791	89,892	93,851	107,793	120,723	117,874	103,230	93,364	74,654	62,618	60,355	52,324	37,907	21,789	12,415	1,434,381
1998-02	92,038	97,369	99,020	96,917	91,678	90,456	104,973	119,239	119,639	105,824	96,193	78,306	64,200	60,112	53,379	38,978	23,227	13,155	1,444,703
1999-03	91,842	95,475	99,777	97,689	93,503	87,784	102,418	117,163	120,526	109,002	98,354	82,255	66,392	59,923	54,320	40,294	24,611	14,094	1,455,422
2000-04	94,820	96,174	102,959	101,051	98,245	88,770	102,796	117,238	124,250	115,365	102,790	88,032	70,507	61,313	55,810	42,205	26,227	15,137	1,503,689
2001-05	96,066	94,122	102,499	101,109	99,283	88,512	99,695	113,475	123,768	118,023	104,439	91,687	73,275	61,092	55,900	43,050	27,313	16,179	1,509,487
2002-06	98,037	93,887	102,045	101,834	100,707	90,788	96,761	110,967	123,980	121,196	106,721	96,727	76,598	62,044	56,031	44,115	28,364	17,388	1,528,190
2003-07	98,714	93,651	100,258	102,340	100,520	93,311	93,018	107,814	122,265	122,861	109,293	99,570	80,221	63,410	55,540	45,016	29,241	18,696	1,535,739
2004-08	99,827	94,485	98,748	103,221	100,845	96,219	90,645	105,471	120,544	124,253	113,037	102,168	84,509	65,722	55,402	45,953	30,412	20,106	1,551,567
2005-09	99,224	93,845	95,727	101,861	99,051	97,632	88,227	102,023	116,365	123,676	115,879	104,201	88,560	68,321	55,412	46,372	31,561	21,948	1,549,885

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009).
http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

CAUCASIAN FEMALE POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	78,619	80,179	88,187	113,136	117,829	104,864	99,309	83,606	71,566	69,165	71,077	71,854	63,550	54,015	42,639	30,847	21,787	18,481	1,280,710
1981-85	80,323	80,997	87,026	110,099	116,793	106,532	101,853	86,153	74,375	70,386	70,456	71,092	64,219	55,670	43,813	31,793	22,344	18,998	1,292,922
1982-86	82,064	81,824	85,880	107,144	115,766	108,227	104,463	88,778	77,294	71,629	69,840	70,338	64,895	57,376	45,020	32,769	22,915	19,529	1,305,751
1983-87	83,842	82,659	84,750	104,269	114,748	109,948	107,139	91,483	80,327	72,893	69,230	69,592	65,578	59,134	46,259	33,774	23,501	20,076	1,319,202
1984-88	85,660	83,502	83,634	101,470	113,739	111,697	109,883	94,271	83,479	74,180	68,626	68,854	66,269	60,945	47,533	34,810	24,102	20,637	1,3332,91
1985-89	87,517	84,354	82,533	98,746	112,739	113,474	112,698	97,143	86,755	75,490	68,027	68,124	66,967	62,812	48,842	35,878	24,719	21,214	1,348,032
1986-90	89,414	85,214	81,446	96,096	111,747	115,279	115,585	100,103	90,159	76,823	67,433	67,401	67,673	64,736	50,187	36,979	25,352	21,808	1,363,437
1987-91	91,290	86,069	81,061	93,036	111,064	116,114	118,271	103,194	93,997	78,251	67,409	66,761	68,282	66,261	51,788	38,067	26,082	22,563	1,379,558
1988-92	93,067	87,022	81,208	90,361	109,925	116,111	120,341	106,481	97,052	80,722	68,076	66,286	68,590	67,291	53,660	39,149	26,846	23,453	1,395,640
1989-93	94,551	88,022	81,847	88,126	108,496	115,042	121,693	109,787	99,568	83,796	69,726	66,059	68,598	67,933	55,649	40,309	27,583	24,557	1,411,340
1990-94	95,596	89,103	83,037	86,568	106,589	11,2945	122,275	113,048	101,733	87,285	72,242	66,230	68,366	68,029	57,749	41,600	28,345	25,750	1,426,490
1991-95	96,096	90,364	84,668	85,845	104,086	110,000	122,059	116,117	103,780	91,295	75,446	66,828	67,968	67,703	59,727	43,058	29,238	27,026	1,441,304
1992-96	95,923	91,678	85,917	86,788	100,461	107,603	120,811	118,818	105,397	95,886	78,549	67,895	67,515	67,498	61,244	44,753	30,105	28,269	1,455,110
1993-97	95,192	92,892	87,211	88,204	97,046	105,184	119,046	120,770	107,742	99,036	82,286	69,534	67187	67,363	62,222	46,707	31,033	29,377	1,468,032
1994-98	93,941	93,950	88,449	90,077	94,136	102,898	116,682	122,041	110,550	101,414	86,036	71,901	67,164	67,227	62,921	48,701	32,115	30,345	1,480,548
1995-99	92,414	94,638	89,577	92,216	92,100	100,633	113,708	122,671	113,514	103,413	89,668	74,743	67,596	67,210	63,103	50,648	33,328	31,293	1,492,473
1996-00	90,257	94,574	90,768	94,336	91,192	97,987	110,354	122,691	116,276	105,190	93,489	77,839	68,286	67,246	63,230	52,351	34,608	32,116	1,502,789
1997-01	88,797	94,011	92,057	94,954	92,734	94,483	107,575	121,708	118,795	106,677	97,902	80,856	69,354	67,150	63,461	53,776	36,102	32,924	1,513,316
1998-02	88,168	92,912	93,163	94,895	95,540	90,998	105,089	120,134	120,907	108,899	101,067	84,527	71,099	67,061	63,710	54,846	37,834	33,970	1,524,819
1999-03	88,438	91,266	94,197	94,957	98,177	88,286	102,806	117,873	122,403	111,701	103,508	88,353	73,537	67,130	63,938	55,832	39,748	35,274	1,537,423
2000-04	92,015	91,813	97,168	97,165	102,529	88,988	103,091	117,674	126,485	117,728	108,162	94,153	77,992	68,949	65,381	57,243	42,097	37,118	1,585,751
2001-05	94,210	89,908	96,780	96,592	103,181	88,975	100,254	113,684	126,320	120,303	109,698	97,737	80,686	69,105	65,059	57,332	43,505	38,712	1,592,041
2002-06	96,989	89,653	96,784	96,569	103,044	92,318	97,542	111,376	126,227	123,680	111,927	102,824	84,034	70,304	65,133	57,845	44,837	40,677	1,611,763
2003-07	98,329	89,558	95,509	97,221	100,438	96,213	93,772	108,411	124,315	125,719	114,059	105,915	87,469	71,718	64,756	57,991	45,714	42,757	1,619,864
2004-08	99,841	90,940	94,185	98,192	98,690	100,399	91,273	106,245	122,276	127,717	117,385	108,699	91,544	74,203	64,846	58,348	46,684	45,170	1,636,637
2005-09	99,453	90,999	91,354	96,986	95,292	102,334	88,989	102,998	117,915	127,666	119,967	110,605	95,084	76,479	64,601	58,072	47,003	47,951	1,633,748

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009).
http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

TOTAL AFRICAN AMERICAN POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	46,897	45,434	51,959	55,157	49,134	42,910	37,844	29,625	24,715	22,107	19,988	18,744	15,266	13,530	9,147	6,527	3,534	2,579	495,097
1981-85	47,798	46,196	51,582	54,338	49,512	44,071	39,300	31,127	25,939	22,701	20,217	18,846	15,518	13,785	9,379	6,711	3,653	2,675	503,348
1982-86	48,717	46,971	51,208	53,532	49,893	45,264	40,812	32,705	27,223	23,311	20,448	18,949	15,774	14,045	9,617	6,900	3,776	2,774	511,919
1983-87	49,653	47,759	50,837	52,737	50,277	46,489	42,383	34,362	28,572	23,938	20,682	19,052	16,035	14,310	9,861	7,095	3,903	2,878	520,823
1984-88	50,607	48,560	50,468	51,954	50,664	47,747	44,014	36,104	29,987	24,581	20,919	19,156	16,300	14,579	10,111	7,295	4,034	2,986	530,066
1985-89	51,579	49,374	50,102	51,183	51,054	49,040	45,708	37934	31,472	25,241	21,159	19,260	16,569	14,853	10,367	7,500	4,170	3,097	539,662
1986-90	52,570	50,202	49,738	50,423	51,446	50,367	47,468	39,856	33,031	25,919	21,402	19,366	16,843	15,132	10,630	7,711	4,310	3,212	549,627
1987-91	54,172	51,175	50,053	49,380	52,258	51,673	49,437	41,844	34,988	26,674	21,825	19,558	17,117	15,379	10,960	7,860	4,499	3,339	562,191
1988-92	56,275	52,448	50,874	48,472	53,098	53,002	51,406	44,030	36,959	27,792	22,436	19,828	17,401	15,598	11,303	8,018	4,680	3,490	577,111
1989-93	58,557	53,977	52,253	48,037	53,735	54,200	53,281	46,384	39,055	29,223	23,336	20,179	17,717	15,768	11,715	8,128	4,887	3,653	594,086
1990-94	60,844	55,778	54,147	48,271	54,031	55,213	55,154	48,880	41,207	31,038	24,457	20,707	18,070	15,855	12,203	8,261	5,096	3,840	613,053
1991-95	62,920	57,989	56,443	49,280	53,969	56,174	56,918	51,458	43,509	33,330	25,785	21,344	18,506	15,917	12,721	8,409	5,361	4,035	634,069
1992-96	63,895	60,622	58,351	51,544	53,045	57,127	58,446	54,115	45,547	36,102	27,134	22,050	19,002	16,076	13,133	8,703	5,540	4,245	654,678
1993-97	64,057	63,449	60,202	54,537	52,021	57,719	59,830	56,586	47,878	38,767	28,753	22,904	19,548	16,313	13,491	8,991	5,742	4,437	675,224
1994-98	64,021	66,258	62,036	57,806	51,513	57,973	61,017	58,851	50,440	41,418	30,550	23,991	20,152	16,671	13,774	9,404	5,871	4,663	696,409
1995-99	63,978	68,919	63,926	61,065	51,864	57,878	61,835	61,040	53,223	43,955	32,627	25,196	20,862	17,138	13,925	9,881	6,005	4,905	718,221
1996-00	64,374	71,027	66,136	64,067	53,217	57,262	62,534	63,030	56,076	46,437	35,125	26,486	21,569	17,779	14,029	10,386	6,143	5,175	740,853
1997-01	65,054	72,187	68,668	66,184	55,750	56,044	62,816	64,727	58,871	48,620	38,016	27,870	22,250	18,402	14,284	10,768	6,400	5,421	762,333
1998-02	66,052	72,427	71,468	67,799	58,888	54,819	62,668	66,024	61,387	50,999	40,812	29,515	23,093	19,006	14,657	11,168	6,678	5,686	783,147
1999-03	66,965	72,306	74,289	69,286	62,010	54,087	62,215	66,882	63,510	53,597	43,489	31,386	24,127	19,632	15,102	11,524	7,083	5,923	803,414
2000-04	68,151	71,914	76,162	70,577	66,593	55,493	62,171	67,673	65,877	56,687	46,259	33,577	25,318	20,323	15,571	11,724	7,570	6,208	827,848
2001-05	68,509	71,176	77,157	71,577	69,120	56,766	60849	67,403	67,128	59,057	48,388	35,892	26,367	20,800	16,146	11,841	7,995	6,499	842,670
2002-06	69,591	71,008	77,931	73,693	71,130	59,730	59,684	67,291	68,730	61,944	50,735	38,948	27,850	21,474	16,807	12,189	8,383	6,937	864,055
2003-07	70,433	71,028	77,412	75,737	72,032	63,251	58,420	66,567	69,572	64,177	52,949	41,674	29,393	22,188	17,326	12,544	8,721	7,374	880,798
2004-08	71,973	71,507	76,952	78,104	73,154	67,202	58,166	66,055	70,368	66,358	55,699	44,443	31,326	23,198	17,969	12,997	9,050	7,913	902,434
2005-09	73,856	74,174	77,192	80,779	75,043	71,694	59,297	65,644	70,489	67,633	57,459	46,004	32,731	23,800	18,176	13,096	9,039	8,233	924,339

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009).
http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

AFRICAN AMERICAN MALE POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	23,413	22,932	25,771	27,047	22,479	19,198	17,162	13,572	11,436	10,281	9,361	8,588	7,120	5,899	3,946	2,611	1,200	808	232,824
1981-85	23,891	23,338	25,628	26,664	22,826	19,852	17,861	14,215	11,990	10,553	9,467	8,635	7,190	6,021	4,026	2,670	1,235	825	236,887
1982-86	24,379	23,752	25,485	26,286	23,179	20,528	18,588	14,888	12,570	10,832	9,574	8,683	7,261	6,146	4,108	2,731	1,271	842	241,103
1983-87	24,876	24,173	25,343	25,914	23,537	21,227	19,345	15,593	13,179	11,118	9,682	8,730	7,333	6,274	4,191	2,793	1,308	859	245,475
1984-88	25,384	24,602	25,202	25,547	23,901	21,949	20,133	16,332	13,817	11,412	9,792	8,778	7,405	6,404	4,276	2,856	1,346	877	250,013
1985-89	25,902	25,038	25,062	25,185	24,270	22,696	20,952	17,106	14,487	11,714	9,903	8,826	7,478	6,536	4,363	2,921	1,386	896	254,721
1986-90	26,431	25,482	24,922	24,828	24,646	23,468	21,805	17,916	15,189	12,024	10,016	8,874	7,552	6,671	4,451	2,988	1,427	914	259,606
1987-91	27,285	25,995	25,079	24,352	25,172	24,218	22,764	18,777	16,088	12,375	10,225	8,954	7,649	6,779	4,574	3,013	1,490	925	265,715
1988-92	28,423	26,651	25,469	23,967	25,637	24,958	23,744	19,765	16,981	12,890	10,507	9,083	7,758	6,867	4,719	3,041	1,549	946	272,956
1989-93	29,636	27,393	26,167	23,794	25,968	25,603	24,686	20,891	17,881	13,544	10,917	9,253	7,899	6,933	4,882	3,067	1,618	969	281,102
1990-94	30,855	28,277	27,146	23,910	26,118	26,116	25,636	22,121	18,792	14,367	11,411	9,519	8,077	6,950	5,074	3,113	1,699	992	290,173
1991-95	31,970	29,365	283,38	24,385	26,063	26,594	26,507	23,431	19,740	15,413	11,998	9,853	8,291	6,933	5,303	3,192	1,792	1,021	300,191
1992-96	32,488	30,680	29,423	25,424	25,618	27,040	27,287	24,768	20,517	16,699	12,595	10,229	8,522	6,981	5,470	3,339	1,848	1,074	310,000
1993-97	32,547	32,134	30,512	26,801	25,168	27,304	27,979	26,010	21,491	17,863	13,334	10,665	8,813	7,062	5,612	3,469	1,919	1,118	319,801
1994-98	32,560	33,663	31,509	28,385	24,975	27,411	28,532	2,7136	22,672	18,977	14,152	11,193	9,144	7,209	5,755	3,633	1,978	1,172	330,057
1995-99	32,552	35,111	32,505	30,077	25,127	27,411	28,852	28,229	24,010	20,038	15,112	11,746	9,515	7,440	5,829	3,802	2,041	1,242	340,637
1996-00	32,685	36,310	33,646	31,728	25,735	27,143	29,164	29,185	25,459	21,032	16,268	12,317	9,918	7,763	5,853	3,995	2,125	1,313	351,639
1997-01	32,932	37,013	34,893	33,052	26,898	26,607	29,251	30,042	269,02	21,814	17,623	12,941	10,315	8,083	5,963	4,143	2,259	1,370	362,099
1998-02	33,346	37,160	36,259	34,125	28,367	26,072	29,153	30,712	28,173	22,838	18,820	13,682	10,760	8,434	6,114	4,330	2,382	1,451	372,179
1999-03	33,649	37,065	37,728	34,977	29,887	25,801	28,952	31,108	29,249	24,061	19,928	14,541	11,254	8,799	6,307	4,524	2,530	1,535	381,895
2000-04	34,094	36,791	38,896	35,893	32,393	26,525	29,075	31,372	30,367	25,505	21,024	15,503	11,760	9,106	6,464	4,604	2,668	1,620	393,660
2001-05	34,188	36,266	39,520	36,444	33,924	27,149	28,578	31,249	30,938	26,711	21,811	16,539	12,189	9,379	6,730	4,627	2,824	1,717	400,783
2002-06	34,696	35,967	40,002	37,505	35,342	28,600	28,149	31,151	31,696	28,158	22,591	17,922	12,814	9,730	7,046	4,757	2,958	1,869	410,973
2003-07	35,098	35,815	39,783	38,507	36,202	30,342	27,659	30,806	32,135	29,254	23,513	19,045	13,463	10,088	7,336	4,878	3,098	1,997	419,019
2004-08	35,869	35,884	39,487	39,814	37,019	32,355	27,675	30,618	32,479	30,301	24,775	20,141	14,311	10,544	7,671	5,041	3,258	2,156	429,398
2005-09	36,762	37,124	39,480	41,038	37,658	34,346	28,031	30,534	32,632	31,188	31,188	20,828	14,981	10,859	7,835	5,110	3,268	2,187	439,669

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009). http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

AFRICAN AMERICAN FEMALE POPULATION

Years	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
1980-84	23,486	22,500	26,187	28,110	26,638	23,700	20,681	16,052	13,279	11,827	10,628	10,155	8,143	7,631	5,200	3,915	2,336	1,769	262,237
1981-85	23,909	22,856	25,953	27,674	26,662	24,203	21,438	16,910	13,949	12,149	10,751	10,210	8,323	7,764	5,352	4,039	2,419	1,847	266,408
1982-86	24,339	23,217	25,721	27,245	26,686	24,717	22,223	17,814	14,653	12,480	10,875	10,266	8,508	7,899	5,508	4,167	2,505	1,929	270,752
1983-87	24,777	23,584	25,491	26,822	26,709	25,242	23,036	18,766	15,393	12,819	11,001	10,322	8,696	8,036	5,669	4,300	2,594	2,015	275,272
1984-88	25,223	23,957	25,263	26,407	26,733	25,778	23,879	19,769	16,170	13,168	11,128	10,379	8,888	8,176	5,835	4,437	2,687	2,104	279,981
1985-89	25,677	24,336	25,037	25,997	26,757	26,326	24,753	20,826	16,985	13,526	11,256	10,436	9,084	8,318	6,005	4,578	2,783	2,197	284,877
1986-90	26,139	24,720	24,813	25,594	26,781	26,885	25,660	21,939	17,842	13,894	11,386	10,494	9,285	8,462	6,180	4,723	2,883	2,295	289,975
1987-91	26,887	25,179	24,972	25,028	27,073	27,446	26,670	23,068	18,900	14,298	11,601	10,605	9,463	8,600	6,388	4,848	3,009	2,411	296,445
1988-92	27,852	25,797	25,404	24,506	27,453	28040	27,660	24,264	19,978	14,902	11,929	10,746	9,640	8,732	6,585	4,978	3,131	2,544	304,139
1989-93	28,921	26,584	26,086	24,242	27,764	28,595	28,594	25,493	21,174	15,679	12,419	10,926	9,817	8,835	6,834	5,063	3,269	2,684	312,978
1990-94	29,989	27,501	27,002	24,361	27,913	29,097	29,518	26,760	22,415	16,671	13,045	11,188	9,992	8,905	7,129	5,148	3,397	2,848	322,880
1991-95	30,951	28,624	28,105	24,896	27,906	29,580	30,411	28,027	23,768	17,917	13,787	11,492	10,215	8,984	7,418	5,217	3,568	3,014	333,879
1992-96	31,407	29,943	28,928	26,120	27,427	30,087	31,159	29,347	25,031	19,403	14,540	11,821	10,480	9,095	7,663	5,364	3,692	3,171	344,678
1993-97	31,511	31,314	29,690	27,737	26,853	30,415	31,852	30,577	26,387	20,904	15,419	12,239	10,735	9,251	7,878	5,521	3,823	3,319	355,424
1994-98	31,461	32,595	30,528	29,420	26,538	30,562	32,485	31,715	27,768	22,441	16,398	12,798	11,008	9,462	8,019	5,771	3,893	3,490	366,352
1995-99	31,426	33,808	31,421	30,987	26,737	30,467	32,983	32,811	29,213	23,917	17,516	13,449	11,348	9,698	8,096	6,080	3,965	3,663	377,584
1996-00	31,689	34,717	32,490	32,339	27,482	30,120	33,370	33,845	30,617	25,405	18,857	14,169	11,650	10,016	8,177	6,391	4,018	3,862	306,470
1997-01	32,122	35,174	33,775	33,132	28,852	29,438	33,564	34,685	31,970	26,806	20,393	14,929	11,936	10,319	8,322	6,625	4,141	4,051	233,242
1998-02	32,707	35,267	35,209	33,674	30,521	28,747	33,515	35,311	33,214	28,161	21,992	15,833	12,333	10,571	8,544	6,838	4,296	4,235	410,968
1999-03	33,316	35,241	36,561	34,310	32,123	28,287	33,263	35,775	34,262	29,535	23,562	16,845	12,872	10,833	8,795	7,000	4,552	4,388	421,519
2000-04	34,057	35,123	37,266	34,684	34,200	28,968	33,096	36,301	35,510	31,182	25,235	18,074	13,558	11,217	9,107	7,120	4,902	4,588	434,188
2001-05	34,321	34,910	37,637	35,133	35,196	29,617	32,271	36,154	36,190	32,346	26,577	19,353	14,178	11,421	9,416	7,214	5,171	4,782	441,887
2002-06	34,895	35,041	37,909	36,188	35,788	31,130	31,535	36,140	37,034	33,786	28,144	21,026	15,036	11,744	9,761	7,432	5,425	5,068	453,082
2003-07	35,335	35,213	37,629	37,230	35,830	32,909	30,761	35,761	37,437	34,923	29,436	22,629	15,930	12,100	9,990	7,666	5,623	5,377	461,779
2004-08	36,104	35,623	37,465	38,290	36,135	34,847	30,491	35,437	37,889	36,057	30,924	24,302	17,015	12,654	10,298	7,956	5,792	5,757	473,036
2005-09	37,094	37,050	37,712	39,741	37,385	37,348	31,266	35,110	37,857	36,445	31,651	25,176	17,750	12,941	10,341	7,986	5,771	6,046	484,670

DATA SOURCES: Delaware Population Consortium, Population Projection Series. October 2010 (for 2004–2008) and March 2012 (for 2005–2009).
http://stateplanning.delaware.gov/information/dpc_projections.shtml – accessed 7/17/2012.

Appendix E: Behavioral Risk Factors

The Behavioral Risk Factor Surveillance System (BRFSS) is the world's largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. The survey was developed to monitor the statewide prevalence of behavioral risk factors that influence premature morbidity and mortality. The BRFSS survey includes a core set of questions developed by the Centers for Disease Control and Prevention (CDC) and is administered to adults ages 18 and older as a random-digit-dial telephone survey. BRFSS survey 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 use.[36]

Delaware's Behavioral Risk Factor Surveillance (BRFS) system is a collaborative effort between Delaware's Division of Public Health (DPH) and the CDC. The data provided below relate to risk factor prevalence among Delawareans for 2011. Data on cancer screening patterns among Delawareans are provided in relevant cancer site sections throughout this document; breast, cervix, colon and rectum and prostate. Survey results that are related to specific cancers are included in those sections of this report (e.g., smoking prevalence is in the lung cancer section).[37]

Overweight/Obesity

Being overweight or obese is a risk factor for numerous cancers, including female breast (in postmenopausal women), 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) between 25 and 30 and obese as a BMI equal to or greater than 30. BMI is calculated using an individual's height and weight. The following data are specific to the 2011 BRFS:

- In Delaware, 63.8 percent of adults ages 18 and over were overweight or obese. At the national level, 63.5 percent of adults were overweight or obese. This difference is not statistically significant.
    - The prevalence of overweight in Delaware differed significantly by sex: 41.6 percent of males and 28.7 percent of females are overweight in 2011.
    - The prevalence of obesity among adult Delawareans did not, however, differ by sex: 29.0 percent of males and 28.6 percent of females are obese in 2011.
    - Significantly more African Americans than Caucasians in Delaware are obese (38.2 percent vs. 27.2 percent, respectively).
    - The prevalence of overweight did not differ significantly between Caucasians and African Americans (35.9 percent vs. 33.4 percent, respectively).
    - The prevalence of obesity was statistically significantly higher among adults with less than a high school education than among college graduates (35.2 percent vs. 24.1 percent, respectively).
    - The prevalence of obesity was also statistically significantly higher among adults with some education after high school than among college graduates (30.9 percent vs. 24.1 percent, respectively).
    - The prevalence of obesity (26.8 percent) was lowest among adults with an income level of more than $50,000. This prevalence was of borderline statistical significance when compared with adults earning $15,000-$24,999 (35.6 percent).
    - No significant difference in overweight prevalence was observed either by education or income level.
    - The state's prevalence of obesity was highest among adults ages 55-64 (36.1 percent). Persons age 65 and older had the highest prevalence of overweight (40.1 percent).

[36] Behavioral Risk Factor Surveillance System http://www.cdc.gov/brfss/

[37] Delaware Behavioral Risk Factor Survey – Measuring Behaviors that Affect Health. http://www.dhss.delaware.gov/dph/dpc/brfsurveys.html

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, type 2 diabetes and stroke, and improved overall well-being.

Respondents in the 2011 survey are considered “physically active” if they respond ‘yes’ to the question: “Did you participate in 150 or more minutes of aerobic physical activity per week?”

* In Delaware, 48.5 percent of adults ages 18 and older were considered physically active compared with 51.7 percent at the national level.
* The prevalence of adults who reported they were physically active did not differ significantly by sex (50.1 percent male vs. 47.0 percent female) or by race (49.7 percent Caucasian vs. 46.4 percent African American).
* Females were less likely to meet the criteria for being physically active than men (47.0 percent versus 50.1 percent) but the difference was not statistically significant.
* African Americans were less likely to be physically active than Caucasians (46.4 percent vs. 49.7, respectively) but the difference was not statistically significant.
* The prevalence of being physical active in Delaware was significantly higher for adults ages 18-24 (62.8 percent) compared to age groups 35 and older.
* The prevalence of physical activity was significantly lower among those earning $15,000-$24,999 (34.8 percent) compared to those earning $35,000-$49,000 (50.8 percent) and those earning $55,000 or more (52.2 percent).
* Significantly more college graduates (55.3 percent) were physically active than those with a high school education or equivalent (43.5 percent).

Dietary Fruits and Vegetables

A diet high in fruits and vegetables is a protective factor against numerous cancers, including breast, cervical, colorectal, uterine, esophageal, oral cavity, ovarian, pancreatic, prostate and stomach cancers. The following data are specific to the 2009 BRFS:

* More adults 18 and older in Delaware consumed five or more servings of fruits and vegetables a day compared to adults at the national average (25.0 Delaware vs. 23.4 percent U.S.). This difference was not statistically significant.
* Significantly fewer Delaware males (21.7 percent) consumed five or more servings of fruits and vegetables daily than females (28.0 percent).
* In Delaware, a larger percent of Caucasians (24.9 percent) than African Americans (20.6 percent) consumed five or more servings of fruits and vegetables daily but the difference was not statistically significant.

Appendix F: Title 16 Chapter 292 of the Delaware Code

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 track. The census tracks will be identified on the maps and shall be color-coded to designate the degree of cancer incidence in each track. 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

Appendix G: Cancer Incidence by Census Tract Methodology

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 Delaware Cancer Registry (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 P.O. 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 files created for DPH by the DCR include all eligible[38] cancer cases diagnosed among Delawareans in each of the two five-year time periods:

- January 1, 2004 – December 31, 2008
- January 1, 2005 – December 31, 2009

For each of the two time periods, 100 percent of the cases were successfully geocoded; i.e. the residential census tract of the individual was identified. The table below shows the percentage level of certainty of the census tract assignments in each time period. Note that since Delaware uses five-year time periods to calculate incidence rates, the two time periods have four calendar years in common. The level of certainty code indicates the basis of the assignment of census tract for each individual. In each time period, more that 99 percent of cases were assigned based on a complete and valid address of residence.

Time period	2004–2008	2005–2009
Census tract based on:		
1 – complete and valid street address of residence	99.1%	99.3%
2 – residence ZIP + 4	0.0%	0.0%
3 – residence ZIP + 2	0.2%	0.2%
4 – residence ZIP code only	0.7%	0.4%
5 – ZIP code of P.O. Box	0.1%	0.1%
Total number of cases	**24,383**	**25,068**

Five-Year Population Estimates by Census Tract

As of the 2000 U.S. Census, Delaware was comprised of 197 census tracts and census tract analyses through 2003-2007 used the 2000 Census tract designations. As of the 2010 U.S. Census, however, the state of 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, and Sussex County includes 53 tracts numbered 501.01 through 519.00.

[38] 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.

Census tract populations for 2004–2008 and 2005–2009 were calculated using estimates from the Delaware Population Consortium (DPC) and both the 2000 Census and 2010 Census. Population data specific for five-year age category and census tract from the 2000 and 2010 Census data were used to calculate the proportion that each of the 18 age groups contributed to the overall census tract population. For intervening years, age-specific proportions by extrapolating between 2000 and 2010 estimates.

For each census tract, denominators for each year within the five-year study period were summed to obtain the total population for the five-year study period. Five-year population estimates for the 2005–2009 study period range in size from 3,468 for Census Tract 511.01 to 50,241 for Census Tract 402.02. These census tracts are located in Sussex and Kent Counties, respectively.

Age-Adjusted and Crude Incidence Rates, by Census Tract

For each census tract, cross-tabulations (age group x census tract) were created to determine the number of cancer cases diagnosed by census tract and age group. These frequencies were used to calculate crude incidence rates at the census tract level.

Crude incidence rates represent the total number of new cancer diagnoses divided by the total population at risk, without consideration of any age-related characteristics of the population. To calculate a crude incidence rate by census tract, the number of cancer cases diagnosed in each age group is divided by the population size for that specific age group and these values were then multiplied by 100,000 (Equation 1).

Equation 1: 2005–2009 Crude All Site Incidence Rate, 40-44 year olds, Census Tract 999.99

$$\frac{(\text{No. cancer cases (2005 - 2009) among } 45-49 \text{ year olds in CT}999.99)}{(2005-2009 \text{ population, } 45-49 \text{ year olds in CT}999.99)} = \frac{(5)}{(929)} \times 100{,}000 = 538.2 \text{ per } 100{,}000$$

Age-adjusted incidence rates were then calculated to 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 were multiplied by the appropriate 2000 U.S. Standard Population weight for that age group (Appendix B). Age-adjusted incidence rates for each of the 18 age groups were then summed to yield the age-adjusted incidence rate for an entire census tract.

Age-Adjusted Incidence Rate for the State of Delaware

The average annual age-adjusted cancer incidence rate for the state of Delaware was calculated for each of the two time periods. Cross-tabulations (age group x census tract) were performed to determine the number of cancer cases diagnosed for each of the eighteen age groups. Using the process described above, frequencies were used to calculate crude and age-adjusted incidence rates at the state level.

Calculation of 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 the following formulas:

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

$$\text{Upper Confidence Limit} = \text{AA Rate} + 1.96\left(\frac{(\text{AA Rate})}{\sqrt{\#\text{ Cases}}}\right),$$

- 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 the following formulas:

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

$$\text{Upper Confidence Limit} = \text{AA Rate} \times U,$$

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 cases.[39]

Comparing Census Tract Rates to the State Rate

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 and 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 will 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 incidence rate is compared to the all-site incidence rate for the state of Delaware. This allows DPH to identify any census tracts that have a cancer incidence rate that is statistically significantly higher or lower than the incidence rate for Delaware as a whole. 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 significantly higher or lower cancer rates compared to the state are denoted in the rate table in Appendix I and in all color-coded maps in Appendices J and K for 2004–2008 and Appendices L and M for 2005–2009.

Supplemental Information

For 2004–2008 only one census tract had a rate that was based on fewer than 25 cases and for 2005–2009 there were two census tracts with less than 25 cancer cases. 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 which 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 are denoted in both the rate table and color-coded maps since they should be interpreted with caution.

[39] 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.

Appendix H: Interpretation of Cancer Incidence Rates by Census Tract

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 and 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.
- We have provided a table that shows the confidence interval for the cancer rate in each census tract and for the state as a whole. 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. The following information is presented to help interpret the information on "Cancer Rates by Census Tract."

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 still have some amount of 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, we have a special problem when we try to interpret this snapshot.

In a small group, such as a census tract, the snapshot changes a lot 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. In Delaware, we publish five-year cancer incidence rates (2004–2008 and 2005–2009 in this report) to allow for better understanding of cancer patterns among small populations. Cancer rates for five-year time periods are less vulnerable to the yearly fluctuations of cancer cases diagnosed in small populations.

We can tell how much uncertainty there is in cancer rate by looking at 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 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 lower confidence limit is very narrow, there is much less uncertainty in the cancer rate.

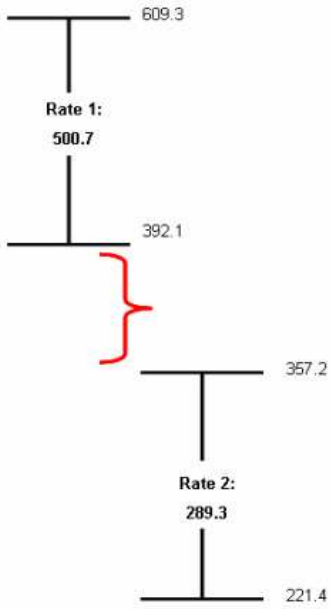
The width of a confidence interval depends on two things: (a) the number of people living in that area and (b) the number of cancer cases diagnosed in that area.

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 to work with. Cancer rates for small areas will probably have very wide confidence intervals.

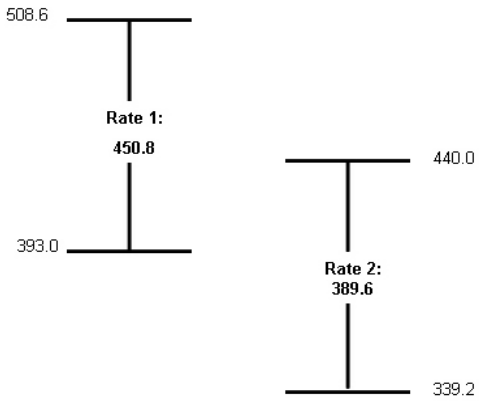
On the other hand, when a cancer rate is calculated for a very large area (like a state or a country), many people live in that area. The odds are that in such a large area, more people will have been diagnosed with cancer compared to a smaller area. When a cancer rate is calculated for a large area, researchers are more certain of the level of cancer in that area. This means that cancer rates for large areas will usually have very narrow confidence intervals.

Confidence intervals are important for another reason, too. They help researchers figure out 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 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.



On the other hand, 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 of Delaware. This means that we were able to tell if any census tracts had a significantly higher-than-expected or lower-than-expected overall cancer rate compared to the whole state.

To help you interpret the cancer rates for any census tract, we are providing maps, plus a table that lists the actual rate and the confidence intervals for both the state as a whole and for each census tract. When you look at the cancer rate for your 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, you should draw conclusions cautiously, keeping in mind that even our best guess may overestimate or underestimate the actual rate of cancer in a census tract.

Appendix I: Age-Adjusted Cancer Incidence Rates & 95 Percent Confidence Intervals by 2010 Census Tract and Time Period; 2004-2008 and 2005-2009

Yellow = Incidence rate is significantly **higher** than the state rate.

Blue = Incidence rate is significantly **lower** than the state rate.

2010 Census Tract ID	Age-Adjusted Incidence Rates (AAR) and 95% Confidence Intervals (95% CI) by Census Tract 2010 and Time Period	
	2004–2008 **DE: 515.6 (509.1, 522.1)**	**2005–2009** **DE: 515.6 (509.2, 522.0)**
	AAR (95% CI)	**AAR (95% CI)**
2.00	556.4 (467.7 , 645.2)	559.9 (470.9 , 648.9)
3.00	513.7 (408.0 , 638.5)	525.9 (417.7 , 653.7)
4.00	511.9 (415.1 , 624.5)	491.3 (396.5 , 601.8)
5.00	388.3 (301.5 , 492.2)	414.9 (325.2 , 521.7)
6.01	516.7 (397.9 , 659.8)	527.0 (407.5 , 670.4)
6.02	683.2 (553.8 , 812.7)	639.1 (518.9 , 778.9)
9.00	513.4 (375.9 , 684.8)	613.3 (460.7 , 800.2)
11.00	416.4 (343.7 , 489.1)	391.8 (323.4 , 460.2)
12.00	509.2 (368.5 , 685.9)	497.4 (361.4 , 667.8)
13.00	436.0 (358.3 , 513.7)	454.6 (374.6 , 534.6)
14.00	403.0 (309.7 , 515.7)	469.0 (364.2 , 594.6)
15.00	417.9 (318.2 , 539.1)	371.6 (281.4 , 481.4)
16.00	361.4 (253.1 , 500.3)	333.5 (232.3 , 463.8)
19.02	430.0 (278.3 , 634.8)	404.2 (261.6 , 596.7)
21.00	576.1 (430.3 , 755.5)	562.5 (418.8 , 739.6)
22.00	355.0 (254.8 , 481.6)	382.9 (280.3 , 510.7)
23.00	459.0 (348.6 , 593.4)	484.3 (370.5 , 622.1)
24.00	427.8 (346.4 , 509.2)	421.1 (340.9 , 501.2)
25.00	636.8 (517.6 , 775.3)	626.2 (507.2 , 764.7)
26.00	476.6 (377.9 , 593.2)	487.1 (386.9 , 605.5)
27.00	413.5 (274.8 , 597.7)	399.7 (261.1 , 585.7)
28.00	433.3 (306.6 , 594.8)	404.9 (283.6 , 560.6)
29.00	569.7 (459.1 , 680.3)	535.4 (433.7 , 653.8)
30.02	370.9 (248.4 , 532.6)	312.1 (203.9 , 457.3)
101.01	524.6 (427.5 , 621.8)	501.7 (407.5 , 595.9)
101.04	588.7 (477.4 , 718.1)	589.9 (479.4 , 718.1)
102.00	454.1 (344.0 , 588.4)	441.4 (333.5 , 573.2)

.

2010 Census Tract ID	Age-Adjusted Incidence Rates (AAR) and 95% Confidence Intervals (95% CI) by Census Tract 2010 and Time Period	
	2004–2008 DE: 515.6 (509.1, 522.1)	2005–2009 DE: 515.6 (509.2, 522.0)
	AAR (95% CI)	AAR (95% CI)
103.00	570.5 (461.0 , 698.1)	551.7 (443.6 , 678.1)
104.00	480.5 (395.6 , 565.5)	554.9 (463.7 , 646.2)
105.02	497.8 (422.6 , 573.1)	478.7 (404.5 , 552.9)
107.02	521.4 (432.1 , 610.6)	525.9 (435.8 , 615.9)
108.00	498.5 (425.2 , 571.7)	494.7 (421.6 , 567.8)
109.00	491.1 (395.3 , 586.9)	517.2 (418.7 , 615.6)
110.00	522.7 (429.1 , 616.2)	504.1 (410.3 , 597.9)
111.00	578.2 (475.2 , 681.3)	546.5 (446.6 , 646.4)
112.01	505.6 (389.4 , 645.7)	503.6 (387.0 , 644.3)
112.02	583.6 (487.6 , 679.6)	564.9 (471.7 , 658.1)
112.03	464.0 (379.9 , 548.1)	448.9 (366.1 , 531.6)
112.04	473.9 (388.4 , 559.4)	448.3 (365.6 , 531.0)
112.05	537.2 (421.8 , 674.3)	411.9 (312.8 , 532.5)
112.06	509.1 (432.8 , 585.5)	505.5 (429.1 , 582.0)
113.00	508.3 (409.6 , 606.9)	505.9 (407.2 , 604.6)
114.00	465.0 (386.6 , 543.5)	461.3 (383.7 , 538.8)
115.00	466.1 (374.3 , 573.6)	433.4 (346.2 , 535.9)
116.00	535.3 (439.5 , 631.1)	444.1 (357.0 , 531.1)
117.00	420.6 (354.2 , 487.1)	420.2 (355.3 , 485.1)
118.00	488.9 (418.4 , 559.3)	483.2 (412.6 , 553.8)
119.00	524.4 (432.1 , 616.7)	490.7 (401.4 , 580.0)
120.00	580.4 (493.9 , 666.9)	586.3 (498.9 , 673.6)
121.00	559.0 (452.1 , 665.9)	567.2 (460.2 , 674.2)
122.00	593.1 (492.3 , 694.0)	567.3 (469.0 , 665.6)
123.00	457.6 (350.1 , 587.8)	495.8 (384.2 , 629.6)
124.00	472.8 (383.6 , 562.0)	464.3 (375.9 , 552.7)
125.00	506.7 (425.6 , 587.8)	488.8 (409.0 , 568.6)
126.00	569.2 (457.6 , 680.7)	546.1 (440.8 , 669.1)
127.00	567.8 (485.3 , 650.3)	551.2 (469.1 , 633.4)
129.00	565.3 (465.4 , 665.2)	586.2 (485.0 , 687.3)
130.00	567.6 (441.6 , 718.3)	606.3 (474.4 , 763.5)
131.00	663.8 (535.8 , 813.3)	605.4 (483.6 , 748.6)
132.00	490.6 (385.9 , 615.0)	462.5 (359.9 , 585.4)

.

2010 Census Tract ID	Age-Adjusted Incidence Rates (AAR) and 95% Confidence Intervals (95% CI) by Census Tract 2010 and Time Period	
	2004–2008 DE: 515.6 (509.1, 522.1)	2005–2009 DE: 515.6 (509.2, 522.0)
	AAR (95% CI)	AAR (95% CI)
133.00	603.9 (483.7 , 744.9)	577.2 (459.7 , 715.5)
134.00	484.5 (391.1 , 593.6)	484.1 (391.2 , 592.5)
135.01	449.1 (395.6 , 502.7)	458.0 (404.2 , 511.7)
135.03	546.5 (473.8 , 619.2)	535.3 (464.1 , 606.6)
135.05	441.4 (349.4 , 550.1)	467.3 (374.3 , 576.4)
135.06	547.3 (446.0 , 648.7)	551.7 (453.8 , 649.6)
136.04	499.5 (410.8 , 588.1)	534.3 (442.5 , 626.2)
136.07	462.5 (390.1 , 534.8)	458.4 (387.4 , 529.4)
136.08	391.6 (282.2 , 529.3)	407.4 (296.0 , 547.0)
136.10	475.3 (394.5 , 556.1)	427.7 (353.6 , 501.8)
136.11	445.3 (366.9 , 523.7)	407.9 (334.6 , 481.2)
136.12	397.4 (331.1 , 463.8)	379.9 (316.5 , 443.3)
136.13	531.4 (451.0 , 611.7)	526.4 (446.8 , 606.0)
136.14	406.0 (313.4 , 517.5)	392.2 (301.3 , 501.7)
136.15	493.8 (414.5 , 573.1)	549.0 (464.7 , 633.3)
137.00	553.3 (447.1 , 677.1)	562.7 (454.2 , 689.3)
138.00	453.4 (374.3 , 532.6)	470.5 (389.6 , 551.4)
139.01	668.5 (537.6 , 821.7)	566.0 (449.5 , 703.5)
139.03	479.9 (379.9 , 598.1)	491.8 (389.4 , 613.0)
139.04	506.6 (415.2 , 598.0)	538.8 (445.5 , 632.1)
140.00	531.1 (437.6 , 624.6)	523.2 (431.5 , 614.9)
141.00	535.8 (436.6 , 635.1)	531.3 (432.9 , 629.7)
142.00	492.4 (363.0 , 652.8)	450.5 (327.3 , 604.8)
143.00	411.9 (339.1 , 484.7)	458.1 (381.1 , 535.1)
144.02	457.5 (359.2 , 574.3)	451.0 (354.1 , 566.2)
144.03	463.3 (368.5 , 575.1)	471.6 (375.1 , 585.4)
144.04	439.5 (351.5 , 542.8)	438.7 (352.7 , 539.2)
145.01	592.5 (396.8 , 850.9)	524.8 (345.8 , 763.5)
145.02	553.1 (358.0 , 816.5) §	521.1 (333.9 , 775.4)
147.02	428.1 (314.5 , 569.2)	424.7 (313.2 , 563.2)
147.03	488.8 (405.1 , 572.5)	510.6 (426.0 , 595.2)
147.05	556.8 (468.9 , 644.8)	541.4 (456.2 , 626.7)

§ Age-adjusted incidence rate is based on fewer than 25 cases.

2010 Census Tract ID	Delaware's Age-Adjusted Incidence Rate and 95% Confidence Interval by Census Tract 2010 and Time Period	
	2004–2008 DE: 515.6 (509.1, 522.1)	2005–2009 DE: 515.6 (509.2, 522.0)
	AAR (95% CI)	AAR (95% CI)
147.06	542.4 (387.5 , 738.6)	565.4 (407.5 , 764.3)
148.03	506.1 (415.6 , 596.7)	493.6 (405.3 , 581.9)
148.05	517.3 (434.3 , 600.4)	533.5 (451.6 , 615.4)
148.07	579.3 (482.3 , 676.3)	595.9 (498.6 , 693.3)
148.08	462.3 (377.4 , 547.2)	514.8 (425.9 , 603.6)
148.09	504.1 (422.3 , 585.9)	509.0 (429.9 , 588.1)
148.10	586.0 (492.9 , 679.2)	593.3 (502.8 , 683.8)
149.03	512.0 (413.6 , 610.5)	577.5 (469.6 , 685.4)
149.04	529.0 (433.6 , 624.5)	464.0 (376.9 , 551.1)
149.06	532.1 (411.5 , 676.9)	528.5 (410.4 , 669.9)
149.07	486.2 (391.9 , 596.2)	500.4 (406.7 , 609.2)
149.08	433.4 (313.6 , 583.7)	355.0 (248.6 , 491.4)
149.09	565.8 (462.0 , 669.7)	616.8 (509.9 , 723.6)
150.00	499.0 (413.9 , 584.2)	520.4 (434.5 , 606.3)
151.00	558.8 (462.7 , 654.9)	567.0 (469.9 , 664.1)
152.00	603.1 (512.4 , 693.7)	618.1 (526.0 , 710.3)
154.00	513.3 (415.3 , 627.4)	475.8 (382.1 , 585.5)
155.02	500.4 (392.2 , 629.2)	464.8 (360.9 , 589.2)
156.00	697.8 (565.9 , 851.3)	651.3 (524.4 , 799.7)
158.02	511.5 (386.4 , 664.2)	433.3 (318.4 , 576.2)
159.00	615.9 (504.3 , 727.5)	637.5 (524.4 , 750.6)
160.00	622.2 (504.0 , 759.9)	615.7 (496.9 , 754.3)
161.00	512.7 (395.1 , 630.3)	550.1 (434.8 , 686.6)
162.00	530.9 (413.9 , 648.0)	578.6 (464.7 , 712.1)
163.01	621.0 (519.2 , 722.8)	626.3 (526.4 , 726.2)
163.02	520.3 (430.9 , 609.7)	529.9 (442.4 , 617.4)
163.05	526.5 (443.9 , 609.1)	464.2 (388.4 , 540.1)
164.01	531.3 (428.2 , 634.4)	552.3 (451.8 , 652.8)
164.04	582.7 (468.0 , 717.1)	527.3 (420.6 , 652.9)
166.01	544.9 (471.9 , 617.9)	559.7 (489.5 , 629.9)
166.02	480.5 (387.7 , 573.3)	480.1 (392.0 , 568.2)
166.04	610.3 (522.1 , 698.5)	589.3 (506.4 , 672.2)

2010 Census Tract ID	Delaware's Age-Adjusted Incidence Rate and 95% Confidence Interval by Census Tract 2010 and Time Period	
	2004–2008 DE: 515.6 (509.1, 522.1)	2005–2009 DE: 515.6 (509.2, 522.0)
	AAR (95% CI)	AAR (95% CI)
166.08	579.8 (472.5 , 687.2)	611.1 (501.8 , 720.5)
168.01	449.3 (362.6 , 550.4)	432.0 (350.3 , 527.0)
168.04	607.9 (492.7 , 723.0)	593.9 (487.2 , 700.6)
169.01	589.2 (463.4 , 738.5)	511.6 (396.5 , 649.8)
169.04	584.2 (461.0 , 730.1)	556.5 (442.0 , 691.7)
401.00	593.1 (503.4 , 682.7)	586.5 (499.6 , 673.4)
402.01	596.8 (488.7 , 705.0)	610.2 (502.3 , 718.0)
402.02	521.9 (461.1 , 582.7)	534.7 (475.4 , 594.1)
402.03	383.6 (301.7 , 480.8)	436.4 (349.6 , 538.3)
405.01	462.2 (378.8 , 545.6)	518.5 (432.0 , 605.0)
405.02	446.7 (356.8 , 552.4)	422.5 (335.5 , 525.2)
407.00	488.2 (408.5 , 568.0)	487.2 (409.2 , 565.1)
409.00	426.2 (335.6 , 516.8)	433.6 (347.3 , 534.8)
410.00	467.8 (384.1 , 551.5)	436.6 (357.1 , 516.0)
411.00	113.6 (41.7 , 247.3) **§**	21.1 (5.7 , 53.9) **§**
412.00	552.8 (448.5 , 657.0)	516.8 (418.4 , 615.2)
413.00	543.4 (411.6 , 704.1)	540.4 (409.3 , 700.1)
414.00	469.6 (370.0 , 587.8)	546.2 (440.3 , 669.9)
415.00	602.6 (501.7 , 703.5)	579.0 (482.1 , 676.0)
416.00	561.7 (456.0 , 684.5)	589.8 (476.4 , 703.1)
417.01	595.6 (508.4 , 682.9)	639.0 (551.8 , 726.3)
417.02	535.5 (438.5 , 632.6)	577.3 (478.4 , 676.1)
418.01	573.7 (502.4 , 644.9)	549.1 (481.3 , 616.9)
418.02	596.1 (484.2 , 708.0)	597.4 (490.5 , 704.3)
419.00	571.2 (478.6 , 663.9)	603.9 (510.1 , 697.8)
420.00	594.9 (479.0 , 730.4)	594.9 (481.9 , 726.5)
421.00	682.9 (571.0 , 794.8)	660.6 (553.4 , 767.7)
422.01	487.4 (408.8 , 565.9)	485.7 (410.7 , 560.7)
422.02	579.1 (500.8 , 657.4)	570.6 (495.7 , 645.5)
425.00	544.2 (439.7 , 665.9)	583.8 (470.5 , 697.1)
428.00	658.0 (571.5 , 744.6)	673.0 (587.5 , 758.5)
429.00	536.9 (444.9 , 628.8)	506.9 (420.8 , 593.1)

§ Age-adjusted incidence rate is based on fewer than 25 cases.

2010 Census Tract ID	Delaware's Age-Adjusted Incidence Rate and 95% Confidence Interval by Census Tract 2010 and Time Period	
	2004–2008 DE: 515.6 (509.1, 522.1)	2005–2009 DE: 515.6 (509.2, 522.0)
	AAR (95% CI)	AAR (95% CI)
430.00	544.0 (456.6 , 631.3)	511.2 (427.7 , 594.7)
431.00	512.3 (405.6 , 638.5)	562.2 (450.9 , 692.7)
432.02	525.3 (430.1 , 620.5)	580.1 (481.5 , 678.7)
433.00	514.7 (433.1 , 596.3)	552.3 (465.9 , 638.7)
434.00	445.6 (365.2 , 526.1)	496.0 (412.3 , 579.7)
501.01	427.1 (343.4 , 510.8)	432.3 (349.6 , 515.0)
501.03	525.5 (436.5 , 614.5)	561.3 (472.6 , 649.9)
501.04	533.4 (441.0 , 625.8)	520.7 (430.9 , 610.6)
501.05	622.4 (522.2 , 722.7)	635.5 (536.7 , 734.3)
502.00	498.6 (392.2 , 625.0)	466.3 (364.2 , 588.1)
503.01	434.3 (369.0 , 499.6)	461.8 (395.8 , 527.8)
503.02	633.3 (529.1 , 737.5)	598.5 (500.1 , 697.0)
504.01	530.2 (430.7 , 629.8)	595.2 (490.8 , 699.5)
504.03	570.6 (461.1 , 698.2)	524.6 (421.3 , 645.5)
504.05	512.6 (426.4 , 598.7)	551.6 (461.5 , 641.7)
504.06	600.5 (514.2 , 686.8)	592.0 (507.4 , 676.6)
504.07	527.3 (441.2 , 613.4)	563.5 (475.7 , 651.4)
504.08	514.4 (422.0 , 606.8)	480.6 (394.3 , 567.0)
505.01	386.7 (304.7 , 484.0)	460.8 (371.9 , 564.5)
505.03	422.8 (336.2 , 524.7)	430.2 (342.6 , 533.3)
505.04	515.9 (427.9 , 603.9)	514.6 (428.1 , 601.1)
506.01	565.1 (469.4 , 660.8)	588.3 (492.2 , 684.4)
506.02	518.9 (441.4 , 596.5)	563.1 (483.5 , 642.8)
507.01	628.4 (526.8 , 729.9)	560.6 (466.7 , 654.5)
507.03	526.3 (423.2 , 647.0)	494.9 (397.9 , 608.3)
507.04	552.5 (470.4 , 634.6)	549.1 (468.9 , 629.4)
507.05	522.9 (452.6 , 593.1)	534.8 (464.3 , 605.4)
507.06	596.9 (482.1 , 711.6)	607.0 (490.9 , 723.1)
508.01	523.6 (424.6 , 638.8)	487.9 (394.7 , 596.4)
508.02	529.6 (441.9 , 617.3)	497.3 (414.7 , 580.0)
508.03	526.3 (460.1 , 592.5)	572.9 (505.3 , 640.5)
509.01	370.5 (273.2 , 491.2)	469.6 (362.4 , 598.6)

2010 Census Tract ID	Delaware's Age-Adjusted Incidence Rate and 95% Confidence Interval by Census Tract 2010 and Time Period	
	2004–2008 DE: 515.6 (509.1, 522.1)	2005–2009 DE: 515.6 (509.2, 522.0)
	AAR (95% CI)	AAR (95% CI)
509.02	521.0 (455.6 , 586.3)	558.7 (491.3 , 626.1)
510.03	544.8 (463.2 , 626.5)	553.4 (473.5 , 633.4)
510.04	544.8 (462.2 , 627.4)	550.0 (469.9 , 630.2)
510.05	517.6 (439.8 , 595.4)	506.9 (431.1 , 582.6)
510.06	553.7 (458.9 , 648.5)	483.6 (398.5 , 568.7)
510.07	506.5 (434.3 , 578.8)	510.4 (439.7 , 581.1)
511.01	599.4 (442.0 , 794.7)	782.1 (590.8 , 1015.6)
511.02	333.7 (244.3 , 445.1)	368.4 (269.7 , 491.4)
511.03	430.4 (303.1 , 593.3)	385.0 (266.6 , 538.0)
512.01	490.5 (379.4 , 624.1)	515.3 (402.5 , 650.0)
512.02	380.8 (276.7 , 511.2)	355.1 (257.0 , 478.3)
512.03	454.9 (334.2 , 604.9)	470.1 (350.0 , 618.1)
512.04	338.4 (231.5 , 477.8)	357.3 (248.9 , 496.9)
512.05	351.5 (233.6 , 508.1)	339.0 (225.2 , 489.9)
513.01	510.8 (443.3 , 578.3)	465.8 (403.2 , 528.4)
513.02	649.2 (534.5 , 763.9)	621.6 (510.8 , 732.3)
513.03	554.7 (478.4 , 631.0)	552.3 (476.9 , 627.7)
513.05	553.6 (463.1 , 644.0)	500.9 (418.0 , 583.9)
513.06	419.7 (339.2 , 513.6)	438.8 (354.8 , 522.7)
514.00	454.1 (365.6 , 557.6)	508.0 (411.3 , 604.8)
515.00	431.9 (357.7 , 506.2)	463.4 (388.2 , 538.5)
517.01	659.8 (549.7 , 769.9)	617.6 (513.4 , 721.8)
517.02	511.2 (430.2 , 592.2)	505.6 (426.0 , 585.2)
518.01	597.6 (502.3 , 692.9)	610.6 (515.7 , 705.5)
518.02	585.9 (485.2 , 686.6)	569.8 (471.1 , 668.5)
519.00	503.9 (417.9 , 589.9)	446.3 (365.7 , 526.8)

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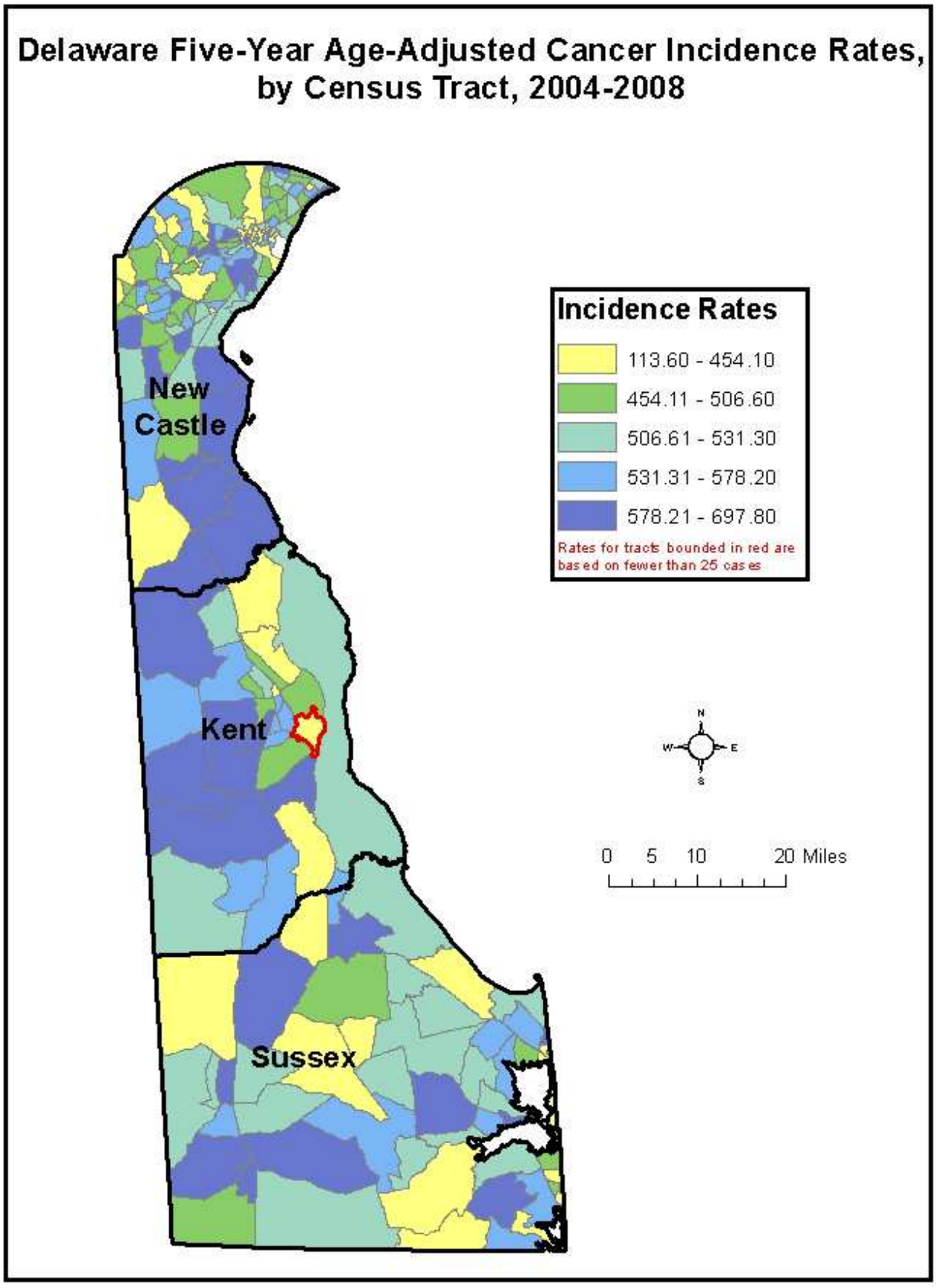
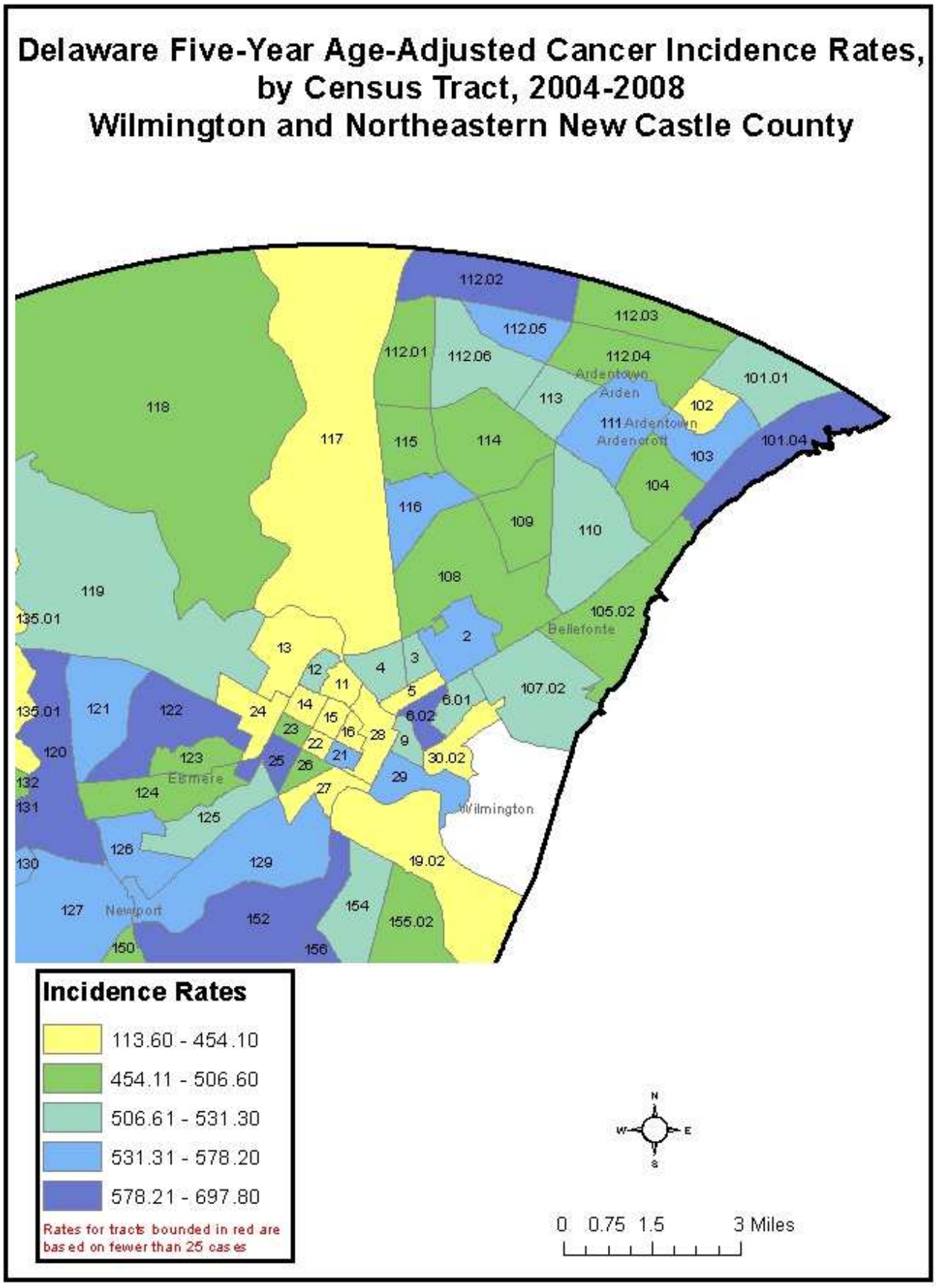
Appendix J:
Maps of 2004–2008 Cancer Rates by Census Tract, Color Coded by Incidence Rate Quintiles

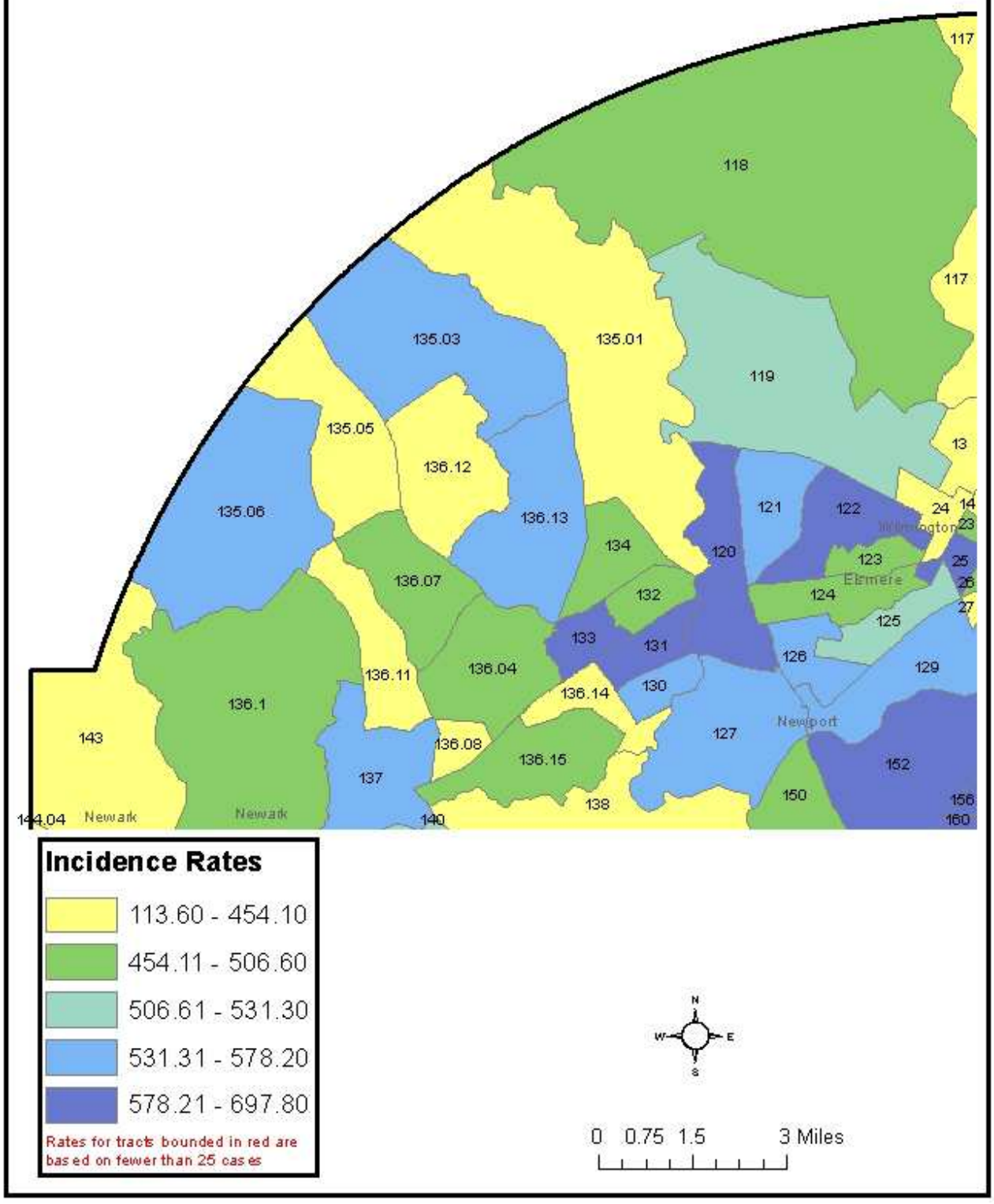


Source: Delaware Cancer Registry



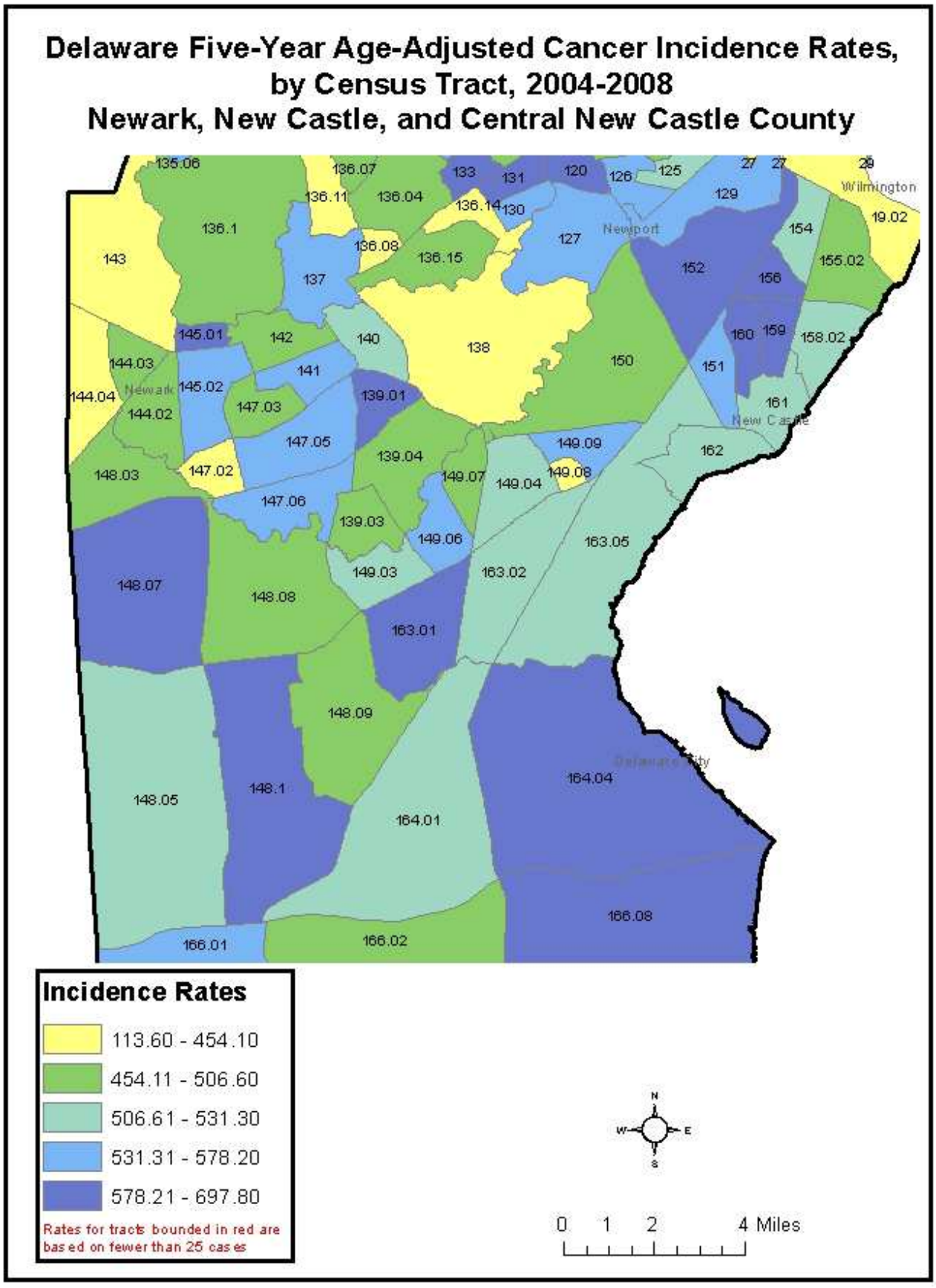
Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2004-2008
Hockessin and Northwestern New Castle County



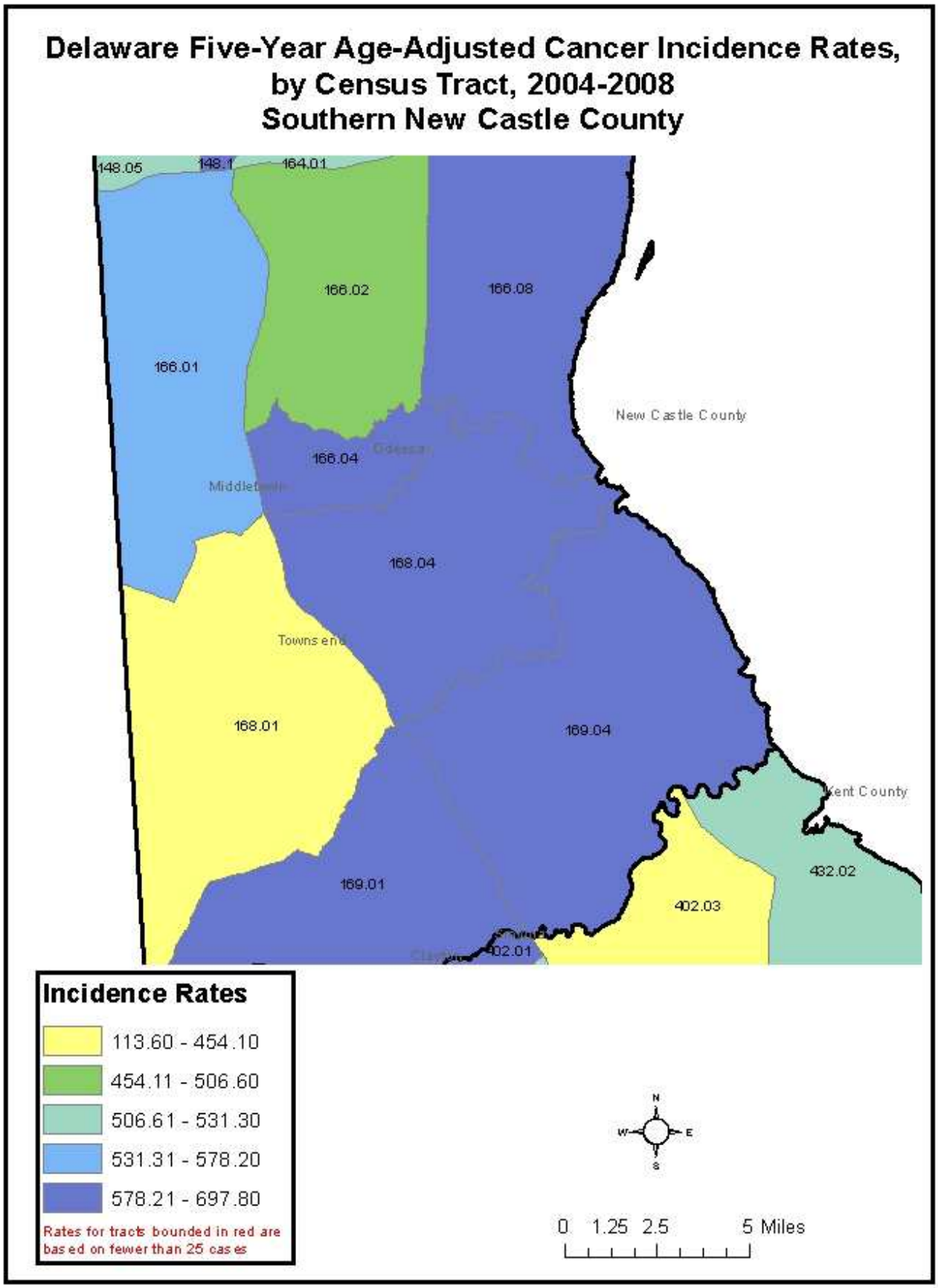
Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2004-2008
Newark, New Castle, and Central New Castle County

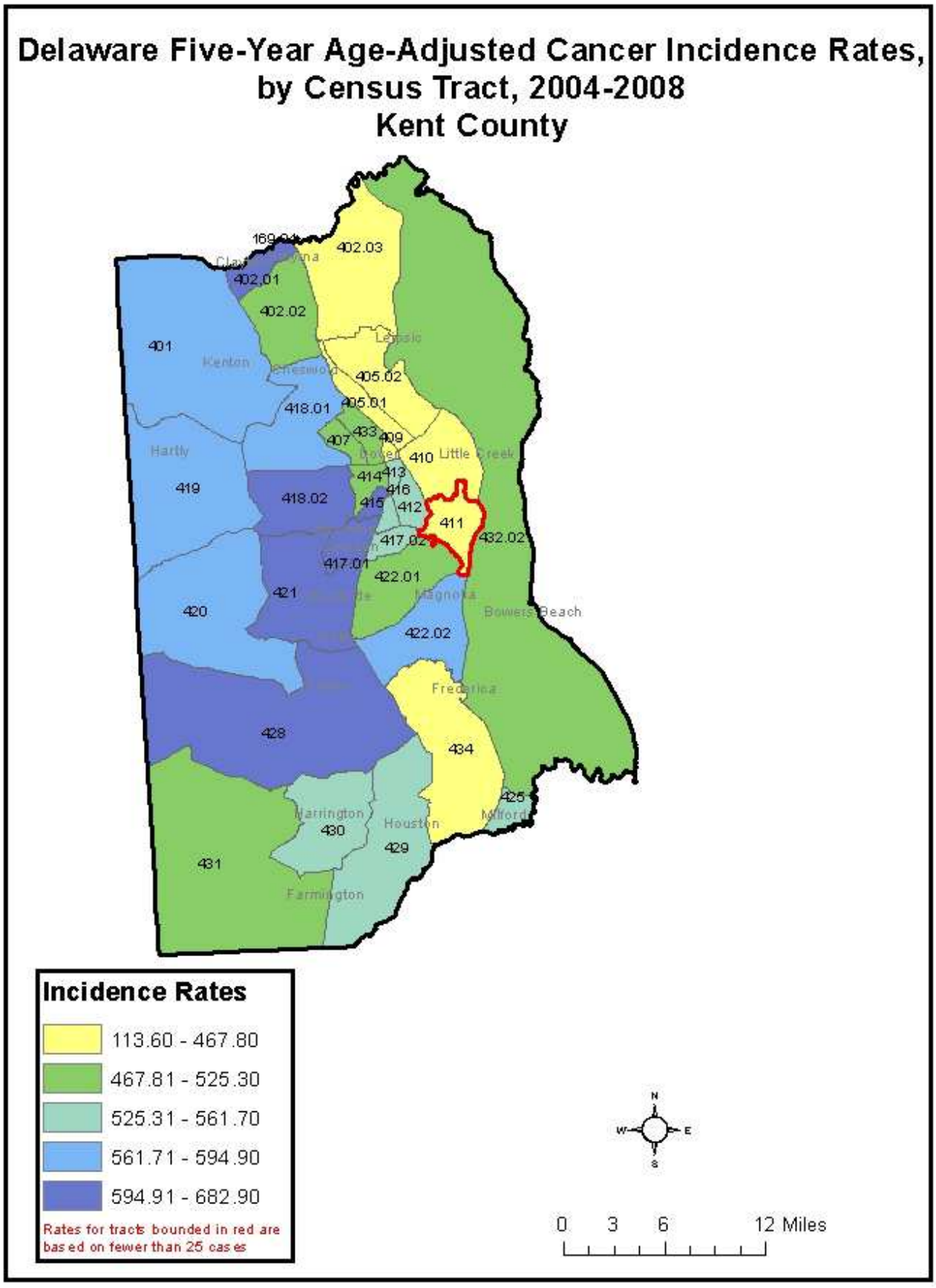


Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2004-2008
Southern New Castle County

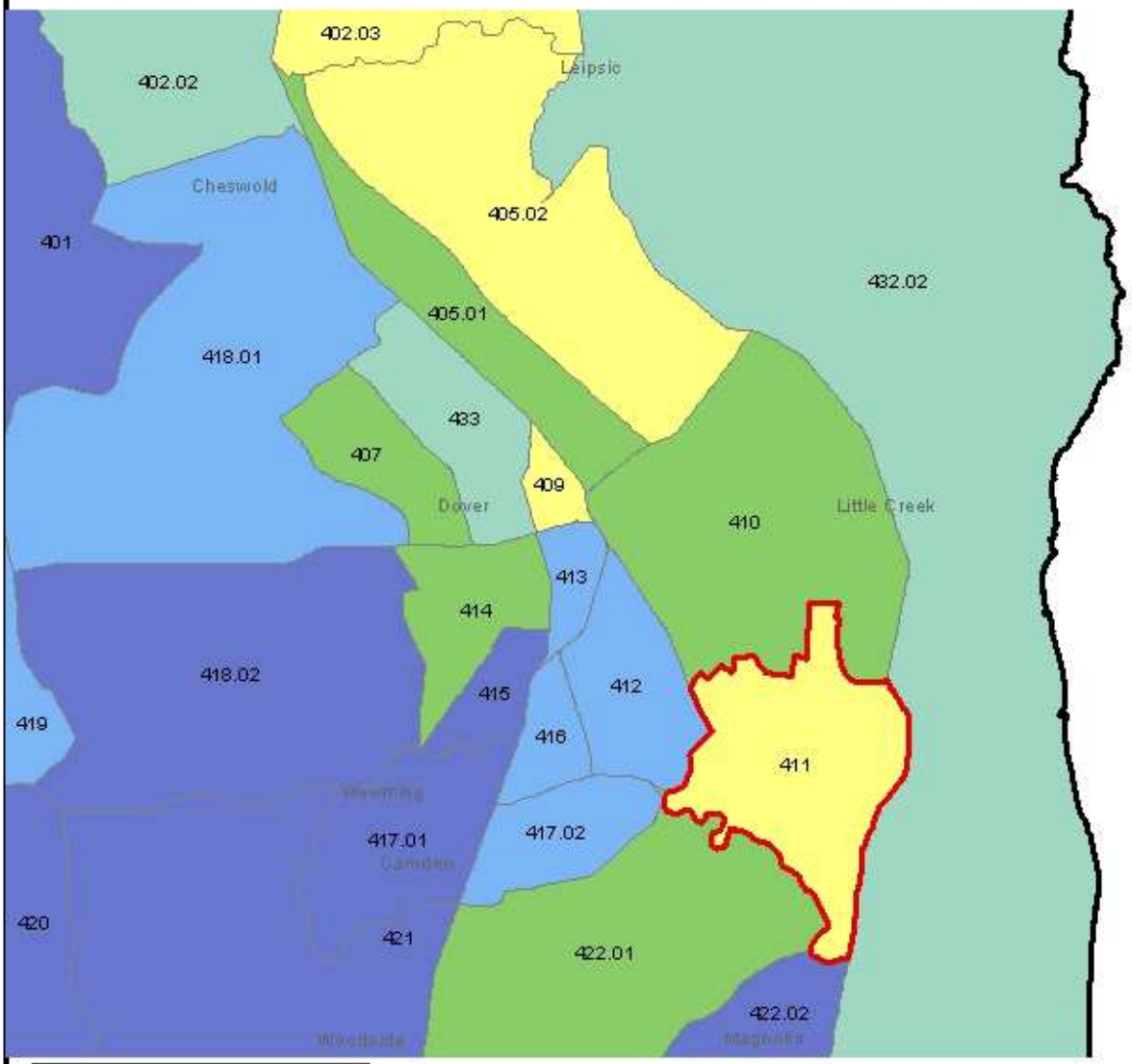


Source: Delaware Cancer Registry

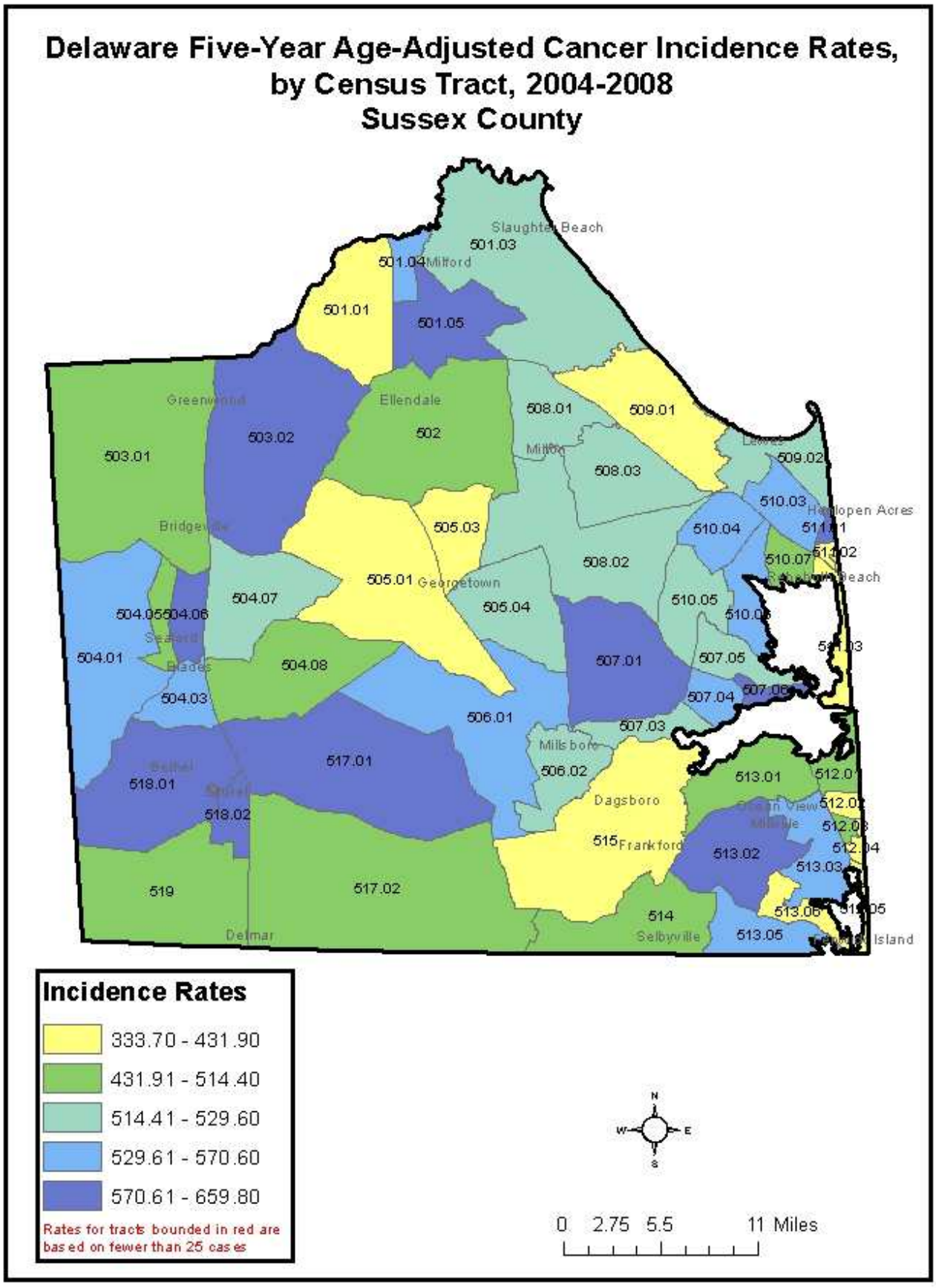


Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2004-2008
Greater Dover



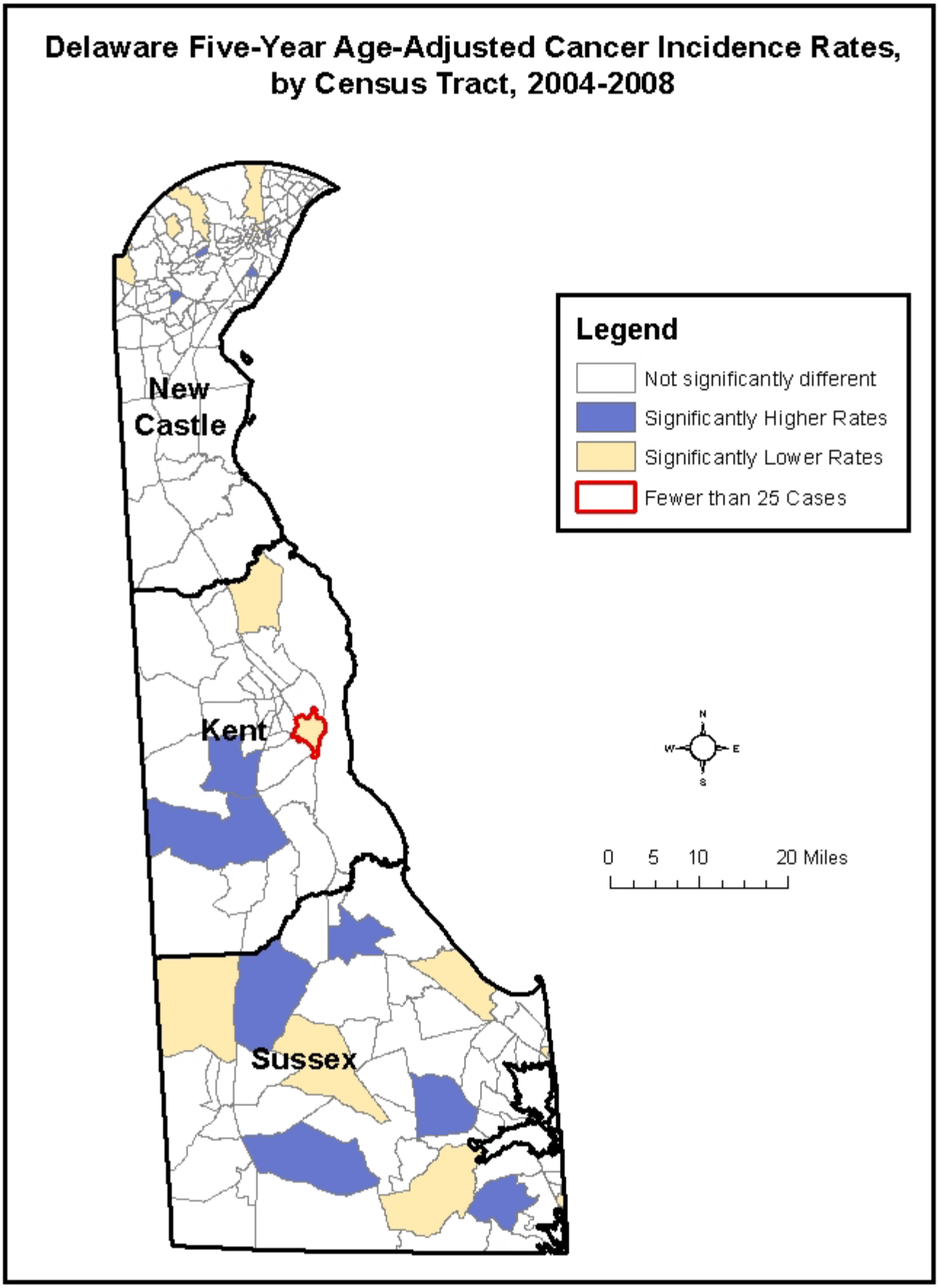
Source: Delaware Cancer Registry



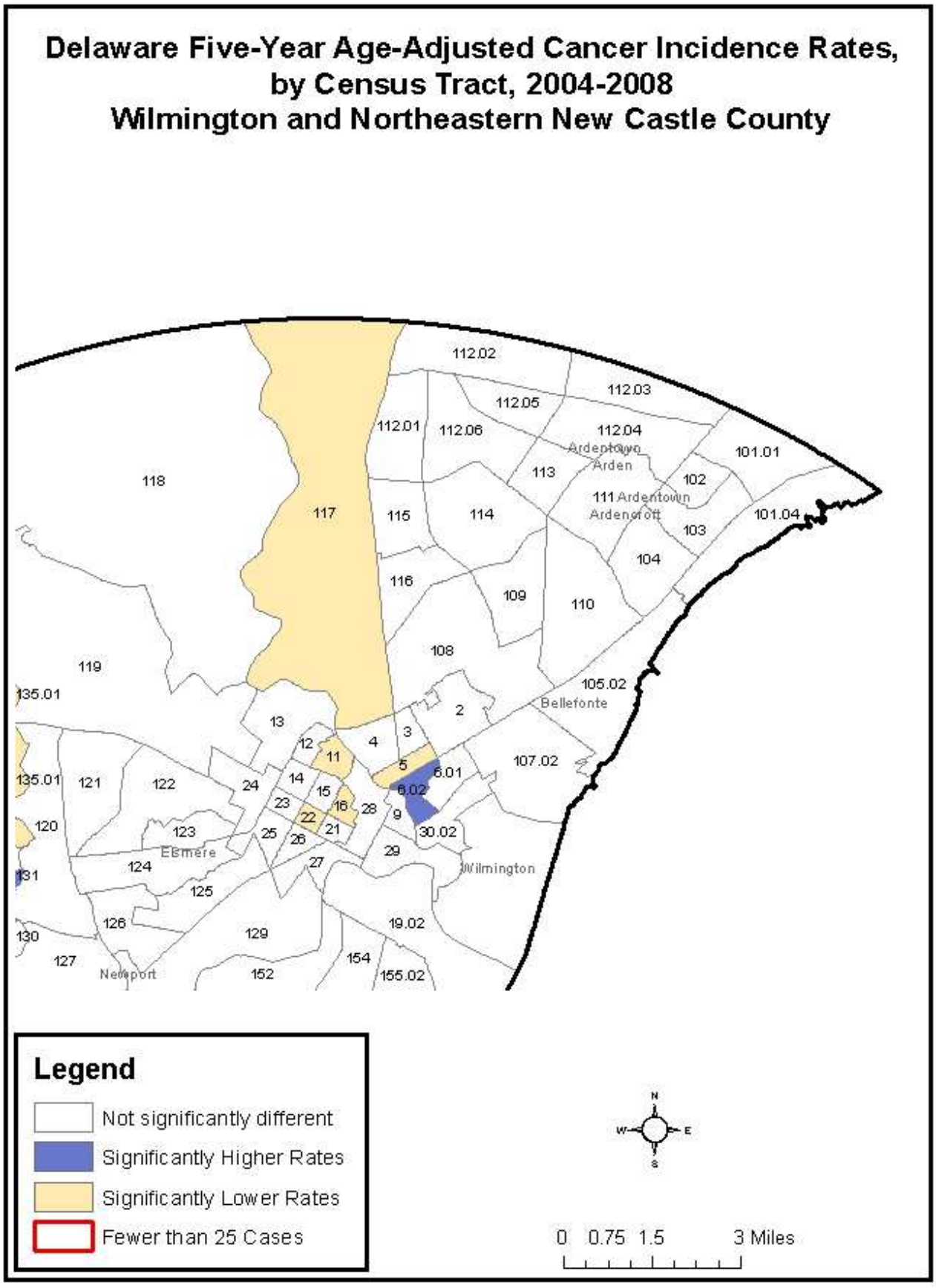
Source: Delaware Cancer Registry

Appendix K:

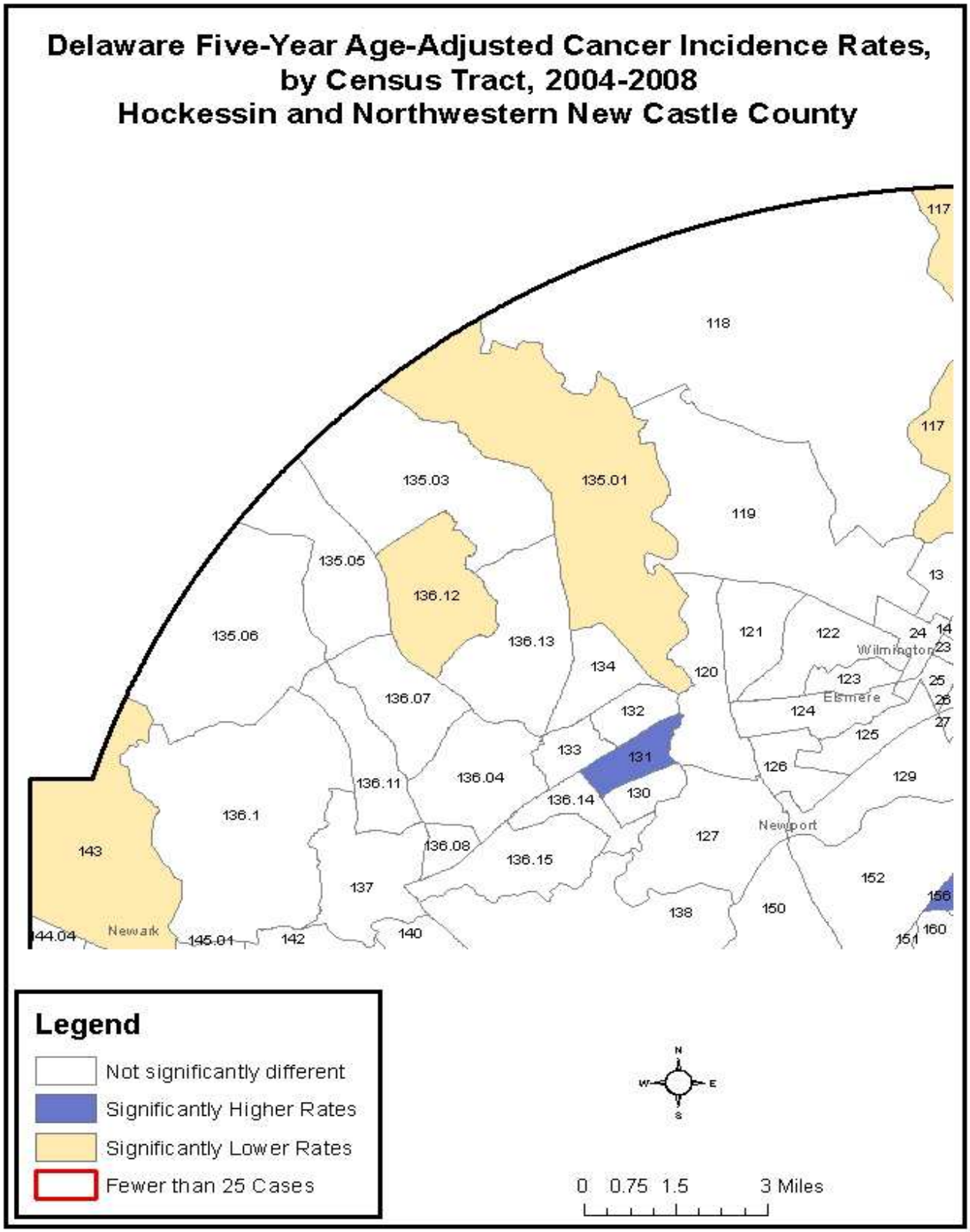
Maps of 2004–2008 Cancer Rates by Census Tract, Color Coded by Significantly Higher and Lower Rates Compared to State Average Rate



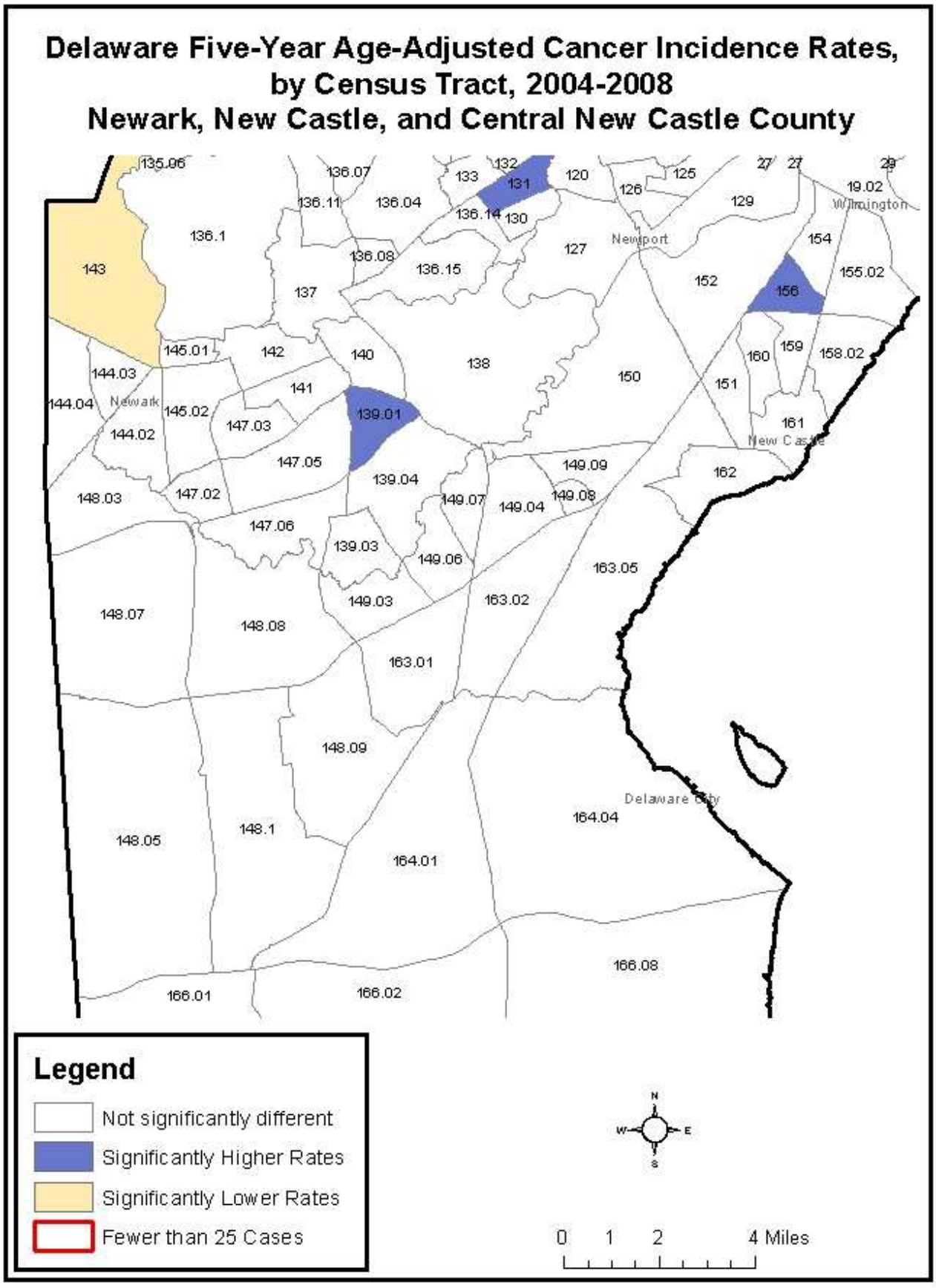
Source: Delaware Cancer Registry



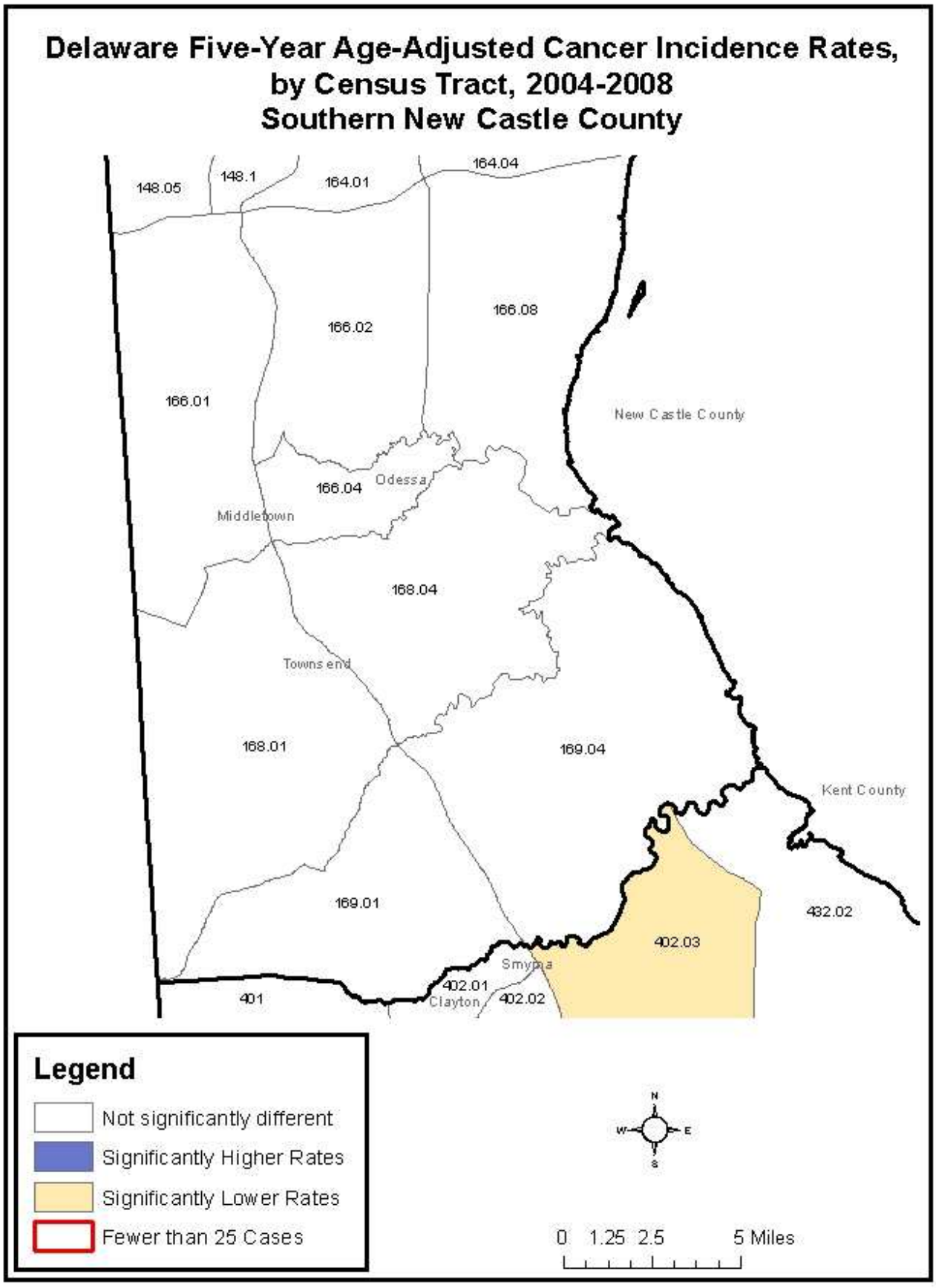
Source: Delaware Cancer Registry



Source: Delaware Cancer Registry

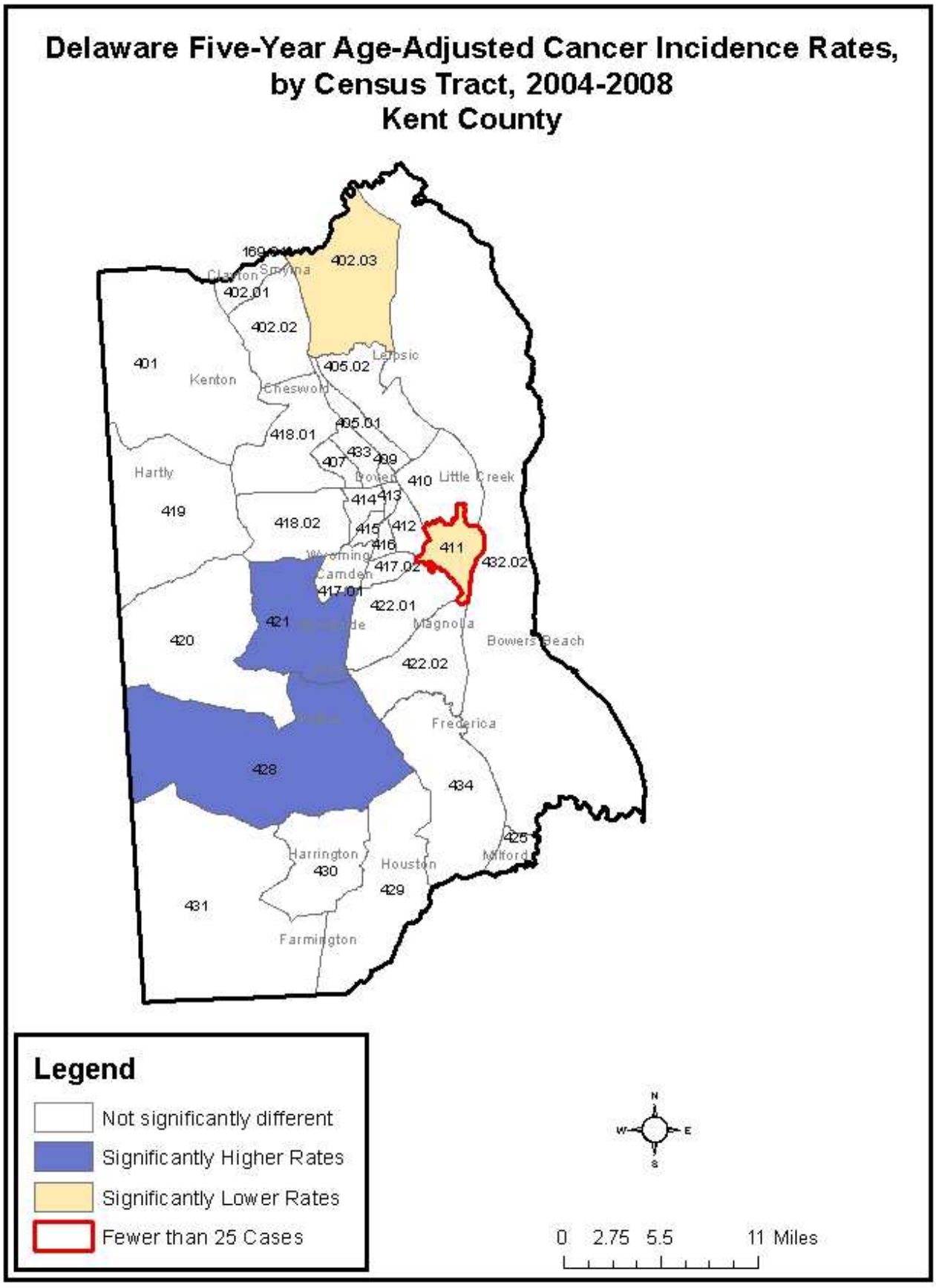


Source: Delaware Cancer Registry

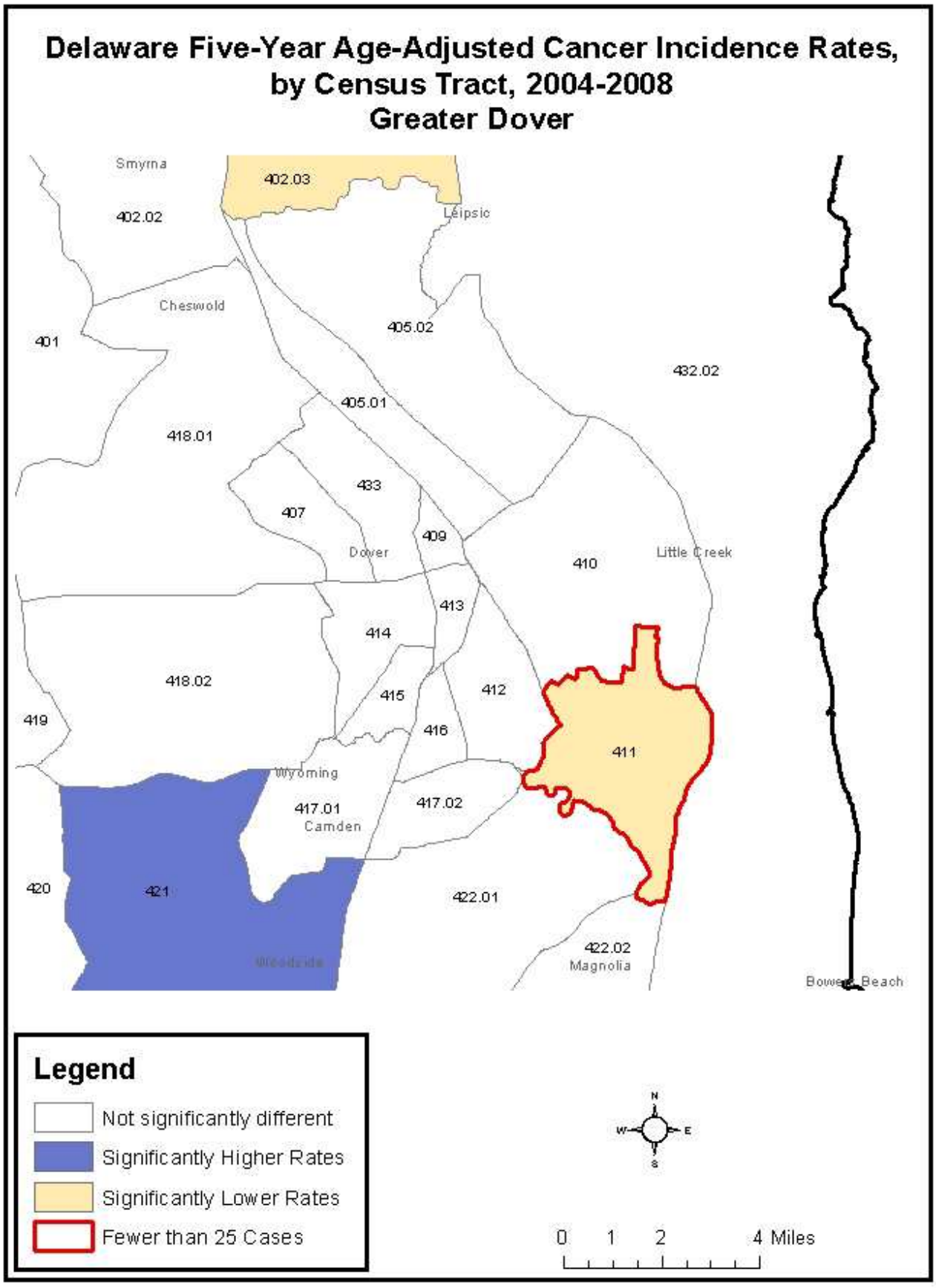


Source: Delaware Cancer Registry

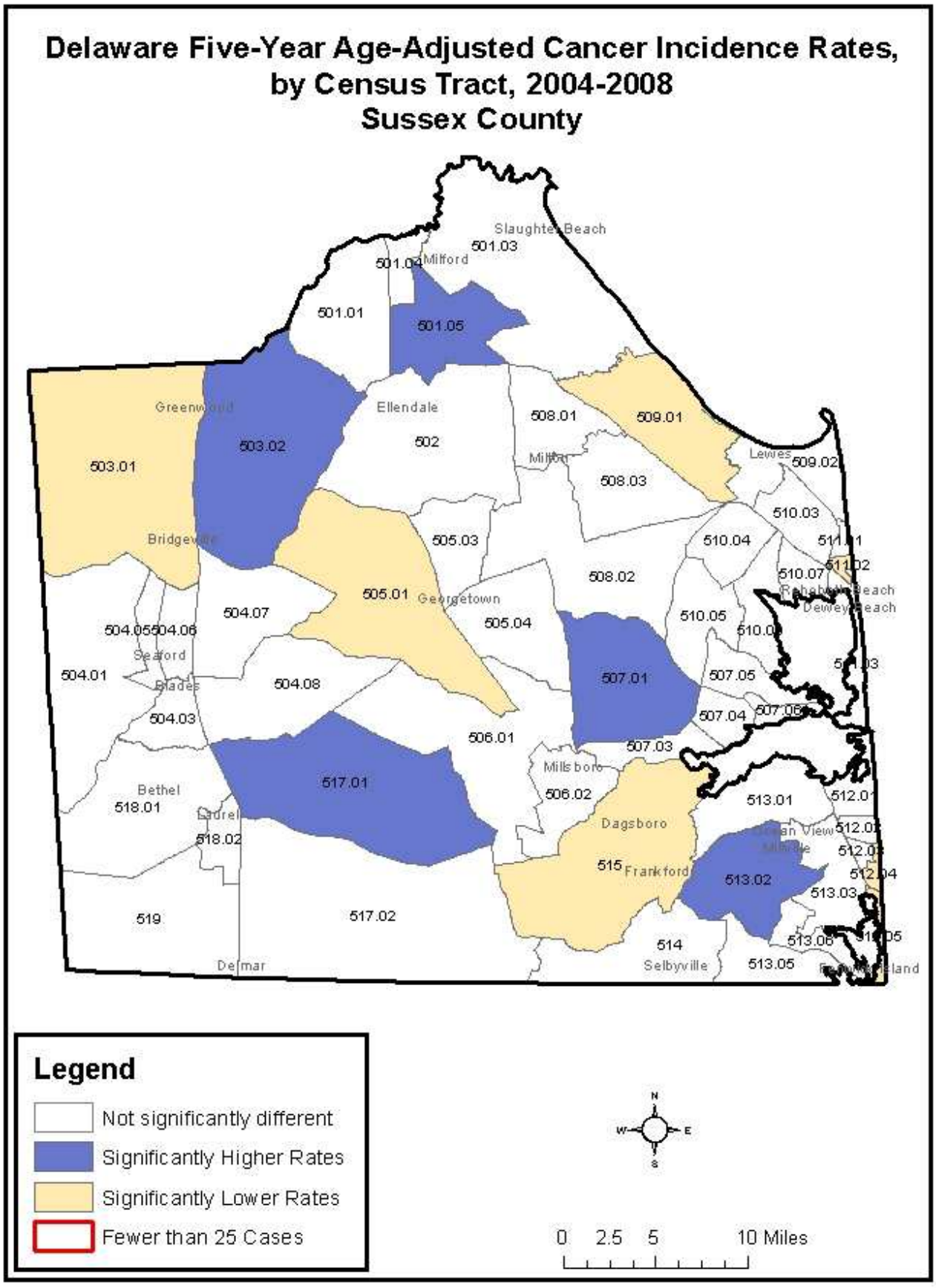
Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2004-2008
Kent County



Source: Delaware Cancer Registry



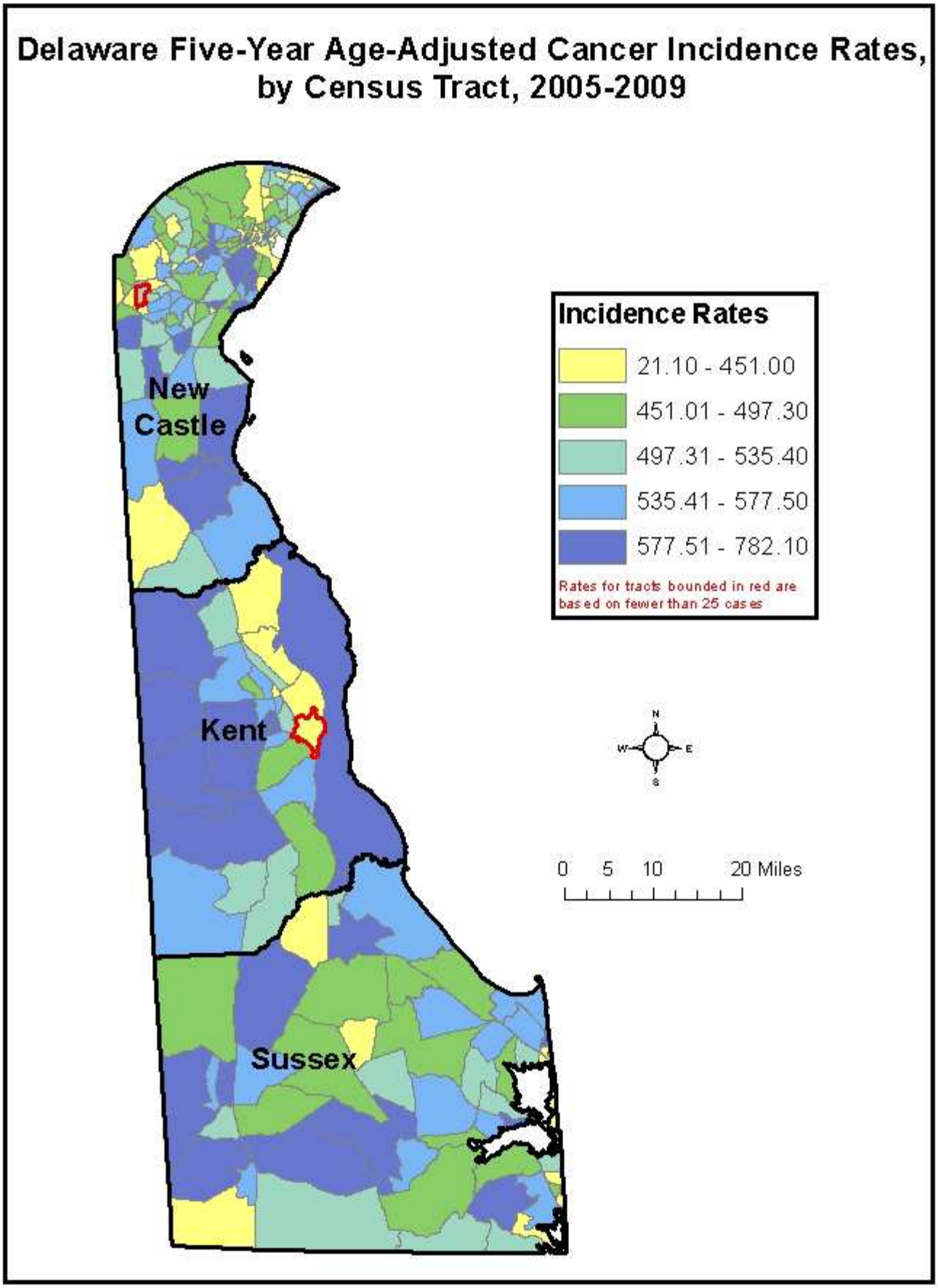
Source: Delaware Cancer Registry



Source: Delaware Cancer Registry

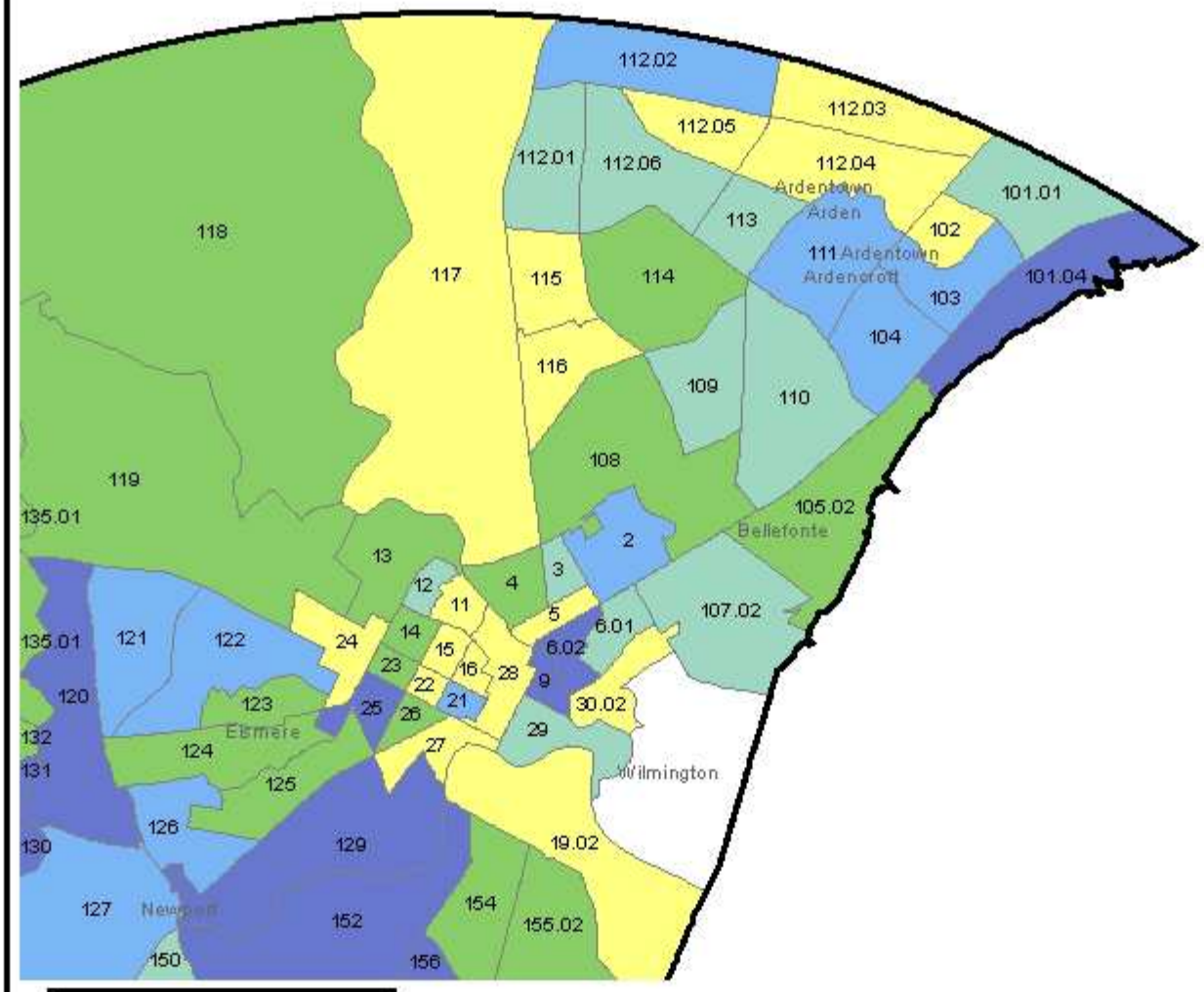
Appendix L:

Maps of 2005–2009 Cancer Rates by Census Tract, Color Coded by Incidence Rate Quintiles



Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Wilmington and Northeastern New Castle County



Incidence Rates

- 21.100 - 451.00
- 451.01 - 497.30
- 497.31 - 535.40
- 535.41 - 577.50
- 577.51 - 782.10

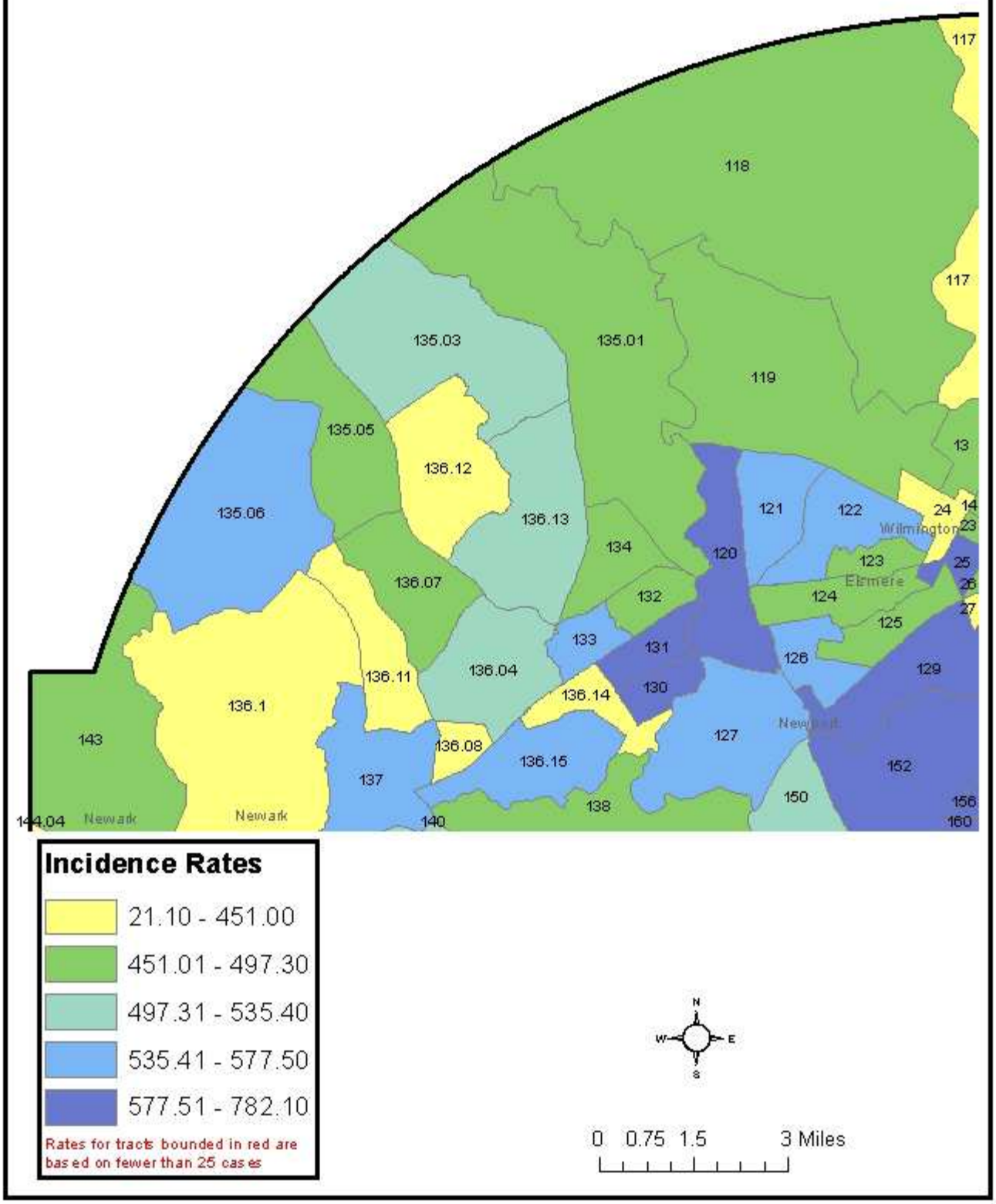
Rates for tracts bounded in red are based on fewer than 25 cases

N W E S

0 0.75 1.5 3 Miles

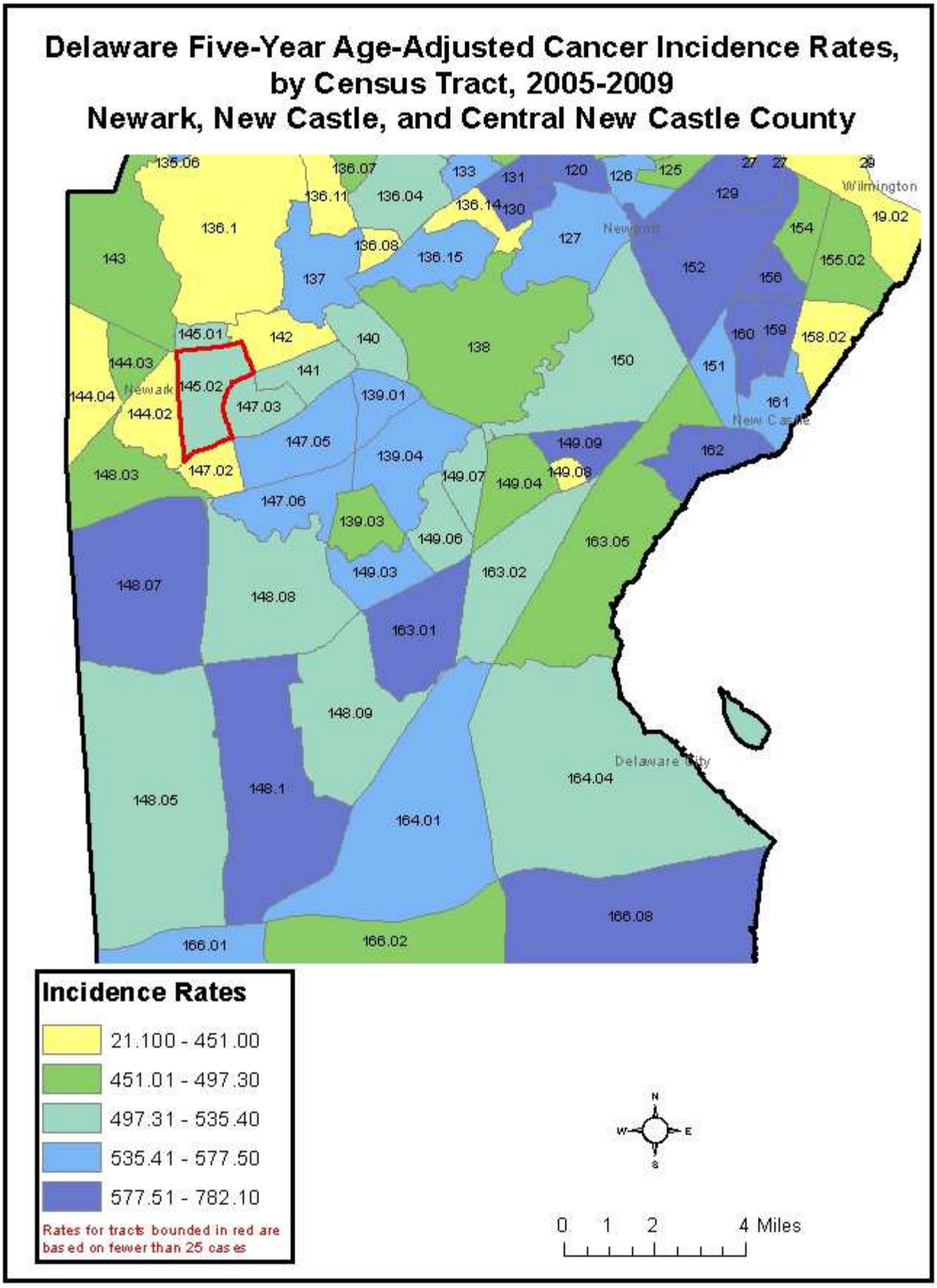
Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Hockessin and Northwestern New Castle County



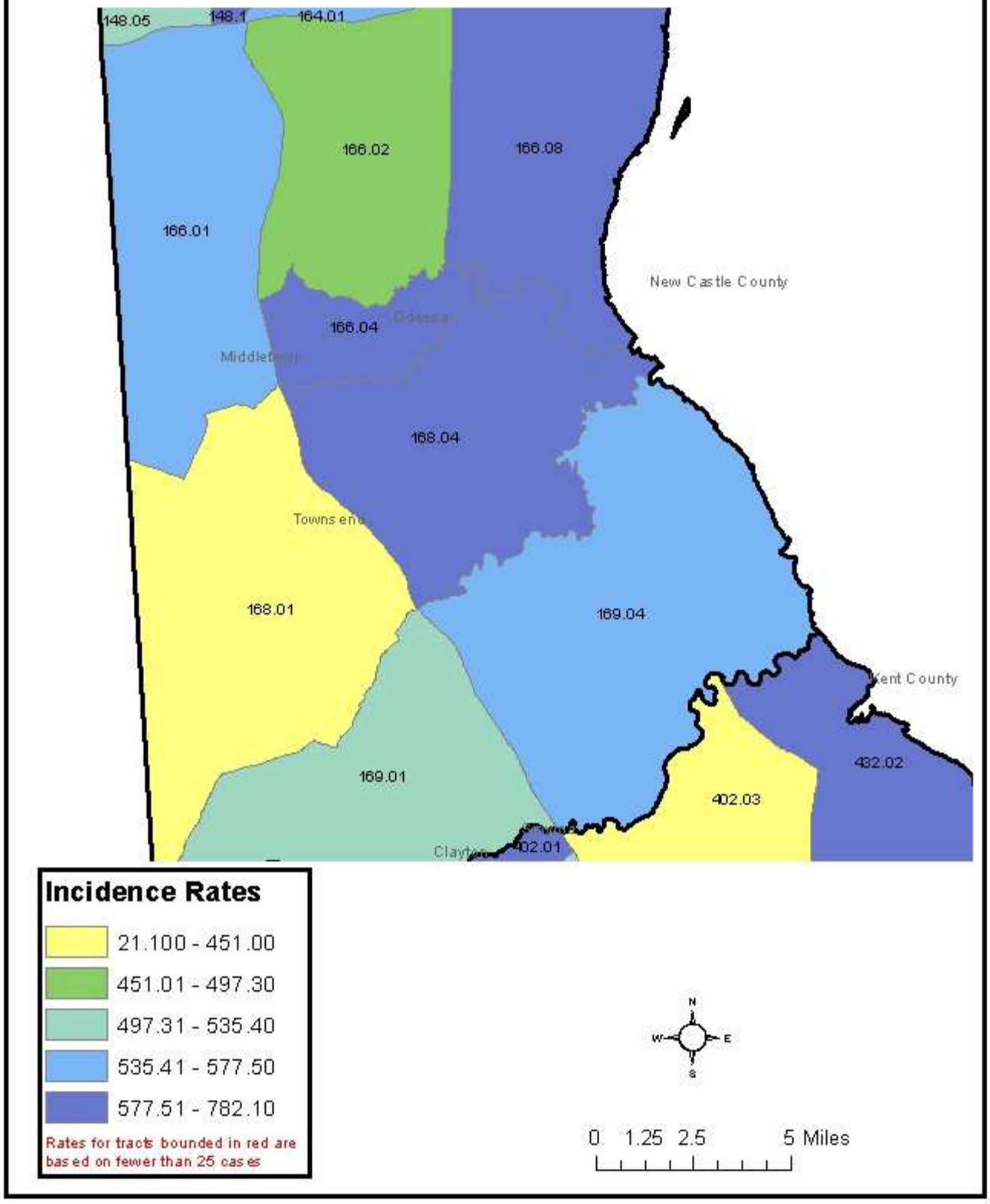
Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Newark, New Castle, and Central New Castle County



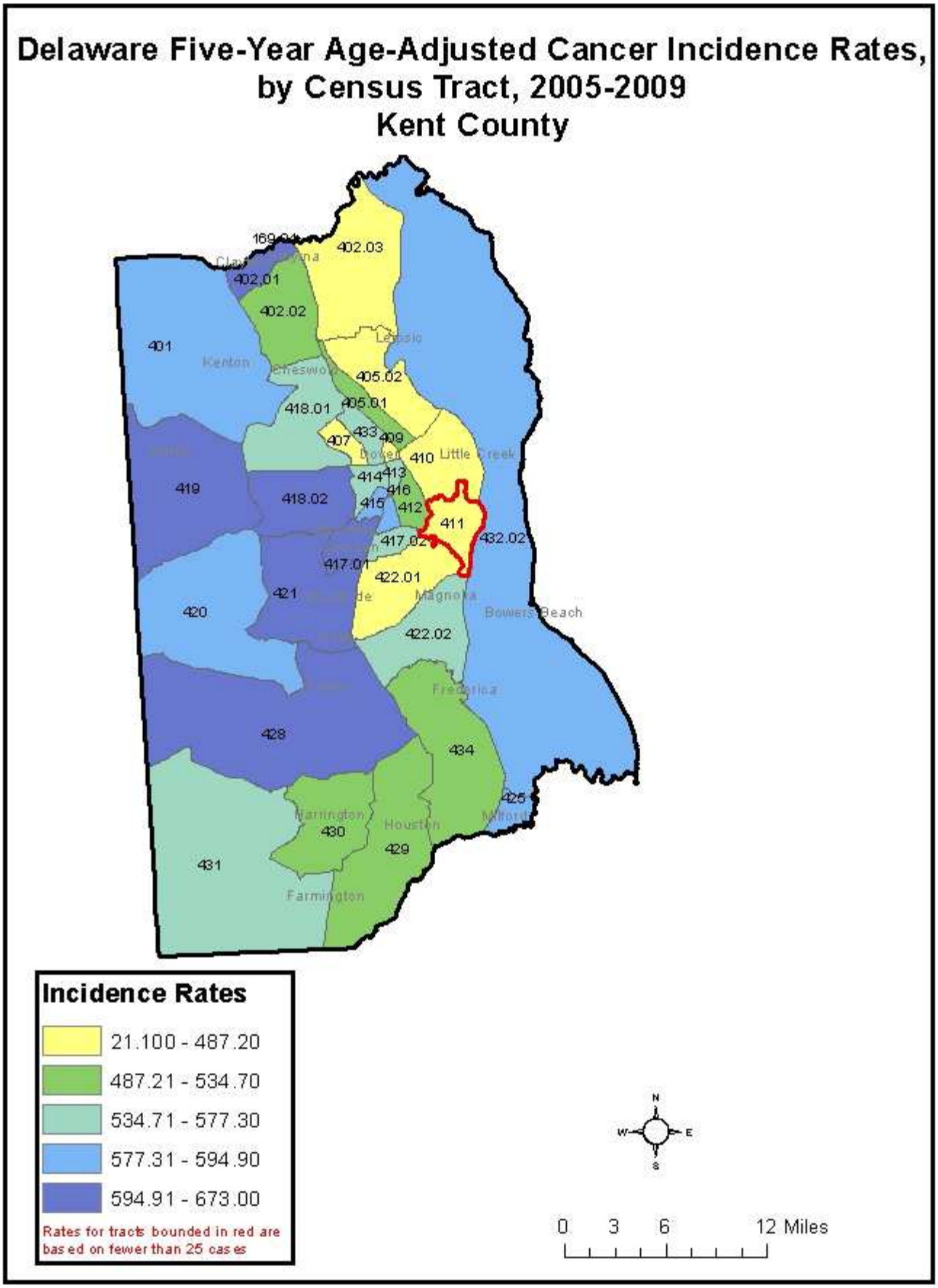
Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Southern New Castle County



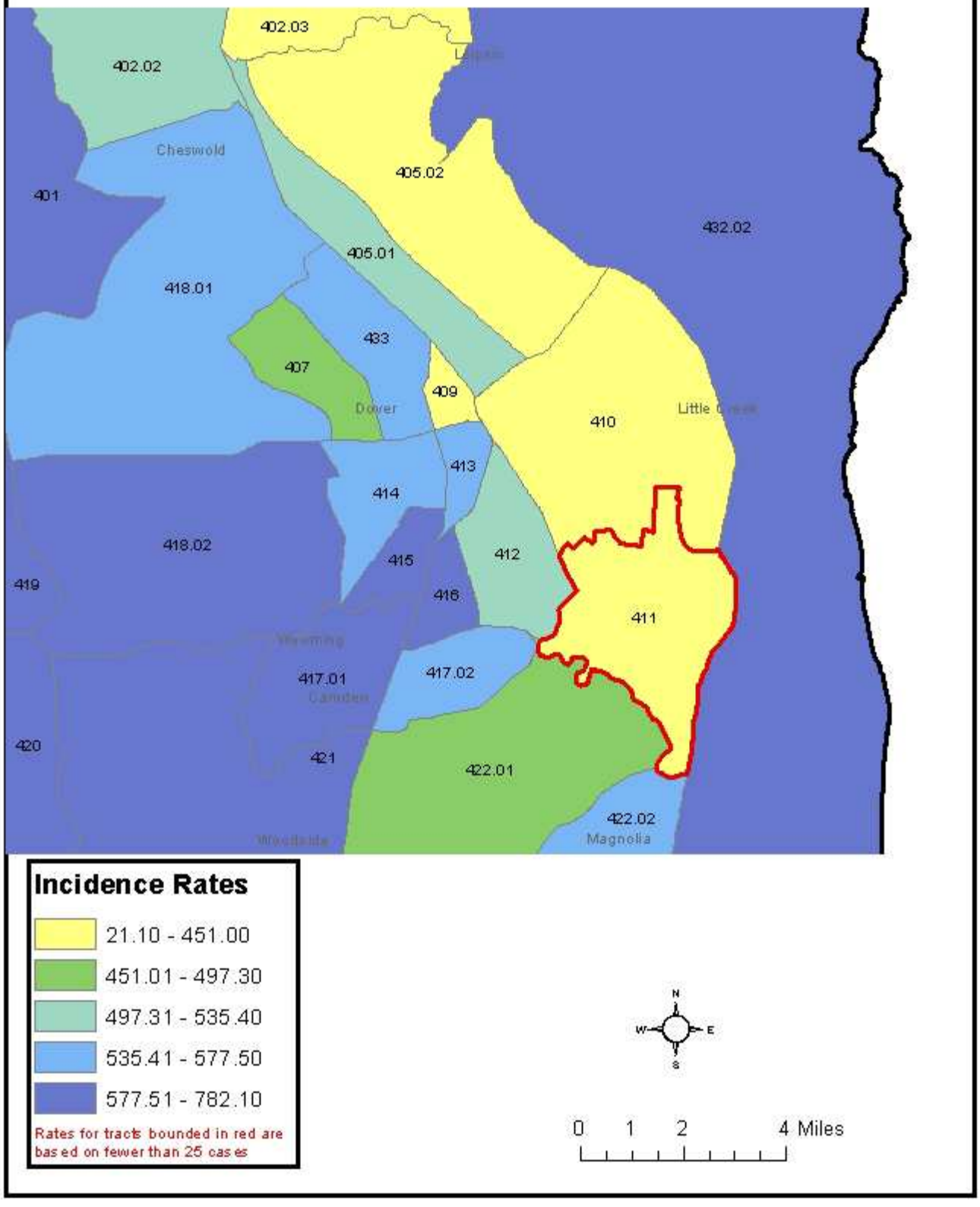
Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Kent County



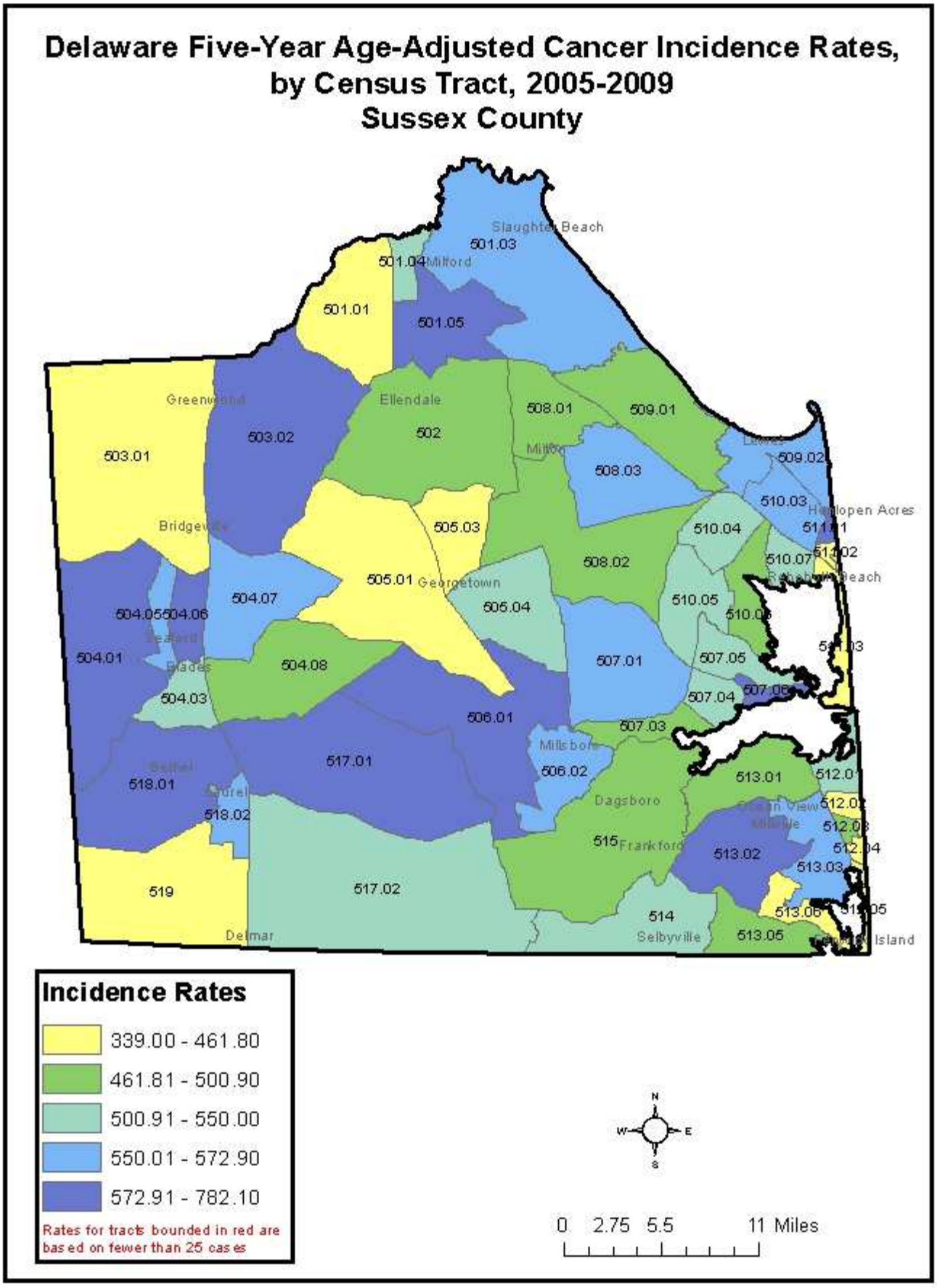
Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Greater Dover



Source: Delaware Cancer Registry

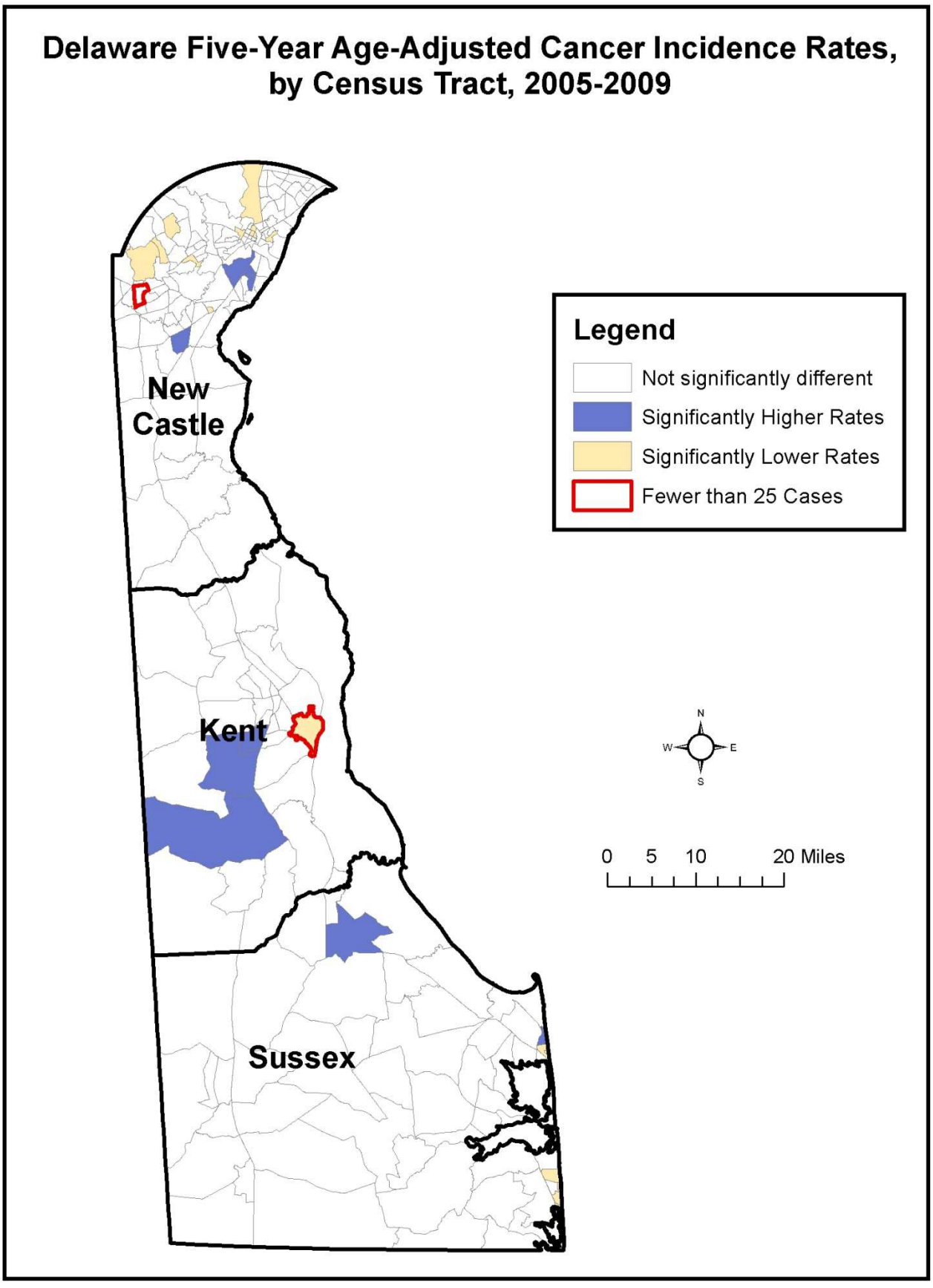
Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Sussex County



Source: Delaware Cancer Registry

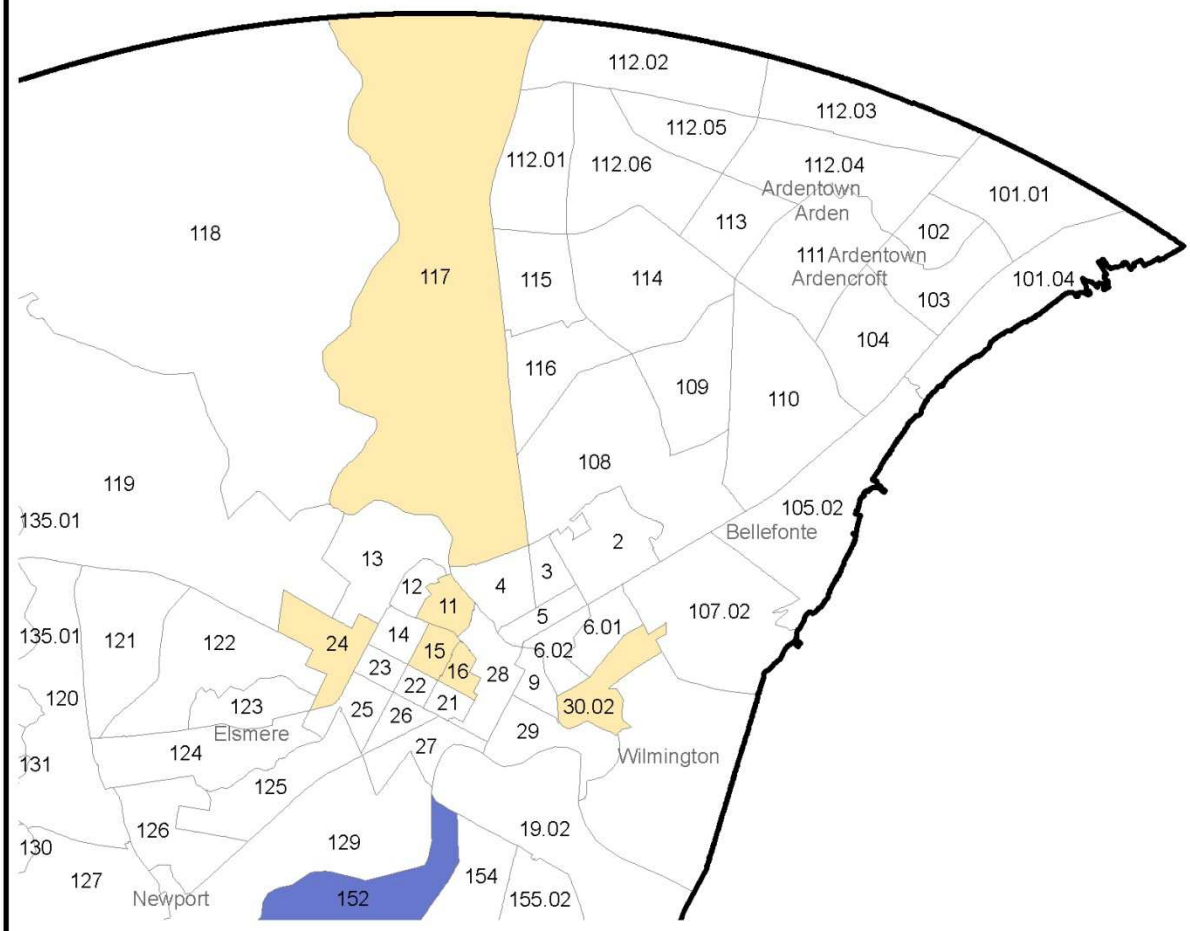
Appendix M:

Maps of 2005–2009 Cancer Rates by Census Tract, Color Coded by Significantly Higher and Lower Rates Compared to State Average Rate



Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Wilmington and Northeastern New Castle County



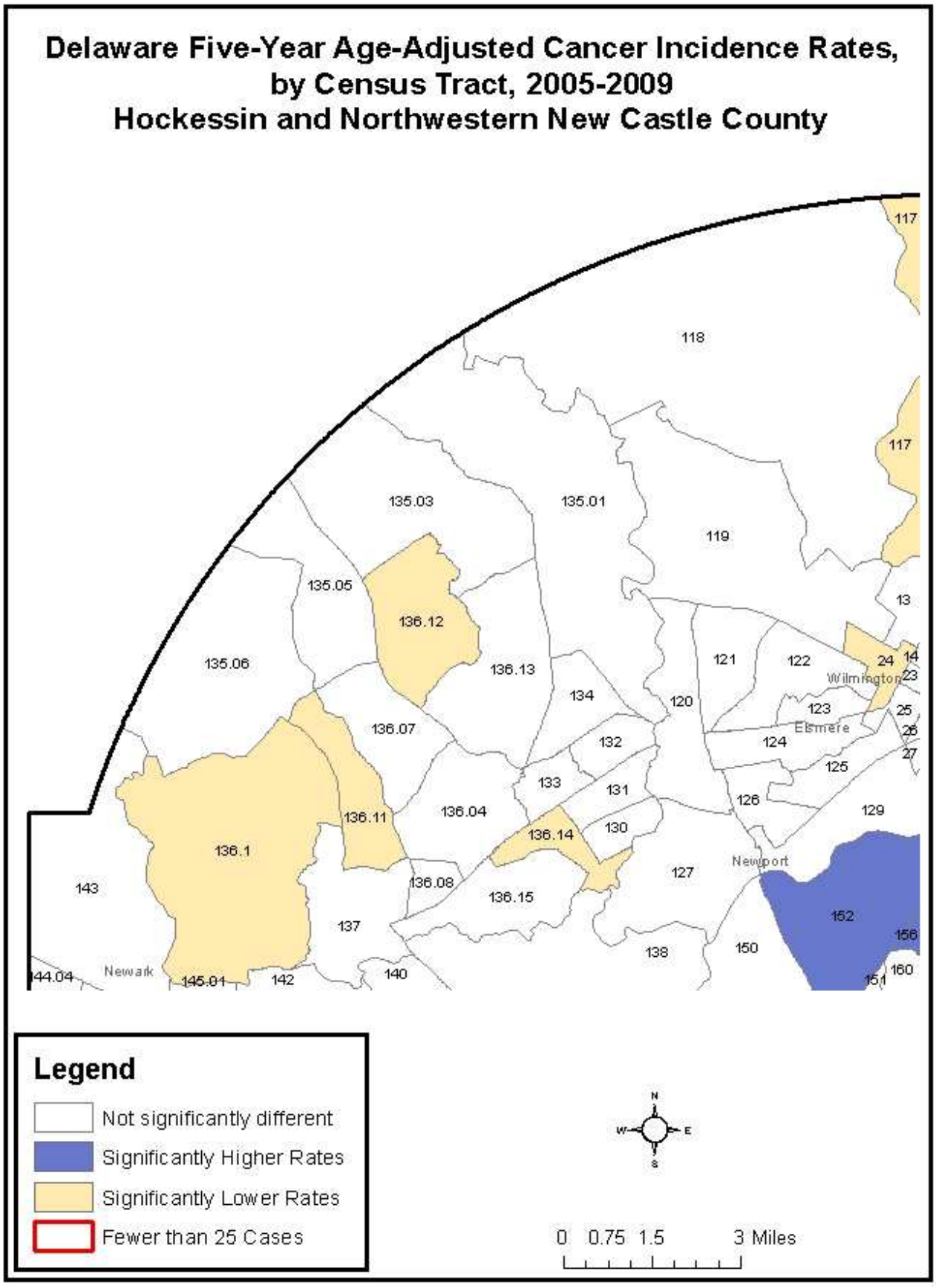
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer than 25 Cases

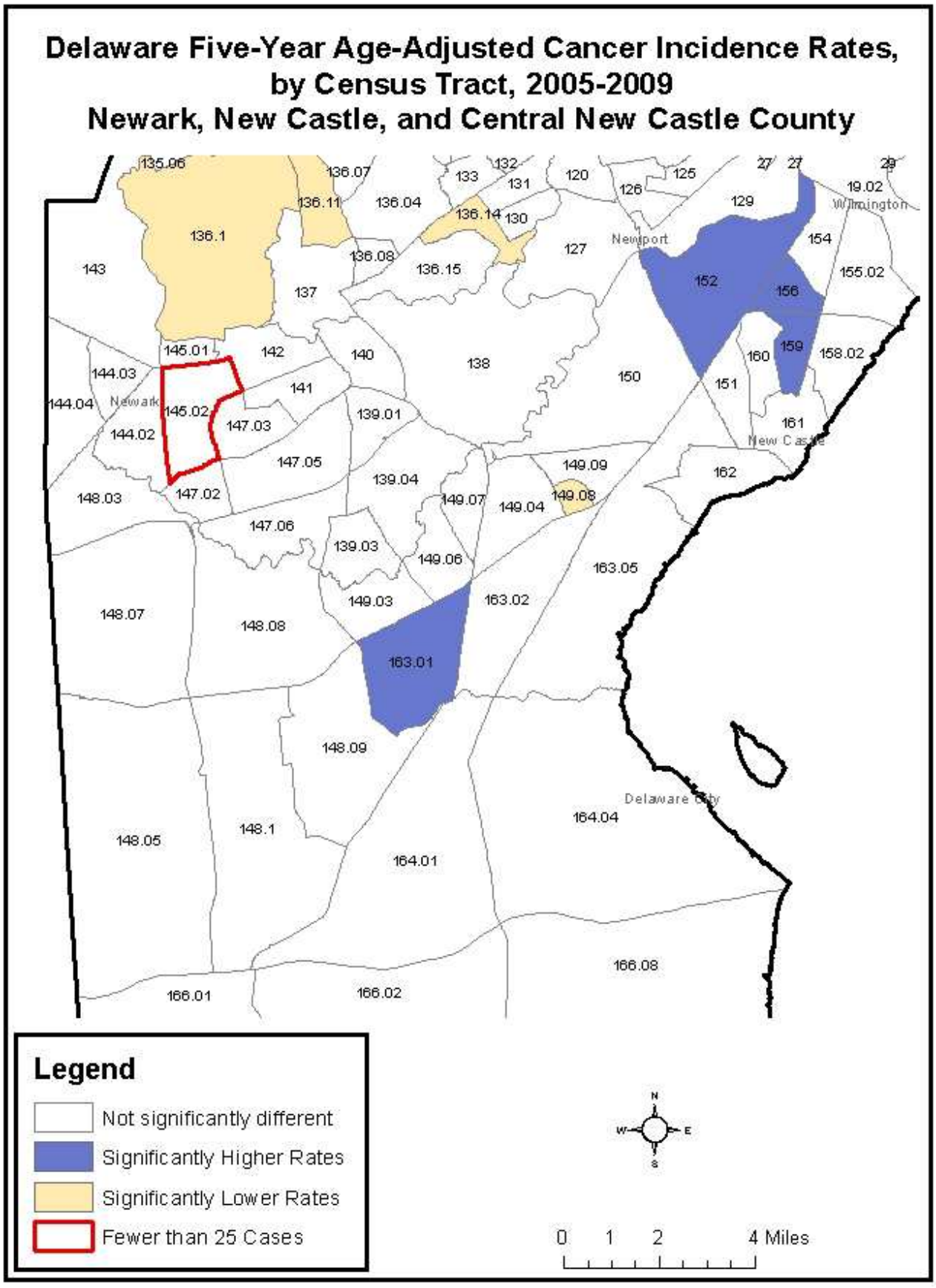
N
W E
S

0 0.75 1.5 3 Miles

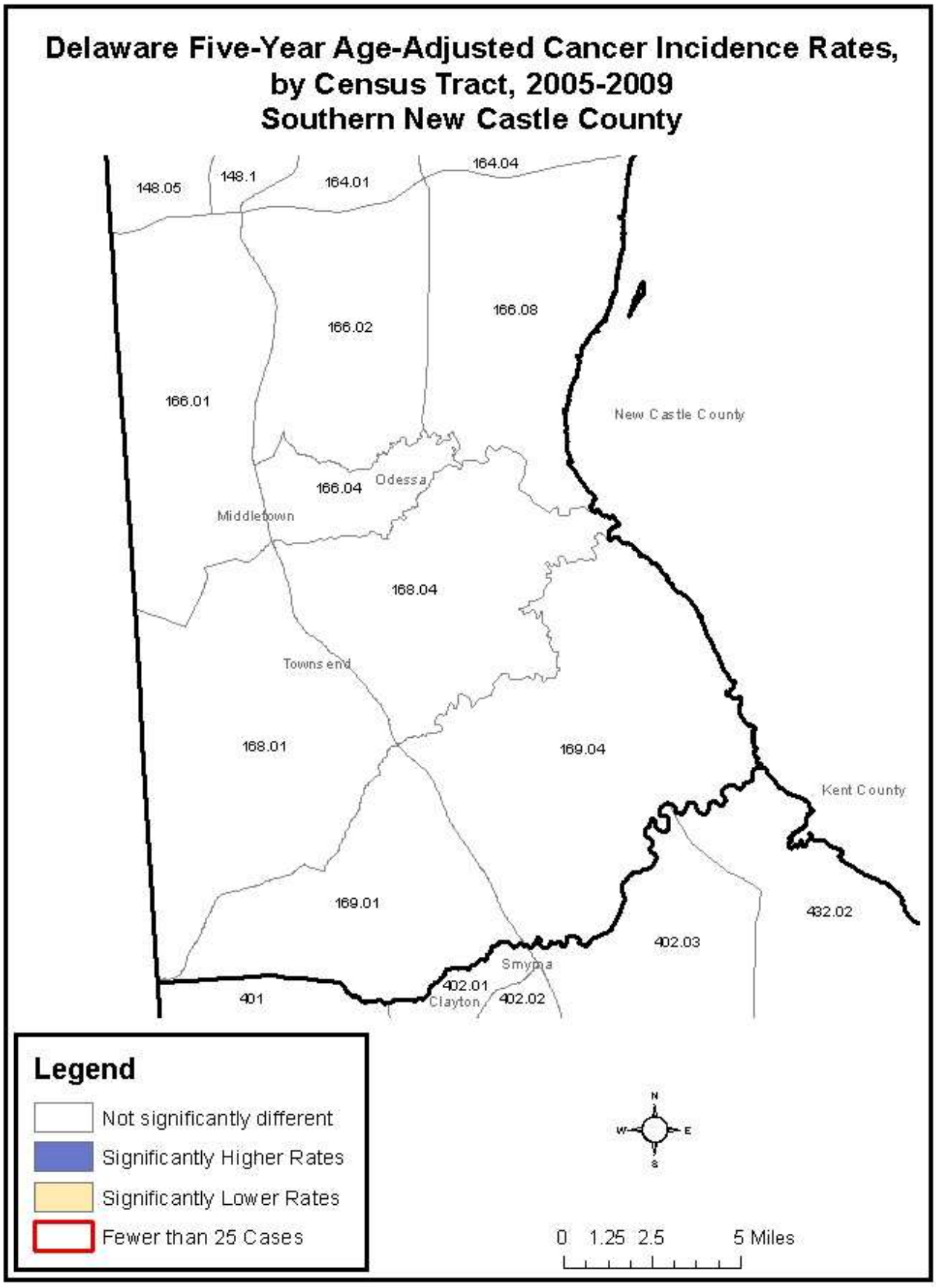
Source: Delaware Cancer Registry



Source: Delaware Cancer Registry

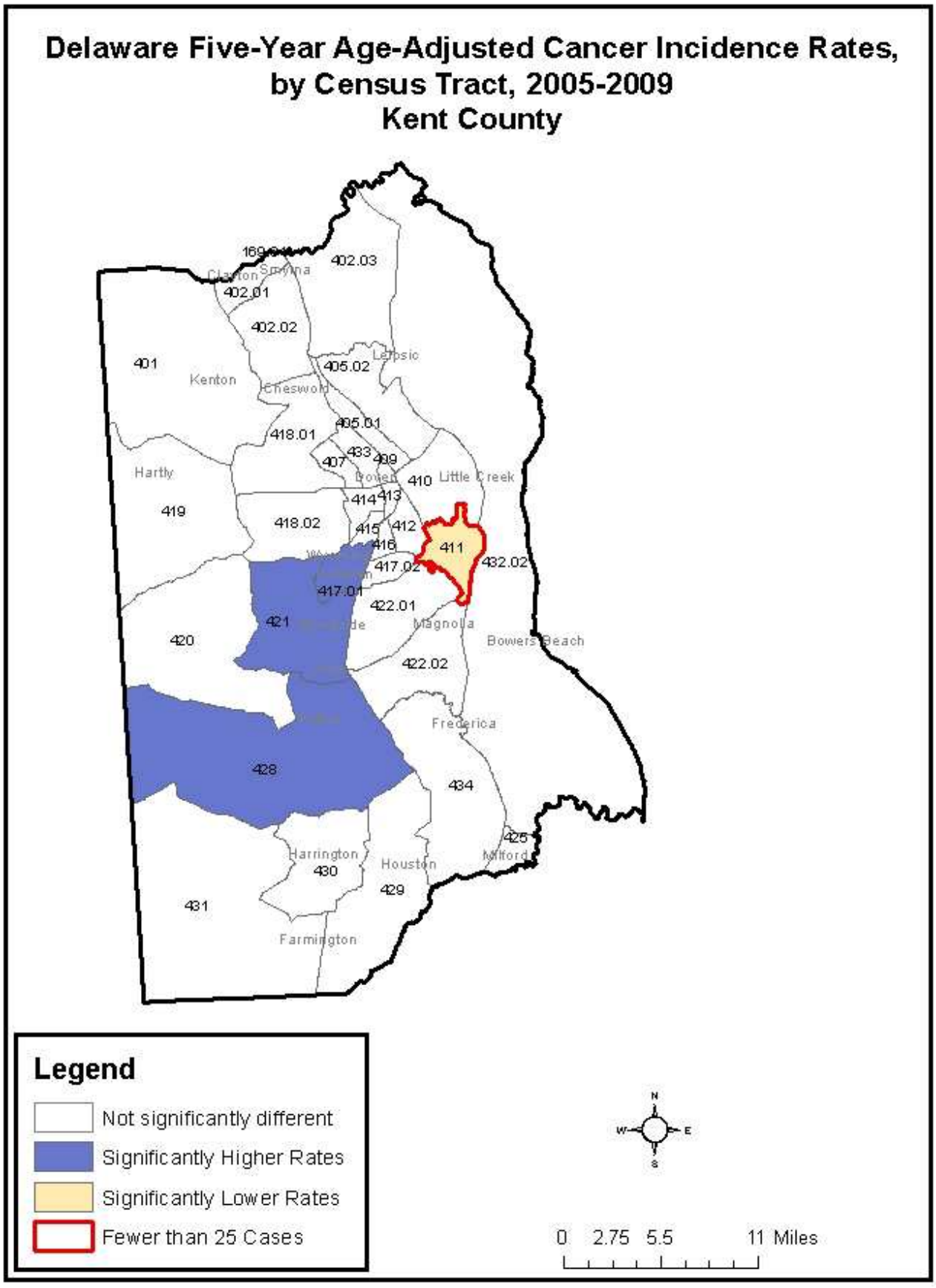


Source: Delaware Cancer Registry

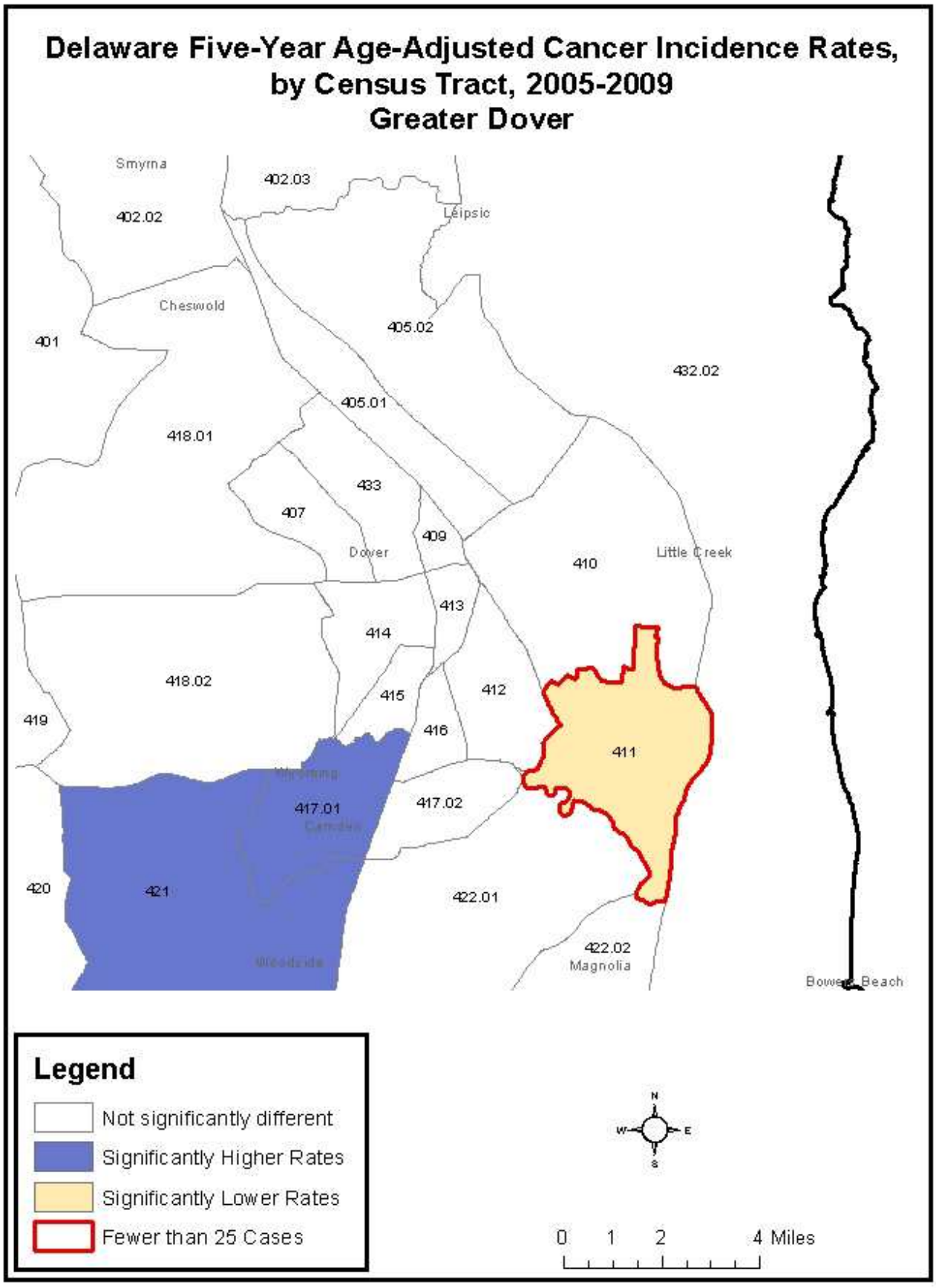


Source: Delaware Cancer Registry

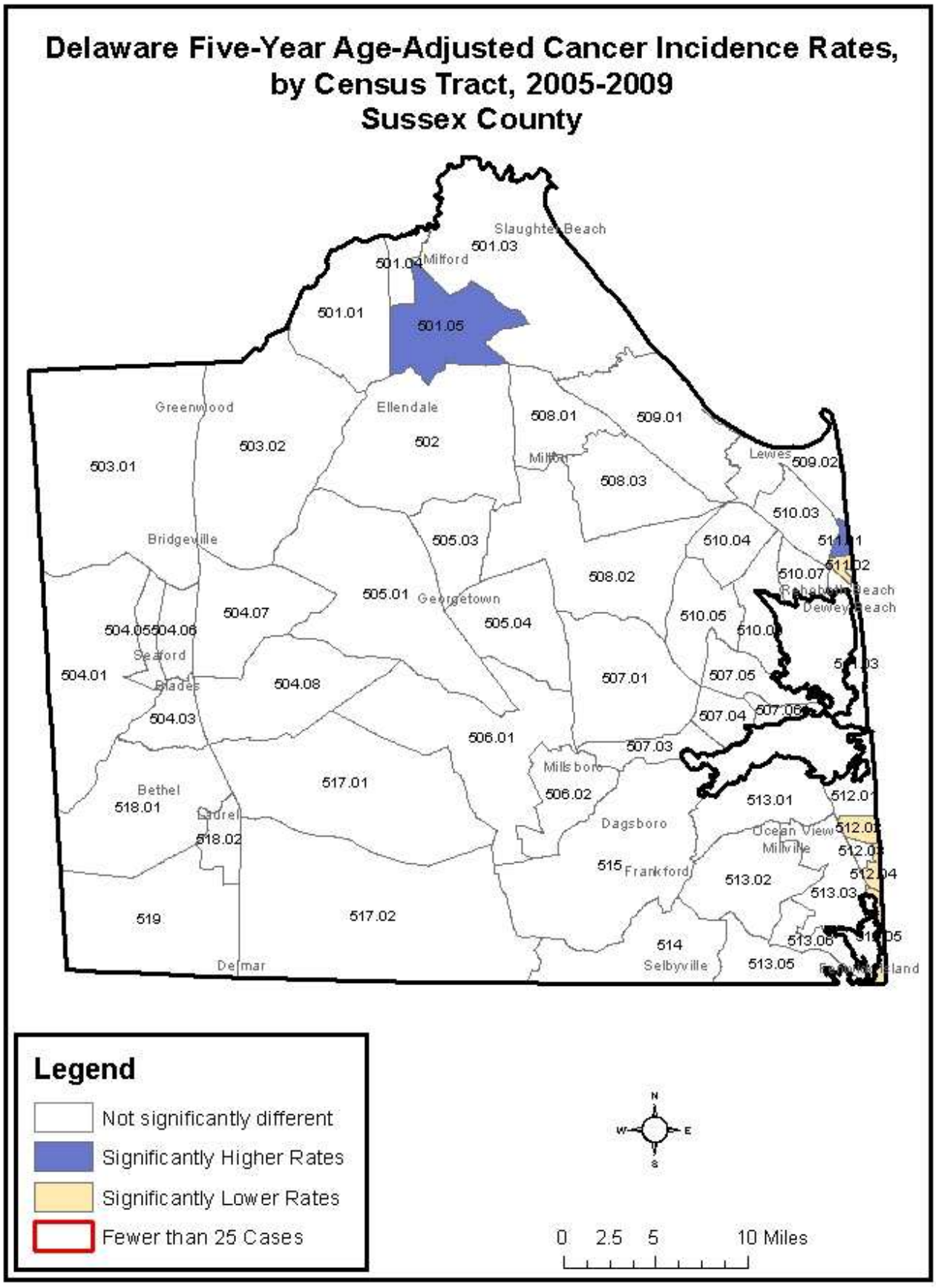
Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2005-2009
Kent County



Source: Delaware Cancer Registry



Source: Delaware Cancer Registry



Source: Delaware Cancer Registry