

Cancer Incidence and Mortality in Delaware

Prepared by Delaware's Division of Public Health

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Delaware Cancer Incidence and Mortality, 2002-06 Executive Summary

From 1992-96 to 2002-06, Delaware's cancer incidence rate decreased 3.8 percent, compared to 5.1 percent nationally. The decline was greater for Delaware males (7.9 percent) than females (1.8 percent) and for African Americans (12.4 percent) compared to Caucasians (2.3 percent).

Declines in cancer mortality have been more significant. During this same time, Delaware's cancer death rate decreased 18.9 percent, compared to 11.5 percent nationally. The decline was greater for Delaware males (22.9 percent) than females (16.7 percent) and for African Americans (30.8 percent) compared to Caucasians (16.8 percent). Mortality rates decreased for all of the types of cancer included in this report.

Many factors contribute to the progress that Delaware has made in reducing the cancer burden in our state. Here are some examples.

- From 1992-96 to 2002-06, Delaware's decline in female breast cancer incidence was 71.2 percent greater than the decline at the national level. Furthermore, Delaware's 2002-06 breast cancer incidence rate for Caucasian women (122.1 per 100,000) was significantly lower than the U.S. rate (127.8 per 100,000). Increases in early detection may be responsible for some of this progress. In 2008, Delaware ranked 5th highest in the nation for breast cancer screening among women age 40 and older.
- From 1992-96 to 2002-06, Delaware's colorectal cancer incidence rate declined 15.4 percent while the comparable U.S. rate declined 12.0 percent. During the same time, Delaware's colorectal cancer mortality rate declined 24.2 percent while the comparable U.S. rate declined 20.5 percent. The decline in colorectal cancer mortality rates has been especially pronounced among African American females. Again, increases in early detection may be responsible for some of this improvement. In 2008, Delaware led the nation in colorectal cancer screening. Over 74 percent of Delawareans age 50 and older reported ever having had a sigmoidoscopy or colonoscopy, compared to 62 percent nationally. In recent years, colorectal cancer screening prevalence has increased dramatically among African American Delawareans. In 2008, Delaware's colorectal cancer screening rate for African Americans was 25.4 percent greater than the comparable U.S. rate.
- An estimated 87 percent of all lung cancer cases are caused by tobacco use. Delaware is now reaping the benefits of reductions in tobacco use that started to occur decades ago. Delaware's current adult smoking prevalence rate (17.8 percent) is the lowest in state history.
- The proportion of prostate cancer cases in Delaware that are detected in the local stage has dramatically increased over the past 30 years. For 2002-06, 86.7 percent of prostate cancer cases diagnosed in Delaware were detected in the local stage compared to just 49.6 percent of cases diagnosed in 1980-84.

Despite Delaware's progress in reducing the state's overall cancer burden, Delaware's 2002-06 cancer incidence rate (507.0 per 100,000) was 9.5% higher than that of the U.S. (462.9 per 100,000). Delaware's 2002-06 cancer mortality rate (194.3 per 100,000) was 4.0% higher than that of the nation (186.9 per 100,000). There is still much work to be done:

- Lung cancer continues to play an enormous role in Delaware's overall cancer burden. For 2002-06, lung cancer accounted for 16.0 percent of all new cancer cases and 31.1 percent of all cancer deaths in the state. Unfortunately, the ability to detect lung cancer early, and effective treatment options, are not nearly as good as for some other cancers.
- For 2002-06, 57.5 percent of all colorectal cancer cases diagnosed in Delaware were detected in the regional or distant stages, after the cancer had spread from its original location. Although this reflects a small improvement since 1992-96, when 61.8 percent of cases were diagnosed in the regional or distant stages, most colorectal cancers are still diagnosed in the advanced stages.
- The prostate cancer burden among men continues to disproportionately affect African Americans. The 2002-06 prostate cancer incidence rate for African American males in Delaware was 1.7 times greater than the rate for Delawarean Caucasian males. Similarly, the 2002-06 prostate cancer mortality rate for African American males in Delaware was 2.1 times greater than the rate for Delawarean Caucasian males.

This report includes data for overall cancer as well as 13 site-specific cancers (female breast, cervical, colorectal, Hodgkin lymphoma (HL), leukemia, lung, myeloma, non-Hodgkin lymphoma (NHL), prostate, stomach, thyroid, urinary bladder and uterine cancers). Tables A and B provide a brief summary of Delaware's 2002-06 incidence and mortality rates compared to the U.S rates.

In addition, as required by Title 16, Chapter 292 of the Delaware Code (Appendix F), this report includes cancer rates for each of Delaware's census tracts. Data used are the 2002-2006 average annual age-adjusted rates. Of 22,760 cancer cases, 97.4 percent were successfully geocoded (the residential census tract of the individual was identified).

In 45 of Delaware's 197 census tracts, the overall cancer incidence rates were significantly higher than Delaware's average incidence rate (507.0 per 100,000), while rates were significantly lower in 22 census tracts. Rates for the remaining 129 census tracts were not significantly different from the state's average rate.

Cancer rates may differ between census tracts for a variety of reasons:

- Clustering of lifestyle behaviors (e.g. smoking);
- Environmental or occupational exposure to chemicals, or lack thereof;
- Access to health care (e.g. more or less cancer screening);
- Chance, or random variation.

Table A: 2002-06 Average Annual Age-Adjusted Cancer Incidence Rates, Delaware vs. U.S.

	Delaware Rate 2002-06	U.S. Rate 2002-06	Delaware % Change: 1992-96 vs. 2002-06	U.S. % Change: 1992-96 vs. 2002-06
All Site	507.0 (500.4, 513.6)*	462.9 (462.2, 463.6)	↓ 3.8%	↓ 5.1%
Female Breast	122.6 (118.2, 127.0)	123.8 (123.3, 124.3)	↓ 10.1%	↓ 5.9%
Cervical	8.2 (7.0, 9.4)	8.2 (8.1, 8.3)	↓ 27.4%	↓ 13.7%
Colorectal	51.7 (49.6, 53.8)*	49.1 (48.9, 49.3)	↓ 15.4%	↓ 12.0%
HL	3.5 (3.0, 4.1)*	2.8 (2.7, 2.9)	↑ 12.9%	No change
Leukemia	10.5 (9.6, 11.5)*	12.2 (12.1, 12.3)	↓ 6.2%	↓ 6.9%
Lung	80.5 (77.9, 83.1)*	63.1 (62.8, 63.4)	↓ 8.0%	↓ 6.5%
Myeloma	5.3 (4.6, 5.9)	5.6 (5.5, 5.7)	↑ 8.2%	↓ 3.4%
NHL	19.2 (17.9, 20.5)	19.5 (19.4, 19.6)	↑ 45.5%	↑ 1.0%
Prostate	178.0 (172.2, 208.5)*	159.3 (158.7, 159.9)	↓ 15.7%	↓ 17.0%
Stomach	7.1 (6.3, 7.9)	7.9 (7.8, 8.0)	(not available)	↓ 9.1%
Thyroid	10.8 (9.8, 11.8)*	9.6 (9.5, 9.7)	↑ 111.8%	↑ 57.4%
Urinary bladder	24.5 (23.1, 26.0)*	21.0 (20.9, 21.1)	↑ 8.9%	↑ 1.0%
Uterine	28.2 (26.1, 30.3)*	23.3 (23.1, 23.5)	↑ 20.0%	↑ 8.4%

All rates are per 100,000. Numbers in parentheses represent 95 percent confidence intervals.

HL=Hodgkin lymphoma; NHL=non-Hodgkin lymphoma

Stomach cancer incidence rates have not previously been calculated at the state level; therefore, historical trend data for are not available for Delaware.

Beginning with reporting year 2002-06, U.S. incidence rates were based on SEER 17 areas whereas earlier rates were based on SEER 9. As a result, rate comparisons over time may be not always be comparable. See Appendix B for more information.

Methodology for the assignment of Hodgkin lymphoma and non-Hodgkin lymphoma was modified beginning in reporting period 2001-2005 to include consideration of histology as well as primary site. Incidence rates for these two types of cancer increased because of this change.

* = Statistically significant compared to the U.S. rate at the 95% confidence level.

Table B: 2002-06 Average Annual Age-Adjusted Cancer Mortality Rates, Delaware vs. U.S.

	Delaware Rate 2002-06	U.S. Rate 2002-06	Delaware % Change: 1992-96 vs. 2002-06	U.S. % Change: 1992-96 vs. 2002-06
All Site	194.3 (190.2, 198.4)*	186.9 (186.7, 187.1)	↓ 18.9%	↓ 11.5%
Female Breast	23.5 (21.6, 25.4)	24.5 (24.4, 24.6)	↓ 30.1%	↓ 20.5%
Cervical	2.5 (1.9, 3.2)	2.5 (2.4, 2.5)	↓ 43.2%	↓ 24.2%
Colorectal	18.5 (17.3, 19.8)	18.2 (18.1, 18.3)	↓ 24.2%	↓ 20.5%
HL	---	0.4 (0.4, 0.5)	---	↓ 33.3%
Leukemia	7.4 (6.6, 8.2)	7.3 (7.3, 7.3)	↓ 9.8%	↓ 7.6%
Lung	59.9 (57.7, 62.2)*	53.4 (53.3, 53.5)	↓ 14.9%	↓ 8.9%
Myeloma	3.2 (2.7, 3.8)	3.6 (3.6, 3.6)	↓ 22.0%	↓ 7.7%
NHL	6.8 (6.0, 7.5)	7.1 (7.1, 7.1)	↓ 18.1%	↓ 16.5%
Prostate	26.8 (24.3, 29.2)	25.6 (25.5, 25.8)	↓ 40.4%	↓ 32.8%
Stomach	3.8 (3.2, 4.3)	4.0 (3.9, 4.0)	(not available)	↓ 25.9%
Thyroid	---	0.5 (0.5, 0.5)	---	↑ 25.0%
Urinary bladder	5.8 (5.1, 6.5)*	4.3 (4.3, 4.4)	↓ 1.7%	↓ 2.3%
Uterine	4.7 (3.9, 5.6)	4.1 (4.1, 4.2)	↓ 2.1%	↓ 2.4%

All rates are per 100,000. Numbers in parentheses represent 95 percent confidence intervals.

'---' = data suppressed due to low numbers. HL=Hodgkin lymphoma; NHL=non-Hodgkin lymphoma;

Stomach cancer mortality rates have not previously been calculated at the state-level; therefore, historical trend data for stomach cancer mortality are not available for Delaware.

* = Statistically significant compared to the U.S. rate at the 95% confidence level.

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1. INTRODUCTION

Delaware Cancer Registry

The Delaware Cancer Registry (DCR) is managed by the Delaware 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 the passage of Senate Bill 372. Senate Bill 372 required physicians to provide additional information to the DCR, including patients' duration of residence in Delaware and their occupational history. Senate Bill 372 also extended the reporting deadline to 180 days from initial diagnosis or treatment.

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

Reporting Facilities

A total of 33 facilities submit data to the DCR; these facilities include seven hospitals, 10 diagnostic laboratories, 15 free-standing ambulatory surgery centers, and hundreds of physician offices. Additionally, the DCR has established 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 the identification of Delawareans whose cancers were diagnosed and/or treated in other states.

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 the removal of all personal identifiers. Researchers who use DCR data must comply with the regulations stated in DPH data use agreements or obtain clearance from Delaware's Human Subjects Review Board.

Data Quality

Internal quality control procedures are 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 abstract to the DCR.

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 for data from diagnosis years 1997, 1998, 1999, 2002, 2003, 2004, 2005 and 2006.

Additionally, NPCR provides an annual Standard Status Report to state cancer registries supported by the CDC. Delaware's data submission for diagnosis years 1997–2006 met the standard levels for quality, completeness and timeliness.

Data Uses

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 federal agencies, research institutions and academic institutions. The Delaware Cancer Consortium and other advisory committees rely heavily on DCR data to monitor cancer trends across the state.

Organization of This Report

This report focuses on all site cancer, as well as 13 other cancer types (female breast, cervical, colorectal, Hodgkin lymphoma, leukemia, lung, myeloma, non-Hodgkin lymphoma, prostate, stomach, thyroid, urinary bladder and uterine cancers).

Delaware's cancer incidence and mortality statistics are broken down by sex, race and county. Race-specific data are limited to Caucasians and African Americans; cancer rates for other racial groups (e.g., Hispanics) are not presented due to small sample size issues and the need to protect patient confidentiality. Relevant behavioral risk factor data and stage at diagnosis are also presented throughout the report. Appendices A-K contain supplemental methodological information related to the report. Appendix E summarizes behavioral risk factor data specific to Delawareans.

2. GUIDELINES FOR THE INTERPRETATION OF INCIDENCE AND MORTALITY RATES

Rates are expressed per 100,000 individuals (i.e., cancer rates for Delaware are expressed per 100,000 Delawareans; cancer rates for the U.S. are expressed per 100,000 U.S. residents). Ninety-five percent (95%) confidence intervals were computed for each cancer rate. Confidence intervals represent the range of values in which the cancer rate could reasonably fall.

Confidence intervals were used to determine if the amount by which two cancer rates differ was statistically significant. If the confidence interval for one rate did not overlap with the confidence interval for another rate, the two rates were significantly different. When one rate is significantly different from another rate, the difference between the rates is larger than would be expected by chance alone. If the confidence interval for one rate overlapped with the confidence interval for another rate, the two rates were not significantly different. When rates are not significantly different from one another, it is commonly interpreted as “no meaningful difference” between rates.

3. All Cancer Sites (All Site)

Data Highlights

New All Site Cancer Cases and Deaths (Tables 3.1 and 3.4)

- A total of 22,760 cases of cancer were diagnosed in Delaware between 2002 and 2006: 12,078 cases (53.1 percent) were diagnosed among males and 10,682 cases (46.9 percent) were diagnosed among females.
- Between 2002 and 2006, 8,712 Delawareans died from cancer: 4,603 decedents (52.8 percent) were male and 4,109 decedents (47.2 percent) were female.

All Site Cancer Incidence and Mortality Rates (Tables 3.2 and 3.5)

- Delaware's 2002-06 all site cancer incidence rate of 507.0 per 100,000 was significantly higher than the U.S. rate of 462.9 per 100,000.
 - The 2002-06 Delaware all site cancer incidence rate among males (603.5 per 100,000) was significantly higher than the rate among females (436.8 per 100,000); this difference persisted in all race and county groups.
 - Delaware's 2002-06 all site cancer incidence rate for African Americans (538.3 per 100,000) was significantly higher than the rate for Caucasians (501.7 per 100,000).
 - Incidence rates were significantly higher for African American males than for Caucasian males at the all geographic levels with the exception of Kent County.
 - At both the national level and Kent County, incidence rates for African American women were significantly lower than among Caucasian women. In contrast, incidence rates for African American and Caucasian females did not differ significantly for Delaware as a whole or for New Castle and Sussex Counties.
- Delaware's 2002-06 overall cancer mortality rate of 194.3 per 100,000 was significantly higher than the U.S. rate of 186.9 per 100,000.
 - In Delaware, the 2002-06 all site cancer mortality rate for males (242.4 per 100,000) was significantly higher than that for females (162.0 per 100,000). This significant difference was observed among all race and county groups. At the national level, the all site cancer mortality rate for males was also significantly greater than that for females (229.9 per 100,000 vs. 157.8 per 100,000, respectively).
 - In the U.S., Delaware, and Sussex County, 2002-06 all site cancer mortality rates for African Americans of either sex were significantly higher than mortality rates for their Caucasian counterparts.
 - The Kent County mortality rates for African Americans of either sex were not significantly different from rates for their Caucasian counterparts.
 - The New Castle County mortality rate for African American males was significantly higher than the rate for Caucasian males; mortality rates for African American and Caucasian females in New Castle County were not significantly different.

Trends in All Site Cancer Incidence and Mortality Rates (Figures 3.1–3.2 and 3.4–3.5)

- Delaware's all site cancer incidence rate decreased 3.8 percent from 1992-96 to 2002-06. During the same ten-year period, the U.S. all site cancer incidence rate decreased 5.1 percent.
 - In Delaware, the percentage decrease in all site cancer incidence rates was larger for African Americans compared to Caucasians (12.4 percent vs. 2.3 percent, respectively) and for males compared to females (7.9 percent vs. 1.8 percent, respectively).
 - Delaware's all site cancer incidence rate for African American males has seen the greatest ten-year reduction, falling 20.9 percent from 1992-96 to 2002-06.

- During the same 10-year period, all site cancer incidence rates fell among Caucasian males, Caucasian females, and African American females by 5.9 percent, 0.9 percent and 4.5 percent, respectively.
- Historically, the all site cancer mortality rate for Delaware has been higher than that for the U.S.
 - In Delaware, between 1992-96 and 2002-06, the all site cancer mortality rate for males and females decreased 22.9 percent and 16.7 percent, respectively.
 - In the U.S., during the same period, the all site cancer mortality rate for males and females decreased 15.3 percent and 9.0 percent, respectively.
 - For 2002-06, African American males in Delaware had the highest all site cancer mortality rate. However, they are also the group with the largest percentage decrease in cancer mortality; over the last 10 years (from 1992-96 to 2002-06), the all site cancer mortality rate for African American males in Delaware decreased 37.7 percent.
 - From 1992-96 to 2002-06, Delaware's all site cancer mortality rates decreased for Caucasian males, Caucasian females and African American females by 20.2 percent, 15.3 percent and 24.9 percent, respectively.

Age-Specific Incidence and Mortality (Tables 3.3 and 3.6, Figures 3.3 and 3.6)

- For all sex and race groups, the risk of developing cancer increased with age, from birth through ages 75-84. Cancer risk then decreased slightly among those ages 85 and older.
- For all sex and race groups, all site cancer mortality rates increased with age. The highest cancer mortality rate occurred among those ages 85 and older.

All Site Cancer Incidence

Table 3.1. Total Number of Cancer Cases in Delaware and Counties, by Race and Sex: 2002-06

REGION	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	22,760	12,078	10,682	18,838	9,960	8,878	3,470	1,876	1,594
Kent	3,637	1,943	1,694	2,955	1,555	1,400	589	340	249
New Castle	13,062	6,793	6,272	10,526	5,435	5,091	2,291	1,226	1,065
Sussex	6,058	3,342	2,716	5,357	2,970	2,387	590	310	280

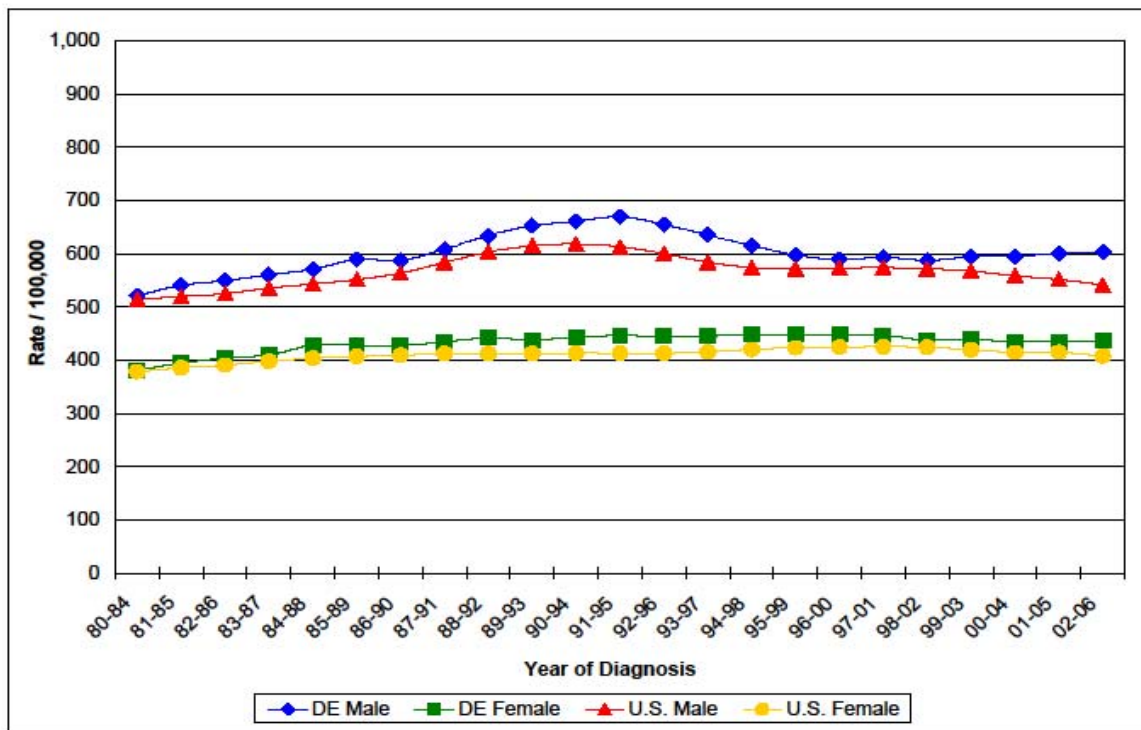
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 3.2. Five-Year Average Age-Adjusted All Site Cancer Incidence Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	462.9 (462.2, 463.6)	541.9 (540.8, 543.0)	408.5 (407.6, 409.4)
Delaware	507.0 (500.4, 513.6)	603.5 (592.8, 614.3)	436.8 (428.5, 445.1)
Kent	530.3 (513.1, 547.6)	640.0 (611.5, 668.4)	450.6 (429.1, 472.1)
New Castle	516.4 (507.5, 525.2)	606.0 (591.6, 620.4)	438.7 (427.9, 449.6)
Sussex	495.7 (483.2, 508.2)	582.0 (562.3, 601.7)	427.6 (411.5, 443.7)
CAUCASIAN			
United States	470.6 (469.8, 471.4)	544.3 (543.0, 545.6)	420.5 (419.5, 421.5)
Delaware	501.7 (494.6, 508.9)	588.1 (576.5, 599.6)	439.7 (430.5, 448.8)
Kent	536.7 (517.3, 556.0)	633.7 (602.2, 665.2)	469.4 (444.8, 493.9)
New Castle	503.3 (493.7, 512.9)	591.1 (575.4, 606.8)	443.8 (431.6, 456.0)
Sussex	482.6 (469.7, 495.5)	565.1 (544.8, 585.4)	416.6 (399.9, 433.3)
AFRICAN AMERICAN			
United States	493.6 (491.1, 496.1)	633.7 (629.6, 637.8)	398.9 (396.0, 401.8)
Delaware	538.3 (520.4, 556.2)	695.4 (663.9, 726.9)	427.2 (406.3, 448.2)
Kent	509.0 (467.9, 550.2)	656.6 (586.8, 726.3)	387.1 (339.0, 435.2)
New Castle	534.0 (512.1, 555.9)	691.8 (653.1, 730.5)	426.6 (401.0, 452.3)
Sussex	571.2 (525.1, 617.3)	732.5 (651.0, 814.1)	465.9 (411.3, 520.5)

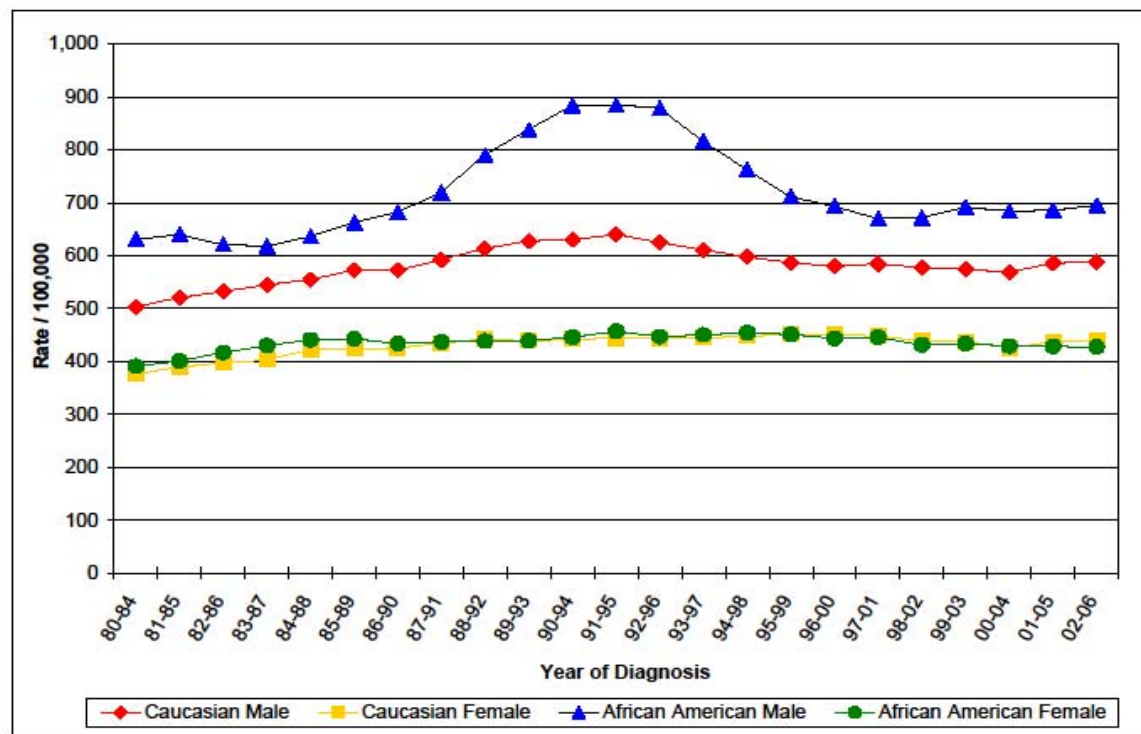
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 3.1. Five-Year Average Age-Adjusted All Site Cancer Incidence Rates* in the U.S. and Delaware, by Sex: 1980–2006



* = 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, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 3.2. Five-Year Average Age-Adjusted All Site Cancer Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = 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, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

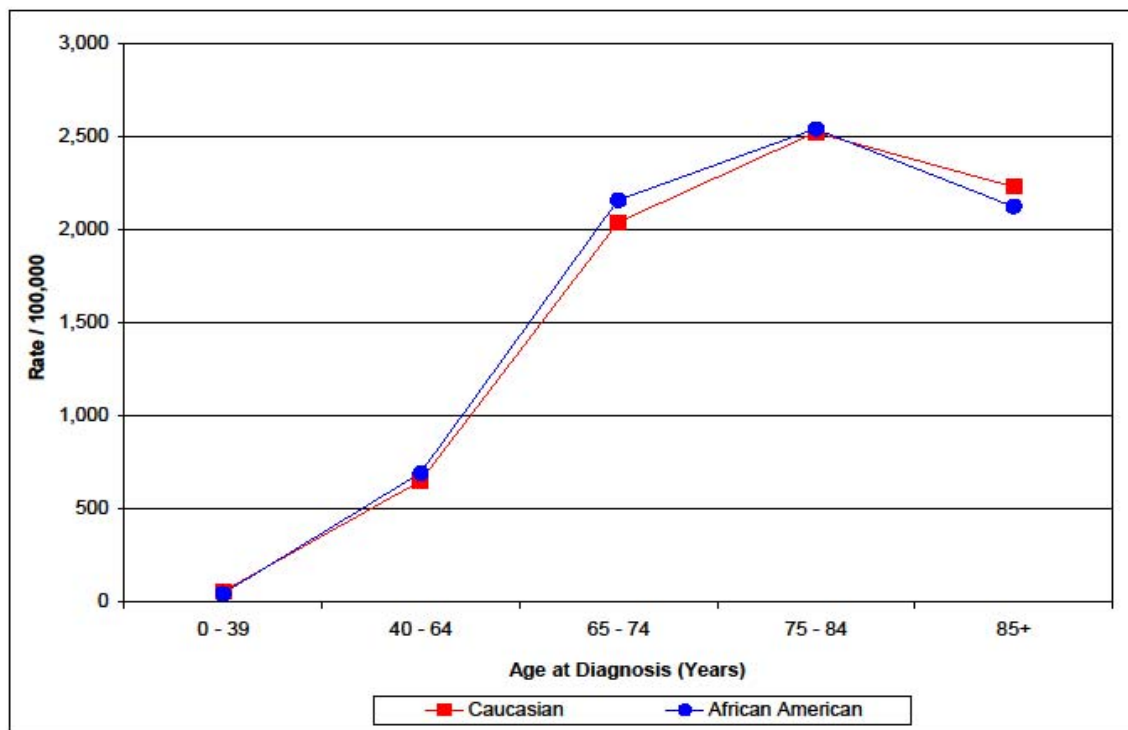
Table 3.3. Age-Specific All Site Cancer Incidence Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	50.5	40.5	60.6	54.0	43.8	64.3	39.9	31.0	48.5
40-64	661.1	697.7	626.9	659.0	681.1	637.9	702.2	817.2	605.7
65-74	2,087.8	2,717.0	1,546.9	2,060.0	2,632.9	1,560.3	2,262.6	3,259.6	1,484.5
75-84	2,538.8	3,342.6	1,980.1	2,528.8	3,293.1	1,988.7	2,485.3	3,520.9	1,863.7
85+	2,192.8	3,117.7	1,800.7	2,198.2	3,140.4	1,794.4	2,024.0	2,852.5	1,719.7

* = Rates are per 100,000 population.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 3.3. Age-Specific All Site Cancer Incidence Rates in Delaware, by Race: 2002-06



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

All Site Cancer Mortality

Table 3.4. Total Number of Cancer Deaths in Delaware and Counties, by Race and Sex: 2002-06

REGION	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	8,712	4,603	4,109	7,283	3,858	3,425	1,363	712	651
Kent	1,391	742	649	1,130	603	527	247	133	114
New Castle	4,929	2,544	2,385	4,029	2,081	1,948	859	441	418
Sussex	2,392	1,317	1,075	2,124	1,174	950	257	138	119

SOURCE: Delaware Health Statistics Center, 2009.

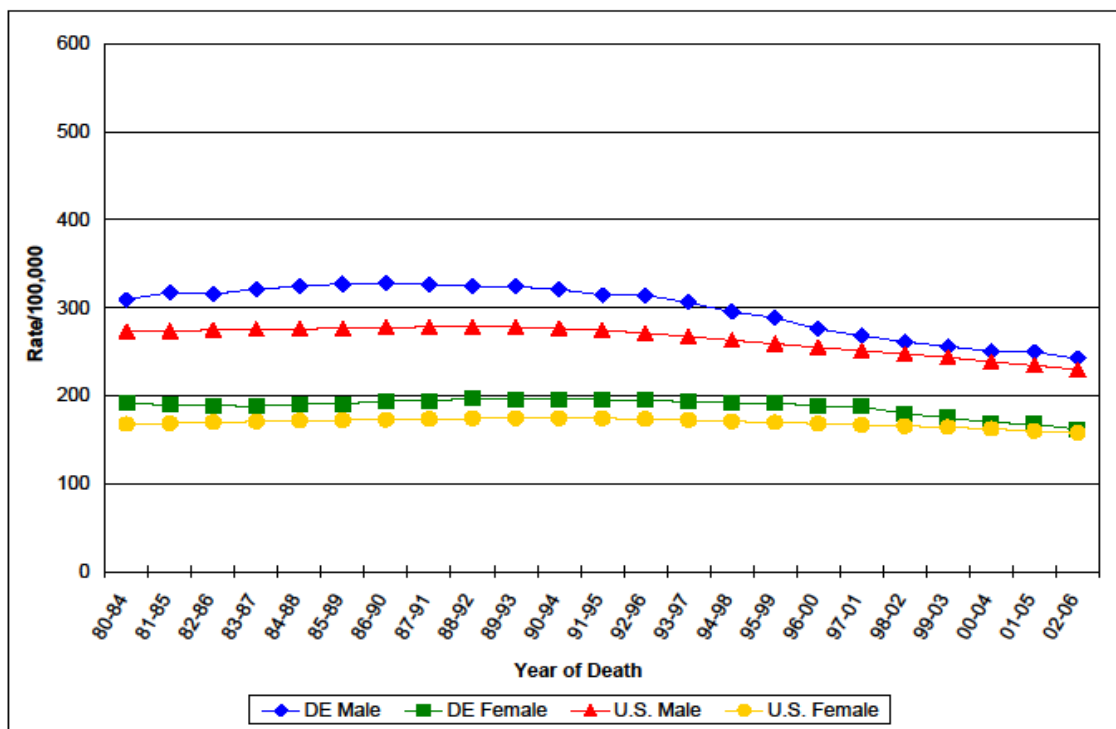
Table 3.5. Five-Year Average Age-Adjusted All Site Cancer Mortality Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	186.9 (186.7, 187.1)	229.9 (229.5, 230.3)	157.8 (157.6, 158.1)
Delaware	194.3 (190.2, 198.4)	242.4 (235.4, 249.4)	162.0 (157.0, 166.9)
Kent	207.8 (196.9, 218.7)	265.6 (246.5, 284.7)	171.0 (157.9, 184.2)
New Castle	197.4 (191.9, 202.9)	241.8 (232.4, 251.2)	162.8 (156.3, 169.3)
Sussex	190.3 (182.7, 198.0)	234.3 (221.7, 247.0)	156.9 (147.5, 166.2)
CAUCASIAN			
United States	185.4 (185.1, 185.6)	226.7 (226.3, 227.1)	157.3 (157.0, 157.6)
Delaware	190.4 (186.0, 194.8)	236.5 (229.0, 244.0)	159.4 (154.1, 164.7)
Kent	207.0 (194.9, 219.0)	265.3 (244.1, 286.4)	171.4 (156.8, 186.0)
New Castle	190.1 (184.2, 196.0)	236.2 (226.0, 246.3)	160.4 (153.3, 167.6)
Sussex	185.1 (177.3, 193.0)	227.3 (214.3, 240.3)	153.1 (143.4, 162.9)
AFRICAN AMERICAN			
United States	229.0 (228.2, 229.8)	304.2 (302.7, 305.8)	183.7 (182.8, 184.7)
Delaware	229.0 (216.8, 241.2)	295.3 (273.6, 317.0)	186.1 (171.8, 200.4)
Kent	229.2 (200.6, 257.8)	277.9 (230.7, 325.1)	190.9 (155.8, 225.9)
New Castle	220.0 (205.3, 234.7)	288.6 (261.7, 315.6)	180.1 (162.8, 197.3)
Sussex	256.4 (225.1, 287.8)	337.5 (281.2, 393.8)	201.7 (165.5, 238.0)

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

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

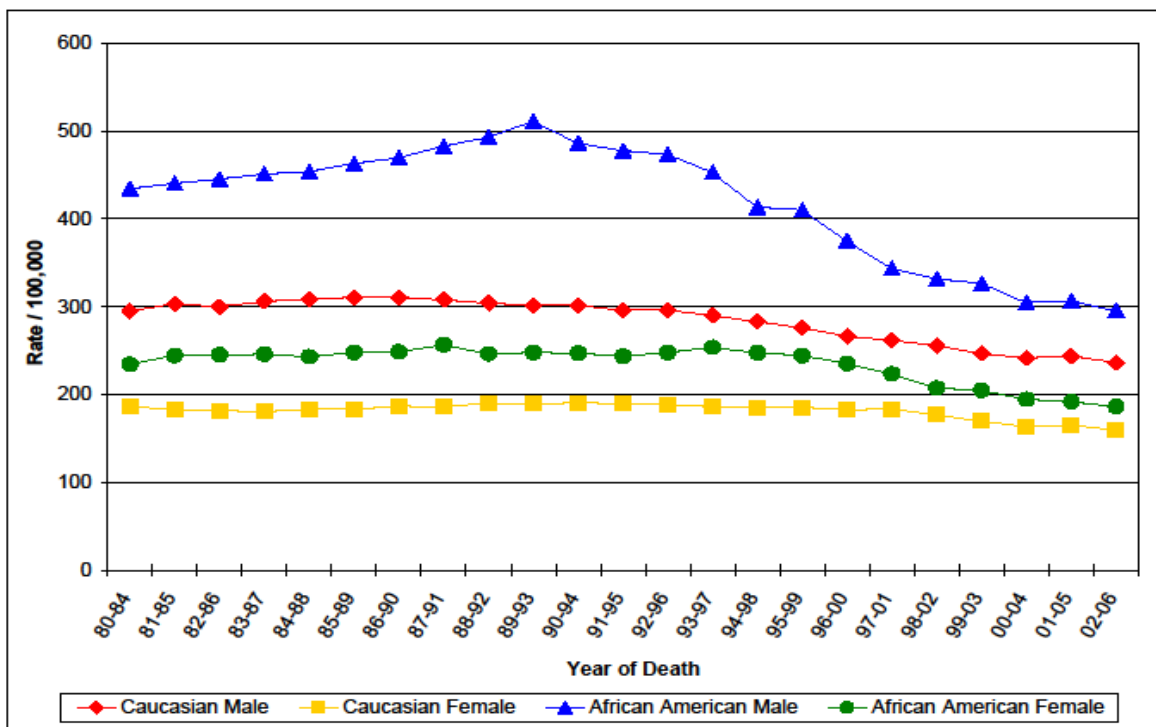
Figure 3.4. Five-Year Average Age-Adjusted All Site Cancer Mortality Rates* in the U.S. and Delaware, by Sex: 1980–2006



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

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 3.5. Five-Year Average Age-Adjusted All Site Cancer Mortality Rates* in Delaware, by Race and Sex: 1980–2006



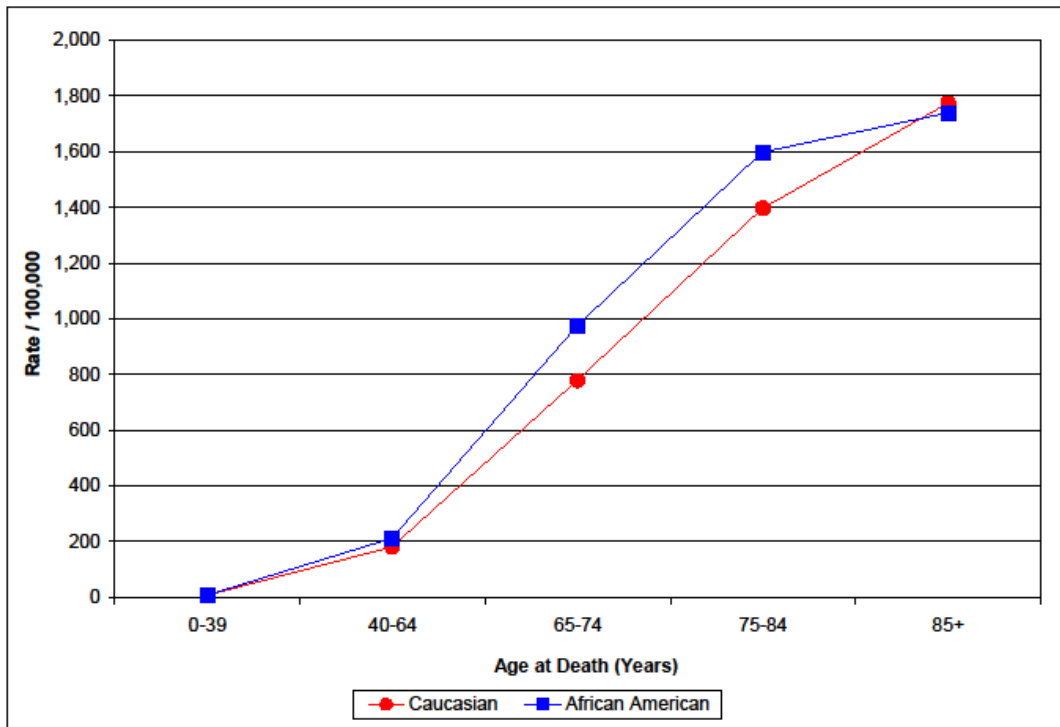
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 3.6. Age-Specific All Site Cancer Mortality Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0–39	7.3	6.4	8.2	7.6	6.2	9.0	7.7	8.1	7.2
40–64	180.8	193.8	168.6	177.3	188.0	167.0	214.6	246.1	188.0
65–74	788.6	968.9	633.7	766.9	937.8	617.8	977.9	1,250.0	765.6
75–84	1,351.0	1,782.2	1,051.3	1,343.1	1,760.2	1,048.4	1,500.9	2,091.7	1,146.3
85+	1,646.5	2,478.8	1,293.6	1,662.8	2,516.9	1,296.8	1,575.8	2,260.5	1,324.4

* = Rates are per 100,000 population.
 SOURCE: Delaware Health Statistics Center, 2009.

Figure 3.6. Age-Specific All Site Cancer Mortality Rates in Delaware, by Race: 2002-06



SOURCE: Delaware Health Statistics Center, 2009.

4. Female Breast Cancer

Risk Factors and Early Detection

Risk Factors for Female Breast Cancer

- Increasing age
- Mother, daughter and/or sister diagnosed with breast cancer
 - Women with a father or brother diagnosed with breast cancer also have an increased risk
- Inherited mutation in BRCA1 or BRCA2 genes, found most often in Jewish women of Eastern European origin
- Personal history of breast cancer, ovarian cancer, or benign breast disease
- Previous abnormal breast biopsy
- Race
 - Caucasian females are slightly more likely to develop breast cancer than African American females. However, African American females are more likely to be younger when diagnosed with breast cancer and to die from the disease.
- High-dose radiation therapy to the chest
- Early age at menarche and/or late age at menopause
- Shorter or longer than average menstrual cycles
- Obesity
- First childbirth after age 35
- Never giving birth
- Current or recent use of estrogen and progesterone hormone replacement therapy
- Heavy alcohol use (level of risk rises with the amount of alcohol consumed)
- Breast tissue that appears dense on a mammogram

Possible Risk Factors for Female Breast Cancer

- Having taken diethylstilbestrol (DES) during pregnancy, or having a mother who took DES during pregnancy
- Mutations in the ATM, CHEK2, p53 or PTEN genes
- High-fat diets that are low in fruits and vegetables
- Pesticide and other environmental estrogen exposures
- Cigarette smoking or exposure to secondhand smoke
- Night-shift work

Protective Factors

- Engaging in physical activity for 4 or more hours per week
- Multiple pregnancies
- Becoming pregnant at an early age
- Breastfeeding for at least several years

Early Detection of Female Breast Cancer

Females at increased risk for breast cancer should talk with their doctors about the benefits and limitations of beginning mammograms when they are younger, having additional tests, or having more frequent exams.

Regular clinical breast exams and mammograms can detect female breast cancer at an earlier stage, resulting in improved chances for survival. Age-specific breast cancer screening recommendations from the American Cancer Society (ACS) are as follows:

Type of Exam	Recommended Frequency	
	Ages 20–39	Ages 40 and Older
Clinical breast exam	Every three years	Annual
Mammogram	Baseline by age 40	Annual

Recent data (2008) from the Behavioral Risk Factor Surveillance System (BRFSS) provide information on the pattern of breast cancer screening among Delawarean women:

- In 2008, 82.3 percent of Delaware women age 40 and older reported having a mammogram within the previous two years compared to 76.0 percent of U.S. women age 40 and older.
- In Delaware, the percentage of Caucasian and African American women age 40 and older who reported having a mammogram in the past two years were not significantly different (81.2 percent vs. 86.2 percent, respectively).
- Delaware women (age 40 and older) earning over \$50,000 per year were significantly more likely to report having had a mammogram in the past two years compared to those earning less than \$50,000 per year (87.3 percent vs. 77.5 percent, respectively).
- Delaware females (age 40 and older) attending some college or with a college degree were just as likely to report having had a mammogram within the past two years as were females with a high school diploma or less (83.4 percent vs. 80.5 percent, respectively).
- The percentage of women ages 40-64 who report having had a mammogram in the past two years was not significantly different from the percentage of women ages 65 and older who report doing the same (82.9 percent vs. 80.8 percent, respectively).

Data Highlights

New Female Breast Cancer Cases and Deaths (Tables 4.1 and 4.6)

- Excluding skin cancers, breast cancer was the most frequently diagnosed cancer among females in Delaware and the U.S. From 2002-06, 2,961 new cases of breast cancer were diagnosed in Delaware, accounting for 27.7 percent of all new cancer cases diagnosed among females.
- For 2002-06, breast cancer was the second leading cause of cancer death among females. During this time, breast cancer accounted for 14.2 percent of cancer deaths among Delaware females.

Female Breast Cancer Incidence and Mortality Rates (Tables 4.2 and 4.7)

- Overall, the 2002-06 female breast cancer incidence rate for Delaware (122.6 per 100,000) was not significantly different from the U.S. rate (123.8 per 100,000).
 - Delaware's 2002-06 breast cancer incidence rate for Caucasian females (122.1 per 100,000) was significantly lower than the U.S. rate (127.8 per 100,000).
 - The 2002-06 breast cancer incidence rate for African American women in Delaware (124.0 per 100,000) was not significantly different from the U.S. rate (117.7 per 100,000).
 - At the national level, the 2002-06 breast cancer incidence rate for African American women was significantly lower than the rate for Caucasian women. However, no significant differences were

observed at the state- and county-levels when breast cancer incidence rates were examined by race.

- Delaware's 2002-06 female breast cancer mortality rate (23.5 per 100,000) was not significantly different from the U.S. rate (24.5 per 100,000).
- In the U.S., the 2002-06 breast cancer mortality rate for African American women was significantly higher than for Caucasian women; this pattern was not observed at the state or county levels.

Trends in Female Breast Cancer Incidence and Mortality Rates (Figures 4.1–4.2 and 4.6–4.7)

- Delaware's female breast cancer incidence rate decreased 10.1 percent from 1992-96 to 2002-06. During this same period, the U.S. breast cancer incidence rate decreased 5.9 percent.
 - From 1992-96 to 2002-06, Delaware's female breast cancer incidence rate decreased 12.1 percent among Caucasians but increased 3.2 percent among African Americans.
- Historically, female breast cancer mortality rates have been higher for Delaware than the U.S., but rates for the two areas no longer differ significantly. From 1992-96 to 2002-06, Delaware's female breast cancer mortality rate decreased 30.1 percent, while the U.S. rate fell 20.5 percent. If this trend continues, Delaware's mortality rate may soon be significantly lower than the national rate.
 - From 1992-96 to 2002-06, Delaware's breast cancer mortality rate decreased 31.0 percent among Caucasian women and 24.8 percent among African American women.

Age-Specific Incidence and Mortality Rates (Tables 4.3 and 4.8, Figures 4.3 and 4.8)

- Among Caucasian women in Delaware, the 2002-06 incidence of female breast cancer increased with age, from birth through ages 75-84. Breast cancer incidence rates then declined among Caucasian women age 85 and older.
- Among African American women in Delaware, the 2002-06 incidence of breast cancer increased with age, peaking among those ages 65-74. Breast cancer incidence rates then declined among African American women age 75 and older.
- Among Caucasian and African American women in Delaware, the 2002-06 female breast cancer mortality rates increased with age, with the oldest age group (women age 85 and older) having the highest mortality rates.

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

- For 2002-06, 64.4 percent, 29.8 percent and 3.7 percent of female breast cancer cases in Delaware were diagnosed at the local, regional and distant stages, respectively. In the U.S., comparable percentages were 60.0 percent, 33.0 percent and 5.0 percent, respectively.
 - During 2002-06, 992 cases of female breast cancer (33.5 percent of all breast 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 breast cancer diagnoses was higher among African American females (38.0 percent) than among Caucasian females (32.7 percent).
 - In Delaware, since 1980-84, the proportion of breast cancers diagnosed at the local stage has increased from 42.3 percent to 64.4 percent. Accordingly, over this same time, the proportion of regional stage breast cancers decreased from 43.3 percent to 29.8 percent, and the proportion of distant stage breast cancers decreased from 6.1 percent to 3.7 percent.

Female Breast Cancer Incidence

Table 4.1. Number of Female Breast Cancer Cases in Delaware and Counties, by Race: 2002-06

	All Female	Caucasian Female	African American Female
Delaware	2,961	2,424	490
Kent	459	383	68
New Castle	1,751	1,388	339
Sussex	751	653	83

SOURCE: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

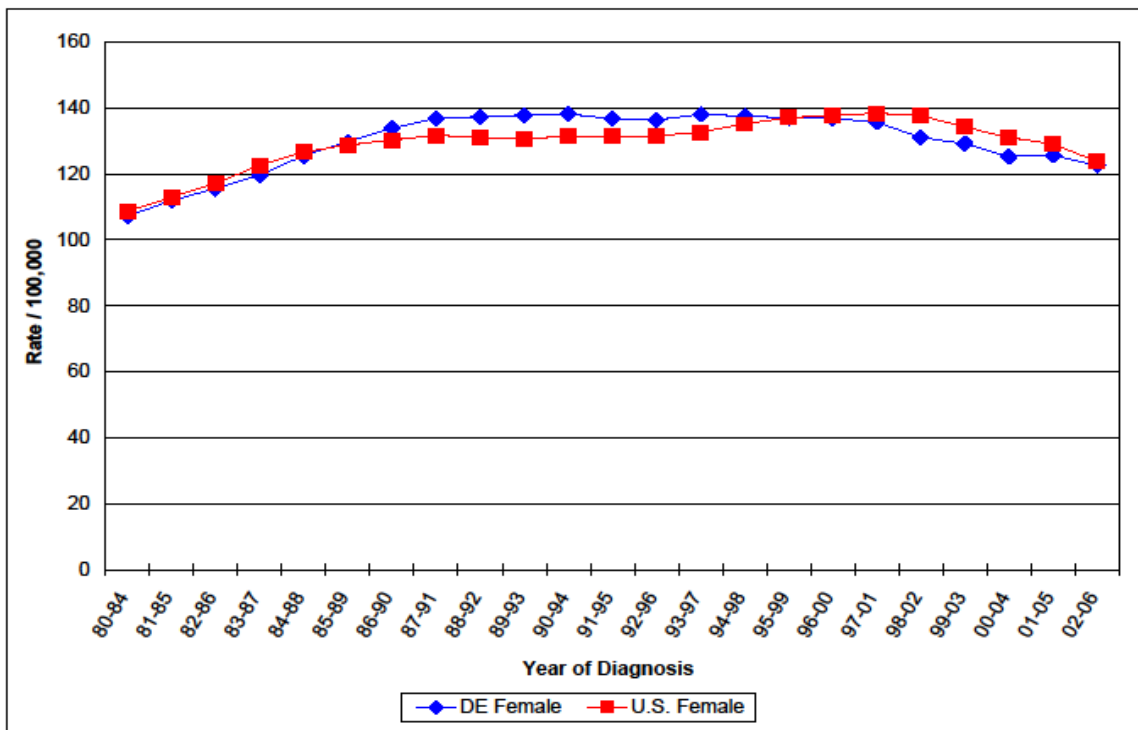
Table 4.2. Five-Year Average Age-Adjusted Female Breast Cancer Incidence Rates* in the U.S., Delaware and Counties, by Race: 2002-06

	All Female	Caucasian Female	African American Female
United States	123.8 (123.3, 124.3)	127.8 (127.2, 128.4)	117.7 (116.2, 119.2)
Delaware	122.6 (118.2, 127.0)	122.1 (117.2, 126.9)	124.0 (113.0, 134.9)
Kent	122.6 (111.4, 133.8)	129.4 (116.4, 142.3)	104.1 (80.9, 132.0)
New Castle	122.7 (116.9, 128.4)	122.3 (115.9, 128.8)	126.2 (112.7, 139.6)
Sussex	121.5 (112.8, 130.1)	115.6 (106.8, 124.5)	135.5 (108.0, 168.0)

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

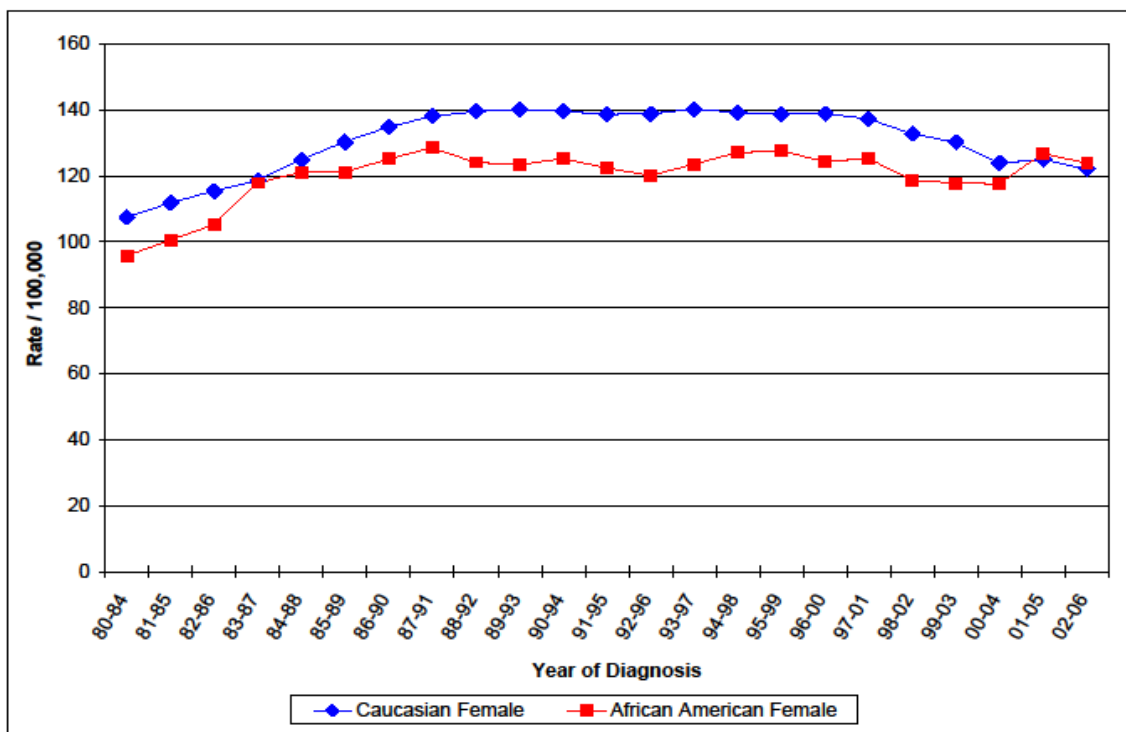
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 4.1. Five-Year Average Age-Adjusted Female Breast Cancer Incidence Rates* in the U.S. and Delaware: 1980–2006



* = 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, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 4.2. Five-Year Average Age-Adjusted Female Breast Cancer Incidence Rates* in Delaware, by Race: 1980–2006



* = 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, 2009.

Table 4.3. Age-Specific Female Breast Cancer Incidence Rates* in Delaware, by Race: 2002-06

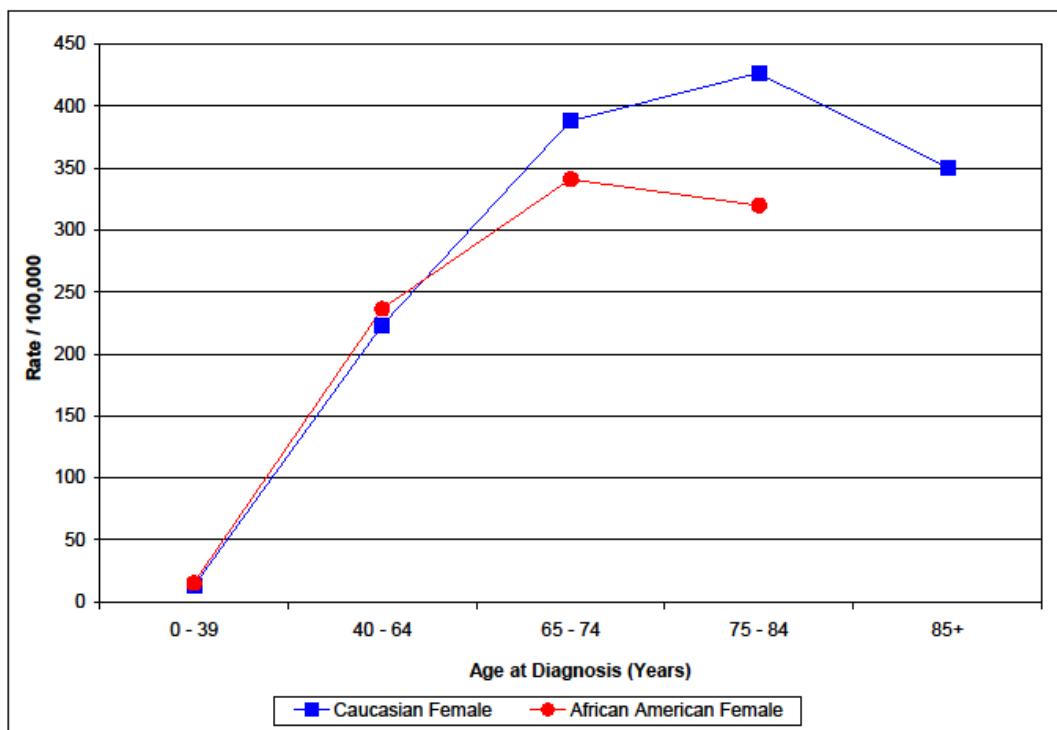
Age Group	All Female	Caucasian Female	African American Female
0-39	13.2	12.7	15.1
40-64	223.3	222.9	236.3
65-74	378.6	387.7	340.8
75-84	413.0	426.4	319.7
85+	348.9	350.5	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 4.3. Age-Specific Female Breast Cancer Incidence Rates in Delaware, by Race: 2002-06



NOTE: Rate for African American females age 85+ is not displayed because of patient confidentiality rules.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Female Breast Cancer by Stage at Diagnosis

Table 4.4. Number of Female Breast Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Female	Caucasian Female	African American Female
Local	1,906	1,585	292
Regional	882	700	170
Distant	110	93	16
Unknown	63	46	12
Total	2,961	2,424	490

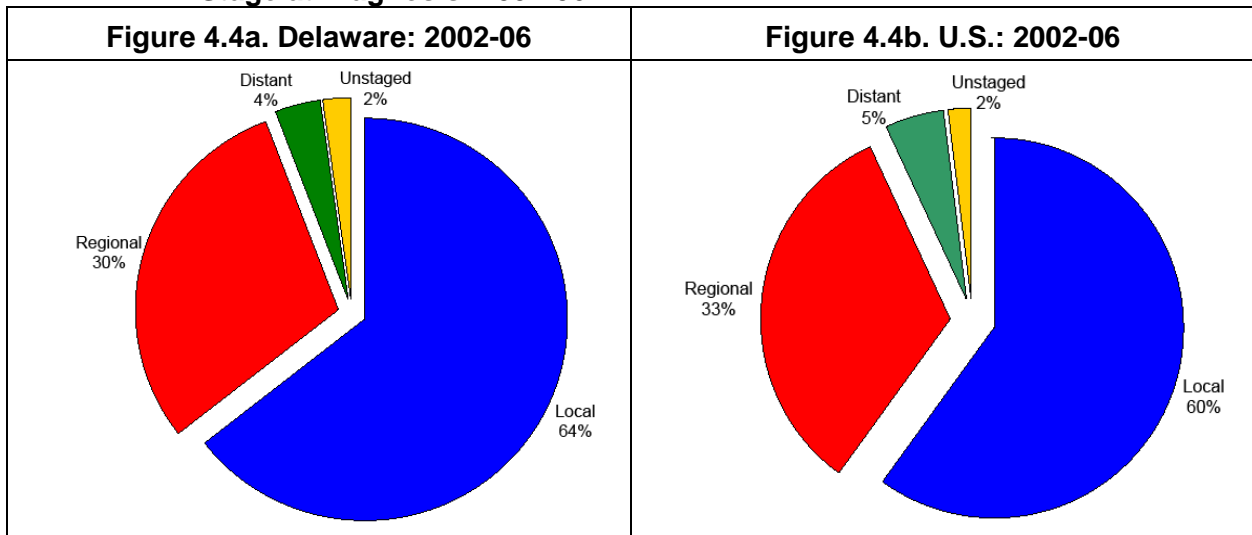
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 4.5. Percentage of Female Breast Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Female	Caucasian Female	African American Female
Local	64.4	65.4	59.6
Regional	29.8	28.9	34.7
Distant	3.7	3.8	3.3
Unknown	2.1	1.9	2.5
Total	100.0	100.0	100.0

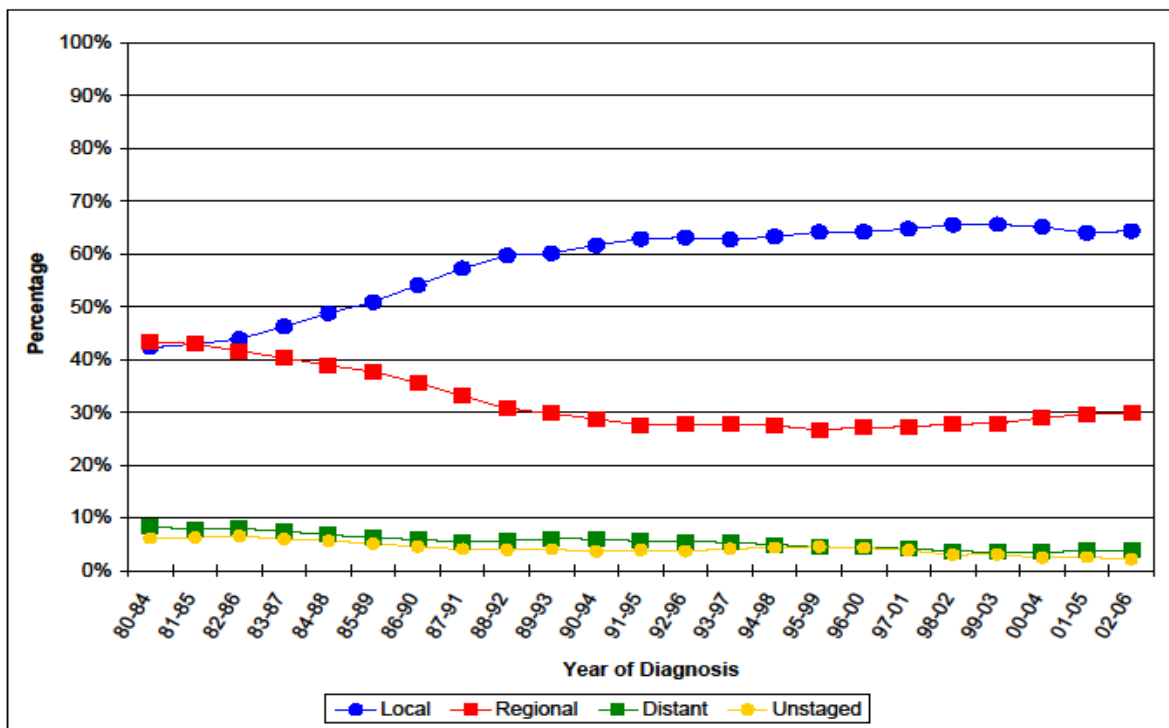
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 4.4. Percentage of Female Breast Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 4.5. Percentage of Female Breast Cancer Cases in Delaware, by Stage at Diagnosis: 1980–2006



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Female Breast Cancer Mortality

Table 4.6. Number of Female Breast Cancer Deaths in Delaware and Counties, by Race: 2002-06

Region	All Female	Caucasian Female	African American Female
Delaware	585	476	106
Kent	91	76	15
New Castle	352	273	77
Sussex	142	127	14

SOURCE: Delaware Health Statistics Center, 2009.

Table 4.7. Five-Year Average Age-Adjusted Female Breast Cancer Mortality Rates* in the U.S., Delaware and Counties, by Race: 2002-06

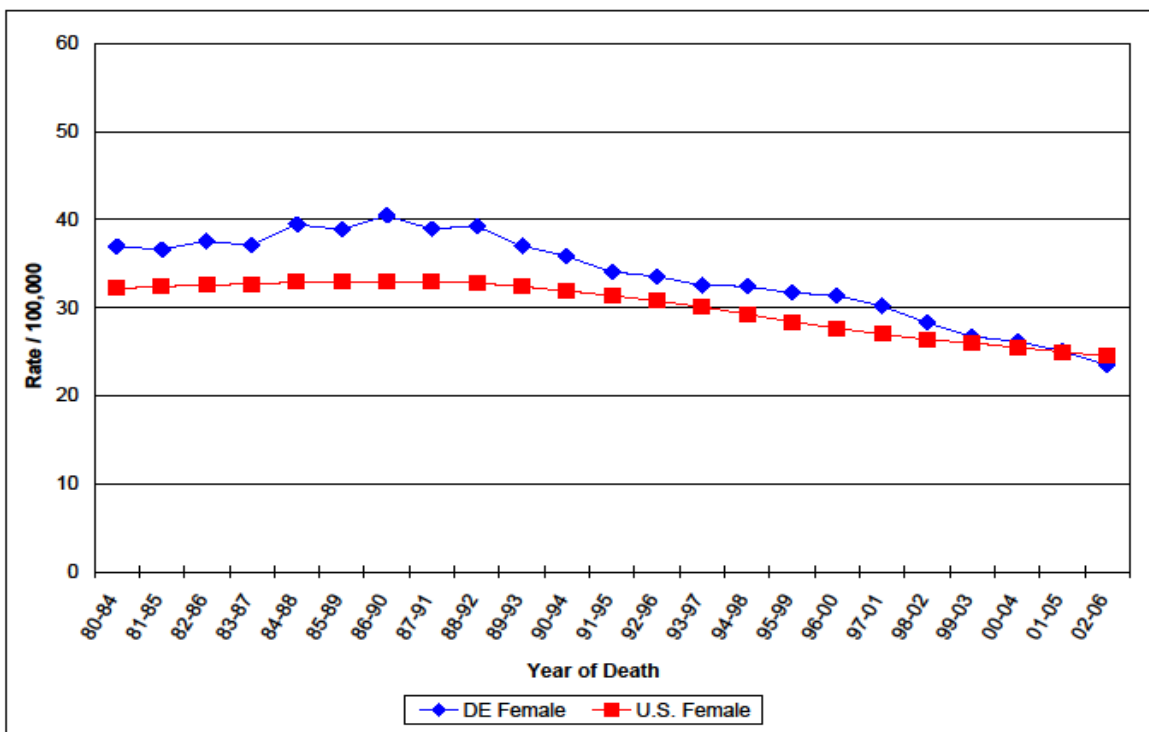
Region	All Female	Caucasian Female	African American Female
United States	24.5 (24.4, 24.6)	23.9 (23.8, 24.0)	33.0 (32.6, 33.4)
Delaware	23.5 (21.6, 25.4)	22.9 (20.9, 25.0)	27.9 (22.6, 33.2)
Kent	24.3 (19.6, 29.9)	25.6 (20.2, 32.1)	---
New Castle	23.9 (21.4, 26.4)	22.7 (20.0, 25.4)	30.1 (23.7, 37.6)
Sussex	22.3 (18.6, 25.9)	22.1 (18.2, 25.9)	---

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

--- = Rate based on fewer than 20 deaths.

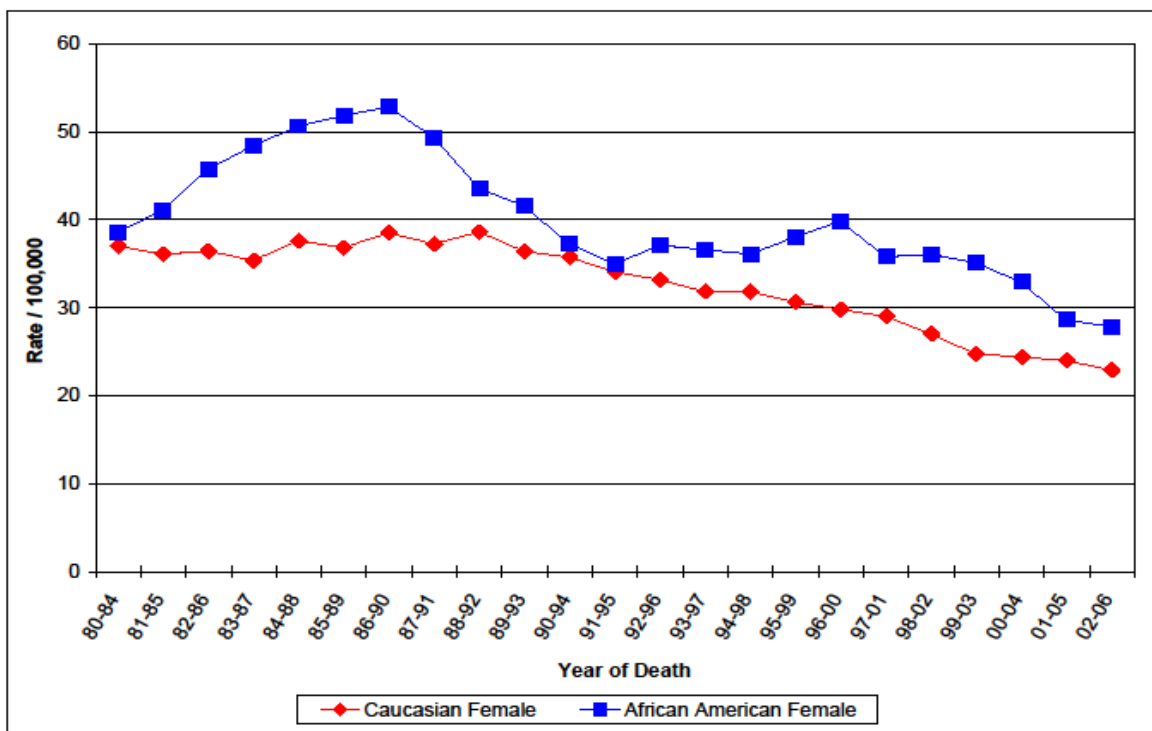
SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 4.6. Five-Year Average Age-Adjusted Female Breast Cancer Mortality Rates* in the U.S. and Delaware: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 4.7. Five-Year Average Age-Adjusted Female Breast Cancer Mortality Rates* in Delaware, by Race: 1980–2006



* = Rates are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 4.8. Age-Specific Female Breast Cancer Mortality Rates* in Delaware, by Race: 2002-06

Age Group	All Female	Caucasian Female	African American Female
0-39	1.8	---	---
40-64	34.5	32.5	46.1
65-74	70.2	68.8	---
75-84	115.7	117.8	---
85+	164.7	166.7	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 deaths.

SOURCE: Delaware Health Statistics Center, 2009.

Figure 4.8. Age-Specific Female Breast Cancer Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

5. Cervical Cancer

Risk Factors and Early Detection

Risk Factors for Cervical Cancer

- Human papillomavirus (HPV) infection
- Sexual intercourse at a young age
- Multiple sexual partners
- Having a partner who has had many sexual partners
- Sexual intercourse with uncircumcised males
- Long-term use of oral contraceptives
- Mother who took diethylstilbestrol (DES) during pregnancy
- Cigarette smoking
- Low socioeconomic status
- Many full-term pregnancies
- Family history of cervical cancer
- Being overweight
- Having a weakened immune system (e.g., through HIV, AIDS, or receiving drugs to suppress the immune system)

Possible Risk Factors for Cervical Cancer

- History of sexually transmitted disease(s), such as Chlamydia
- Diets low in fruits and vegetables
- Exposure to secondhand smoke

Protective Factors

- Gardasil[®] vaccine to protect against HPV
 - The Federal Advisory Committee on Immunization Practices (ACIP) has approved vaccine use for girls and women ages 11-26
- Condoms provide some protection against HPV infection, a known cervical cancer risk factor

Early Detection of Cervical Cancer

Routine Pap tests can detect cervical cancer at an earlier stage, resulting in greatly improved chances for survival

Current recommendations for cervical cancer screening are as follows:

- All females should begin having annual Pap test about three years after they start having sex, but no later than age 21
- Beginning at age 30, females who have had three normal Pap tests in a row may get the Pap test every two to three years. Alternatively, females over age 30 may be tested every three years with the Pap test, plus the HPV DNA test.
- Females age 70 and older who have had three normal test results in a row and no abnormal results in the last 10 years may choose to stop cervical cancer testing unless they have a history of cervical cancer, DES exposure before birth, HIV infection, or a weakened immune system. Females who have had a total hysterectomy may also choose to stop cervical cancer testing unless the surgery was a treatment for cervical cancer or precancerous cells.

Recent data (2008) from the Behavioral Risk Factor Surveillance System (BRFSS) provide information on the pattern of cervical cancer screening among Delawarean women:

- In 2008, 84.5 percent of Delaware females age 18 and older reported that they had had a Pap test within the previous three years. By comparison, 82.9 percent of U.S. females age 18 and older reported having had a Pap test within the previous three years.
- In Delaware, significantly more African American females reported having had a Pap test within the last three years compared to Caucasian females (92.6 percent vs. 82.8 percent, respectively).
- In 2008, significantly fewer Delaware females age 55 and older reported having had a Pap test in the last three years compared to women ages 18-54 (24.7 percent vs. 10.7 percent, respectively).

Data Highlights

New Cervical Cancer Cases and Deaths (Tables 5.1 and 5.6)

- For 2002-06, 181 women in Delaware were diagnosed with cervical cancer. Cervical cancer accounted for 1.7 percent of all cancer diagnosed among women during this time.
- For 2002-06, 58 Delaware females died from cervical cancer. Cervical cancer accounted for 1.4 percent of all cancer deaths among Delaware women during this time.

Cervical Cancer Incidence and Mortality Rates (Tables 5.2 and 5.7)

- The 2002-06 cervical cancer incidence rate was the same for Delaware and the U.S. (8.2 per 100,000).
 - The U.S. cervical cancer incidence rate for African American women was significantly higher than the rate for Caucasian women (10.4 per 100,000 vs. 8.1 per 100,000). However, Delaware's 2002-06 cervical cancer incidence rates did not differ significantly between African American and Caucasian women (11.5 per 100,000 vs. 7.7 per 100,000, respectively).
- The 2002-06 cervical cancer mortality rate was the same for Delaware and the U.S. (2.5 per 100,000).
 - While the 2002-06 cervical mortality rate for Caucasian women (2.2 per 100,000) was significantly lower than for African American women (4.6 per 100,000) at the national level, no significant differences existed between races at the state or county levels.

Trends in Cervical Cancer Incidence and Mortality (Figures 5.1–5.2 and 5.6–5.7)

- Historically, cervical cancer incidence rates have been higher in Delaware than in the U.S. However, from 1992-96 to 2002-06, Delaware's cervical cancer incidence rate decreased 27.4 percent while the U.S. rate decreased 13.7 percent; rates for the two areas are now equivalent.
 - From 1992-96 to 2002-06, Delaware's cervical cancer incidence rate declined 43.3 percent among African American women. In contrast, Delaware's rate for Caucasian females fell 20.6 percent over the same time.
- From 1992-96 to 2002-06, Delaware's cervical cancer mortality rate decreased 43.2 percent while the U.S. rate decreased 24.2 percent. If this trend continues, Delaware's cervical cancer mortality rate may soon be significantly lower than the national rate.
 - From 1992-96 to 2002-06, Delaware's cervical cancer mortality rate declined 64.9 percent among African American women. In contrast, Delaware's rate for Caucasian females fell 35.1 percent over the same time.

Age-Specific Incidence and Mortality Rates (Tables 5.3 and 5.8)

- The 2002-06 age-specific incidence rate for cervical cancer was highest among females age 40–64.
- Mortality data were too sparse to examine rates by race group.

Stage at Diagnosis of Cervical Cancer (Tables 5.4–5.5, Figures 5.4–5.5)

- In Delaware, from 2002-06, 55.8 percent, 28.2 percent and 11.1 percent of cervical cancers were diagnosed at the local, regional and distant stages, respectively. At the national level, comparison percentages were 50.0 percent, 35.0 percent and 11.0 percent, respectively.
- In Delaware, from 2002-06, 71 cervical cancer cases (39.2 percent) were diagnosed in the late stages (i.e., regional or distant stage).
- Among those diagnosed with cervical cancer, African American females were more likely than Caucasian females to have their cervical cancer diagnosed at the local stage (62.5 percent vs. 53.1 percent, respectively).
- In Delaware, the percentage of cervical cancer cases diagnosed at the local stage increased from 32.4 percent in 1980-84 to 55.8 percent in 2002-06. Accordingly, there was a decline in the percentage of regional stage cases during the same period (from 48.9 percent to 28.2 percent). There was minimal change in the percentage of distant stage cases diagnosed during the same time.

Cervical Cancer Incidence

Table 5.1. Number of Cervical Cancer Cases in Delaware and Counties, by Race: 2002-06

	All Female	Caucasian Female	African American Female
Delaware	181	128	48
Kent	41	32	8
New Castle	105	72	30
Sussex	35	24	10

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 5.2. Five-Year Average Age-Adjusted Cervical Cancer Incidence Rates* in the U.S., Delaware and Counties, by Race: 2002-06

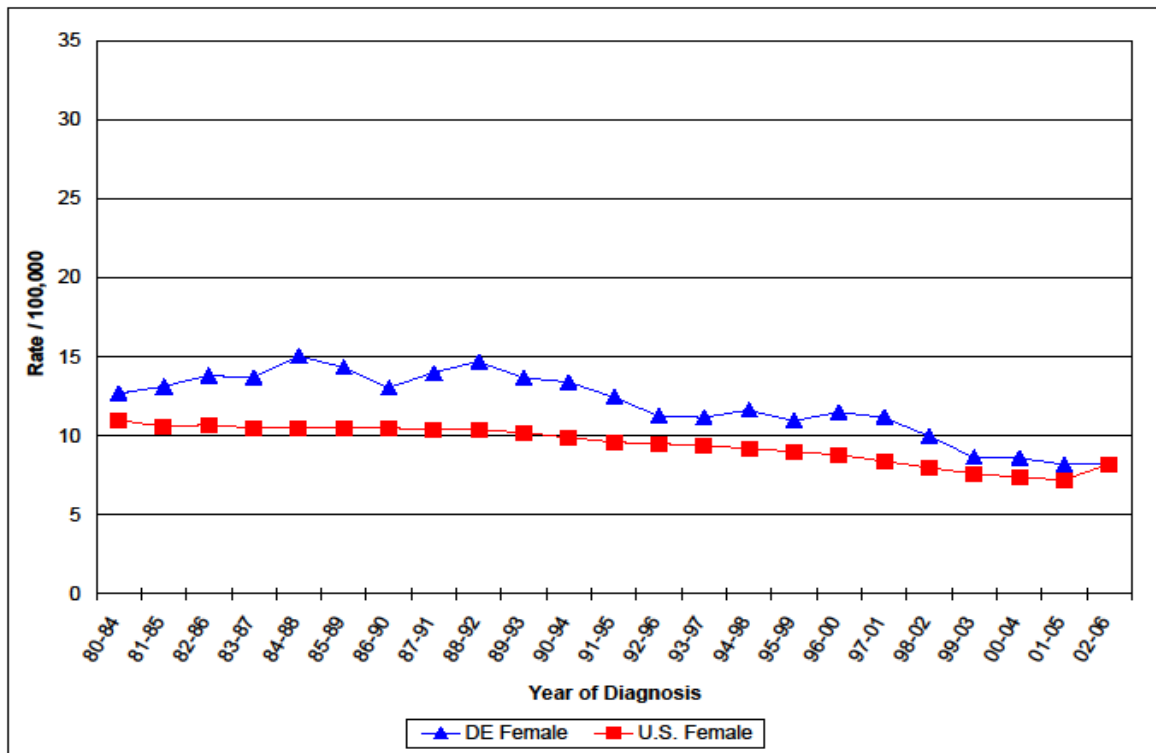
	All Female	Caucasian Female	African American Female
United States	8.2 (8.1, 8.3)	8.1 (8.0, 8.2)	10.4 (10.0, 10.8)
Delaware	8.2 (7.0, 9.4)	7.7 (6.3, 9.0)	11.5 (8.5, 15.2)
Kent	11.3 (8.1, 15.3)	11.8 (8.1, 16.7)	---
New Castle	7.6 (6.2, 9.1)	7.1 (5.5, 9.1)	10.4 (7.0, 14.8)
Sussex	7.8 (5.5, 10.9)	6.6 (4.2, 9.7)	---

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

--- = Rate based on fewer than 20 cases.

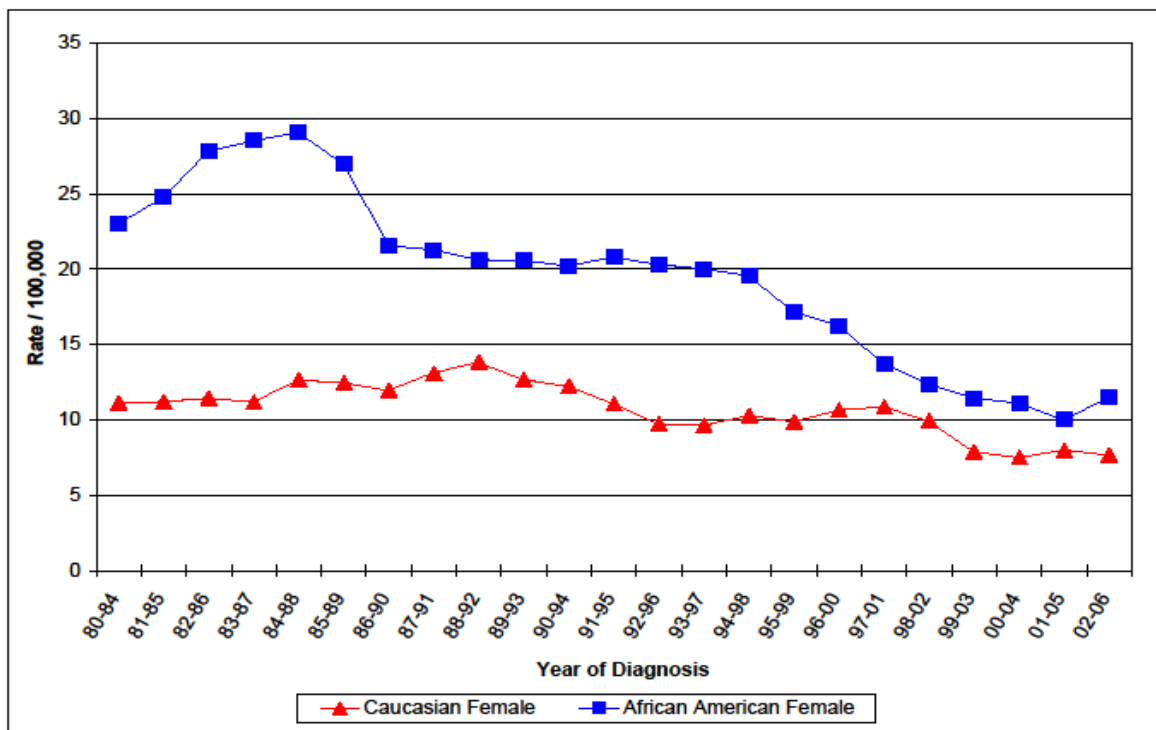
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 5.1. Five-Year Average Age-Adjusted Cervical Cancer Incidence Rates* in the U.S. and Delaware: 1980–2006



* = 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, 2009 U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009

Figure 5.2. Five-Year Average Age-Adjusted Cervical Cancer Incidence Rates* in Delaware, by Race: 1980–2006



* = 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, 2009

Table 5.3. Age-Specific Cervical Cancer Incidence Rates* in Delaware, by Race: 2002-06

Age Group	All Female	Caucasian Female	African American Female
0-39	4.2	4.5	---
40-64	15.0	14.3	18.6
65+	8.7	7.5	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 5.3. Age-Specific Cervical Cancer Incidence Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Cervical Cancer by Stage at Diagnosis

Table 5.4. Number of Cervical Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Female	Caucasian Female	African American Female
Local	101	68	30
Regional	51	41	10
Distant	20	13	---
Unknown	9	6	---
Total	181	128	48

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

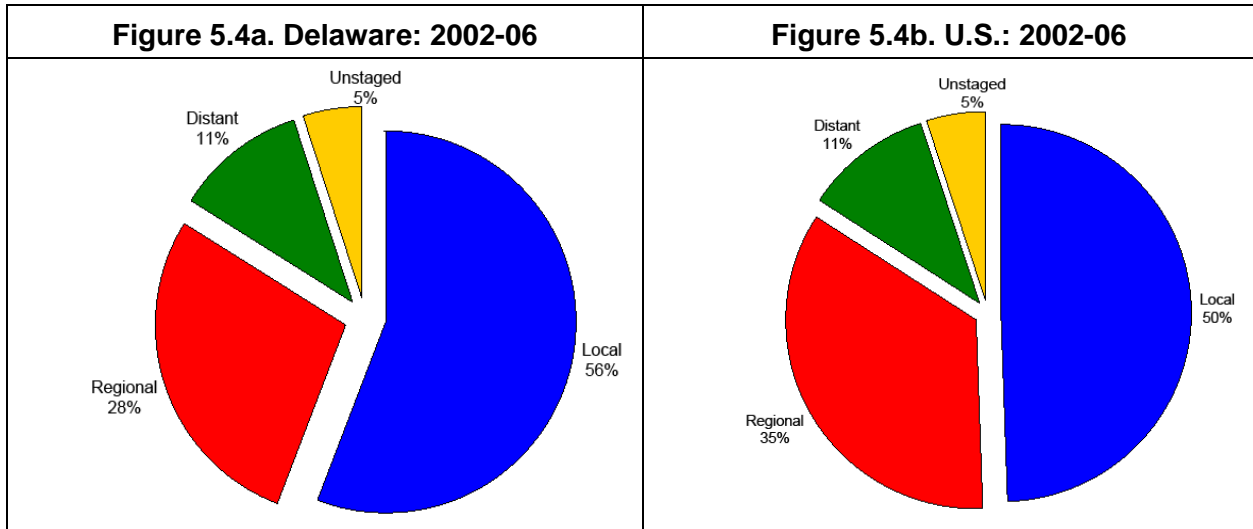
Table 5.5. Percentage of Cervical Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Female	Caucasian Female	African American Female
Local	55.8	53.1	62.5
Regional	28.2	32.0	20.8
Distant	11.1	10.2	---
Unknown	5.0	4.7	---
Total	100.0	100.0	100.0

--- = Percentages are suppressed for patient confidentiality.

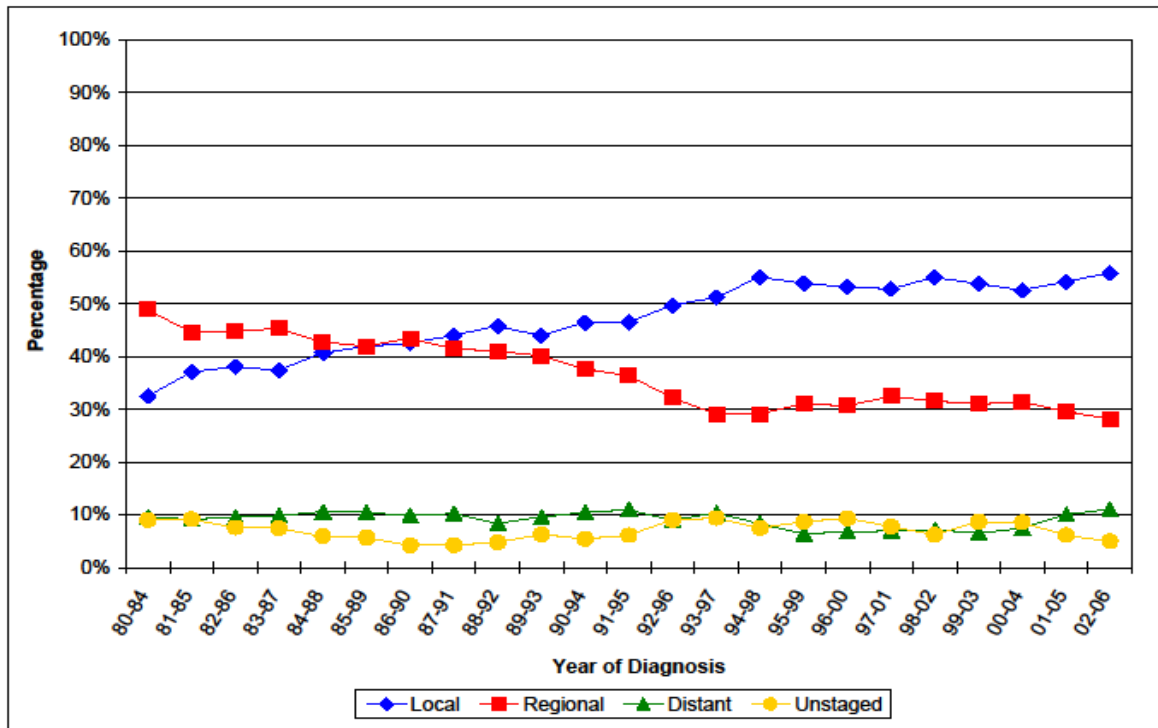
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 5.4. Percentage of Cervical Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 5.5. Percentage of Cervical Cancer Cases in Delaware, by Stage at Diagnosis: 1980–2006



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009

Cervical Cancer Mortality

Table 5.6. Number of Cervical Cancer Deaths in Delaware and Counties, by Race: 2002-06

	All Female	Caucasian Female	African American Female
Delaware	58	44	13
Kent	13	---	---
New Castle	32	25	6
Sussex	13	---	---

--- = Cell counts are suppressed for patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2009.

Table 5.7. Five-Year Average Age-Adjusted Cervical Cancer Mortality Rates* in the U.S., Delaware and Counties, by Race: 2002-06

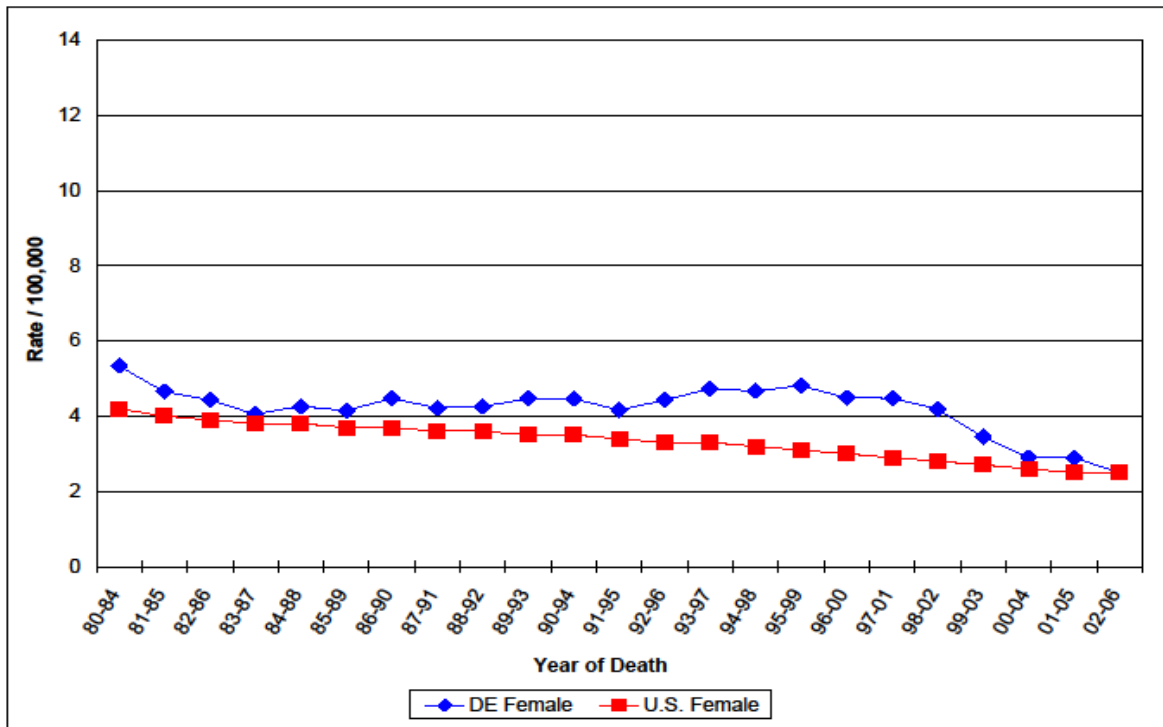
	All Female	Caucasian Female	African American Female
United States	2.5 (2.4, 2.5)	2.2 (2.2, 2.3)	4.6 (4.4, 4.7)
Delaware	2.5 (1.9, 3.2)	2.4 (1.8, 3.2)	---
Kent	---	---	---
New Castle	2.3 (1.6, 3.2)	2.3 (1.5, 3.4)	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 deaths.

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 5.6. Five-Year Average Age-Adjusted Cervical Cancer Mortality Rates* in the U.S. and Delaware: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 5.7. Five-Year Average Age-Adjusted Cervical Cancer Mortality Rates* in Delaware, by Race: 1980–2006

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Table 5.8. Age-Specific Cervical Cancer Mortality Rates* in Delaware, by Race: 2002-06

NOTE: Table is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Figure 5.8. Age-Specific Cervical Cancer Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

6. Colorectal Cancer

Risk Factors and Early Detection

Risk Factors for Colorectal Cancer

- Increasing age: the chance of developing colorectal cancer increases markedly after age 50
- Personal history of colorectal adenomatous polyps or colorectal cancer
- Family history of colorectal cancer or polyps
- Personal history of inflammatory bowel disease, such as ulcerative colitis or Crohn's disease
- Personal history of ovarian, breast or uterine cancer
- Personal history of diabetes
- Race: African Americans have the highest incidence and mortality rates of all racial groups in the U.S.
- Ethnicity: Jews of Eastern European descent have the highest risk of any ethnic group
- Physical inactivity
- Obesity
- Heavy alcohol use
- Cigarette smoking

Possible Risk Factors for Colorectal Cancer

- Diets high in red meat, processed meats and/or other high-fat foods
- Diets low in fruits, vegetables, fiber and folic acid
- Men who have had testicular cancer may be at greater risk for colorectal cancer
- Men receiving radiation therapy for prostate cancer may have a greater risk for colorectal cancer
- Night-shift work

Protective Factors

- Combined hormone replacement therapy, which includes both estrogen and progesterone
- Removal of colorectal polyps

Early Detection of Colorectal Cancer

The American Cancer Society colorectal cancer screening guidelines are as follows:

- Beginning at age 50, both males and females should follow one of the five screening options below:
 1. Yearly fecal occult blood test (FOBT) or immunochemical FOBT. The take-home multiple sample method should be used, with all positive tests followed up by a colonoscopy;
 2. Flexible sigmoidoscopy every five years;
 3. Colonoscopy every 10 years;
 4. Double contrast barium enema every five years; or
 5. Yearly FOBT or immunochemical FOBT, plus flexible sigmoidoscopy every five years*.

* "The ACS recommends more intensive surveillance for individuals at higher risk for colorectal cancer, including those with a history of adenomatous polyps; those with a personal history of curative-intent resection of colorectal cancer; those with a family history of either colorectal cancer or colorectal adenomas diagnosed in a first-degree relative before age 60; those with a history of inflammatory bowel disease of significant duration; or those with a family history or genetic testing indicating the presence of 1 of 2 hereditary syndromes, such as hereditary nonpolyposis colorectal cancer and familial adenomatous polyposis."

Recent data (2008) from the Behavioral Risk Factor Surveillance System (BRFSS) provide information on the pattern of colorectal cancer screening among Delawareans:

- In 2008, 36.5 percent of Delawareans age 50 and older reported ever having used an at-home blood stool test; while fewer African Americans than Caucasians reported ever having used an at-home blood stool test (31.7 percent vs. 37.6 percent, respectively), the difference is not significant.
- Among Delawareans age 50 and older, 74.3 percent reported that they had ever had a sigmoidoscopy or a colonoscopy.
 - The percentage of Delawareans who had had a colonoscopy or sigmoidoscopy increased with age. Significantly more Delawareans age 65 and older reported ever having had a colonoscopy or sigmoidoscopy compared to those age 50-64 (79.4 percent vs. 70.6 percent, respectively).
 - In 2008, African Americans age 50 and older in Delaware were just as likely to have ever had a colonoscopy or sigmoidoscopy as Caucasians (73.5 percent vs. 74.7 percent, respectively).
 - Education level and income category did not significantly affect the percentage of Delawareans ever having had a colonoscopy or sigmoidoscopy.

Data Highlights

New Colorectal Cancer Cases and Deaths (Tables 6.1 and 6.6)

- Colorectal cancer was the state's third most frequently diagnosed cancer among both males and females for 2002-06. A total of 2,320 cases of colorectal cancer were diagnosed in Delaware during this time.
 - Colorectal cancer accounted for 10.2 percent of all cancer cases diagnosed during 2002-06 in Delaware.
 - Newly diagnosed cases were fairly evenly split by sex: 1,206 cases (52.0 percent) were diagnosed among males and 1,114 cases (48.0 percent) were diagnosed among females.
- Colorectal cancer was the state's third most common cause of cancer deaths among both males and females for 2002-06.
 - Deaths from colorectal cancer accounted for 9.5 percent of all cancer deaths in Delaware during 2002-06.
 - Of the 828 Delaware residents who died from colorectal cancer, 52.5 percent were male and 47.5 percent were female.

Colorectal Cancer Incidence and Mortality Rates (Tables 6.2 and 6.7)

- Delaware's 2002-06 colorectal cancer incidence rate (51.7 per 100,000) was significantly higher than the U.S. rate (49.1 per 100,000).
 - For 2002-06 at all geographic levels, for all races combined, the colorectal cancer incidence rates for males were significantly higher than rates for females.
 - Among Caucasians, the incidence rates for males were significantly higher than for females at all geographic levels with the exception of Kent County.
 - Among African Americans, the incidence rates for males were significantly higher than for females at the national and state levels but not at the county level.
 - For both sexes combined and males only, the U.S., Delaware and Sussex County 2002-06 colorectal cancer incidence rates for African Americans were significantly higher than for Caucasians; incidence rates did not differ significantly between African Americans and Caucasians in Kent and New Castle counties.

- Among females, the incidence rate for African Americans was significantly higher than for Caucasians at the national level, but not at the state or county levels.
- Delaware's 2002-06 colorectal cancer mortality rate (18.5 per 100,000) was not significantly different from that of the U.S. (18.2 per 100,000).
- For 2002-06, at both the state and national levels and for all races, the colorectal cancer mortality rates were significantly higher for males than for females.

Trends in Colorectal Cancer Incidence and Mortality Rates (Figures 6.1-6.2 and 6.6-6.7)

- From 1992-96 to 2002-06, Delaware's colorectal cancer incidence rate decreased 15.4 percent while the U.S. rate dropped 12.0 percent.
 - Delaware's colorectal cancer incidence rates decreased 17.2 percent for Caucasians and 7.0 percent for African Americans between 1992-96 and 2002-06.
 - Delaware's colorectal incidence rates decreased 18.2 percent for males and 13.9 percent for females between 1992-96 and 2002-06.
- Historically, Delaware's colorectal cancer mortality rate has been higher than the U.S. rate. However, Delaware's 2002-06 colorectal cancer mortality rate was not significantly different from the U.S. rate.
 - Between 1992-96 and 2002-06, Delaware's colorectal cancer mortality rate dropped 24.2 percent while the U.S. rate dropped 20.5 percent.
 - The state's colorectal mortality rates decreased by 24.2 percent among Caucasians and by 32.4 percent among African Americans between 1992-96 and 2002-06.
 - Delaware's largest rate decline occurred among African American females, with a ten-year (1992-96 to 2002-06) decrease of 36.8 percent.
 - Over this same time, rates decreased among African American males, Caucasian males and Caucasian females by 14.1 percent, 27.2 percent and 21.7 percent, respectively.

Age-Specific Incidence and Mortality Rates (Tables 6.3 and 6.8, Figures 6.3 and 6.8)

- The 2002-06 colorectal 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 2002-06 colorectal cancer incidence rates were higher for males than for females.
- For all races combined, the 2002-06 age specific mortality rates increased with age; Delawareans ages 85 and older had the highest age-specific mortality rate.
 - The 2002-06 data were too sparse to analyze by sex and race.

Stage at Diagnosis of Colorectal Cancer (Tables 6.4–6.5, Figures 6.4–6.5)

- For 2002-06, 36.6 percent, 40.9 percent and 16.6 percent of colorectal cancers diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 39.0 percent, 37.0 percent and 19.0 percent, respectively.
 - In Delaware, for 2002-06, 1,334 colorectal cancer cases (57.5 percent) were diagnosed in the late stages (i.e., regional or distant stage).
 - Among those diagnosed with colorectal cancer, African Americans were just as likely to have their cancer diagnosed in the local stage as Caucasians (36.4 percent vs. 36.6 percent, respectively).
 - In Delaware, the percentage of colorectal cancer cases diagnosed in the local stage increased from 31.7 percent in 1980-84 to 36.6 percent in 2002-06. Accordingly, there was a decrease in cases diagnosed in the distant stage, from 20.0 percent in 1980-84 to 16.6 percent in 2002-06. There was minimal change in the percentage of regional stage cases diagnosed during the same time.

Colorectal Cancer Incidence

Table 6.1. Number of Colorectal Cancer Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	2,320	1,206	1,114	1,899	989	910	363	184	179
Kent	393	209	184	313	161	152	68	40	28
New Castle	1,304	658	646	1,043	532	511	226	107	119
Sussex	623	339	284	543	296	247	69	37	32

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

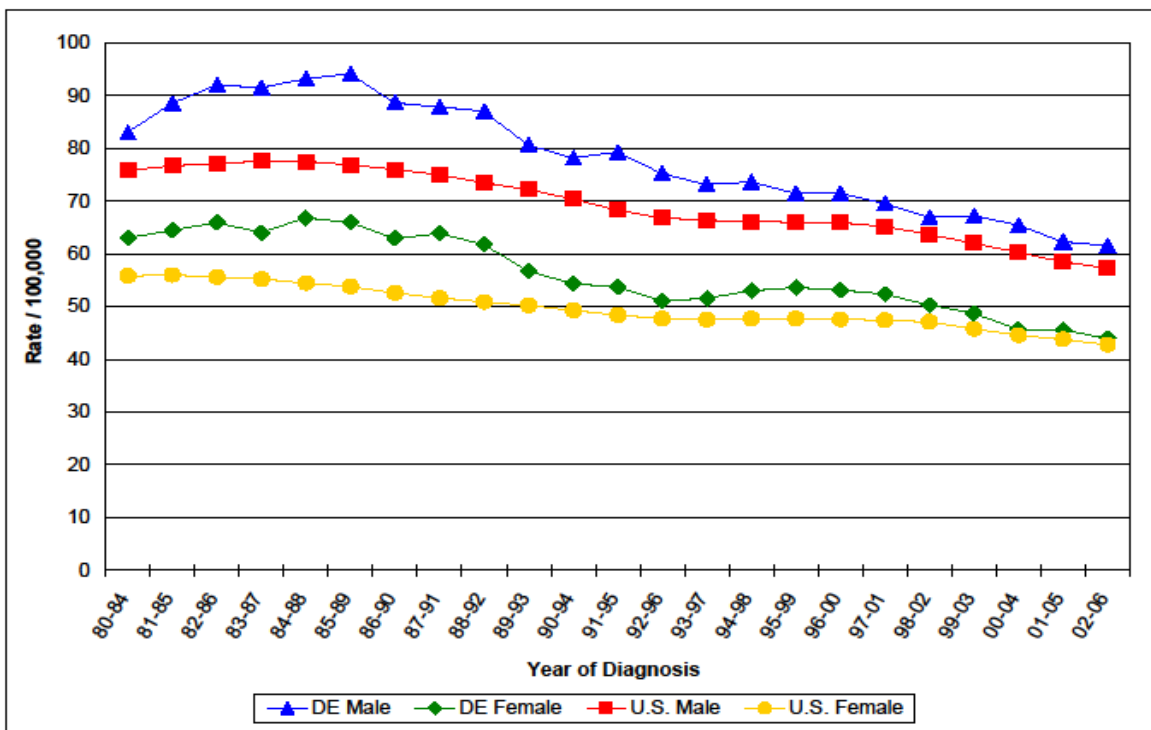
Table 6.2. Five-Year Average Age-Adjusted Colorectal Cancer Incidence Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	49.1 (48.9, 49.3)	57.3 (56.9, 57.7)	42.8 (42.5, 43.1)
Delaware	51.7 (49.6, 53.8)	61.5 (58.1, 65.0)	44.0 (41.4, 46.6)
Kent	57.9 (52.2, 63.7)	69.5 (60.1, 78.9)	48.6 (41.6, 55.7)
New Castle	52.1 (49.3, 54.9)	60.1 (55.5, 64.7)	44.3 (40.9, 47.7)
Sussex	50.2 (46.3, 54.2)	60.5 (54.0, 66.9)	41.7 (36.9, 46.6)
CAUCASIAN			
United States	48.6 (48.4, 48.8)	56.9 (56.5, 57.3)	42.1 (41.8, 42.4)
Delaware	50.0 (47.8, 52.3)	59.3 (55.6, 63.0)	42.4 (39.6, 45.1)
Kent	57.0 (50.7, 63.4)	66.1 (55.9, 76.3)	49.6 (41.7, 57.5)
New Castle	49.5 (46.5, 52.5)	58.7 (53.7, 63.6)	42.2 (38.6, 45.9)
Sussex	48.1 (44.0, 52.1)	57.8 (51.2, 64.4)	39.7 (34.7, 44.6)
AFRICAN AMERICAN			
United States	59.9 (59.0, 60.8)	69.3 (67.8, 70.8)	53.5 (52.4, 54.6)
Delaware	59.9 (53.7, 66.0)	74.5 (63.8, 85.3)	51.2 (43.7, 58.7)
Kent	61.2 (47.5, 77.6)	79.6 (56.9, 108.4)	46.7 (31.0, 67.4)
New Castle	57.1 (49.7, 64.5)	67.8 (54.9, 80.6)	51.7 (42.4, 61.0)
Sussex	68.7 (53.4, 86.9)	92.3 (65.0, 127.2)	54.1 (37.0, 76.4)

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

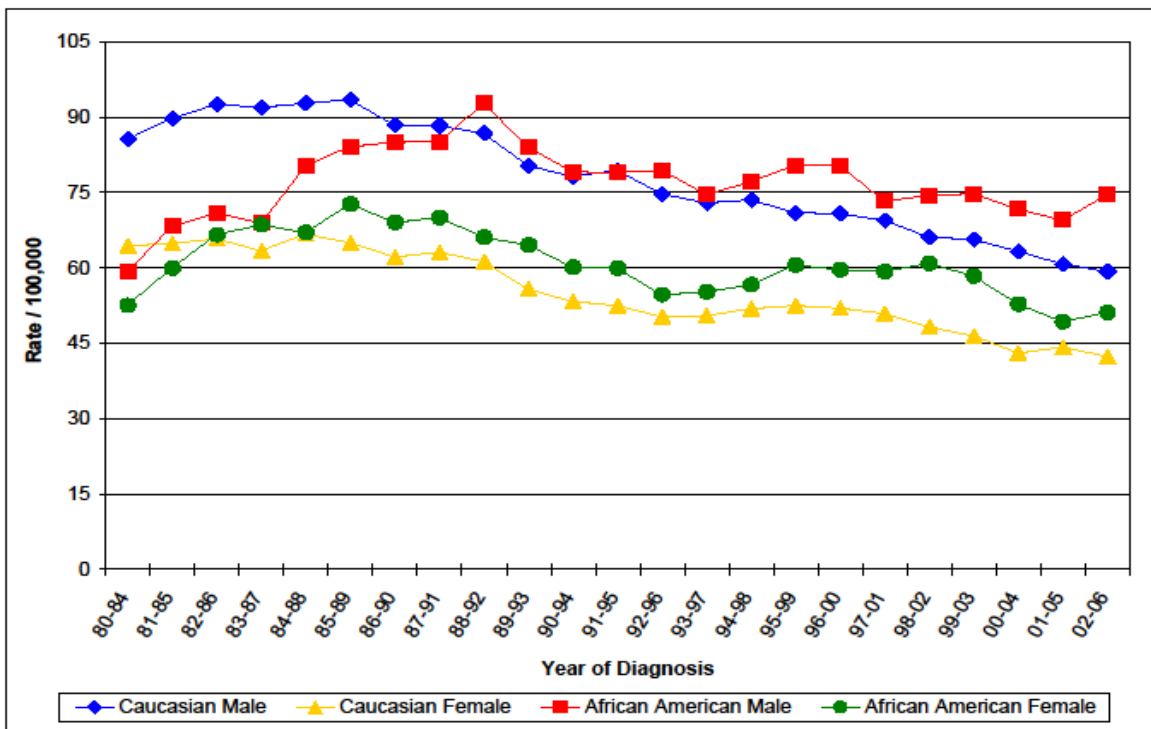
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 6.1. Five-Year Average Age-Adjusted Colorectal Cancer Incidence Rates* in the U.S. and Delaware, by Sex: 1980–2006



* = 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 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute 2009.

Figure 6.2. Five-Year Average Age-Adjusted Colorectal Cancer Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = 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, 2009.

Table 6.3. Age-Specific Colorectal Cancer Incidence Rates* in Delaware, by Race and Sex: 2002-06

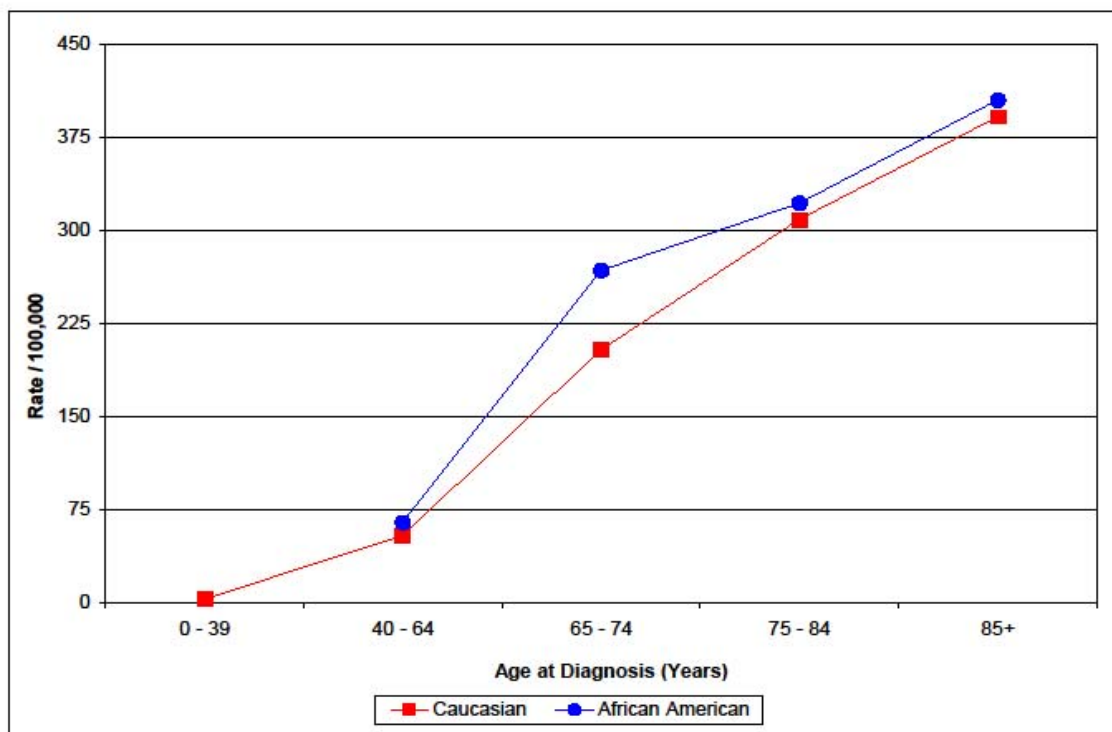
Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	2.2	2.8	---	2.5	3.2	---	---	---	---
40-64	55.8	68.9	43.6	53.7	68.0	40.0	64.2	73.5	56.5
65-74	212.7	254.4	176.8	203.5	243.4	168.7	267.4	323.0	224.1
75-84	314.4	336.5	299.0	308.6	325.0	296.9	321.6	363.8	296.3
85+	394.1	516.2	342.4	391.2	486.2	350.5	404.8	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 6.3. Age-Specific Colorectal Cancer Incidence Rates in Delaware, by Race: 2002-06



NOTE: Rate for African Americans age 0-39 is not displayed due to patient confidentiality rules.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Colorectal Cancer by Stage at Diagnosis

Table 6.4. Number of Colorectal Cancer Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	849	450	399	694	365	329	132	74	58
Regional	949	484	465	798	410	388	137	65	72
Distant	385	209	176	304	171	133	76	34	42
Unknown	137	63	74	103	43	60	18	11	7
Total	2,320	1,206	1,114	1,899	989	910	363	184	179

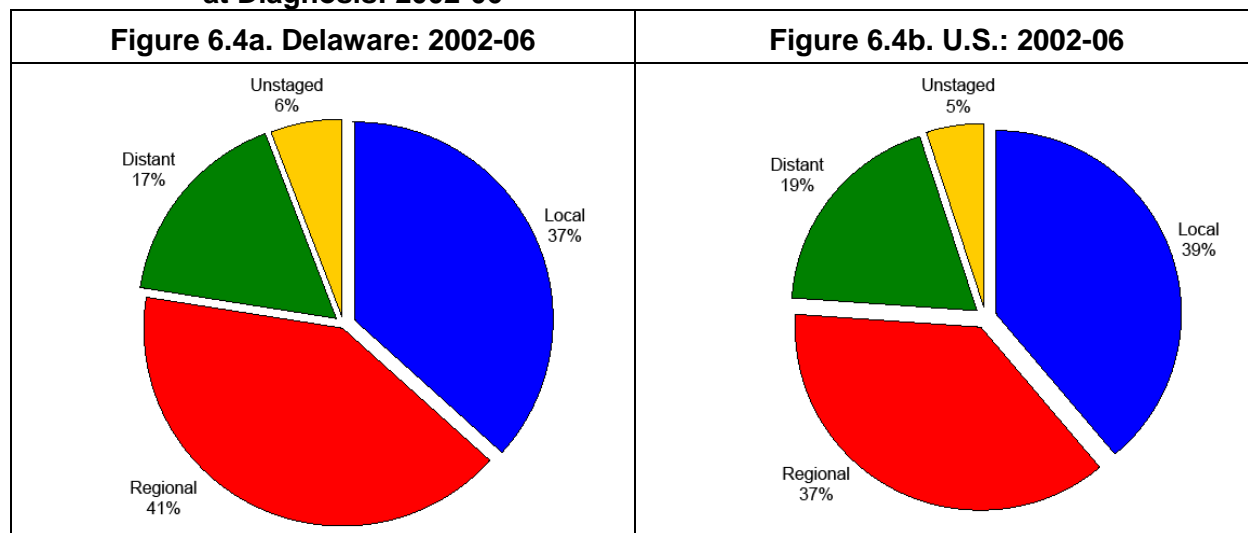
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 6.5. Percentage of Colorectal Cancer Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	36.6	37.3	35.8	36.6	36.9	36.2	36.4	40.2	32.4
Regional	40.9	40.1	41.7	42.0	41.5	42.6	37.7	35.3	40.2
Distant	16.6	17.3	15.8	16.0	17.3	14.6	20.9	18.5	23.5
Unknown	5.9	5.2	6.6	5.4	4.4	6.6	5.0	6.0	3.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

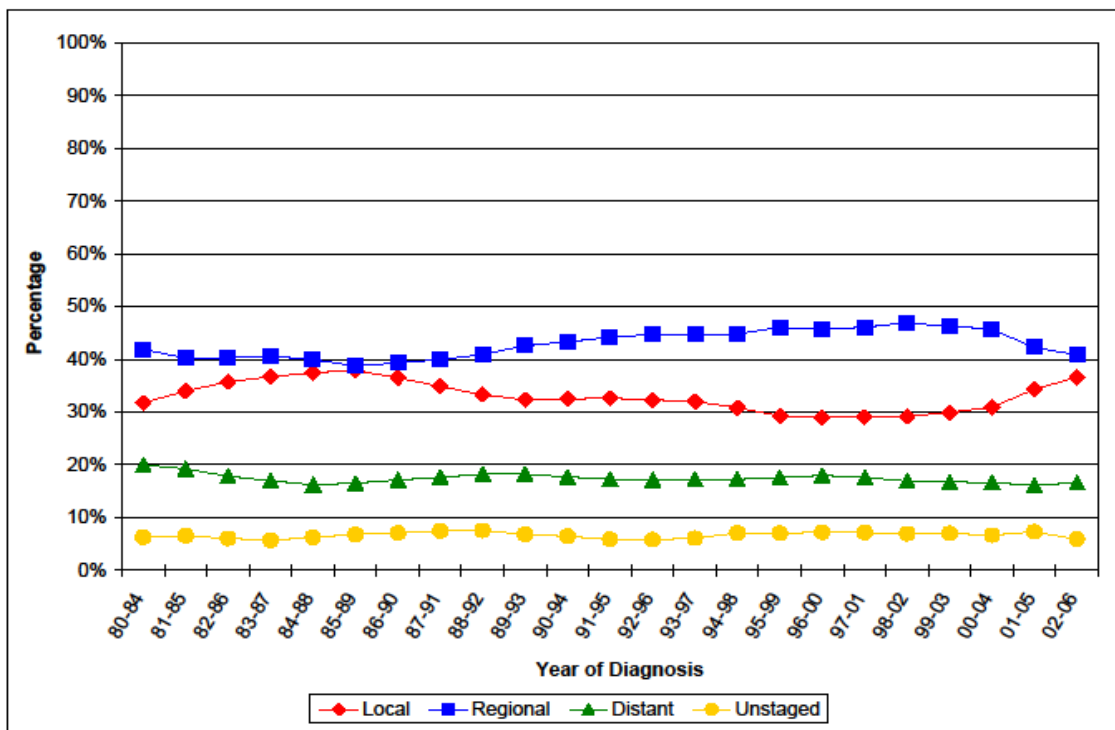
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 6.4. Percentage of Colorectal Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 6.5. Percentage of Colorectal Cancer Cases in Delaware, by Stage at Diagnosis: 1980–2006



SOURCE: Delaware Cancer Registry, Delaware’s Division of Public Health, 2009.

Colorectal Cancer Mortality

Table 6.6. Number of Colorectal Cancer Deaths in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	828	435	393	686	357	329	136	74	62
Kent	134	72	62	107	58	49	25	12	13
New Castle	449	232	217	363	187	176	82	43	39
Sussex	245	131	114	216	112	104	29	19	10

SOURCE: Delaware Health Statistics Center, 2009.

Table 6.7. Five-Year Average Age-Adjusted Colorectal Cancer Mortality Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

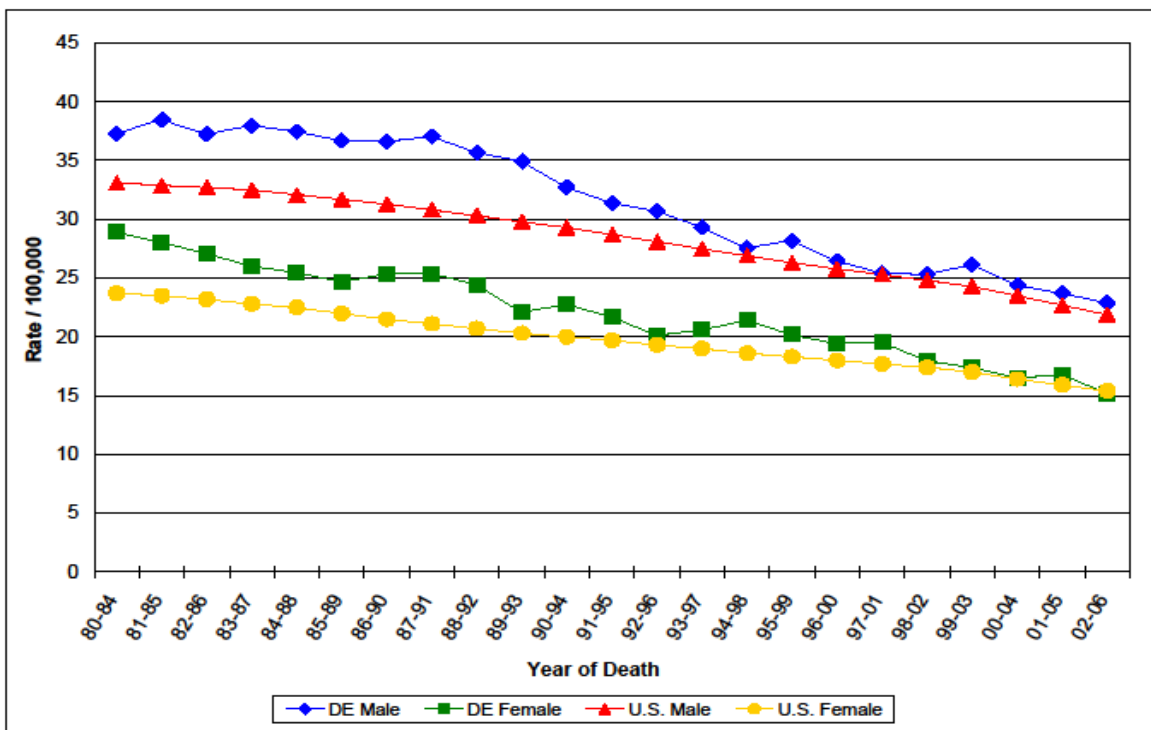
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	18.2 (18.1, 18.3)	21.9 (21.8, 22.1)	15.4 (15.3, 15.5)
Delaware	18.5 (17.3, 19.8)	22.9 (20.8, 25.1)	15.2 (13.7, 16.7)
Kent	20.1 (16.7, 23.5)	25.5 (19.9, 32.1)	16.4 (12.6, 21.0)
New Castle	18.0 (16.4, 19.7)	22.1 (19.2, 24.9)	14.3 (12.4, 16.2)
Sussex	19.9 (17.4, 22.4)	23.5 (19.5, 27.6)	16.6 (13.5, 19.6)
CAUCASIAN			
United States	17.7 (17.6, 17.7)	21.4 (21.2, 21.5)	14.9 (14.8, 15.0)
Delaware	17.9 (16.6, 19.3)	21.9 (19.7, 24.2)	14.8 (13.2, 16.4)
Kent	19.7 (16.0, 23.4)	24.5 (18.6, 31.7)	16.1 (11.9, 21.2)
New Castle	16.9 (15.2, 18.7)	21.3 (18.3, 24.4)	13.7 (11.7, 15.7)
Sussex	19.3 (16.7, 21.8)	22.0 (17.9, 26.0)	16.8 (13.6, 20.0)
AFRICAN AMERICAN			
United States	25.4 (25.1, 25.7)	31.4 (30.9, 31.9)	21.6 (21.3, 21.9)
Delaware	23.6 (19.6, 27.5)	31.0 (24.4, 38.9)	18.2 (13.9, 23.3)
Kent	24.1 (15.6, 35.5)	---	---
New Castle	21.3 (17.0, 26.5)	26.7 (19.3, 36.0)	17.1 (12.2, 23.4)
Sussex	29.2 (19.6, 42.0)	---	---

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

--- = Rate based on fewer than 20 deaths.

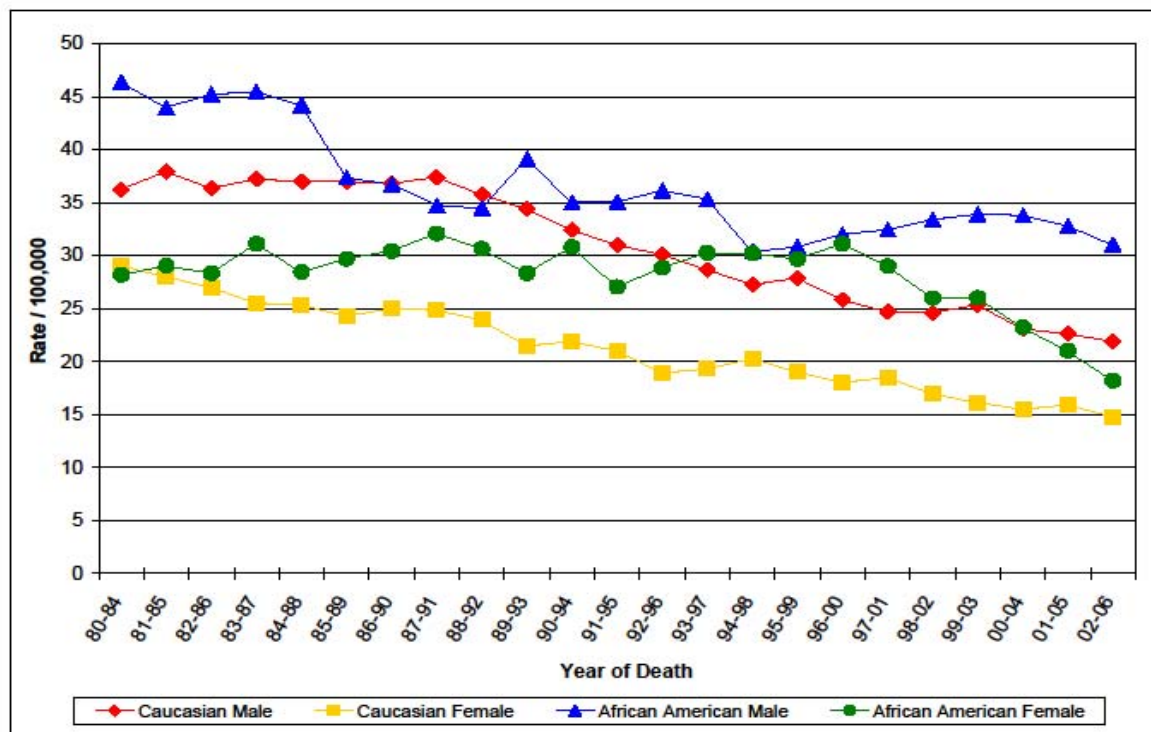
SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 6.6. Five-Year Average Age-Adjusted Colorectal Cancer Mortality Rates* in the U.S. and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 6.7. Five-Year Average Age-Adjusted Colorectal Cancer Mortality Rates* in Delaware, by Race and Sex: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 6.8. Age-Specific Colorectal Cancer Mortality Rates* in Delaware, by Race and Sex: 2002-06

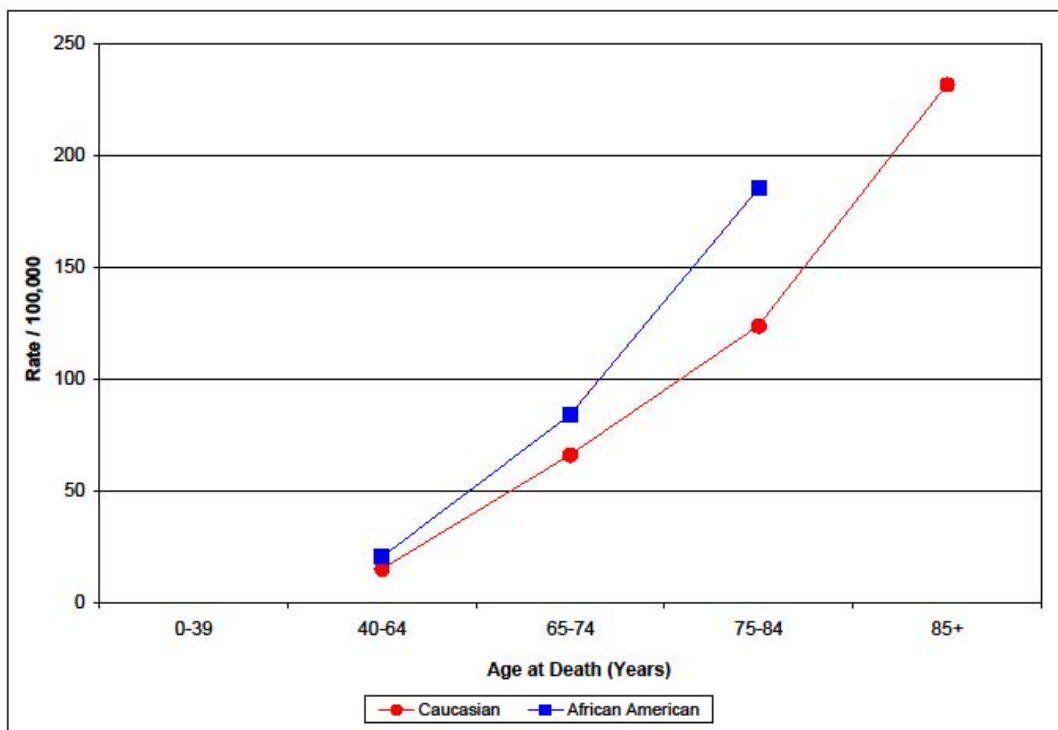
Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	15.5	18.8	12.4	14.8	17.9	11.9	20.2	25.7	15.6
65-74	68.1	90.4	48.9	66.0	88.2	46.6	83.9	---	---
75-84	129.9	165.2	105.4	123.8	151.5	104.2	185.2	285.8	---
85+	225.2	245.3	216.7	231.7	257.4	220.6	---	----	----

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 deaths.

SOURCE: Delaware Health Statistics Center, 2009.

Figure 6.8. Age-Specific Colorectal Cancer Mortality Rates* in Delaware, by Race: 2002-06



NOTE: Rates for either race age 0-39 and African Americans age 85+ are not displayed due to patient confidentiality rules.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

7. Hodgkin Lymphoma

Risk Factors and Early Detection

Risk Factors for Hodgkin Lymphoma (HL)

- Family history of the disease, particularly having a sibling with HL
- Sex: Males have a slightly higher occurrence of HL than do females
- Past infection with Epstein-Barr virus
- Age: HL incidence peaks in early adulthood (ages 15-40) and in late adulthood (ages 55 and older)
- People in higher socioeconomic groups are at increased risk for HL; the reasons for this are not established
- Geographic area: HL is most common in North America and Europe and least common in Asia
- Compromised immune system
- Exposure to solvents (especially TCE), pesticides (especially acid herbicides, DDT and chlorophenols) and benzene

Possible Risk Factors for HL

- Workers in the dry cleaning, woodworking and rubber- and/or plastic-making industries may be at an increased risk for HL
- Tobacco use

Early Detection of HL

There is currently no recommended screening test for Hodgkin lymphoma. The best method of early detection is for individuals to know their risks and report any symptoms to their doctors.

Data Highlights

New Hodgkin Lymphoma Cases and Deaths (Tables 7.1 and 7.6)

- Hodgkin lymphoma was one of the lesser-diagnosed cancers from 2002-06. A total of 145 cases of HL were diagnosed in Delaware during this time.
 - HL accounted for 0.6 percent of all cancer cases diagnosed during 2002-06 in Delaware.
 - Newly diagnosed cases affected more males than females: 80 cases (55.2 percent) were diagnosed among males and 65 cases (44.8 percent) were diagnosed among females.
- Hodgkin lymphoma was the one of the least common causes of cancer deaths among both males and females for 2002-06, accounting for only 0.2 percent of the state's cancer deaths.
 - Of the 17 Delaware residents who died from HL, 58.8 percent were male and 41.2 percent were female.

Hodgkin Lymphoma Incidence and Mortality Rates (Tables 7.2 and 7.7)

- Delaware's 2002-06 Hodgkin lymphoma incidence rate (3.5 per 100,000) was significantly higher than the U.S. rate (2.8 per 100,000).
 - At the national level, the 2002-06 HL incidence rates among males were significantly elevated compared to females; no significant differences were observed between sexes at the state level.
 - The 2002-06 HL incidence data were too sparse to analyze by race and sex at the county level.
- Due to the low number of deaths in Delaware attributable to Hodgkin lymphoma and the unreliability of rates based on small numbers, the 2002-06 mortality rate is not published.

Trends in Hodgkin Lymphoma Incidence and Mortality Rates (Figures 7.1–7.2 and 7.6–7.7)

Note: Methodology for the assignment of Hodgkin lymphoma and non-Hodgkin lymphoma was modified beginning in reporting period 2001-2005 to include consideration of histology as well as primary site. Incidence rates for these two types of cancer increased as a result of this change.

- From 1992-96 to 2002-06, Delaware's Hodgkin lymphoma incidence rate increased 12.9 percent while the U.S. rate remained stable.
 - Between 1992-96 and 2002-06, Delaware's HL incidence rates increased 27.6 percent for Caucasians while the rate fell 19.5 percent for African Americans.
 - Delaware's HL incidence rates increased 2.6 percent for males and 29.2 percent for females between 1992-96 and 2002-06.
 - From 1992-96 to 2002-06, Delaware's rates dropped among African American males and females by 18.8 percent and 17.1 percent, respectively.
 - Over the same ten-year period, Delaware's rates increased among Caucasian males and females by 16.7 and 40.9 percent, respectively.
- Trends in Delaware's HL mortality rate cannot be evaluated due to the low number of deaths attributed to HL.

Age-Specific Incidence and Mortality Rates (Tables 7.3 and 7.8, Figures 7.3 and 7.8)

- The 2002-06 Hodgkin lymphoma incidence rate for Delaware followed the bimodal trend seen at the national level, with highest rates occurring in the 0-39 and 75-84 age groups.
 - In Delaware, the 2002-06 HL incidence rates were higher for males than for females in the 0-74 age groups while they were higher for females than for males in the 75-older age groups.

Stage at Diagnosis of Hodgkin Lymphoma (Figure 7.4)

- For 2002-06, 22.8 percent, 37.2 percent and 36.6 percent of HL cases diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 19.0 percent, 40.0 percent and 35.0 percent, respectively.

Hodgkin Lymphoma Incidence

Table 7.1. Number of Hodgkin Lymphoma Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	145	80	65	113	63	50	29	15	14
Kent	19	10	9	16	9	7	---	---	---
New Castle	94	53	41	68	40	28	25	13	12
Sussex	32	17	15	29	14	15	---	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 7.2. Five-Year Average Age-Adjusted Hodgkin Lymphoma Incidence Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

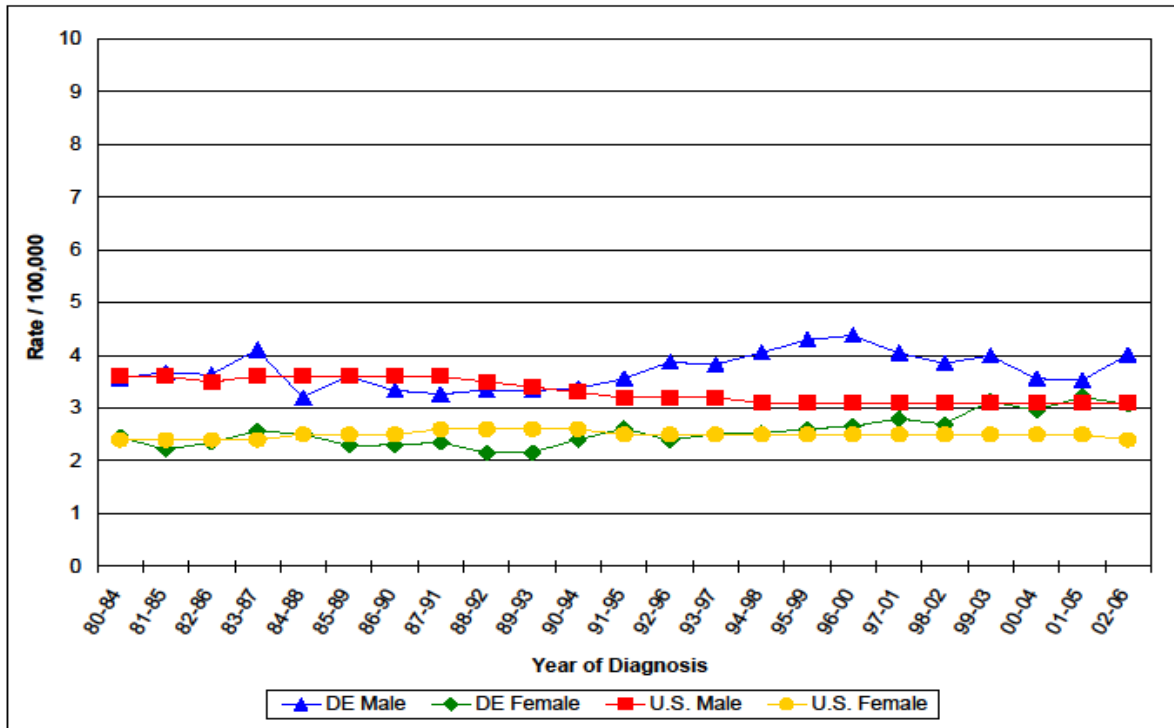
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	2.8 (2.7, 2.9)	3.1 (3.0, 3.2)	2.5 (2.4, 2.6)
Delaware	3.5 (3.0, 4.1)	4.0 (3.2, 5.0)	3.1 (2.4, 3.9)
Kent	---	---	---
New Castle	3.6 (2.9, 4.4)	4.2 (3.1, 5.5)	3.1 (2.2, 4.2)
Sussex	3.8 (2.6, 5.3)	---	---
CAUCASIAN			
United States	3.0 (2.9, 3.1)	3.3 (3.2, 3.4)	2.7 (2.6, 2.8)
Delaware	3.7 (3.0, 4.3)	4.2 (3.2, 5.3)	3.1 (2.3, 4.1)
Kent	---	---	---
New Castle	3.6 (2.8, 4.5)	4.3 (3.1, 5.8)	2.9 (2.0, 4.2)
Sussex	4.0 (2.7, 5.8)	---	---
AFRICAN AMERICAN			
United States	2.6 (2.4, 2.8)	2.9 (2.7, 3.1)	2.3 (2.1, 2.5)
Delaware	3.3 (2.2, 4.8)	---	---
Kent	---	---	---
New Castle	4.3 (2.8, 6.3)	---	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 cases.

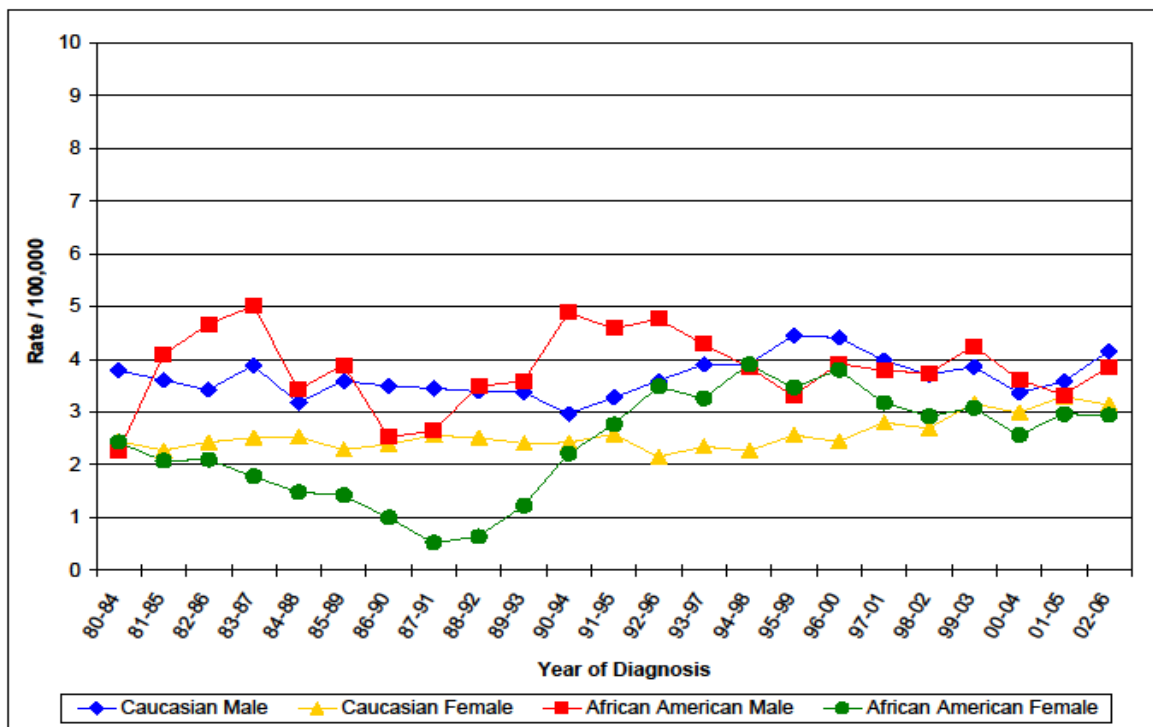
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 7.1. Five-Year Average Age-Adjusted Hodgkin Lymphoma Incidence Rates* in the United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Cancer Registry, Delaware’s Division of Public Health 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.
 Methodology for the assignment of Hodgkin lymphoma and non-Hodgkin lymphoma was modified beginning in reporting period 2001-2005 to include consideration of histology as well as primary site. Incidence rates for these two types of cancer increased as a result of this change.

Figure 7.2. Five-Year Average Age-Adjusted Hodgkin Lymphoma Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Cancer Registry, Delaware’s Division of Public Health, 2009.

Table 7.3. Age-Specific Hodgkin Lymphoma Incidence Rates* in Delaware, by Race and Sex: 2002–06

NOTE: Table is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

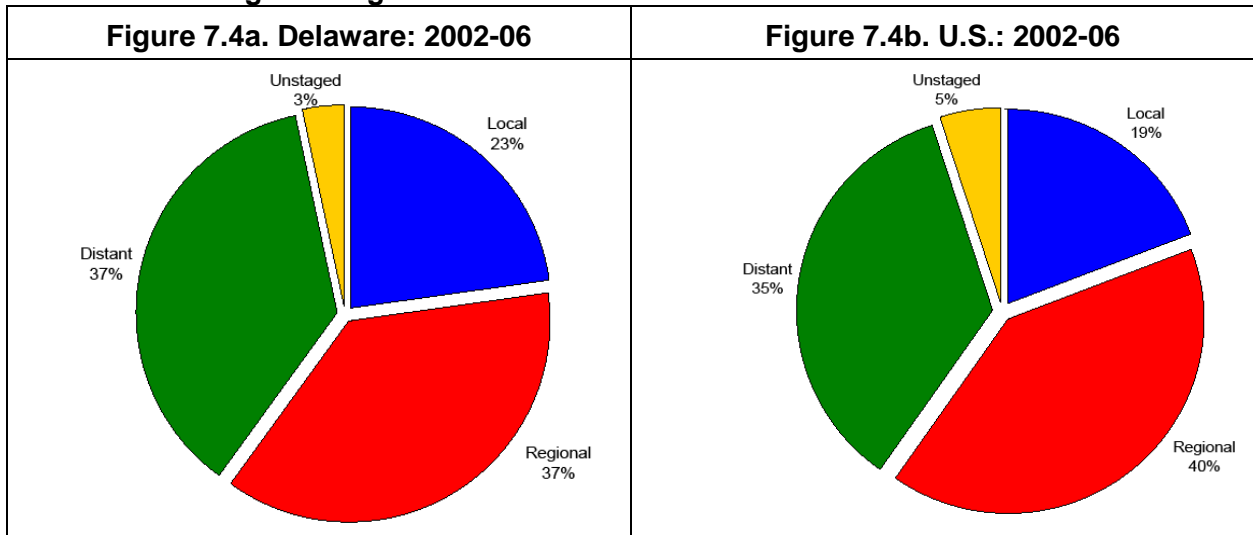
Figure 7.3. Age-Specific Hodgkin Lymphoma Incidence Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Hodgkin Lymphoma by Stage at Diagnosis

NOTE: Tables showing number of cases and percentage of cases of HL by stage at Diagnosis by race and sex were not compiled due to the small number of incident cases from 2002-06.

Figure 7.4. Percentage of Hodgkin Lymphoma Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware’s Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Hodgkin Lymphoma Mortality

Table 7.4. Number of Hodgkin Lymphoma Deaths in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	17	10	7	16	9	7	---	---	---
Kent	---	---	---	---	---	---	---	---	---
New Castle	---	---	---	---	---	---	---	---	---
Sussex	8	---	---	7	---	---	---	---	---

--- = Cell counts are suppressed for patient confidentiality.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 7.5 Five-Year Average Age-Adjusted Hodgkin Lymphoma Mortality Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	0.4 (0.4, 0.5)	0.5 (0.5, 0.6)	0.4 (0.3, 0.4)
Delaware	---	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---
CAUCASIAN			
United States	0.5 (0.4, 0.5)	0.6 (0.5, 0.5)	0.4 (0.4, 0.4)
Delaware	---	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---
AFRICAN AMERICAN			
United States	0.4 (0.4, 0.4)	0.5 (0.5, 0.6)	0.3 (0.3, 0.3)
Delaware	---	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 deaths.

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 7.5. Five-Year Average Age-Adjusted Hodgkin Lymphoma Mortality Rates* in the United States and Delaware, by Sex: 1980-2006

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Figure 7.6. Five-Year Average Age-Adjusted Hodgkin Lymphoma Mortality Rates* in Delaware, by Race and Sex: 1980-2006

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Table 7.6. Age-Specific Hodgkin Lymphoma Mortality Rates* in Delaware, by Race and Sex: 2002-06

NOTE: Table is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Figure 7.8. Age-Specific Hodgkin Lymphoma Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

8. Leukemia

Risk Factors and Early Detection

Risk Factors for Leukemia (Note: In this publication, “Leukemia” is an umbrella term that includes five general types of blood cancers: Acute Lymphocytic Leukemia or ALL, Acute Myeloid Leukemia or AML, Chronic Lymphocytic Leukemia or CLL, Chronic Myelogenous Leukemia or CML, and Childhood Leukemia. The risk factors below do not pertain to **every** type of leukemia, but are known risk factors for at least one, if not more than one, type.)

- Exposure to ionizing radiation
- Exposure to certain chemicals including some chemotherapy drugs and benzene
- Sex: males are at a greater risk of developing leukemias than are females
- Certain genetic conditions, such as Down syndrome
- Family history of leukemia
- Personal history of myelodysplastic syndrome and certain other blood disorders
- Certain viral infections
- Tobacco use

Under Investigation as Risk Factors for Leukemia

- Exposure to electromagnetic fields (e.g., from power lines)
- Exposure to certain pesticides/herbicides

Early Detection of Leukemia

There is currently no recommended screening test for leukemia. The best method of early detection is for individuals to know their risks and report any symptoms to their doctors.

Data Highlights

New Leukemia Cases and Deaths (Tables 8.1 and 8.4)

- Leukemia was the 13th most frequently diagnosed cancer in Delaware from 2002-06. A total of 462 cases of leukemia were diagnosed in the state during this time.
 - Leukemia accounted for 2.0 percent of all cancer cases diagnosed during 2002-06 in Delaware.
 - Newly diagnosed cases affected more males than females: 268 cases (58.0 percent) were diagnosed among males and 194 cases (42.0 percent) were diagnosed among females.
- Leukemia was the state’s sixth most common cause of cancer deaths among both males and females for 2002-06.
 - Deaths from leukemia accounted for 3.8 percent of all cancer deaths in Delaware during 2002-06.
 - Of the 327 Delaware residents who died from leukemia in this five-year period, 54.1 percent were male and 45.9 percent were female.

Leukemia Incidence and Mortality Rates (Tables 8.2 and 8.5)

- Delaware’s 2002-06 leukemia incidence rate (10.5 per 100,000) was significantly lower than the U.S. rate (12.1 per 100,000).
 - For 2002-06 at all geographic levels except Kent County, for all races combined, the leukemia incidence rates for males were significantly higher than rates for females.
 - Among Caucasians, the incidence rates for males were significantly higher than for females at all geographic levels with the exception of Kent County.

- At the national level, 2002-06 incidence rates for African Americans were significantly lower than for Caucasians; no significant differences were observed by race at the state level.
- Delaware's 2002-06 leukemia mortality rate (7.4 per 100,000) was not significantly different from that of the U.S. (7.3 per 100,000).
 - For 2002-06, for all races combined, the leukemia mortality rates were significantly higher for males than for females at the national, state and New Castle county levels.
 - No significant differences in the state's 2002-06 leukemia mortality rates by race and sex were observed by county of residence.

Trends in Leukemia Incidence and Mortality Rates (Figures 8.1–8.2 and 8.4–8.5)

- From 1992-96 to 2002-06, Delaware's leukemia incidence rate decreased 6.2 percent while the U.S. rate fell 6.9 percent.
 - Delaware's leukemia incidence rates decreased 7.0 percent for Caucasians and 4.8 percent for African Americans between 1992-96 and 2002-06.
 - Delaware's leukemia rates decreased 4.7 percent for males and 12.1 percent for females between 1992-96 and 2002-06.
- Historically, Delaware's leukemia mortality rate has been slightly higher than the U.S. rate. However, Delaware's 2002-06 leukemia mortality rate was not significantly different from the U.S. rate.
 - Between 1992-96 and 2002-06, Delaware's leukemia mortality rate dropped 9.8 percent while the U.S. rate dropped 7.6 percent.
 - Delaware's mortality rate for males decreased 17.9 percent from 1992-96 to 2002-06 while the rate for females fell 7.8 percent.

Age-Specific Incidence and Mortality Rates (Tables 8.3 and 8.6, Figures 8.3 and 8.6)

- The 2002-06 leukemia incidence rate increased with age; Delawareans age 85 and older had the highest age-specific incidence rate with the exception of African American women (highest in the 74-85 age group).
 - For all races and age groups, the leukemia incidence rates were higher for males than for females.
 - The 2002-06 leukemia mortality rate increased with age; Delawareans age 85 and older had the highest age-specific incidence rate with the exception of African American women (highest in the 74-85 age group).
 - For all races, the leukemia mortality rates were higher for males than for females in age groups 65 and up while mortality rates were higher among women than men in age groups 0 - 64.

Stage at Diagnosis of Leukemia

- Leukemia was not staged for this report.

Leukemia Incidence

Table 8.1. Number of Leukemia Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	462	268	194	387	228	159	66	34	32
Kent	75	39	36	65	35	30	10	---	---
New Castle	250	140	110	208	120	88	36	17	19
Sussex	137	89	48	114	73	41	20	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 8.2. Five-Year Average Age-Adjusted Leukemia Incidence Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

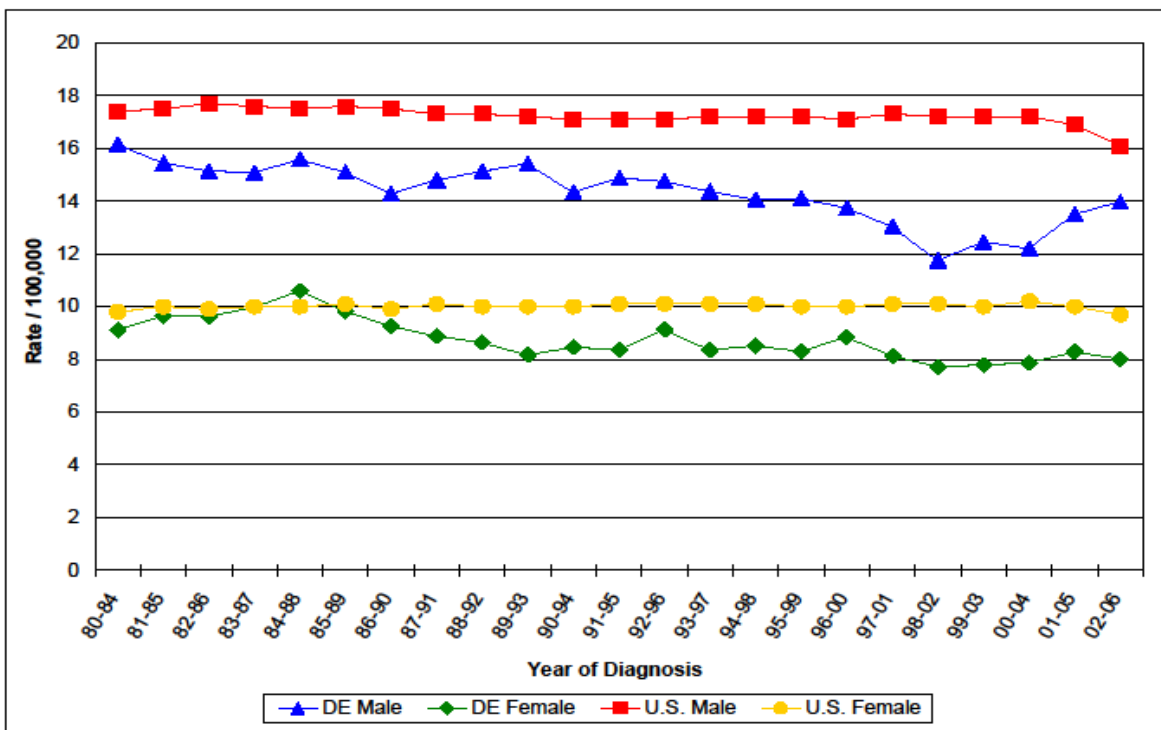
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	12.2 (12.1, 12.3)	15.8 (15.6, 16.0)	9.5 (9.4, 9.6)
Delaware	10.5 (9.6, 11.5)	14.0 (12.3, 15.7)	8.0 (6.9, 9.1)
Kent	11.1 (8.7, 13.9)	13.7 (9.8, 18.8)	9.7 (6.8, 13.4)
New Castle	9.9 (8.7, 11.2)	12.9 (10.8, 15.0)	7.7 (6.3, 9.1)
Sussex	11.8 (9.8, 13.8)	16.9 (13.5, 20.7)	7.5 (5.5, 9.9)
CAUCASIAN			
United States	12.8 (12.7, 12.9)	16.5 (16.3, 16.7)	9.9 (9.7, 10.1)
Delaware	10.6 (9.6, 11.7)	14.2 (12.3, 16.0)	8.0 (6.8, 9.2)
Kent	12.1 (9.3, 15.4)	14.8 (10.3, 20.5)	10.3 (6.9, 14.7)
New Castle	10.1 (8.7, 11.4)	13.6 (11.1, 16.0)	7.6 (6.1, 9.4)
Sussex	10.8 (8.8, 12.7)	14.9 (11.7, 18.7)	7.3 (5.2, 9.9)
AFRICAN AMERICAN			
United States	9.8 (9.5, 10.1)	12.7 (12.1, 13.3)	7.8 (7.4, 8.2)
Delaware	9.9 (7.7, 12.6)	12.8 (8.9, 17.9)	8.4 (5.8, 11.9)
Kent	---	---	---
New Castle	8.0 (5.6, 11.1)	---	---
Sussex	18.8 (11.5, 29.1)	---	---

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

--- = Rate based on fewer than 20 cases.

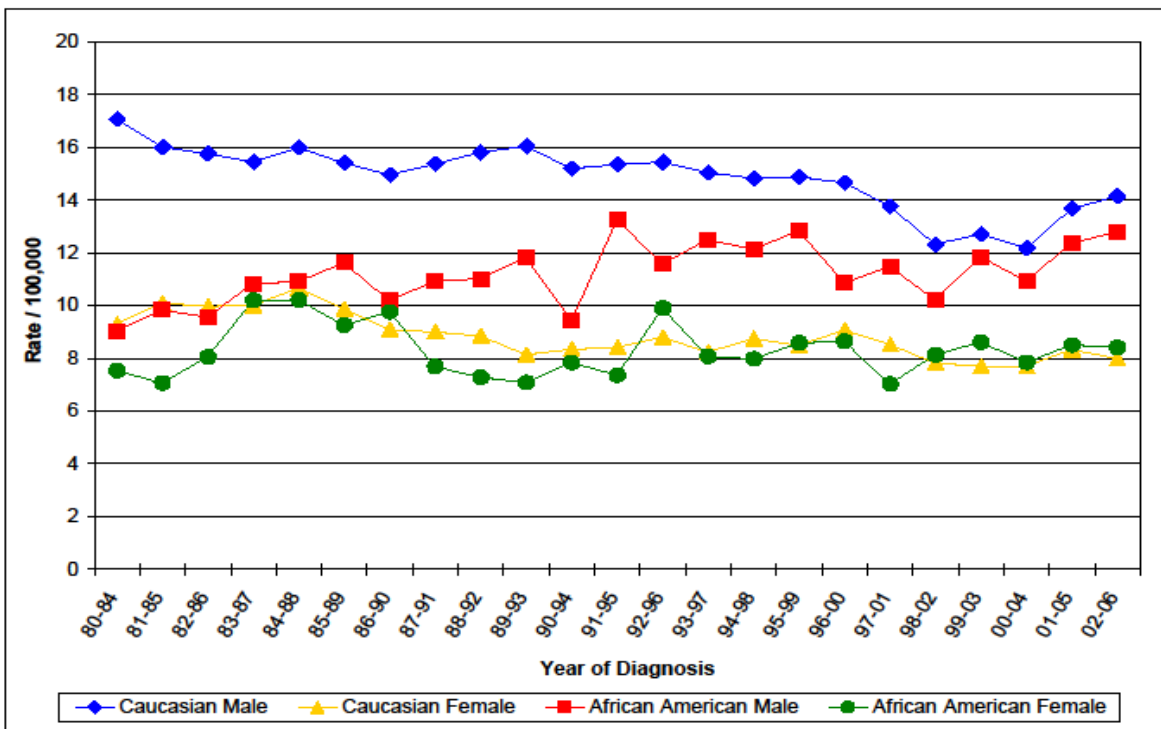
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 8.1. Five-Year Average Age-Adjusted Leukemia Incidence Rates* in the United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 8.2. Five-Year Average Age-Adjusted Leukemia Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 8.3. Age-Specific Leukemia Incidence Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	3.1	3.8	2.4	3.3	4.0	2.6	---	---	---
40-64	9.7	11.0	8.4	9.4	10.7	8.2	11.3	---	---
65-74	36.7	51.0	24.4	38.3	54.3	24.4	---	---	---
75-84	52.6	74.0	37.7	52.5	75.8	36.0	---	---	---
85+	74.6	122.7	54.2	77.2	120.1	58.8	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 8.3. Age-Specific Leukemia Incidence Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Leukemia Mortality

Table 8.4. Number of Leukemia Deaths in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	327	177	150	290	157	133	35	18	17
Kent	51	21	30	39	16	23	11	---	---
New Castle	196	111	85	178	99	79	17	11	6
Sussex	80	45	35	73	42	31	7	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Health Statistics Center, 2009.

Table 8.5. Five-Year Average Age-Adjusted Leukemia Mortality Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

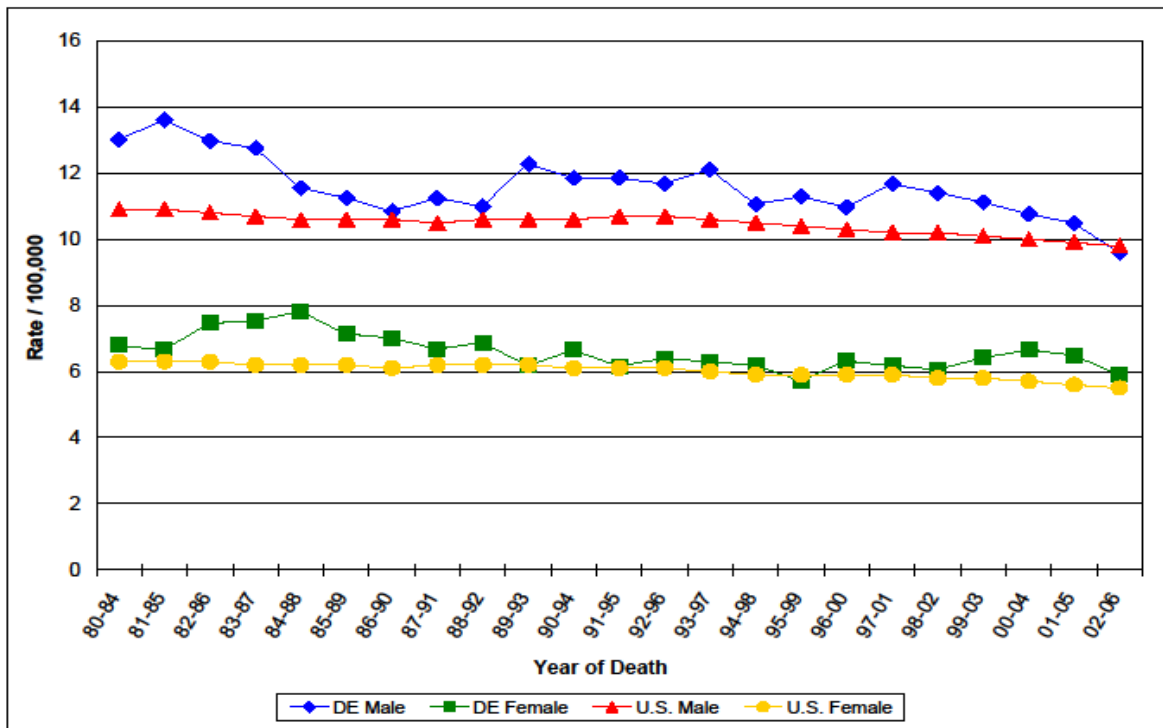
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	7.3 (7.3, 7.3)	9.8 (9.7, 9.9)	5.5 (5.5, 5.6)
Delaware	7.4 (6.6, 8.2)	9.6 (8.2, 11.0)	5.9 (5.0, 6.9)
Kent	7.8 (5.8, 10.3)	8.2 (5.1, 12.6)	7.9 (5.3, 11.2)
New Castle	7.9 (6.8, 9.0)	10.9 (8.8, 12.9)	5.8 (4.7, 7.2)
Sussex	6.3 (5.0, 7.9)	8.1 (5.9, 10.8)	4.8 (3.4, 6.7)
CAUCASIAN			
United States	7.5 (7.5, 7.6)	10.1 (10.0, 10.2)	5.7 (5.6, 5.7)
Delaware	7.6 (6.8, 8.5)	9.9 (8.3, 11.4)	6.2 (5.2, 7.3)
Kent	7.3 (5.2, 10.0)	---	7.3 (4.6, 10.9)
New Castle	8.5 (7.2, 9.7)	11.5 (9.4, 14.0)	6.7 (5.3, 8.3)
Sussex	6.3 (4.9, 7.9)	8.1 (5.8, 10.9)	4.7 (3.2, 6.7)
AFRICAN AMERICAN			
United States	6.4 (6.3, 6.6)	8.5 (8.3, 8.8)	5.1 (4.9, 5.2)
Delaware	5.6 (3.9, 7.8)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 deaths.

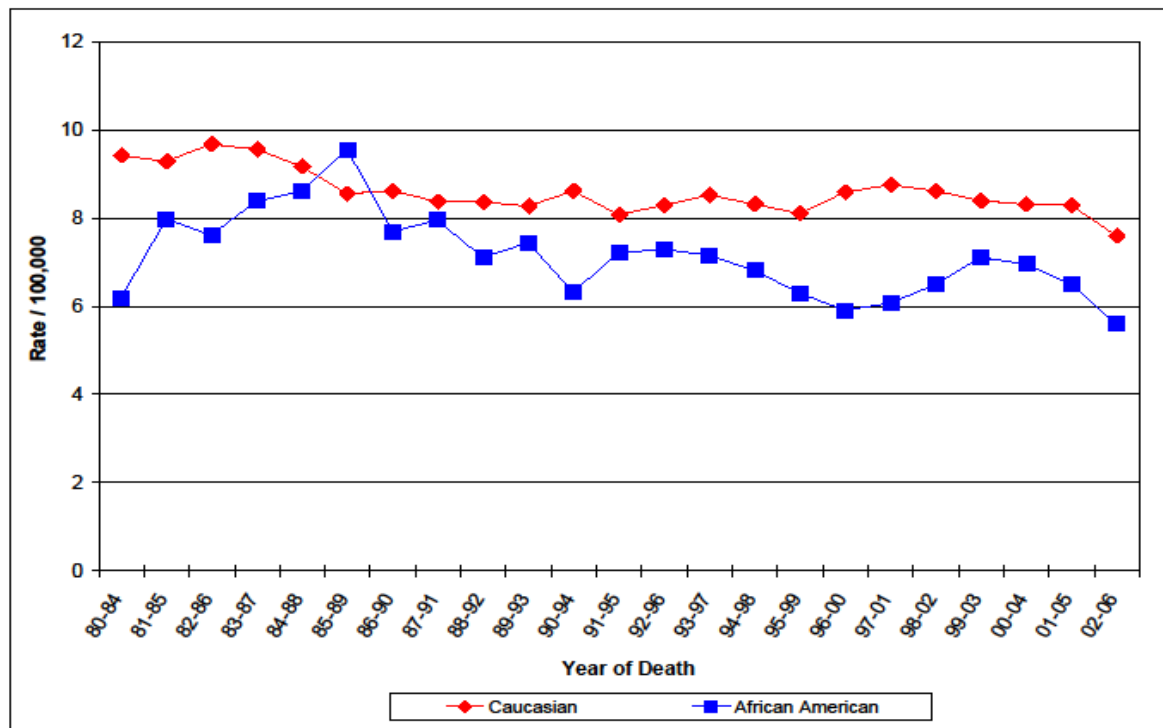
SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 200-.

Figure 8.4. Five-Year Average Age-Adjusted Leukemia Mortality Rates* in the United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 8.5. Five-Year Average Age-Adjusted Leukemia Mortality Rates* in Delaware, by Race: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 8.6. Age-Specific Leukemia Mortality Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	0.9	---	---	---	---	---	---	---	---
40-64	5.2	5.0	5.4	5.3	5.2	5.5	---	---	---
65-74	24.6	34.3	16.3	26.1	35.6	17.8	---	---	---
75-84	54.6	77.7	38.6	58.2	82.6	40.9	---	---	---
85+	82.2	122.7	65.0	87.5	125.8	71.1	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 deaths.

SOURCE: Delaware Health Statistics Center, 2009.

Figure 8.6. Age-Specific Leukemia Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

9. Lung and Bronchial Cancer

Risk Factors and Early Detection

Risk Factors for Lung Cancer

- Tobacco use: cigarette, cigar and pipe smoking
 - An estimated 87 percent of lung cancers are caused by smoking cigarettes, cigars or pipes
 - The longer a person has smoked and the more packs smoked per day, the greater the risk
- Occupational exposures to known lung carcinogens, including asbestos, mustard gas, radioactive ores and heavy metals
- Exposure to secondhand smoke
- Exposure to radon gas
- Radiation therapy to the chest, especially for people who smoke
- Personal history of lung cancer
- Family history of lung cancer
- Diseases such as silicosis, berylliosis and chronic obstructive pulmonary disease

Possible Risk Factors for Lung Cancer

- Diets low in fruits and vegetables
- High levels of arsenic in drinking water
- Heavy alcohol use
- Smoking marijuana
- Exposure to air pollution

Protective Factors

- Never smoking
- Stopping smoking at any age
- Diets rich in fruits and vegetables
- Engaging in recommended levels of physical activity

Early Detection of Lung Cancer

There is currently no effective screening test for lung cancer. The American Cancer Society recommends that people at higher risk for lung cancer be aware of their risk and discuss it with their doctor.

In addition to lung cancer, cigarette smoking is recognized as a risk factor in the development of numerous other cancers, including cervical, esophageal, kidney, laryngeal, oral, pharyngeal, pancreatic and urinary bladder cancers.

Current Trends in Smoking in Delaware and the U.S. Based on 2008 Behavioral Risk Factor Surveillance Study (BRFSS) Data

Current smoking trends may be predictive of cancer rates in the 2030s. In the 1980s (i.e., the time period relevant to current lung and bronchial cancer rates), Delaware's smoking prevalence rates were among the highest in the country. Historical BRFSS data show that in 1982, 30 percent of adult Delawareans smoked cigarettes. By the 1990s, Delaware's smoking rate among those over the age of 18 had declined to approximately 25 percent. Currently, just fewer than 18 percent of adult Delawareans smoke cigarettes.

- In 2008, the prevalence of cigarette smoking in Delaware was comparable to prevalence in the U.S. (17.8 percent vs. 18.4 percent, respectively).
 - In Delaware, there were no significant differences among current smokers with regard to sex or race. On the other hand, at the national level, males were significantly more likely to be current smokers than women and African Americans were significantly more likely to be current smokers than Caucasians.
- The prevalence of cigarette smoking was significantly higher for Delawareans between the ages of 18 and 64 compared to those 65 and older (19.9 percent vs. 8.3 percent, respectively).
- Delaware college graduates were significantly less likely to be current smokers than Delawareans with less than a college degree (6.8 percent vs. 20.8 percent, respectively).
- Delawareans earning less than \$25,000 per year were significantly more likely to be current smokers than Delawareans earning more than \$25,000 per year (30.4 percent vs. 16.3 percent, respectively).

Data Highlights

New Lung/Bronchus Cancer Cases and Deaths (Tables 9.1 and 9.6)

- From 2002-06, 3,648 lung cancer cases were diagnosed in Delaware. Lung cancer accounted for 16.0 percent of all new cancer cases diagnosed in the state during this time.
 - Of the 3,648 lung cancer cases diagnosed from 2002-06, 1,915 cases (52.5 percent) were male. The remaining 1,733 cases (47.5 percent) were female.
 - From 2002-06, lung cancer was the second most commonly diagnosed cancer among both males and females in Delaware.
- Lung cancer was the leading cause of cancer deaths among Delaware males and females during 2002-06, accounting for 31.1 percent of all cancer deaths.
 - From 2002-06, 2,705 Delaware residents died of lung cancer; 1,505 deaths (55.6 percent) occurred among males and 1,200 (44.4 percent) among females.

Lung/Bronchus Cancer Incidence and Mortality Rates (Tables 9.2 and 9.7)

- Delaware's 2002-06 lung cancer incidence rate (80.5 per 100,000) was significantly higher than the U.S. rate (63.1 per 100,000).
 - The 2002-06 lung cancer incidence rates for males were significantly higher than for females across all geographic levels and race groups.
 - At the national level, the 2002-06 lung cancer incidence rates for African Americans were significantly higher than for Caucasians, regardless of sex. However, rates did not differ significantly by race at the state or county levels.
- Delaware's 2002-06 lung cancer mortality rate (59.9 per 100,000) was significantly higher than the U.S. rate (53.4 per 100,000).
 - Regardless of race, the 2002-06 lung cancer mortality rates for males were significantly higher than for females at both the state and national level.

Trends in Lung/Bronchus Cancer Incidence and Mortality (Figures 9.1–9.2 and 9.6–9.7)

- Since the 1980s, in both Delaware and the U.S., lung cancer incidence rates have decreased among males. For females, rates among African American women have begun to decrease, but continue to increase among Caucasian females.
 - From 1992-96 to 2002-06, Delaware's male lung cancer incidence rate decreased 19.1 percent while the comparable U.S. rate fell 15.5 percent. During the same time, Delaware's female lung cancer incidence rate increased 6.5 percent while the comparable U.S. rate increased 4.3 percent.
 - In Delaware, from 1992-96 to 2002-06, the African American male lung cancer incidence rate fell 36.6 percent, the African American female rate fell 5.5 percent and the Caucasian male lung

cancer incidence rate fell 15.8 percent. During this same time, Delaware's lung cancer incidence rate for Caucasian females increased 9.6 percent.

- Delaware's male and female lung cancer mortality rates have historically been higher than comparable U.S. rates. Among Delaware males, however, this disparity has decreased over time. When Delaware's lung cancer mortality rate peaked among men (the five-year period 1987-91), the state rate was 21 percent greater than the national rate. For 2002-06, however, Delaware's male lung cancer mortality rate was only 9.5 percent greater than the national rate.
- Lung cancer mortality rates among Delawarean women peaked in 1992-96 at 50.2 per 100,000; since then, the lung cancer mortality rate for females in the state has experienced a minimal decrease.
- No significant differences in the 2002-06 lung cancer mortality rates were observed between African Americans and Caucasians of either sex at the state level.

Age-Specific Incidence and Mortality Rates (Tables 9.3 and 9.8, Figures 9.3 and 9.8)

- In Delaware, for 2002-06, lung cancer incidence increased with age, with a peak incidence observed among Delawareans age 75-84. In this age group, the male lung cancer incidence rate was approximately 1.6 times higher than the female rate.
- Delaware's 2002-06 lung cancer mortality peaked among those aged 75-84.

Stage at Diagnosis of Lung/Bronchus Cancer (Tables 9.4–9.5, Figures 9.4–9.5)

- In Delaware, for 2002-06, 18.4 percent, 27.1 percent and 47.3 percent of lung and bronchial cancers were diagnosed at the local, regional and distant stage, respectively. In the U.S., for 2002-06, comparable percentages were 15.0 percent, 22.0 percent and 55.0 percent, respectively.
- Among Delawareans diagnosed with lung cancer, the proportion of those diagnosed with advanced disease did not differ by race. Among African Americans diagnosed with the disease, 74.9 percent of cases were diagnosed in the regional or distant stages. Among Caucasians, 74.4 percent of cases were diagnosed in the regional or distant stages.

Lung and Bronchial Cancer Incidence

Table 9.1. Number of Lung and Bronchial Cancer Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	3,648	1,915	1,733	3,097	1,617	1,480	514	276	238
Kent	601	331	270	497	271	226	95	56	39
New Castle	1,964	977	987	1,621	802	819	325	164	161
Sussex	1,083	607	476	979	544	435	94	56	38

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

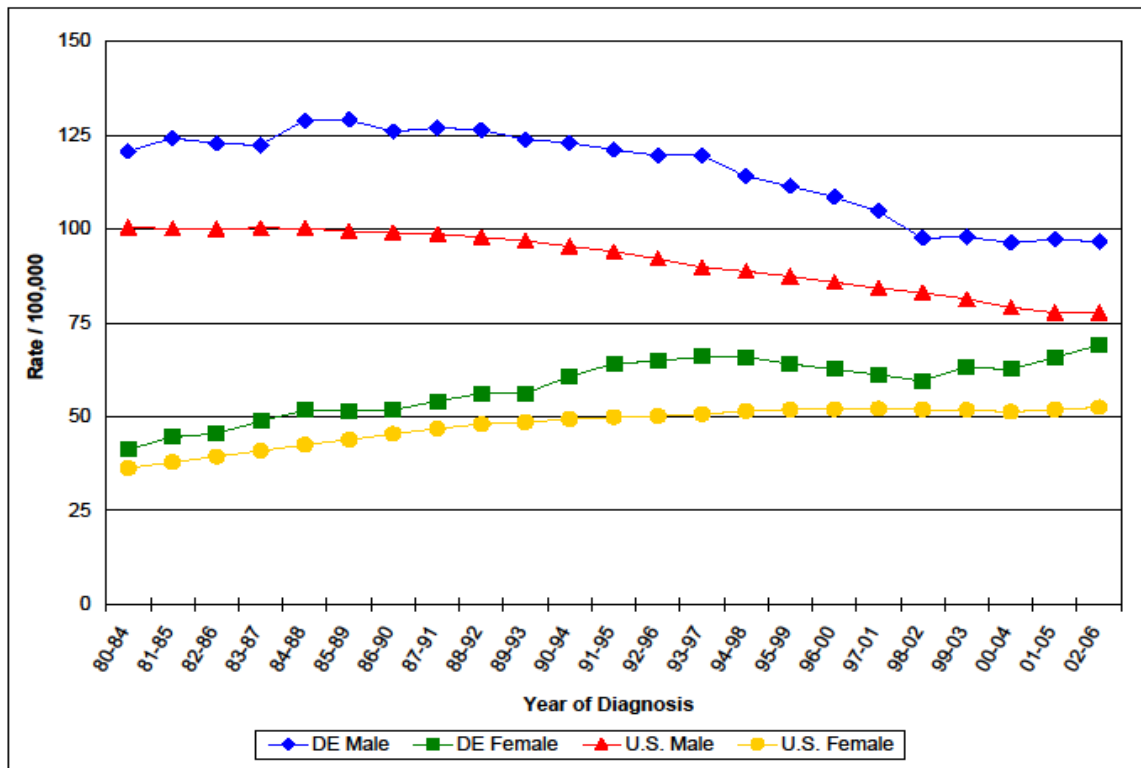
Table 9.2. Five-Year Average Age-Adjusted Lung and Bronchial Cancer Incidence Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	63.1 (62.8, 63.4)	77.7 (77.3, 78.1)	52.5 (52.2, 52.8)
Delaware	80.5 (77.9, 83.1)	96.7 (92.3, 101.0)	69.1 (65.8, 72.3)
Kent	88.1 (81.1, 95.2)	112.1 (100.0, 124.2)	71.0 (62.5, 79.4)
New Castle	78.4 (74.9, 81.9)	89.3 (83.7, 94.9)	68.9 (64.6, 73.2)
Sussex	84.5 (79.5, 89.5)	103.9 (95.6, 112.2)	69.5 (63.2, 75.7)
CAUCASIAN			
United States	64.4 (64.1, 64.7)	77.6 (77.1, 78.1)	54.8 (54.4, 55.2)
Delaware	80.5 (77.6, 83.3)	95.3 (90.6, 99.9)	69.9 (66.4, 73.5)
Kent	89.5 (81.6, 97.3)	112.1 (98.7, 125.4)	73.2 (63.7, 82.8)
New Castle	76.9 (73.1, 80.6)	88.0 (82.0, 94.1)	69.6 (64.8, 74.3)
Sussex	84.0 (78.7, 89.2)	101.3 (92.8, 109.9)	70.6 (64.0, 77.3)
AFRICAN AMERICAN			
United States	74.7 (73.7, 75.7)	104.3 (102.5, 106.1)	54.7 (53.6, 55.8)
Delaware	84.6 (77.3, 91.9)	109.6 (96.6, 122.5)	68.1 (59.5, 76.8)
Kent	88.4 (71.5, 108.0)	120.2 (90.8, 155.7)	65.1 (46.3, 89.1)
New Castle	80.5 (71.7, 89.2)	98.1 (83.0, 113.1)	69.4 (58.7, 80.1)
Sussex	93.5 (75.5, 114.4)	134.1 (101.3, 174.1)	65.7 (46.5, 90.1)

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

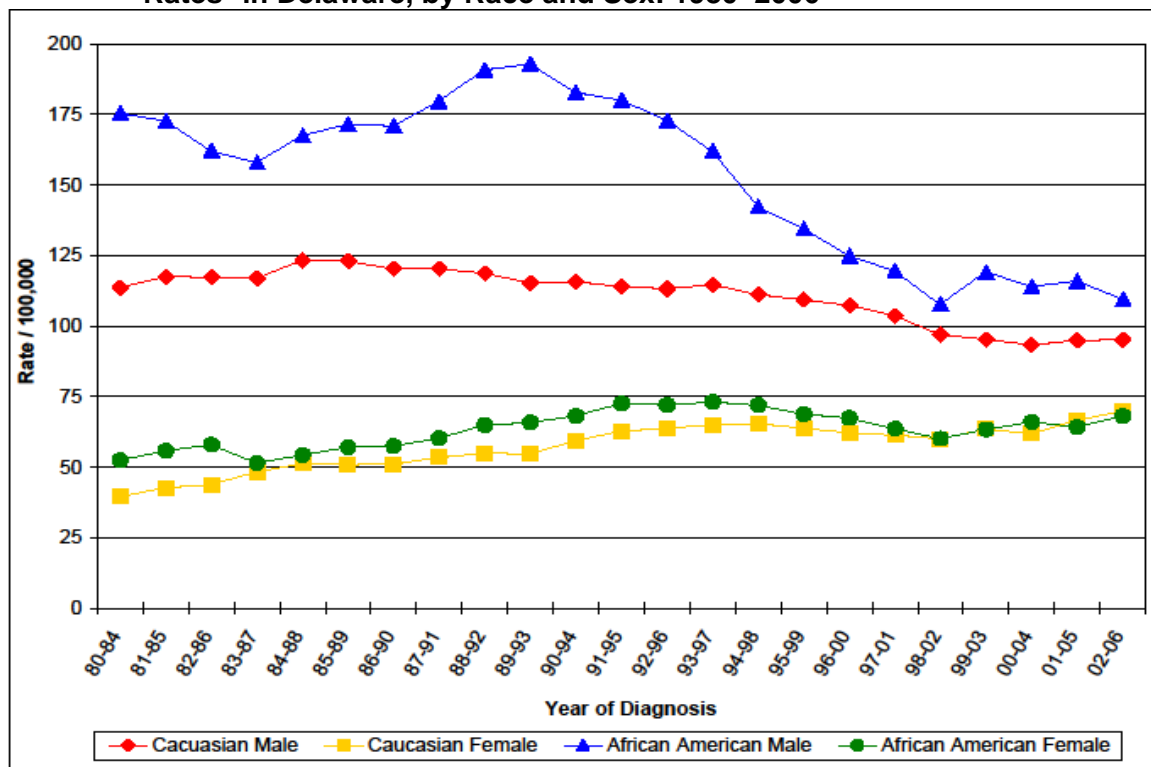
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 9.1. Five-Year Average Age-Adjusted Lung and Bronchial Cancer Incidence Rates* in the U.S. and Delaware, by Sex: 1980–2006



* = 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, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 9.2. Five-Year Average Age-Adjusted Lung and Bronchial Cancer Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = 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, 2009.

Table 9.3. Age-Specific Lung and Bronchial Cancer Incidence Rates* in Delaware, by Race and Sex: 2002-06

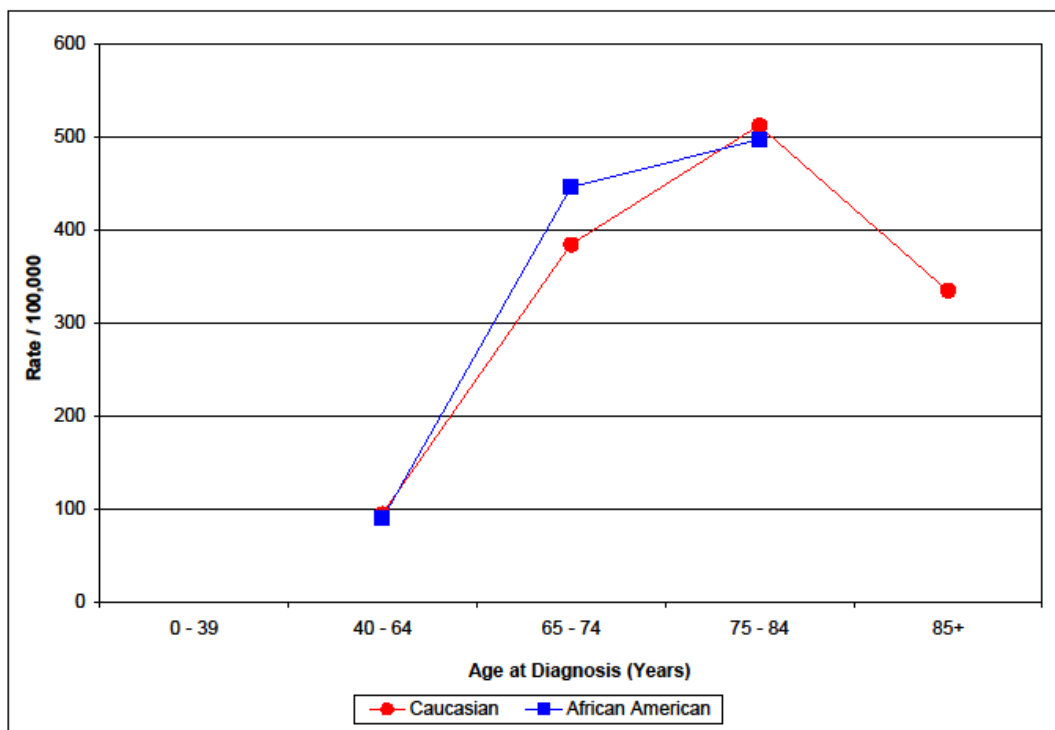
Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	1.1	---	---	1.3	---	---	---	---	---
40-64	91.6	97.0	86.5	94.5	97.9	91.2	89.3	105.4	75.8
65-74	391.3	462.9	329.7	384.0	451.1	325.5	445.7	538.3	373.5
75-84	508.0	647.1	411.3	512.2	643.2	419.6	497.1	714.6	366.5
85+	325.6	536.7	236.2	334.6	543.4	245.1	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 9.3. Age-Specific Lung and Bronchial Cancer Incidence Rates in Delaware, by Race: 2002-06



NOTE: Rates for either race age 0-39 and African Americans age 85+ are not displayed due to patient confidentiality rules. SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Lung and Bronchial Cancer by Stage at Diagnosis

Table 9.4. Number of Lung and Bronchial Cancer Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	670	306	364	562	254	308	101	48	53
Regional	989	510	479	835	422	413	143	82	61
Distant	1,727	963	764	1,469	826	643	242	127	115
Unknown	262	136	126	231	115	116	28	19	9
Total	3,648	1,915	1,733	3,097	1,617	1,480	514	276	238

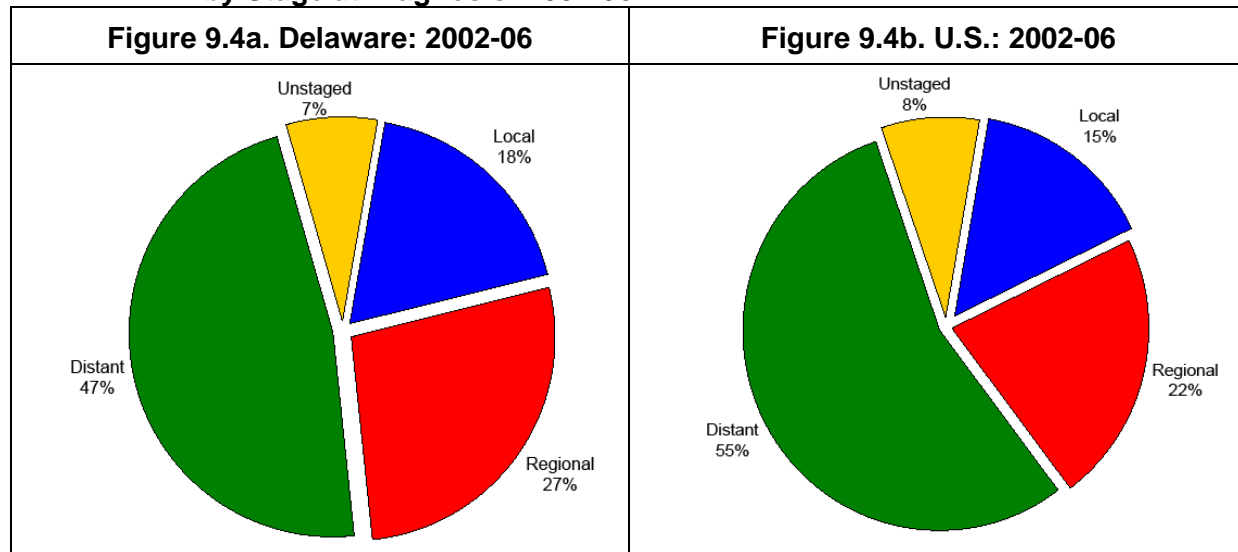
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 9.5. Percentage of Lung and Bronchial Cancer Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	18.4	16.0	21.0	18.2	15.7	20.8	19.7	17.4	22.3
Regional	27.1	26.6	27.6	27.0	26.1	27.9	27.8	29.7	25.6
Distant	47.3	50.3	44.1	47.4	51.1	43.5	47.1	46.0	48.3
Unknown	7.2	7.1	7.3	7.5	7.1	7.8	5.5	6.9	3.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

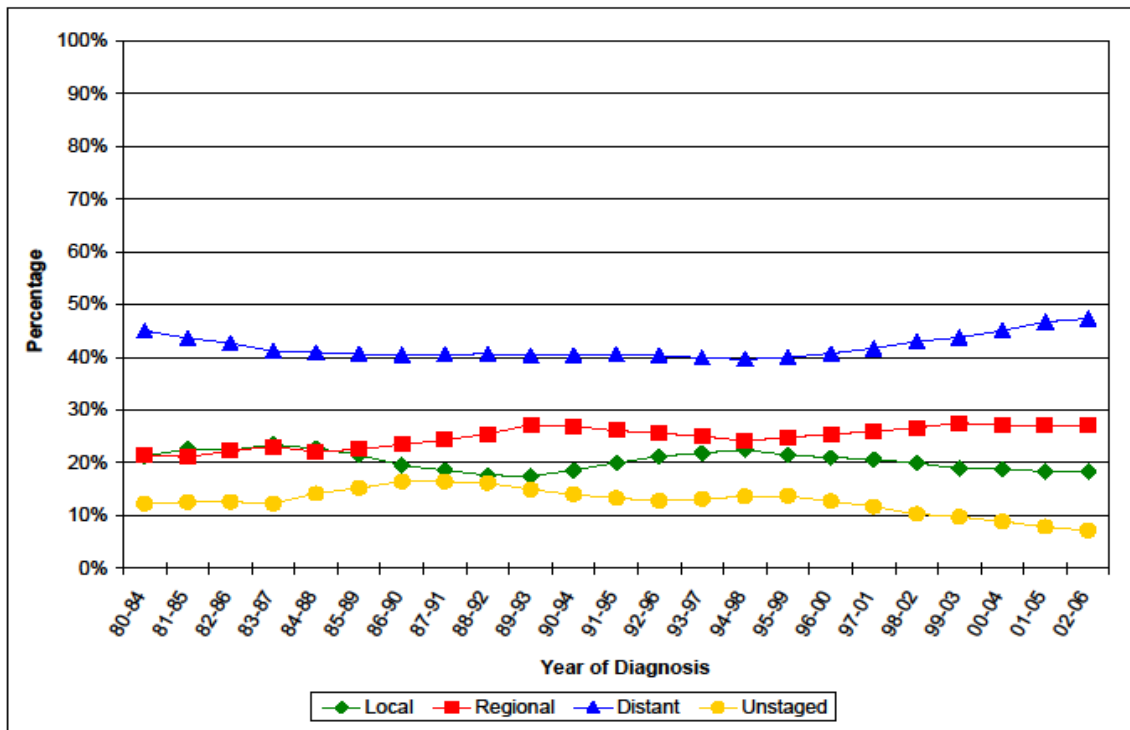
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 9.4. Percentage of Lung and Bronchial Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 9.5. Percentage of Lung and Bronchial Cancer Cases in Delaware, by Stage at Diagnosis: 1980–2006



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Lung and Bronchial Cancer Mortality

Table 9.6. Number of Lung and Bronchial Cancer Deaths in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	2,705	1,505	1,200	2,288	1,272	1,016	393	222	171
Kent	445	268	177	366	219	147	74	47	27
New Castle	1,450	776	674	1,201	642	559	235	127	108
Sussex	810	461	349	721	411	310	84	48	36

SOURCE: Delaware Health Statistics Center, 2009.

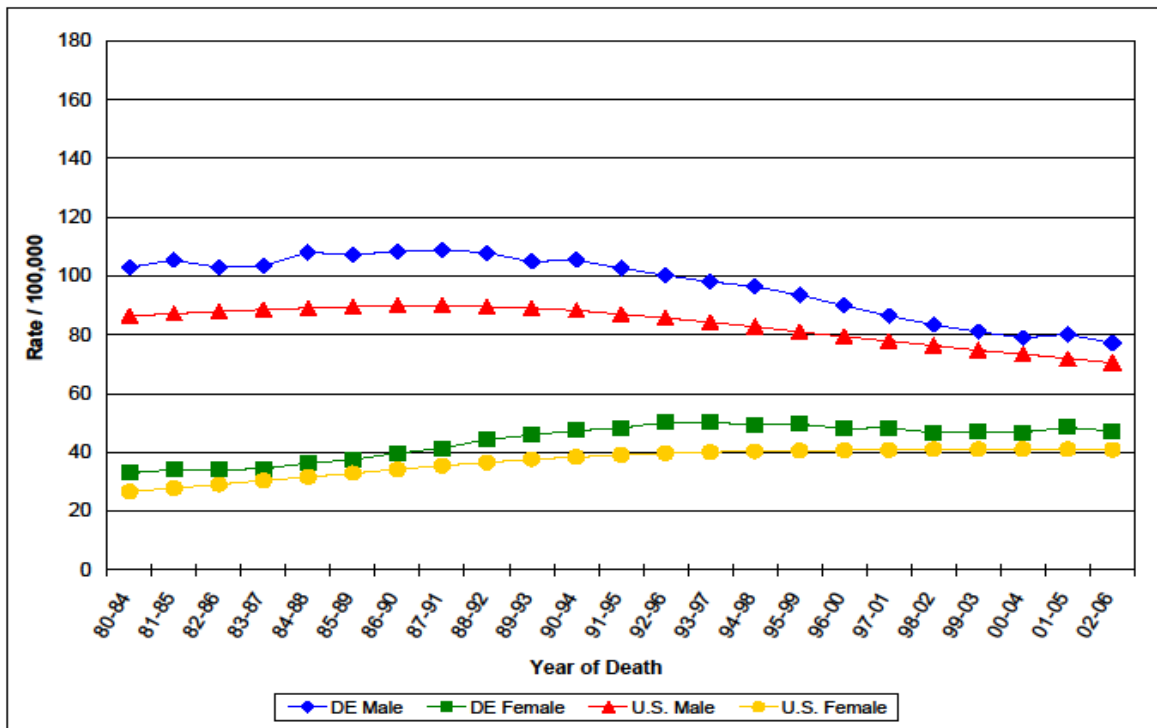
Table 9.7. Five-Year Average Age-Adjusted Lung and Bronchial Cancer Mortality Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	53.4 (53.3, 53.5)	70.5 (70.3, 70.7)	40.9 (40.7, 41.0)
Delaware	59.9 (57.7, 62.2)	77.2 (73.3, 81.1)	47.3 (44.6, 49.9)
Kent	65.9 (59.8, 72.0)	92.8 (81.7, 103.9)	46.6 (39.8, 53.5)
New Castle	58.2 (55.2, 61.2)	72.1 (67.0, 77.1)	46.6 (43.0, 50.1)
Sussex	62.7 (58.3, 67.0)	79.4 (72.1, 86.7)	49.8 (44.5, 55.0)
CAUCASIAN			
United States	53.8 (53.6, 53.9)	69.9 (69.7, 70.2)	41.9 (41.7, 42.0)
Delaware	59.3 (56.9, 61.7)	75.9 (71.7, 80.1)	47.0 (44.1, 49.9)
Kent	66.3 (59.5, 73.1)	92.4 (80.2, 104.6)	47.5 (39.8, 55.1)
New Castle	56.8 (53.6, 60.0)	71.4 (65.8, 76.9)	46.4 (42.5, 50.2)
Sussex	61.1 (56.6, 65.5)	76.9 (69.5, 84.3)	48.9 (43.5, 54.4)
AFRICAN AMERICAN			
United States	59.9 (59.4, 60.3)	90.1 (89.3, 91.0)	40.0 (39.5, 40.4)
Delaware	66.5 (59.9, 73.1)	90.0 (78.1, 101.8)	50.5 (42.9, 58.0)
Kent	69.7 (54.7, 87.5)	101.1 (74.3, 134.5)	46.9 (30.9, 68.2)
New Castle	59.8 (52.1, 67.4)	77.7 (64.2, 91.2)	47.8 (38.8, 56.8)
Sussex	85.0 (67.8, 105.2)	117.7 (86.8, 156.0)	62.1 (43.5, 86.0)

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

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

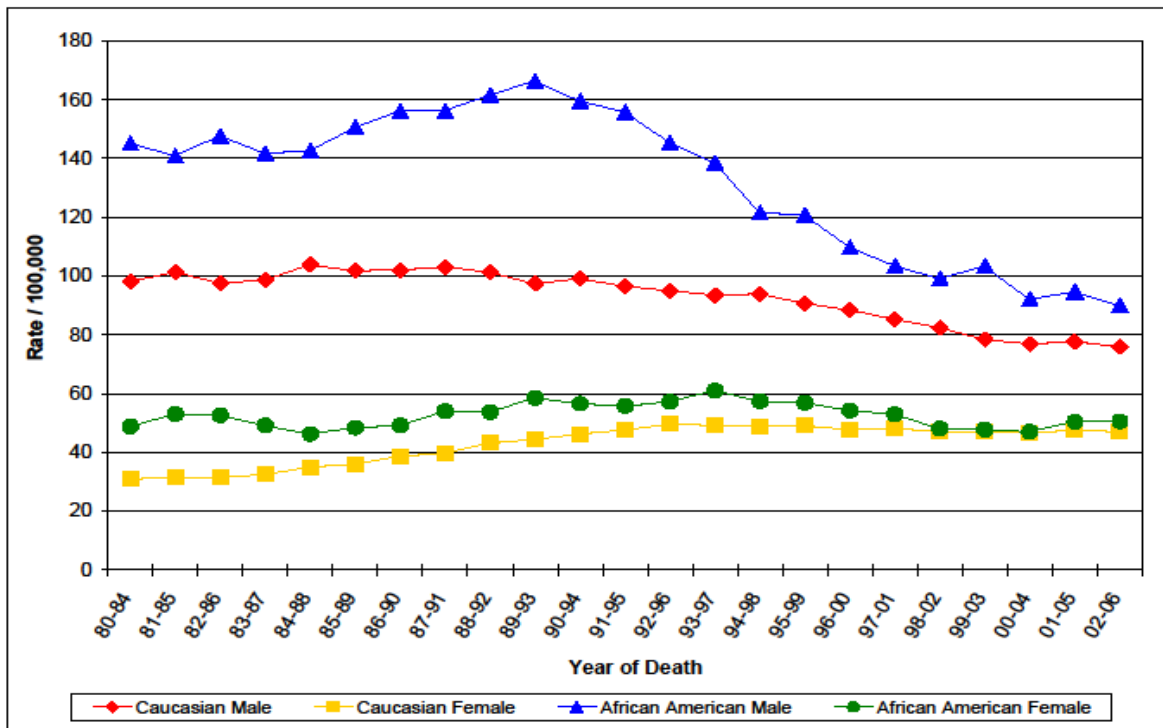
Figure 9.6. Five-Year Average Age-Adjusted Lung and Bronchial Cancer Mortality Rates* in the U.S. and Delaware, by Sex: 1980–2006



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

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 9.7. Five-Year Average Age-Adjusted Lung and Bronchial Cancer Mortality Rates* in Delaware, by Race and Sex: 1980–2006



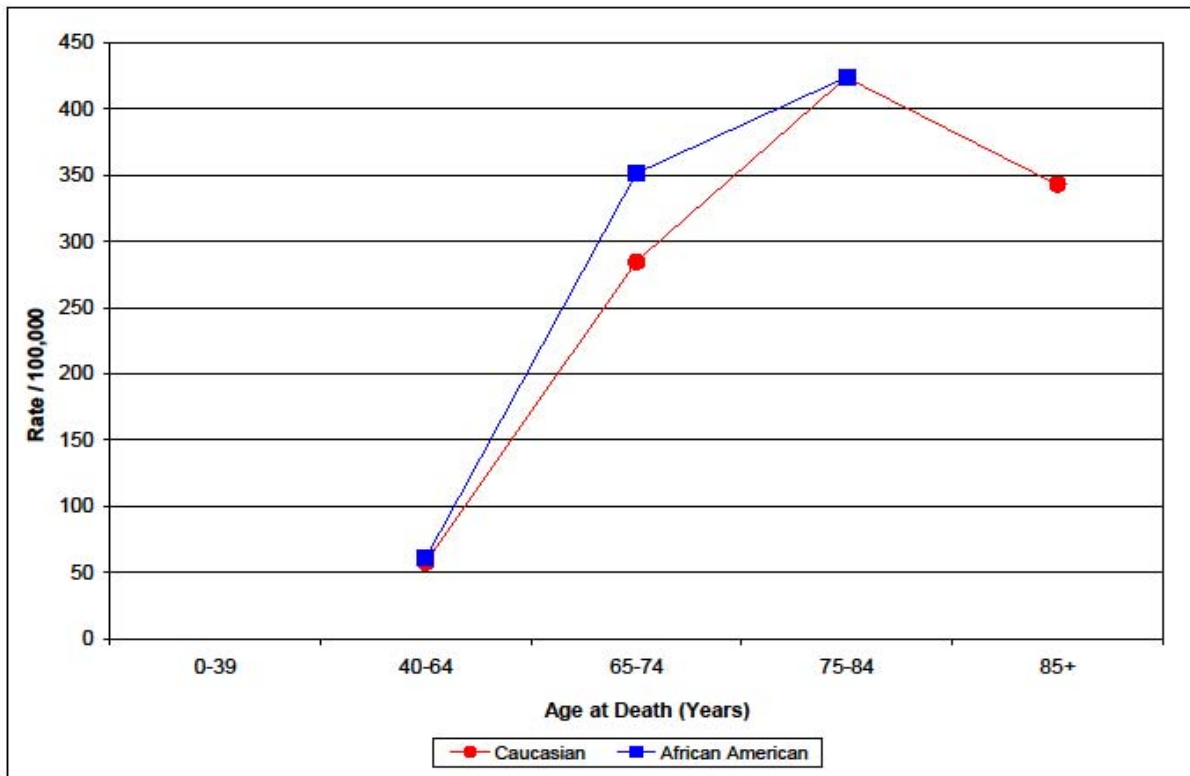
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 9.8. Age-Specific Lung and Bronchial Cancer Mortality Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0–39	---	---	---	---	---	---	---	---	---
40–64	57.1	66.9	47.9	57.5	65.7	49.7	60.6	81.5	43.1
65–74	291.9	357.9	235.0	284.5	349.4	227.9	351.3	430.6	289.4
75–84	420.0	574.4	312.7	423.8	575.7	316.4	424.0	623.6	304.1
85+	337.8	526.4	257.9	343.2	532.0	262.3	303.6	---	---

* = Rates are per 100,000 population.
 --- = Rate based on fewer than 20 deaths.
 SOURCE: Delaware Health Statistics Center, 2009.

Figure 9.8. Age-Specific Lung and Bronchial Cancer Mortality Rates in Delaware, by Race: 2002-06



NOTE: Rates for either race age 0-39 and African Americans age 85+ are not displayed due to patient confidentiality rules.
SOURCE: Delaware Health Statistics Center, 2009.

10. Myeloma

Risk Factors and Early Detection

Risk Factors for Myeloma

- Increasing age: most myeloma cases are diagnosed among those age 65 or greater
- Sex: males have a slightly higher risk of developing myeloma than do females
- Race: myeloma is almost twice as prevalent among African Americans than among Caucasians
- Family history of myeloma; someone with a sibling or parent with myeloma is four times more likely to develop the disease
- Personal history of solitary plasmacytoma or MGUS (monoclonal gammopathy of uncertain significance)
- Being overweight or obese

Possible Risk Factors for Myeloma

- Exposure to radiation
- Workers in certain petroleum-related industries may have an increased risk of developing myeloma

Early Detection of Myeloma

There is currently no recommended screening test for myeloma. The best method of early detection is for individuals to know their risks and report any symptoms to their doctors.

Data Highlights

New Myeloma Cases and Deaths (Tables 10.1 and 10.4)

- For 2002-06, 240 myeloma cases were diagnosed in Delaware, accounting for 1.1 percent of all new cancer cases diagnosed during this time.
 - Of the 240 myeloma cases diagnosed from 2002-06, 136 cases (57.7 percent) were male. The remaining 104 cases (43.3 percent) were female.
- Myeloma was the 15th leading cause of cancer deaths among Delaware males and females during 2002-06, accounting for 1.7 percent of all cancer deaths.
 - In 2002-06, 145 Delaware residents died from myeloma; 76 deaths (56.0 percent) occurred among males and 69 (44.0 percent) among females.

Myeloma Incidence and Mortality Rates (Tables 10.2 and 10.5)

- Delaware's 2002-06 myeloma incidence rate (5.3 per 100,000) was comparable to the U.S. rate (5.6 per 100,000).
 - The 2002-06 myeloma incidence rates for males were significantly higher than for females at the state and national levels for both races combined and Caucasians only.
 - At the national level, the 2002-06 myeloma incidence rate for African American males was significantly higher than for females; no significant differences between sexes were observed at the state level.
 - At the national and state levels, the 2002-06 myeloma incidence rates for African Americans were significantly higher than for Caucasians, regardless of sex.
 - The 2002-06 incidence data were too sparse for analyses by race at the county-level.
- Delaware's 2002-06 myeloma mortality rate (3.2 per 100,000) did not differ significantly from the U.S. rate (3.6 per 100,000).
 - While the 2002-06 myeloma mortality rates for males of either race were significantly greater than their female counterparts at the national level, no significant differences were observed by sex and race on the state level.

- Delaware's 2002-06 myeloma mortality rate for African Americans (5.6 per 100,000) was significantly greater than the rate for Caucasians (2.9 per 100,000).

Trends in Myeloma Incidence and Mortality (Figures 10.1–10.2 and 10.4–1.5)

- From 1992-96 to 2002-06, Delaware's myeloma incidence rate increased 8.2 percent while the U.S. rate decreased 3.4 percent.
 - From 1992-96 to 2002-06, Delaware's myeloma incidence rate among males decreased 2.9 while the female myeloma incidence rate increased 20.6.
 - Over the same ten-year period, the state's incidence rate among African Americans fell 13.5 percent while the rate among Caucasians increased 12.5 percent.
 - Delaware's myeloma incidence rate for Caucasian males and females and African American females increased by 3.4 percent, 22.2 percent and 22.5 percent, respectively.
 - Conversely, the incidence rate among African American males decreased by 30.5 percent over the same ten-year period.

Age-Specific Incidence and Mortality Rates (Tables 10.3 and 10.6, Figures 10.3 and 10.6)

- In Delaware, for 2002-06, myeloma incidence increased with age, with a peak incidence observed among Delawareans age 75-84.
 - Delaware's 2002-06 myeloma incidence data were too sparse for meaningful analyses by sex and race.
- Delaware's 2002-06 myeloma mortality peaked in the 75 and older age group; no deaths occurred in the 0-39 age group.

Stage at Diagnosis of Myeloma

- Myeloma was not staged for this report.

Myeloma Incidence

Table 10.1. Number of Myeloma Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	240	136	104	174	102	72	58	30	28
Kent	39	22	17	33	20	13	---	---	---
New Castle	140	78	62	99	56	43	36	19	17
Sussex	61	36	25	42	26	16	---	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 10.2. Five-Year Average Age-Adjusted Myeloma Incidence Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

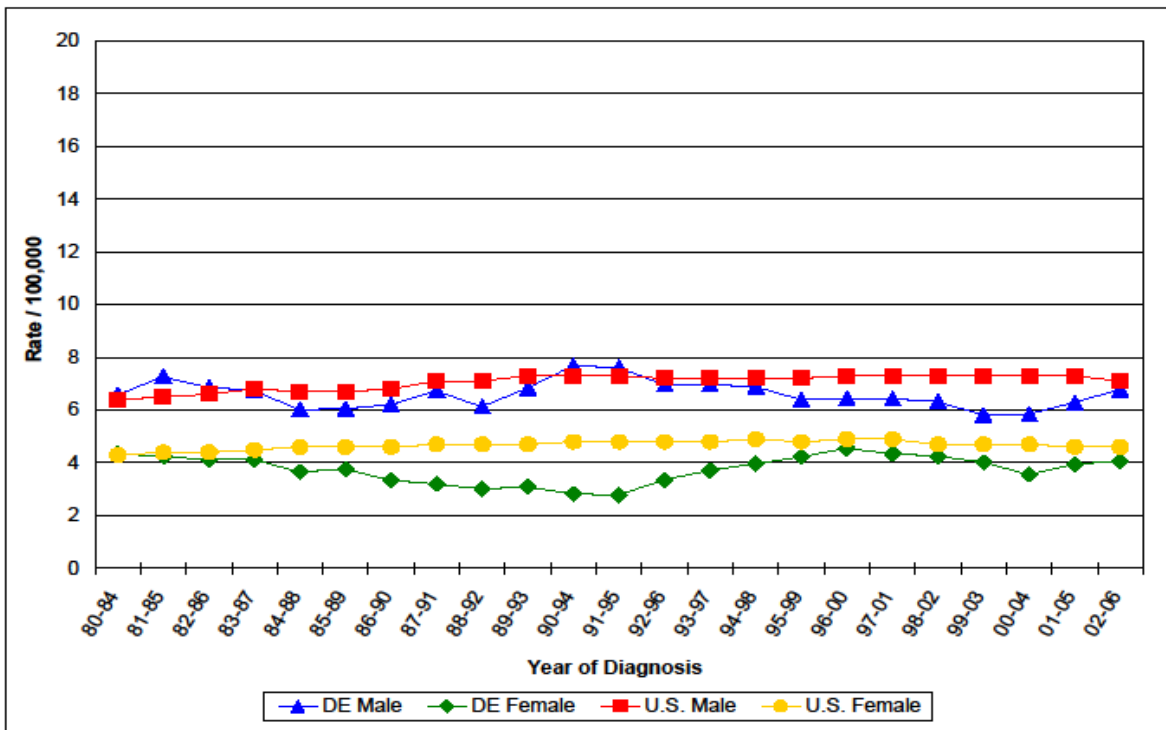
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	5.6 (5.5, 5.7)	7.1 (7.0, 7.2)	4.6 (4.5, 4.7)
Delaware	5.3 (4.6, 5.9)	6.8 (5.6, 7.9)	4.1 (3.3, 4.9)
Kent	5.7 (4.1, 7.8)	7.6 (4.8, 11.5)	---
New Castle	5.5 (4.6, 6.4)	6.8 (5.4, 8.5)	4.2 (3.2, 5.4)
Sussex	4.9 (3.7, 6.3)	6.5 (4.5, 9.0)	3.6 (2.3, 5.3)
CAUCASIAN			
United States	5.2 (5.1, 5.3)	6.6 (6.5, 6.7)	4.1 (4.0, 4.2)
Delaware	4.5 (3.8, 5.2)	6.0 (4.8, 7.1)	3.3 (2.6, 4.3)
Kent	6.0 (4.1, 8.4)	8.5 (5.2, 13.2)	---
New Castle	4.6 (3.8, 5.6)	6.0 (4.5, 7.8)	3.5 (2.6, 4.8)
Sussex	3.7 (2.7, 5.0)	5.2 (3.4, 7.7)	---
AFRICAN AMERICAN			
United States	11.7 (11.3, 12.1)	14.3 (13.6, 15.0)	10.0 (9.5, 10.5)
Delaware	9.6 (7.3, 12.4)	11.6 (7.8, 16.5)	8.1 (5.4, 11.7)
Kent	---	---	---
New Castle	9.5 (6.6, 13.1)	---	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 cases.

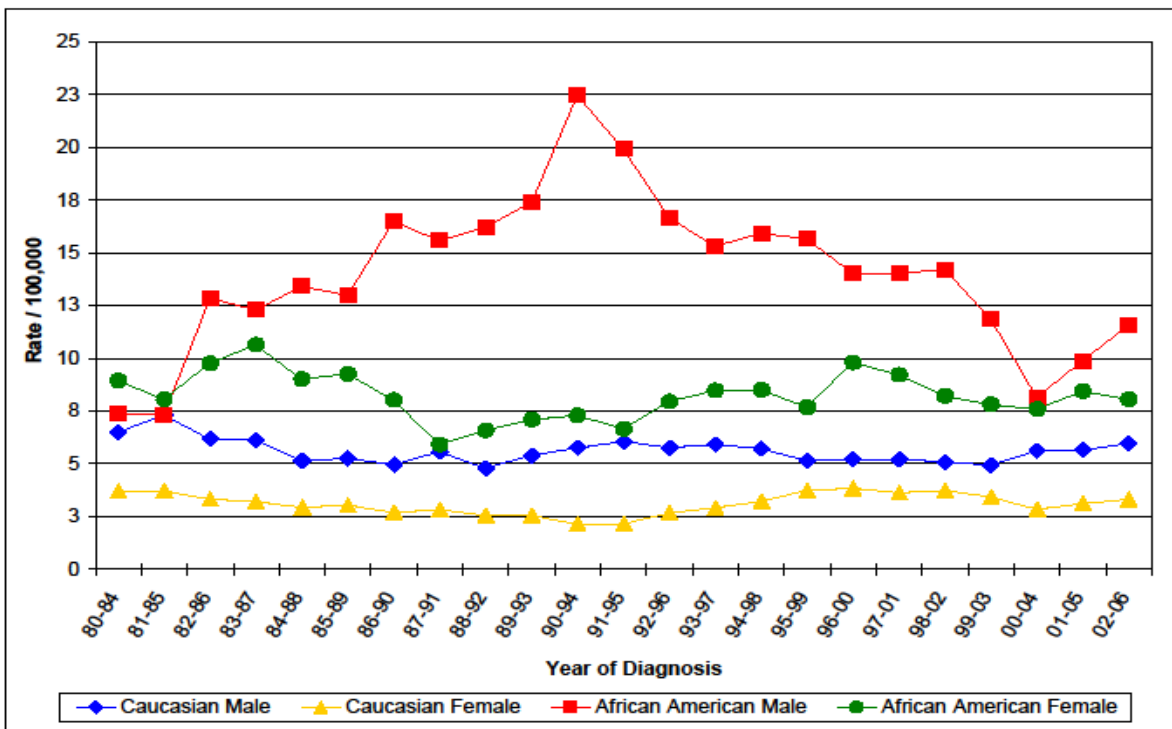
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 10.1. Five-Year Average Age-Adjusted Myeloma Incidence Rates* in the United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 10.2. Five-Year Average Age-Adjusted Myeloma Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 10.3. Age-Specific Myeloma Incidence Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	7.1	8.7	5.6	6.2	7.8	4.6	10.9	---	---
65-74	19.2	21.1	17.6	15.4	17.0	---	---	---	---
75-84	34.9	54.2	21.4	31.4	51.0	---	---	---	---
85+	---	---	---	---	---	---	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 10.3. Age-Specific Myeloma Incidence Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Myeloma Mortality

Table 10.4. Number of Myeloma Deaths in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	145	76	69	114	62	52	30	13	17
Kent	20	11	9	18	9	9	---	---	---
New Castle	77	34	43	57	27	30	19	6	13
Sussex	48	31	17	39	26	13	---	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Health Statistics Center, 2009.

Table 10.5. Five-Year Average Age-Adjusted Myeloma Mortality Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

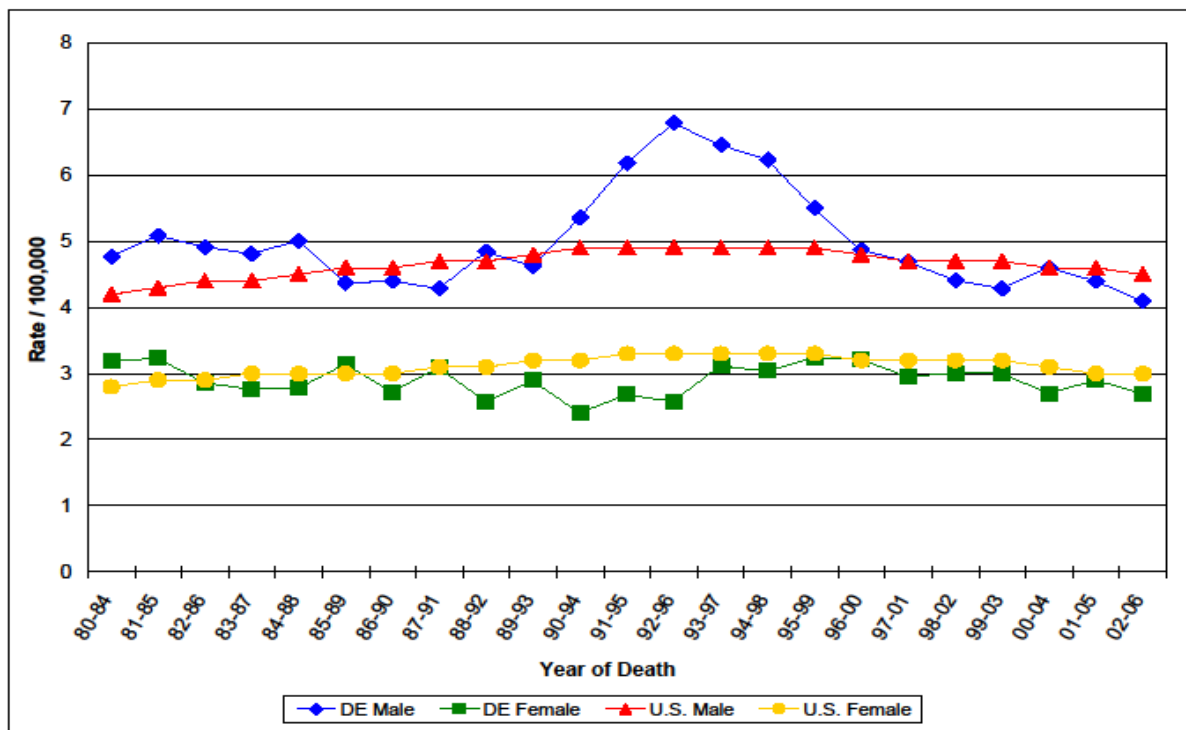
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	3.6 (3.6, 3.6)	4.5 (4.5, 4.6)	3.0 (2.9, 3.0)
Delaware	3.2 (2.7, 3.8)	4.1 (3.2, 5.1)	2.7 (2.1, 3.4)
Kent	3.0 (1.8, 4.7)	---	---
New Castle	3.1 (2.5, 3.9)	3.3 (2.3, 4.6)	2.9 (2.1, 3.9)
Sussex	3.6 (2.7, 4.8)	5.5 (3.7, 7.7)	---
CAUCASIAN			
United States	3.4 (3.3, 3.4)	4.3 (4.2, 4.3)	2.7 (2.7, 2.8)
Delaware	2.9 (2.4, 3.5)	3.8 (2.9, 4.9)	2.3 (1.8, 3.1)
Kent	---	---	---
New Castle	2.7 (2.0, 3.5)	3.1 (2.1, 4.6)	2.4 (1.6, 3.4)
Sussex	3.2 (2.3, 4.3)	4.9 (3.2, 7.2)	---
AFRICAN AMERICAN			
United States	6.8 (6.6, 6.9)	8.2 (8.0, 8.5)	5.8 (5.7, 6.0)
Delaware	5.6 (3.8, 8.0)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 deaths.

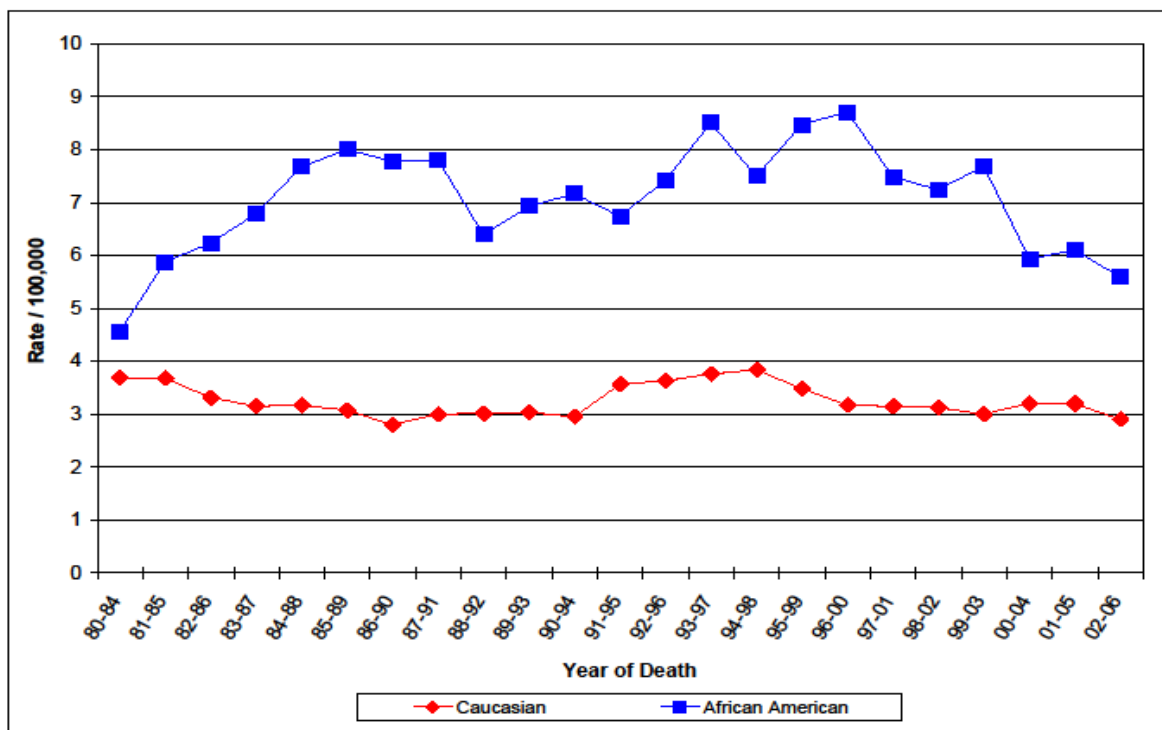
SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 10.4. Five-Year Average Age-Adjusted Myeloma Mortality Rates* in the United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 10.5. Five-Year Average Age-Adjusted Myeloma Mortality Rates* in Delaware, by Race: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 10.6. Age-Specific Myeloma Mortality Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	1.8	---	---	---	---	---	---	---	---
65-74	15.2	17.5	13.2	13.0	---	---	---	---	---
75+	28.5	36.7	23.3	26.5	36.6	20.2	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 deaths.

SOURCE: Delaware Health Statistics Center, 2009.

Figure 10.6. Age-Specific Myeloma Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

11. Non-Hodgkin Lymphoma (NHL)

Risk Factors and Early Detection

Risk Factors for non-Hodgkin Lymphoma

- Increasing age: most cases are diagnosed among those age 60 and older
- Abnormalities of the immune system (either congenital or from therapeutic immunosuppression and the use of certain drugs) and certain autoimmune diseases (systemic lupus, rheumatoid arthritis)
- Infection with HIV, Epstein-Barr virus, helicobacter pylori, human-T-cell leukemia/lymphoma virus or hepatitis C virus
- Overall, NHL is more common among men than women although some types are more common among women
- Race: Caucasians are more likely to develop NHL than are other ethnic groups in the U.S.
- Exposure to radiation

Possible risk factors for non-Hodgkin Lymphoma

- Exposure to chemotherapy and other chemicals including certain herbicides, benzene and hair dyes
- Being extremely overweight/obese

Early Detection of non-Hodgkin Lymphoma

There is currently no recommended screening test for NHL. The best method of early detection is for individuals to know their risks and report any symptoms to their doctors.

Data Highlights

New non-Hodgkin Lymphoma Cases and Deaths (Tables 11.1 and 11.6)

- For 2002-06, 853 non-Hodgkin lymphoma cases were diagnosed in Delaware. NHL was the seventh most frequently diagnosed cancer type over these five years, accounting for 3.7 percent of all new cancer cases diagnosed during this time.
 - Of the 853 NHL cases diagnosed from 2002-06, 465 cases (54.5 percent) were among males. The remaining 388 cases (47.5 percent) were among females.
- Non-Hodgkin lymphoma was the 7th leading cause of cancer deaths among Delaware males and females during 2002-06, accounting for 3.5 percent of all cancer deaths in the state.
 - In 2002-06, 301 Delaware residents died from NHL; 168 deaths (55.8 percent) occurred among males and 133 (44.2 percent) among females.

Non-Hodgkin Lymphoma Incidence and Mortality Rates (Tables 11.2 and 11.7)

- Delaware's 2002-06 non-Hodgkin lymphoma incidence rate (19.2 per 100,000) was comparable to the U.S. rate (19.5 per 100,000).
 - For both races combined and Caucasians only, the 2002-06 NHL incidence rates for males were significantly higher than for females at both the state and national levels.
 - At the national level, the 2002-06 NHL incidence rate for African American males was significantly higher than for their female counterparts whereas no significant differences between sexes were observed at the state level.
 - At the national level, the 2002-06 NHL incidence rates for African Americans were significantly higher than for Caucasians, regardless of sex. No significant differences were observed by sex and race at the state level.
- Delaware's 2002-06 non-Hodgkin lymphoma mortality rate (6.8 per 100,000) was comparable to the U.S. rate (7.1 per 100,000).
 - The 2002-06 NHL mortality rates for males were significantly higher than for females at both the state and national levels.

- At the national level, the 2002-06 NHL mortality rates for African Americans were significantly lower than for their Caucasian counterparts whereas no significant differences by race were observed at the state level.

Trends in non-Hodgkin Lymphoma Incidence and Mortality (Figures 11.1–11.2 and 11.5–11.6)

Note: Methodology for the assignment of Hodgkin lymphoma and non-Hodgkin lymphoma was modified beginning in reporting period 2001-2005 to include consideration of histology as well as primary site. Incidence rates for these two types of cancer increased as a result of this change.

- Non-Hodgkin lymphoma rates have steadily increased at the state level; from 1992-96 to 2002-06, Delaware's NHL incidence rate increased 45.5 percent. Meanwhile, the comparable U.S. rate remained relatively stable, with only a 1.0 percent increase over the same time.
 - The rates of increase in NHL incidence were similar for Delaware males and females. From 1992-96 to 2002-06, the state's NHL incidence rate for males increased 41.0 percent while the rate for females increased 50.0 percent.
 - Among Delaware males, the increase in NHL incidence rates was more pronounced among Caucasians. From 1992-96 to 2002-06, Delaware's NHL incidence rate for Caucasian males increased 47.0 percent while the state rate for African American males increased 7.4 percent.
 - Among Delaware females, the increase in NHL incidence rates was more pronounced among African Americans. From 1992-96 to 2002-06, Delaware's NHL incidence rate for African American females increased 103.6 percent while the rate for Caucasian females increased 47.8 percent.
- In general, non-Hodgkin lymphoma mortality rates for Delaware and the U.S. peaked in the mid-to-late 1990s and have since begun to decline.
 - Delaware's NHL mortality rate peaked in 1993-97. Since that time, Delaware's NHL mortality rate has declined 20.9 percent.
 - The U.S. NHL mortality rate peaked in 1995-99 and has since declined 18.4 percent.

Age-Specific Incidence and Mortality Rates (Tables 11.3 and 11.8, Figures 11.3 and 11.7)

- In Delaware, for 2002-06, non-Hodgkin lymphoma incidence increased with age, with a peak incidence observed among Delawareans age 75-84. When analyzed by sex, however, the incidence rate was highest for males over age 85 and highest for females age 75-84.
- Delaware's 2002-06 non-Hodgkin lymphoma mortality rates increased with age, with the highest mortality among those age 75 and older.

Stage at Diagnosis of non-Hodgkin Lymphoma (Tables 11.4-11.5, Figure 11.4)

- For 2002-06, 29.8 percent, 17.7 percent and 44.8 percent of non-Hodgkin lymphoma cases diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 30.0 percent, 15.0 percent and 47.0 percent, respectively.

Non-Hodgkin Lymphoma Incidence

Table 11.1. Number of non-Hodgkin Lymphoma Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	853	465	388	740	402	338	99	55	44
Kent	118	74	44	107	65	42	9	---	---
New Castle	524	256	268	438	211	227	78	41	37
Sussex	211	135	76	195	126	69	12	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 11.2. Five-Year Average Age-Adjusted non-Hodgkin Lymphoma Incidence Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

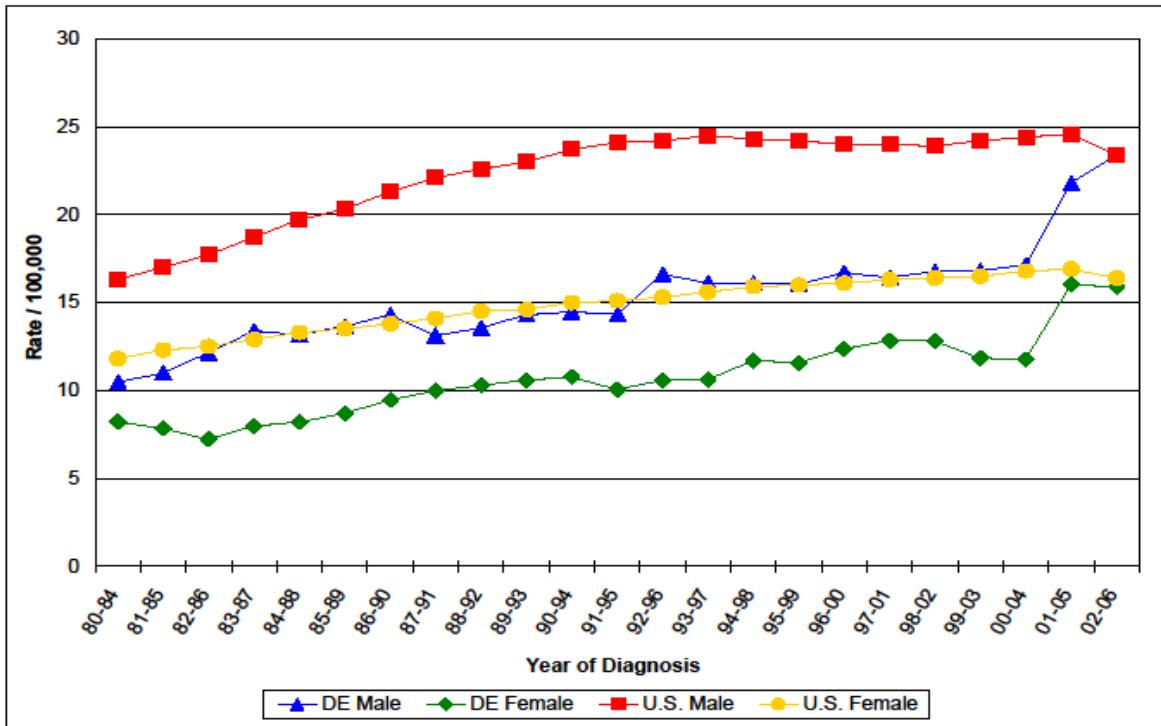
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	19.5 (19.4, 19.6)	23.5 (23.3, 23.7)	16.4 (16.2, 16.6)
Delaware	19.2 (17.9, 20.5)	23.4 (21.2, 25.5)	15.9 (14.3, 17.5)
Kent	17.2 (14.1, 20.3)	24.2 (19.0, 30.3)	11.6 (8.5, 15.6)
New Castle	20.8 (19.0, 22.5)	22.6 (19.9, 25.4)	18.8 (16.6, 21.1)
Sussex	17.3 (15.0, 19.7)	23.8 (19.8, 27.8)	11.7 (9.2, 14.6)
CAUCASIAN			
United States	20.4 (20.2, 20.6)	24.4 (24.1, 24.7)	17.2 (17.0, 17.4)
Delaware	20.0 (18.5, 21.4)	24.1 (21.7, 26.4)	16.7 (14.9, 18.4)
Kent	19.7 (16.0, 23.4)	27.0 (20.8, 34.4)	13.9 (10.0, 18.7)
New Castle	21.1 (19.1, 23.1)	23.0 (19.9, 26.1)	19.8 (17.2, 22.4)
Sussex	17.7 (15.2, 20.2)	24.3 (20.0, 28.5)	11.9 (9.2, 15.0)
AFRICAN AMERICAN			
United States	14.8 (14.4, 15.2)	18.3 (17.6, 19.0)	12.2 (11.7, 12.7)
Delaware	14.6 (11.8, 17.7)	18.8 (14.2, 24.5)	11.4 (8.3, 15.3)
Kent	---	---	---
New Castle	17.4 (13.8, 21.7)	21.9 (15.7, 29.8)	14.3 (10.1, 19.7)
Sussex	---	---	---

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

--- = Rate based on fewer than 20 cases.

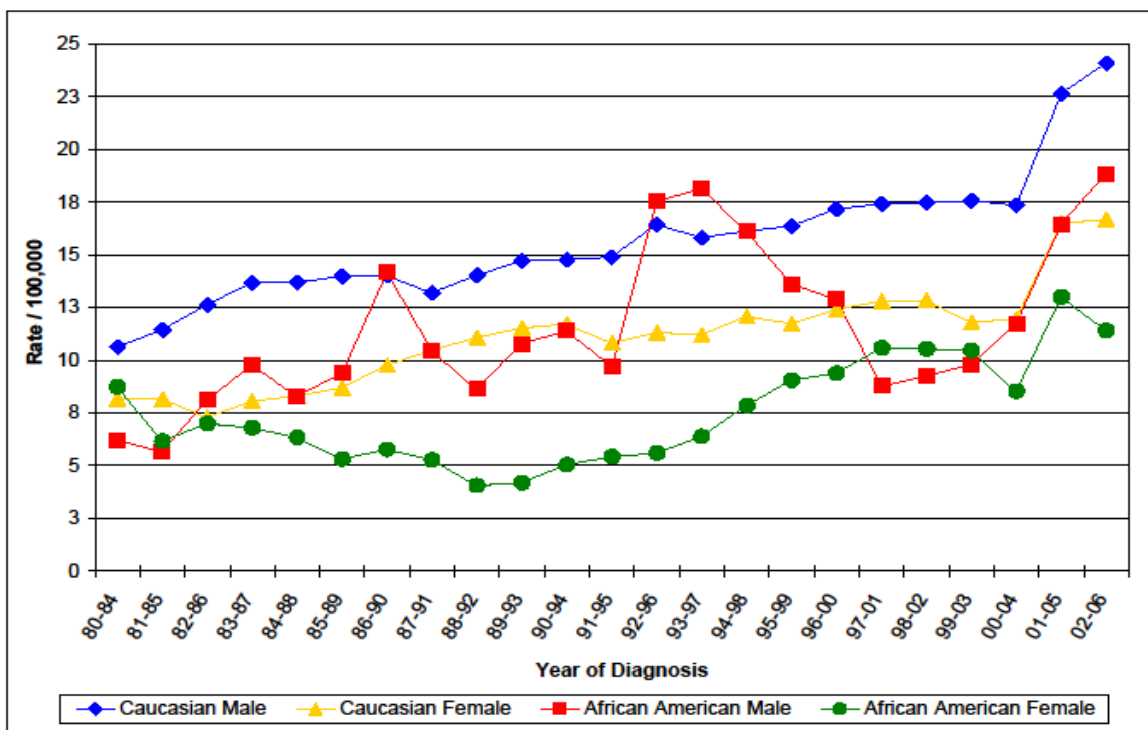
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 11.1. Five-Year Average Age-Adjusted non-Hodgkin Lymphoma Incidence Rates* in United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.
 Methodology for the assignment of Hodgkin lymphoma and non-Hodgkin lymphoma was modified beginning in reporting period 2001-2005 to include consideration of histology as well as primary site. Incidence rates for these two types of cancer increased as a result of this change.

Figure 11.2. Five-Year Average Age-Adjusted non-Hodgkin Lymphoma Incidence Rates* in Delaware, by Race and Sex: 1980–2006



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

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Methodology for the assignment of Hodgkin lymphoma and non-Hodgkin lymphoma was modified beginning in reporting period 2001-2005 to include consideration of histology as well as primary site. Incidence rates for these two types of cancer increased as a result of this change.

Table 11.3. Age-Specific non-Hodgkin Lymphoma Incidence Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0–39	3.2	3.7	2.7	3.4	4.0	2.7	---	---	---
40–64	23.1	27.6	18.8	23.8	28.3	19.6	20.6	25.7	16.4
65–74	75.2	94.8	58.3	82.6	102.6	65.1	---	---	---
75–84	94.5	109.7	84.0	96.4	107.4	88.6	---	---	---
85+	89.8	122.7	75.8	92.7	131.6	76.0	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 11.3. Age-Specific non-Hodgkin Lymphoma Incidence Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Non-Hodgkin Lymphoma by Stage at Diagnosis

Table 11.4. Number of non-Hodgkin Lymphoma Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	254	112	142	223	100	123	27	9	18
Regional	151	86	65	132	75	57	16	9	7
Distant	382	234	148	326	199	127	51	33	18
Unknown	66	33	33	59	28	31	5	4	1
Total	853	465	388	740	402	338	99	55	44

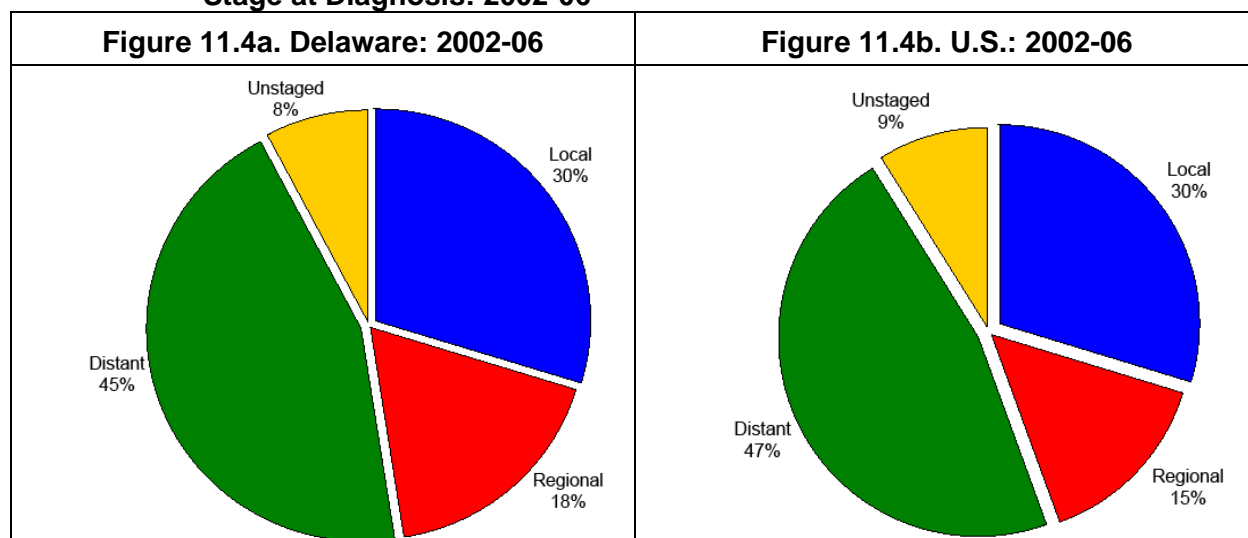
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 11.5. Percentage of non-Hodgkin Lymphoma Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	29.8	24.1	36.6	30.1	24.9	36.4	27.3	16.4	40.9
Regional	17.7	18.5	16.8	17.8	18.7	16.9	16.2	16.4	15.9
Distant	44.8	50.3	38.1	44.1	49.5	37.6	51.5	60.0	40.9
Unknown	7.7	7.1	8.5	8.0	7.0	9.2	5.1	7.3	2.3
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, 2009.

Figure 11.4. Percentage of non-Hodgkin Lymphoma Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Non-Hodgkin Lymphoma Mortality

Table 11.6. Number of non-Hodgkin Lymphoma Deaths in Delaware and Counties, by Race and Sex: 2002-006

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	301	168	133	265	152	113	36	16	20
Kent	48	31	17	43	27	16	---	---	---
New Castle	180	91	89	150	79	71	30	12	18
Sussex	73	46	27	72	46	26	---	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Health Statistics Center, 2009.

Table 11.7. Five-Year Average Age-Adjusted non-Hodgkin Lymphoma Mortality Rates* in the U.S., Delaware and Counties, by Race and Sex: 2002-06

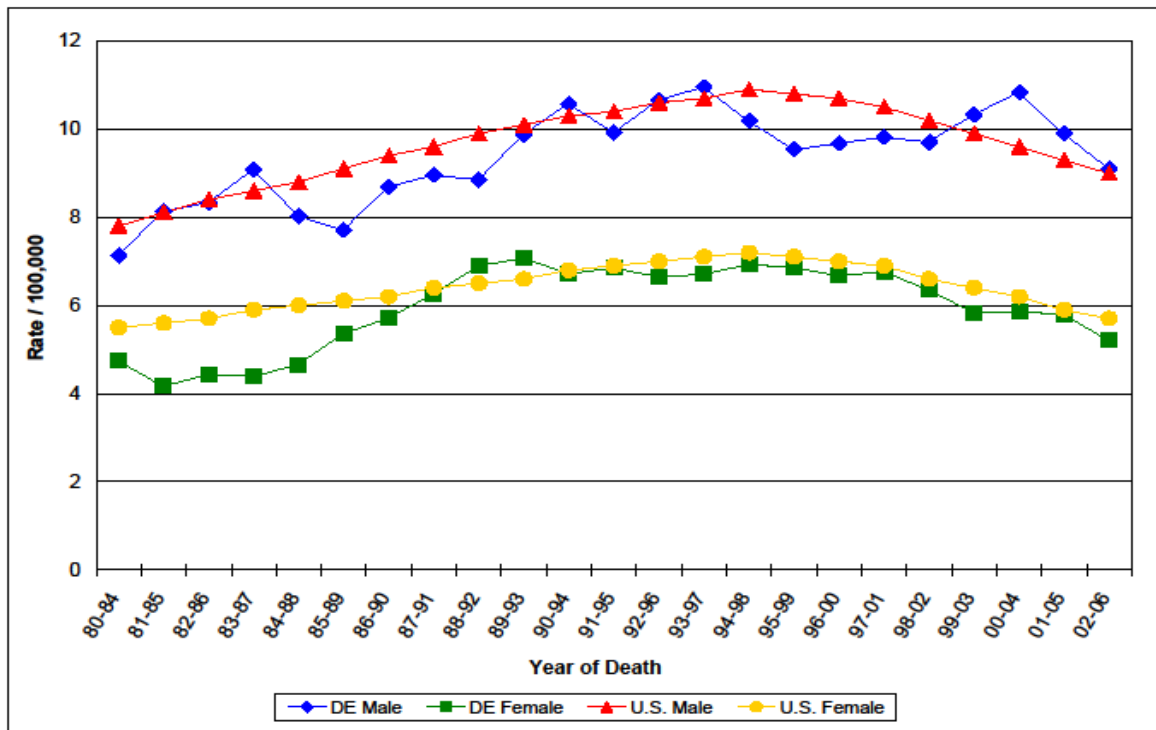
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	7.1 (7.1, 7.1)	9.0 (8.9, 9.1)	5.7 (5.7, 5.8)
Delaware	6.8 (6.0, 7.5)	9.1 (7.7, 10.5)	5.2 (4.3, 6.0)
Kent	7.5 (5.5, 9.9)	12.0 (8.1, 17.0)	---
New Castle	7.3 (6.2, 8.4)	8.9 (7.2, 10.9)	6.0 (4.8, 7.4)
Sussex	5.8 (4.5, 7.2)	8.4 (6.1, 11.1)	3.9 (2.5, 5.6)
CAUCASIAN			
United States	7.4 (7.3, 7.4)	9.3 (9.3, 9.4)	5.9 (5.9, 6.0)
Delaware	6.9 (6.1, 7.8)	9.5 (8.0, 11.0)	5.1 (4.2, 6.1)
Kent	8.1 (5.9, 11.0)	13.0 (8.6, 19.0)	---
New Castle	7.1 (6.0, 8.3)	9.2 (7.2, 11.4)	5.7 (4.5, 7.2)
Sussex	6.2 (4.9, 7.9)	9.1 (6.7, 12.1)	4.1 (2.7, 6.0)
AFRICAN AMERICAN			
United States	5.0 (4.9, 5.1)	6.3 (6.0, 6.5)	4.1 (3.9, 4.2)
Delaware	5.9 (4.2, 8.2)	---	5.7 (3.5, 8.7)
Kent	---	---	---
New Castle	7.8 (5.3, 11.1)	---	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 deaths.

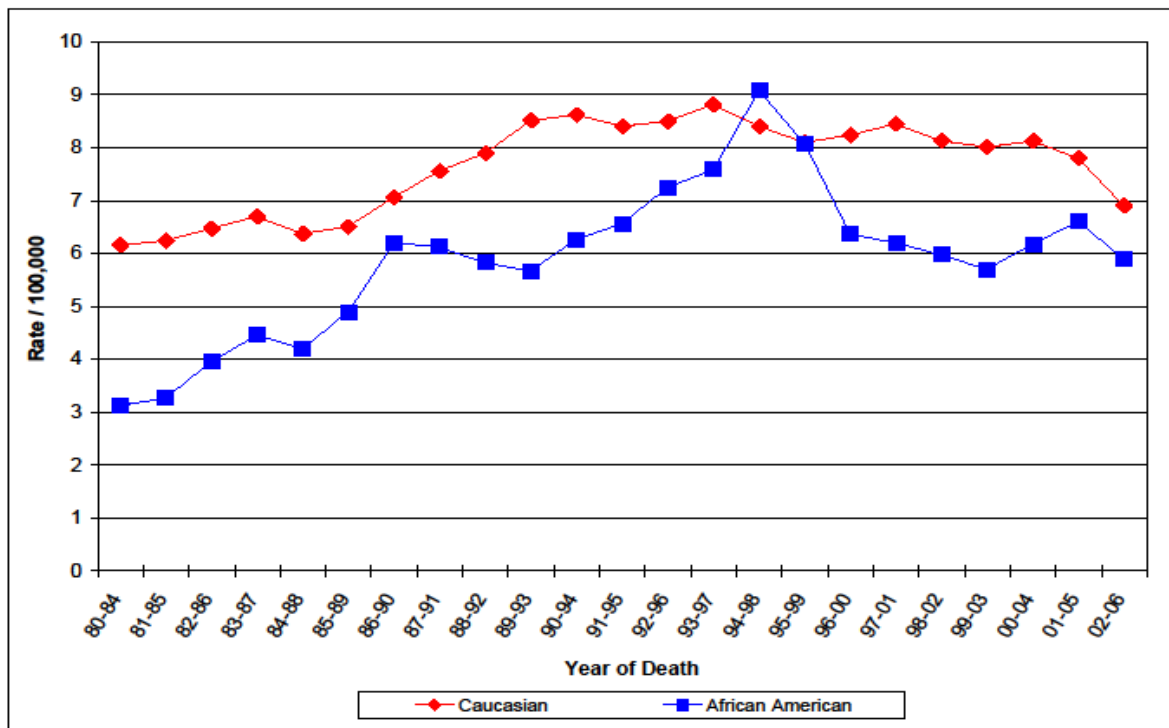
SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 11.5. Five-Year Average Age-Adjusted non-Hodgkin Lymphoma Mortality Rates* in the United States and Delaware, by Sex: 1980-2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 11.6. Five-Year Average Age-Adjusted non-Hodgkin Lymphoma Mortality Rates* in Delaware, by Race: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 11.8. Age-Specific non-Hodgkin Lymphoma Mortality Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	5.0	6.9	3.3	4.7	7.1	---	---	---	---
65-74	23.9	29.9	18.8	26.1	32.2	20.7	---	---	---
75+	59.2	77.5	47.9	61.6	82.1	48.8	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 deaths.

SOURCE: Delaware Health Statistics Center, 2009.

Figure 11.7 Age-Specific non-Hodgkin Lymphoma Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

12. Prostate Cancer

Risk Factors and Early Detection

Risk Factors for Prostate Cancer

- Increasing age: the risk of prostate cancer rises rapidly after age 50
- Family history of prostate cancer
- African American race
- Nationality: prostate cancer is most commonly diagnosed cancer among men in North America, northwestern Europe, Australia and the Caribbean
- Certain genes, such as the BRCA1 and BRCA 2 genes, may increase prostate cancer risk

Possible Risk Factors for Prostate Cancer

- Diets high in red meat and other high-fat foods (especially animal fats) and low in fruits and vegetables
- Diets high in calcium
- Heavy alcohol use
- Inflammation of the prostate gland
- Working in certain industries, for example welders, battery manufacturers, rubber workers, and workers exposed to cadmium
- Obesity

Protective Factors

- High levels of physical activity, particularly in older men, may lower the risk of advanced prostate cancer

Early Detection of Prostate Cancer

- Digital rectal exam
- Prostate-specific antigen (PSA) blood test

The American Cancer Society (ACS) does not support routine testing for prostate cancer for all men at this time but does encourage men to discuss their situation and risk with their doctor. However, the ACS does recommend that the digital rectal exam and PSA blood test be offered yearly, beginning at age 50 to men at an average risk of prostate cancer and with at least a 10 year life expectancy.

Recent data (2008) from the Behavioral Risk Factor Surveillance System (BRFSS) provide information on the pattern of prostate cancer screening among Delawarean men:

- In 2008, 57.1 percent of Delaware males ages 40 and older reported having had a PSA blood test in the past two years, compared to 54.8 percent at the national level. This difference did not reach a level of statistical significance.
- Men ages 40-64 were significantly less likely to have had a PSA test in the past two years (49.1 percent) than were men ages 65 and older (79.3 percent).
- The percentage of Delawarean men who reported having had a PSA blood test in the past two years did not significantly differ by race, education, or income level.

New Prostate Cancer Cases and Deaths (Tables 12.1 and 12.6)

- With the exception of skin cancers, prostate cancer was the most frequently diagnosed cancer among Delaware males. For 2002-06, it accounted for 3,644 (30.2 percent) of newly diagnosed cancer cases among males in the state.
- Prostate cancer was the second leading cause of cancer deaths among males in Delaware for 2002-06; the 452 prostate cancer deaths accounted for 9.8 percent of all cancer deaths among Delaware males in this five-year period.

Prostate Cancer Incidence and Mortality Rates (Tables 12.2 and 12.7)

- Delaware's 2002-06 prostate cancer incidence rate (178.0 per 100,000) was significantly higher than the U.S. rate (159.3 per 100,000).
 - The 2002-06 prostate cancer incidence rates for African American males were significantly higher than the rates for their Caucasian counterparts at all geographic levels.
 - The 2002-06 Sussex County prostate cancer incidence rates for all males and Caucasian males were significantly lower than the other county, state and national rates.
- Delaware's 2002-06 prostate cancer mortality rate (26.8 per 100,000) was comparable to the U.S. rate (25.6 per 100,000).
 - The 2002-06 prostate cancer mortality rates for African American males were significantly higher than the rates for their Caucasian counterparts at all geographic levels.
 - No significant differences in prostate cancer mortality rates were observed by county.

Trends in Prostate Cancer Incidence and Mortality (Figures 12.1–12.2 and 12.6–12.7)

- From 1992-96 to 2002-06, Delaware's prostate cancer incidence rate fell 15.7 percent. During the same period, the national prostate cancer incidence rate decreased 17.0 percent.
 - From 1992-96 to 2002-06, the prostate incidence rate for Caucasian males in Delaware decreased by 15.9 percent while the rate for African American males in the state dropped 20.9 percent. Corresponding rates fell 17.2 percent for Caucasian males and 22.0 percent for African American males at the national level.
 - In Delaware, the difference in prostate cancer incidence rates between African Americans and Caucasians has remained stable over the last ten years. For 1992-96, the African American prostate cancer mortality rate was 1.8 times the rate for Caucasians. For 2002-06, the African American rate was 1.7 times greater than the Caucasian rate.
- From 1992-96 to 2002-06, Delaware's prostate cancer mortality rate fell 40.4 percent. During the same period, the national prostate cancer mortality rate decreased 32.8 percent.
 - In Delaware, the difference in prostate cancer mortality rates between African Americans and Caucasians has decreased slightly over the last ten years. For 1992-96, the African American prostate cancer mortality rate was 2.8 times the rate for Caucasians. By 2002-06, the African American rate was 2.1 times greater than the Caucasian rate.

Age-Specific Incidence and Mortality Rates (Tables 12.3 and 12.8, Figures 12.3 and 12.8)

- For 2002-06, prostate cancer incidence rates in Delaware peaked among males age 65-74 then decreased somewhat among the older age groups.
- During the same time, the state's prostate cancer mortality rates increased with age, with the 85 and older age group having the highest rate.

Stage at Diagnosis of Prostate Cancer (Tables 12.4–12.5, Figures 12.4–12.5)

- In Delaware, for 2002-06, 86.7 percent, 7.3 percent and 2.8 percent of prostate cancers were diagnosed at the local, regional and distant stage respectively. At the national level, from 2002-06, comparable percentages were 80.0 percent, 12.0 percent and 4.0 percent, respectively.

- In Delaware, for 2002-06, 369 cases (10.1 percent of all prostate cancers) were diagnosed in the late (i.e., regional or distant) stages. The proportion of late stage diagnoses did not differ substantially by race.
- The proportion of local stage prostate cancers increased from 1980-84 to 2002-06 (from 49.6 percent to 86.7 percent, respectively). During the same time, the proportion of distant stage prostate cancer diagnoses decreased from 27.3 percent to 2.8 percent.

Prostate Cancer Incidence

Table 12.1. Number of Prostate Cancer Cases in Delaware and Counties, by Race: 2002-06

	All Male	Caucasian Male	African American Male
Delaware	3,644	2,810	750
Kent	602	447	131
New Castle	2,190	1,629	524
Sussex	852	734	95

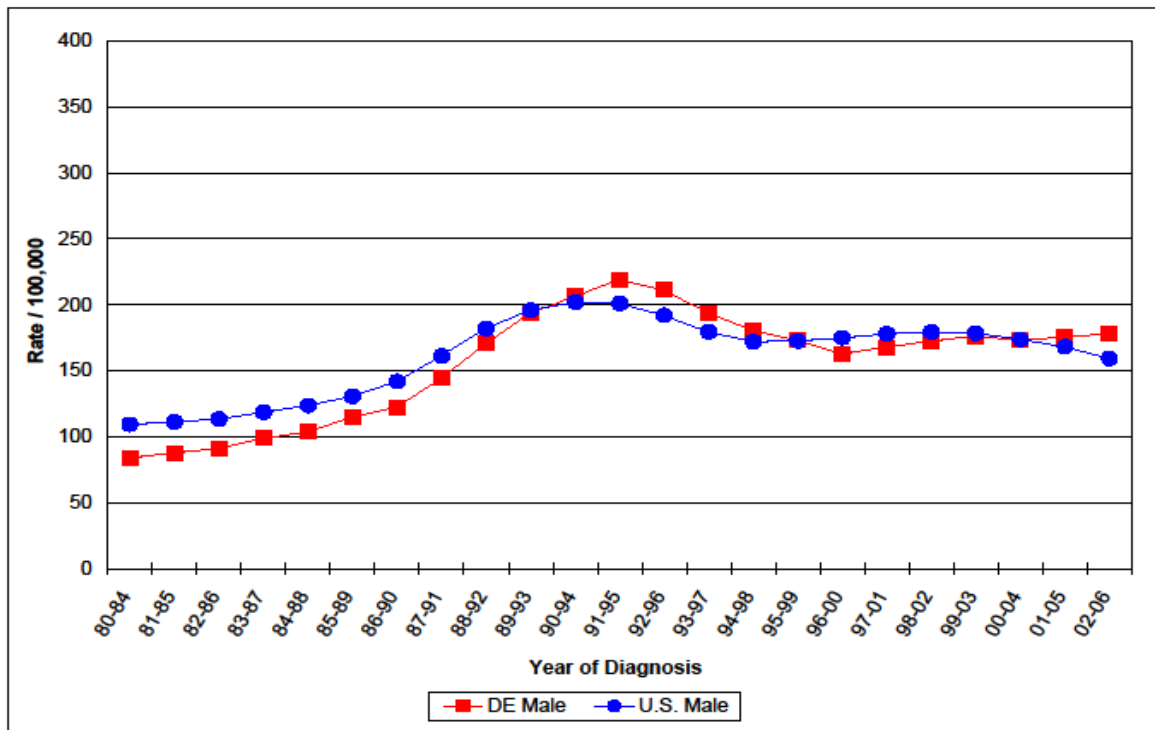
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 12.2. Five-Year Average Age-Adjusted Prostate Cancer Incidence Rates* in the U.S., Delaware and Counties, by Race: 2002-06

	All Male	Caucasian Male	African American Male
United States	159.3 (158.7, 159.9)	153.0 (152.3, 153.7)	239.8 (237.1, 242.5)
Delaware	178.0 (172.2, 183.8)	161.0 (155.1, 167.0)	276.6 (256.8, 296.4)
Kent	193.1 (177.7, 208.5)	175.2 (159.0, 191.4)	254.0 (210.5, 297.5)
New Castle	193.9 (185.8, 202.0)	175.8 (167.2, 184.3)	295.3 (270.0, 320.6)
Sussex	139.7 (130.3, 149.1)	129.4 (120.0, 138.7)	225.7 (182.6, 275.8)

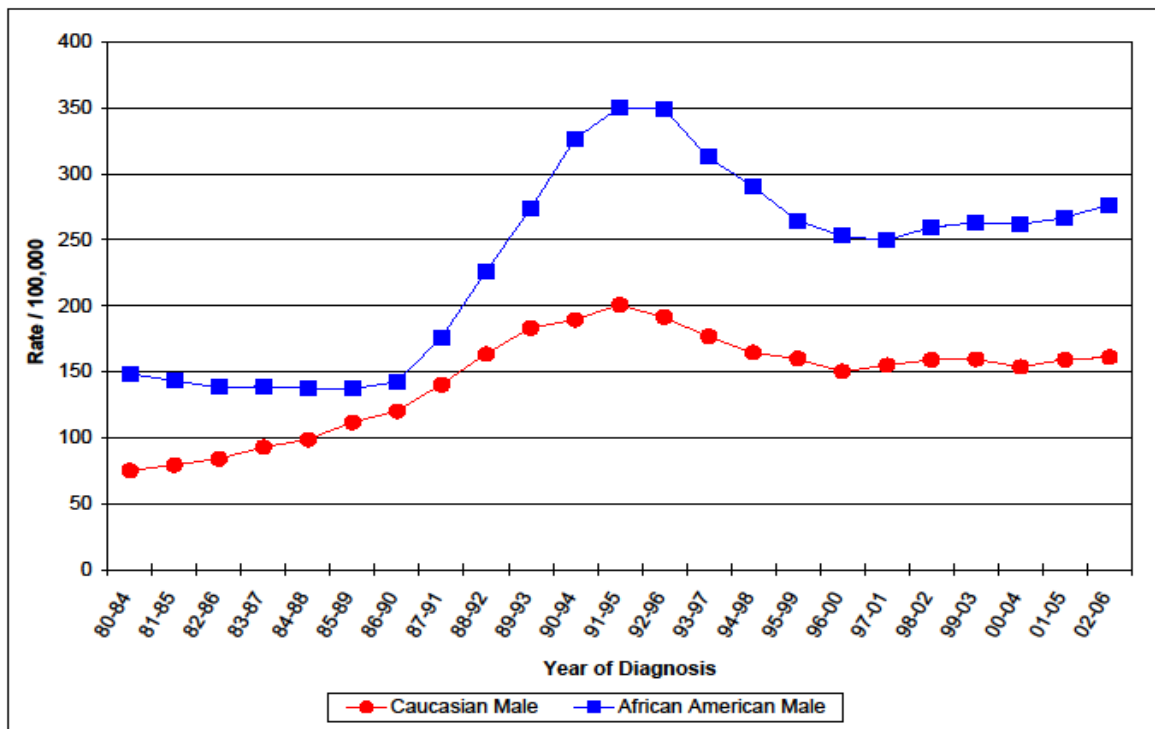
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 12.1. Five-Year Average Age-Adjusted Prostate Cancer Incidence Rates* in the U.S. and Delaware: 1980–2006



* = 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, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 12.2. Five-Year Average Age-Adjusted Prostate Cancer Incidence Rates* in Delaware, by Race: 1980–2006



* = 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, 2009.

Table 12.3. Age-Specific Prostate Cancer Incidence Rates* in Delaware, by Race: 2002-06

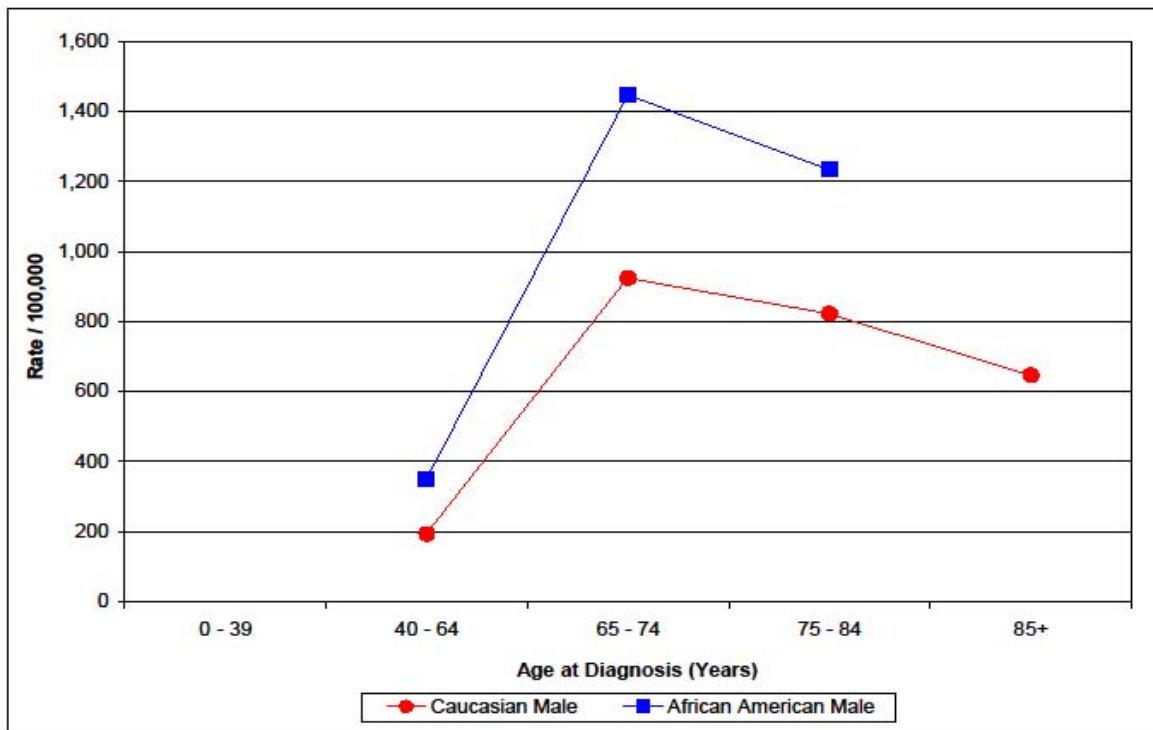
Age Group	All Male	Caucasian Male	African American Male
0-39	---	---	---
40-64	218.6	192.8	349.7
65-74	990.7	924.3	1,447.4
75-84	878.8	822.2	1,234.3
85+	684.9	646.4	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 12.3. Age-Specific Prostate Cancer Incidence Rates in Delaware, by Race: 2002-06



NOTE: Rates for either race age 0-39 and African Americans age 85+ are not displayed due to patient confidentiality rules.
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Prostate Cancer by Stage at Diagnosis

Table 12.4. Number of Prostate Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Male	Caucasian Male	African American Male
Local	3,161	2,440	649
Regional	266	214	48
Distant	103	75	27
Unknown	114	81	26
Total	3,644	2,810	750

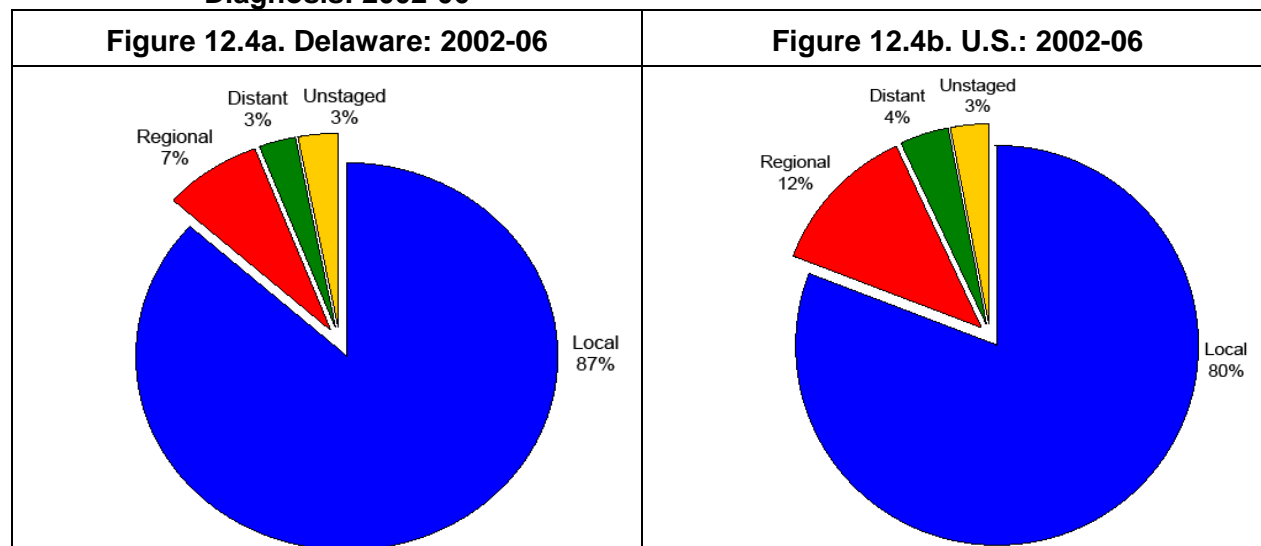
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 12.5. Percentage of Prostate Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Male	Caucasian Male	African American Male
Local	86.7	86.8	86.5
Regional	7.3	7.6	6.4
Distant	2.8	2.7	3.6
Unknown	3.1	2.9	3.5
Total	100.0	100.0	100.0

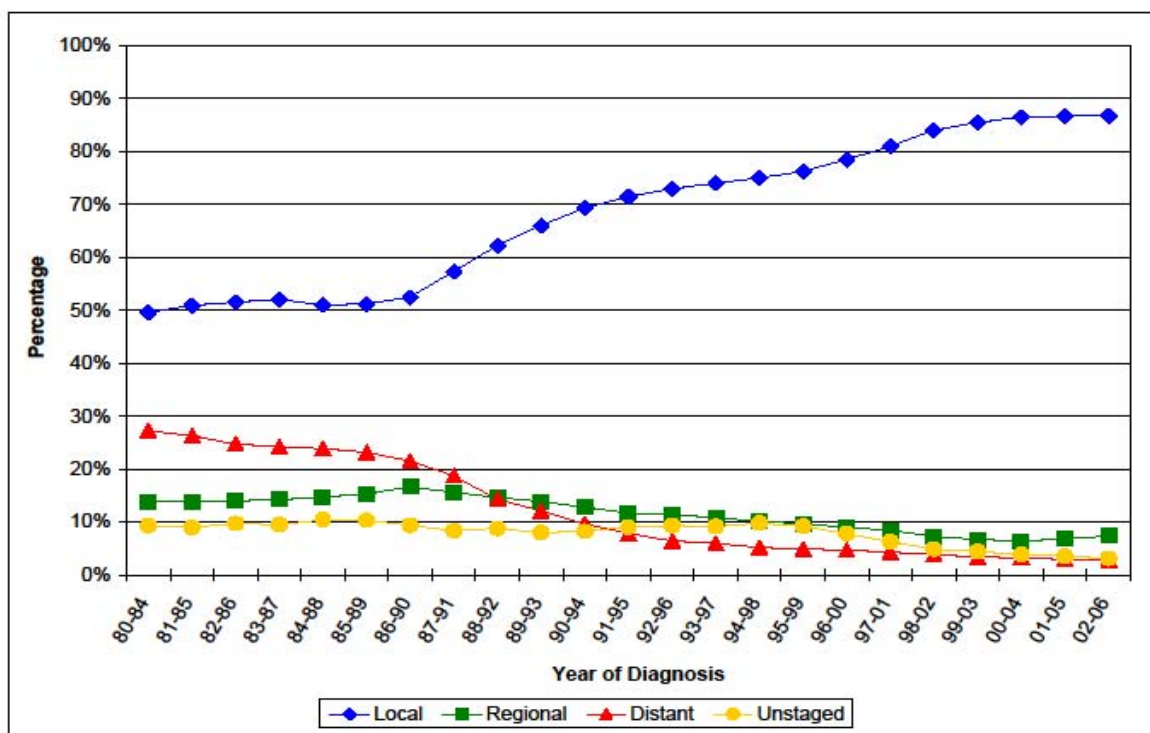
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 12.4. Percentage of Prostate Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 12.5. Percentage of Prostate Cancer Cases in Delaware, by Stage at Diagnosis: 1980–2006



SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Prostate Cancer Mortality

Table 12.6. Number of Prostate Cancer Deaths in Delaware and Counties, by Race: 2002-06

	All Male	Caucasian Male	African American Male
Delaware	452	350	96
Kent	63	45	18
New Castle	258	196	59
Sussex	131	109	19

SOURCE: Delaware Health Statistics Center, 2009.

Table 12.7. Five-Year Average Age-Adjusted Prostate Cancer Mortality Rates* in the U.S., Delaware and Counties, by Race: 2002-06

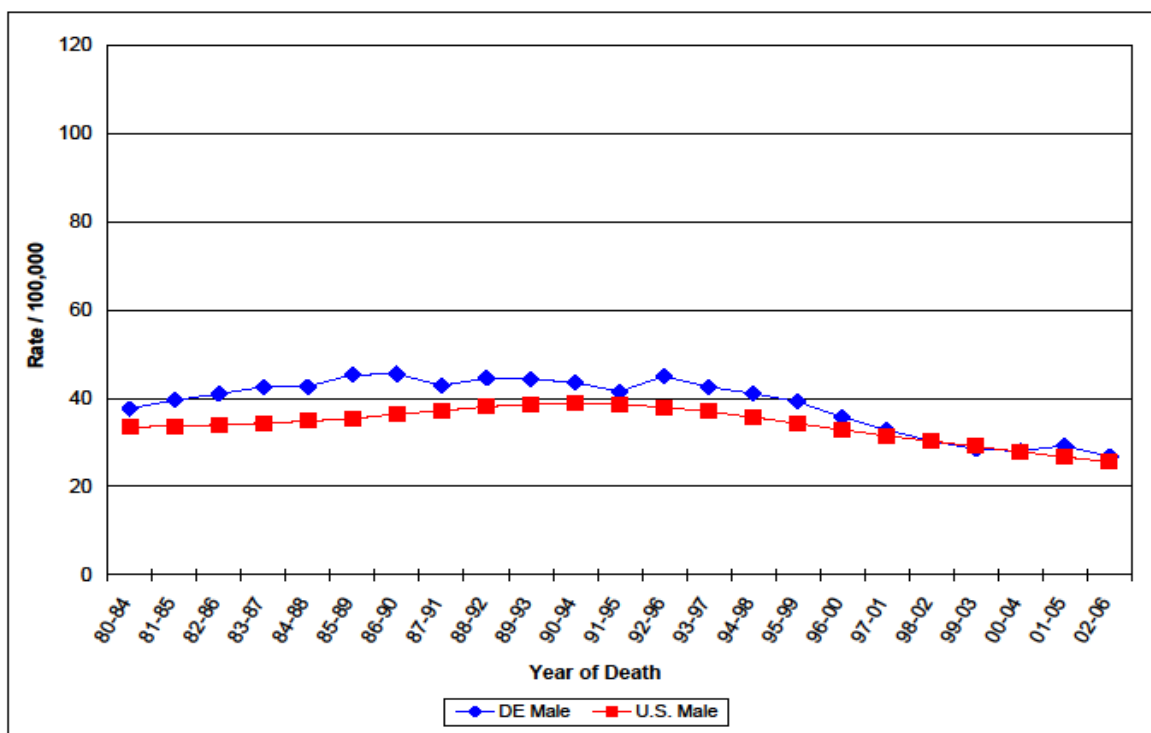
	All Male	Caucasian Male	African American Male
United States	25.6 (25.5, 25.8)	23.6 (23.5, 23.8)	56.3 (55.6, 57.1)
Delaware	26.8 (24.3, 29.2)	23.9 (21.4, 26.4)	50.8 (41.2, 62.1)
Kent	25.3 (19.4, 32.3)	22.6 (16.5, 30.2)	---
New Castle	27.9 (24.5, 31.3)	24.6 (21.2, 28.0)	55.5 (42.3, 71.6)
Sussex	25.6 (21.2, 30.0)	23.4 (19.0, 27.8)	---

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

--- = Rate based on fewer than 20 deaths.

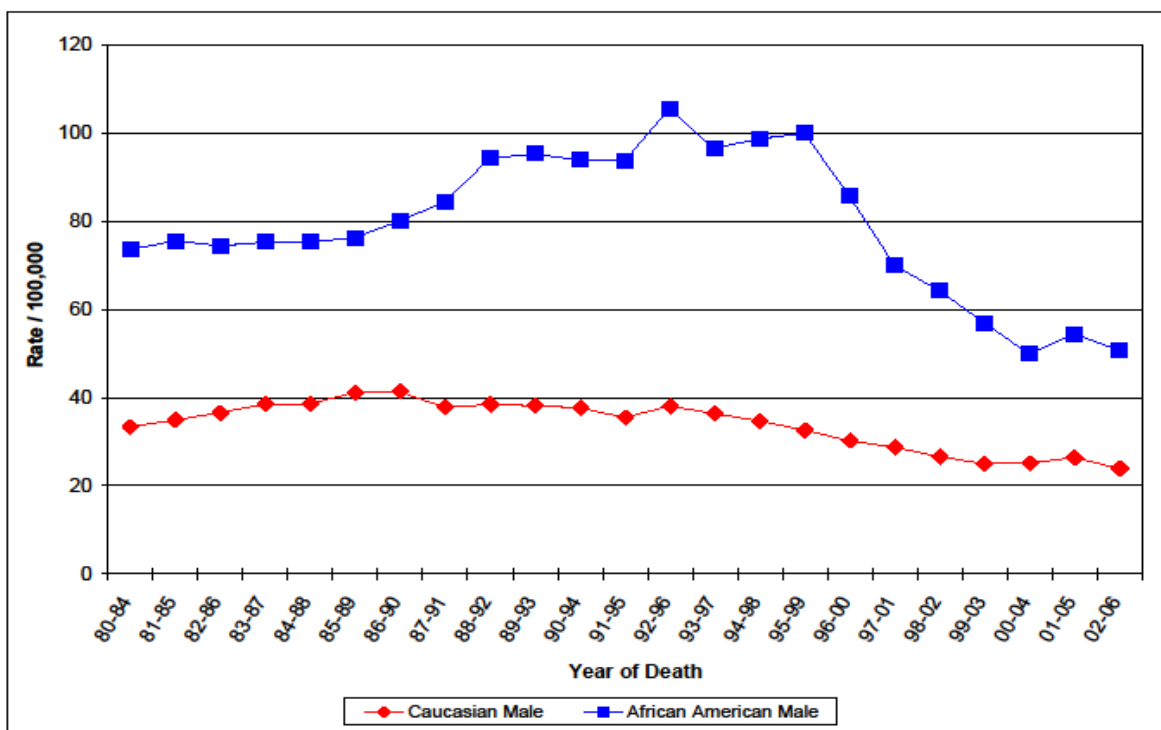
SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 12.6. Five-Year Average Age-Adjusted Prostate Cancer Mortality Rates* in the U.S. and Delaware: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 12.7. Five-Year Average Age-Adjusted Prostate Cancer Mortality Rates* in Delaware, by Race: 1980–2006



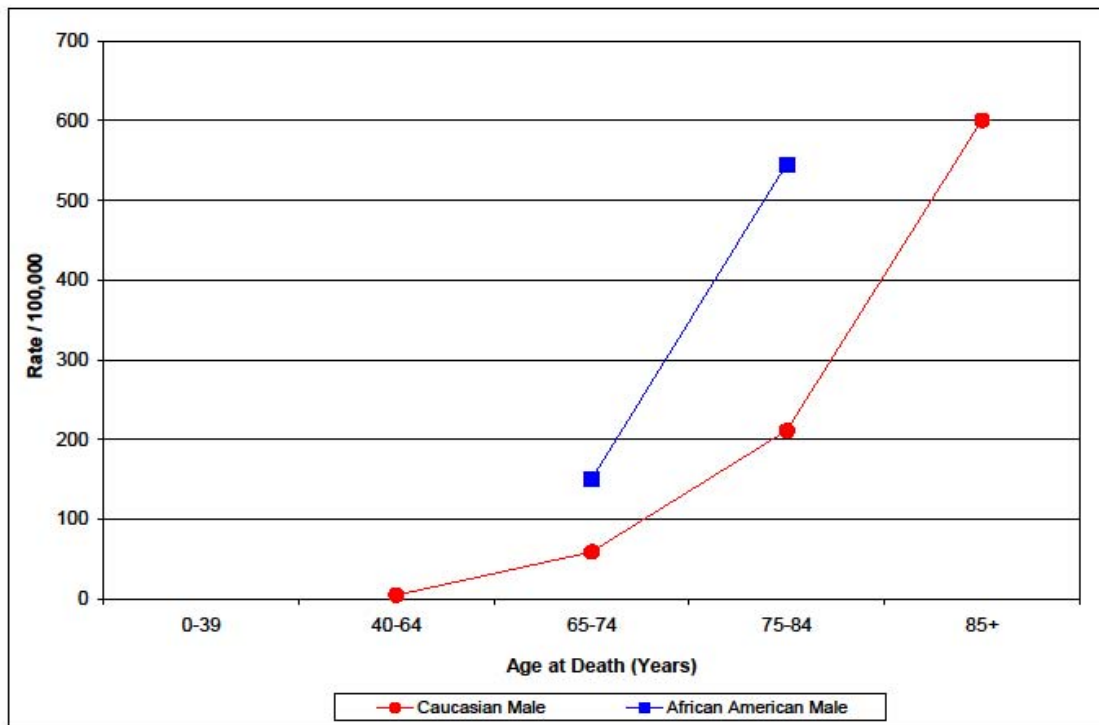
* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 12.8. Age-Specific Prostate Cancer Mortality Rates* in Delaware, by Race: 2002-06

Age Group	All Male	Caucasian Male	African American Male
0-39	---	---	---
40-64	6.0	4.2	---
65-74	69.3	58.5	149.5
75-84	242.8	210.7	545.7
85+	613.3	600.6	---

* = Rates are per 100,000 population.
 --- = Rate based on fewer than 20 deaths.
 SOURCE: Delaware Health Statistics Center, 2009.

Figure 12.8. Age-Specific Prostate Cancer Mortality Rates in Delaware, by Race: 2002-06



NOTE: Rates for either race age 0-39 and for African Americans ages 40-64 and 85+ are not displayed due to patient confidentiality rules.
 SOURCE: Delaware Health Statistics Center, 2009.

13. Stomach Cancer

Risk Factors and Early Detection

Risk Factors for Stomach Cancer

- Infection with *Helicobacter pylori* (*H. pylori*)
- Sex: stomach cancer occurs more frequently among males than females
- Increasing age: most stomach cancers are diagnosed among those age 50 and older
- Race: stomach cancer is more common among Hispanics and African Americans than Caucasians in the U.S.
- Geography: stomach cancer is more common in Japan, China, Southern and Eastern Europe and South and Central America than in North America, South Central Asia and North or West Africa
- Diets high in smoked, salted fish and meat
- Tobacco use
- Previous stomach surgery in which part of the stomach was removed for non-cancerous diseases such as ulcers
- Personal history of pernicious anemia, stomach lymphoma or Menetrier disease
- Type A blood
- Family history of stomach cancer

Possible Risk Factors for Stomach Cancer

- Workers in the coal, metal and rubber industries may have an increased risk for stomach cancer
- Infection with the Epstein-Barr virus
- Personal history of adenomatous stomach polyps
- Several inherited conditions may increase the risk of stomach cancer: Hereditary diffuse gastric cancer, hereditary non-polyposis colorectal cancer (Lynch syndrome), BRCA1 and BRCA2 genes
- Obesity

Early Detection of Stomach Cancer

There are currently no recommended screening guidelines for stomach cancer. People at an increased risk should discuss screening options with their doctors.

Data Highlights

New Stomach Cancer Cases and Deaths (Tables 13.1 and 13.6)

- During 2002-06, 318 stomach cancer cases were diagnosed in Delaware, accounting for 1.4 percent of the state's new cancer cases. Stomach cancer was the state's 16th most frequently diagnosed cancer type over these five years.
 - Of the 318 stomach cancer cases diagnosed from 2002-06, 195 cases (61.3 percent) were male. The remaining 123 cases (38.7 percent) were female.
- Stomach cancer was the 13th leading cause of cancer deaths among Delaware males and females during 2002-06, accounting for 1.9 percent of the state's cancer deaths.

- In 2002-06, 168 Delaware residents died from stomach cancer; 100 deaths (59.5 percent) occurred among males and 68 (40.5 percent) among females.

Stomach Cancer Incidence and Mortality Rates (Tables 13.2 and 13.7)

- Delaware's 2002-06 stomach cancer incidence rate (7.1 per 100,000) was comparable to the U.S. rate (7.9 per 100,000).
 - At the state and national levels, the 2002-06 stomach cancer incidence rates for African Americans were significantly higher than for Caucasians, regardless of sex.
 - The 2002-06 stomach cancer incidence rates for Caucasian women were significantly lower than for Caucasian men at both the state and national level.
 - The 2002-06 stomach cancer incidence rate for African American females was significantly lower than for African American males at the U.S. level but did not differ significantly at the state level.
- Delaware's 2002-06 stomach cancer mortality rate (3.8 per 100,000) did not differ significantly from the U.S. rate (4.0 per 100,000).
 - The 2002-06 stomach cancer mortality rates for Caucasians were significantly lower than for their African American counterparts at both the state and national levels.
 - At the national level, the 2002-06 stomach cancer mortality rates for males were significantly greater than for females regardless of race.
 - In Delaware, the 2002-06 mortality rate for Caucasian males was significantly greater than for Caucasian females. No significant differences were observed by sex among African Americans.

Trends in Stomach Cancer Incidence and Mortality

- Five-year average stomach cancer incidence and mortality rates have not been previously calculated for the state, therefore historical trends are not available.

Age-Specific Incidence and Mortality Rates (Tables 13.3 and 13.8, Figures 13.3 and 13.8)

- In Delaware, for 2002-06, stomach cancer incidence increased with age, with a peak incidence observed among Delawareans ages 75-84 and 85 and older.
- The state 2002-06 stomach cancer mortality rate increased with age; those in the 75 and older group experienced the highest mortality.

Stage at Diagnosis of Stomach Cancer (Tables 13.4 and 13.5, Figure 13.4)

- For 2002-06, 23.9 percent, 31.1 percent and 31.1 percent of stomach cancer cases diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 23.0 percent, 32.0 percent and 33.0 percent, respectively.

Stomach Cancer Incidence

Table 13.1. Number of Stomach Cancer Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	318	195	123	223	151	72	81	41	40
Kent	48	26	22	34	21	13	11	---	---
New Castle	201	123	78	136	92	44	56	28	28
Sussex	69	46	23	53	38	15	14	---	---

--- = Cell counts are suppressed for patient confidentiality.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 13.2. Five-Year Average Age-Adjusted Stomach Cancer Incidence Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	7.9 (7.8, 8.0)	11.0 (10.8, 11.2)	5.5 (5.4, 5.6)
Delaware	7.1 (6.3, 7.9)	10.0 (8.6, 11.4)	4.9 (4.0, 5.7)
Kent	7.1 (5.2, 9.4)	8.8 (5.8, 12.9)	5.8 (3.6, 8.7)
New Castle	8.0 (6.9, 9.1)	11.1 (9.2, 13.1)	5.4 (4.2, 6.7)
Sussex	5.6 (4.3, 7.1)	8.4 (6.2, 11.3)	3.3 (2.1, 5.0)
CAUCASIAN			
United States	6.9 (6.8, 7.0)	9.8 (9.6, 10.0)	4.7 (4.6, 4.8)
Delaware	5.9 (5.1, 6.7)	9.2 (7.7, 10.6)	3.3 (2.6, 4.3)
Kent	6.3 (4.3, 8.8)	9.0 (5.6, 13.7)	---
New Castle	6.4 (5.4, 7.5)	10.0 (8.1, 12.3)	3.6 (2.6, 4.9)
Sussex	4.6 (3.5, 6.1)	7.7 (5.5, 10.6)	---
AFRICAN AMERICAN			
United States	12.1 (11.7, 12.5)	16.8 (16.1, 17.5)	9.0 (8.6, 9.4)
Delaware	13.7 (10.9, 17.1)	16.6 (11.9, 22.5)	11.6 (8.3, 15.8)
Kent	---	---	---
New Castle	14.4 (10.9, 18.7)	18.1 (12.0, 26.1)	12.3 (8.2, 17.8)
Sussex	---	---	---

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

--- = Rate based on fewer than 20 cases.

SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 13.1. Five-Year Average Age-Adjusted Stomach Cancer Incidence Rates* in the United States (Estimates) and Delaware, by Sex: 1980-2006

Five-year average stomach cancer incidence and mortality rates have not been previously calculated for the state, therefore no historical trends are available for comparison at this time.

Figure 13.2. Five-Year Average Age-Adjusted Stomach Cancer Incidence Rates* in Delaware, by Race and Sex: 1980-2006

Five-year average stomach cancer incidence and mortality rates have not been previously calculated for the state, therefore no historical trends are available for comparison at this time.

Table 13.3. Age-Specific Stomach Cancer Incidence Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	7.7	10.5	5.0	6.4	9.9	---	11.7	---	---
65-74	28.0	38.6	18.8	21.7	32.2	---	65.5	---	---
75-84	46.0	65.3	32.6	40.5	60.6	26.3	---	---	---
85+	45.7	----	---	37.8	---	---	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 13.3. Age-Specific Stomach Cancer Incidence Rates in Delaware, by Race: 2000-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Stomach Cancer by Stage at Diagnosis

Table 13.4. Number of Stomach Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	76	40	36	46	27	19	28	13	15
Regional	99	66	33	71	53	18	23	11	12
Distant	99	67	32	73	53	20	23	13	10
Unknown	44	22	22	33	18	15	7	4	3
Total	318	195	123	223	151	72	81	41	40

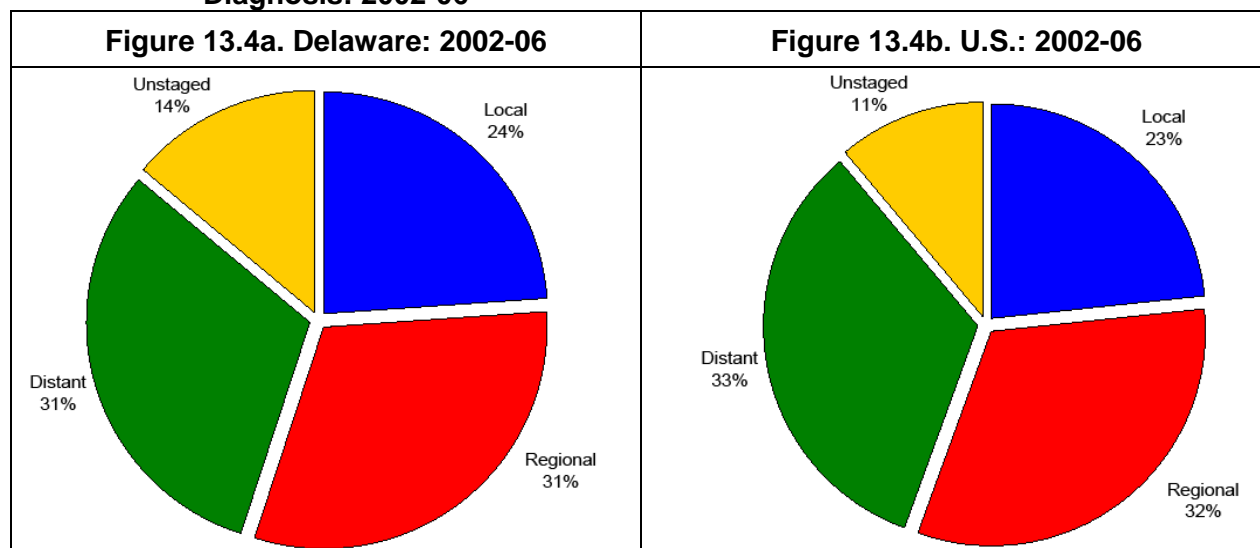
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 13.5. Percentage of Stomach Cancer Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	23.9	20.5	29.3	20.6	17.9	26.4	34.6	31.7	37.5
Regional	31.1	33.9	26.8	31.8	35.1	25.0	28.4	26.8	30.0
Distant	31.1	34.4	26.0	32.7	35.1	27.8	28.4	31.7	25.0
Unknown	13.8	11.3	17.9	14.8	11.9	20.8	8.6	9.8	7.5
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, 2009.

Figure 13.4. Percentage of Stomach Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Stomach Cancer Mortality

Table 13.6. Number of Stomach Cancer Deaths in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	168	100	68	111	69	42	53	30	23
Kent	29	17	12	20	13	7	8	---	---
New Castle	104	64	40	66	42	24	35	21	14
Sussex	35	19	16	25	14	11	10	---	---

--- = Cell counts are suppressed for patient confidentiality.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 13.7. Five-Year Average Age-Adjusted Stomach Cancer Mortality Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	4.0 (3.9, 4.0)	5.5 (5.4, 5.5)	2.8 (2.8, 2.9)
Delaware	3.8 (3.2, 4.3)	5.3 (4.2, 6.3)	2.7 (2.1, 3.4)
Kent	4.4 (2.9, 6.3)	---	---
New Castle	4.2 (3.4, 4.9)	6.0 (4.6, 7.7)	2.7 (2.0, 3.7)
Sussex	2.8 (1.9, 3.9)	---	---
CAUCASIAN			
United States	3.5 (3.4, 3.5)	4.8 (4.8, 4.9)	2.4 (2.4, 2.5)
Delaware	2.9 (2.4, 3.5)	4.3 (3.4, 5.5)	1.9 (1.4, 2.6)
Kent	3.7 (2.3, 5.7)	---	---
New Castle	3.1 (2.4, 3.9)	4.8 (3.5, 6.5)	1.9 (1.3, 2.9)
Sussex	2.2 (1.4, 3.2)	---	---
AFRICAN AMERICAN			
United States	7.6 (7.4, 7.7)	11.0 (10.7, 11.3)	5.3 (5.1, 5.5)
Delaware	9.0 (6.7, 11.7)	11.7 (7.9, 16.8)	6.9 (4.4, 10.4)
Kent	---	---	---
New Castle	9.2 (6.4, 12.8)	12.1 (7.5, 18.5)	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 deaths.

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 13.5. Five-Year Average Age-Adjusted Stomach Cancer Mortality Rates* in the United States and Delaware, by Sex: 1980-2006

NOTE: Figure is not displayed because of lack of trend data.

Figure 13.6. Five-Year Average Age-Adjusted Stomach Cancer Mortality Rates* in Delaware, by Race and Sex: 1980-2006

NOTE: Figure is not displayed because of lack of trend data.

Table 13.8. Age-Specific Stomach Cancer Mortality Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	3.1	4.1	---	2.1	---	---	---	---	---
65-74	12.8	19.0	---	8.7	---	---	---	---	---
75+	31.1	41.7	24.6	27.0	40.0	18.8	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 deaths.

SOURCE: Delaware Health Statistics Center, 2009.

Figure 13.7. Age-Specific Stomach Cancer Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

14. Thyroid Cancer

Risk Factors and Early Detection

Risk Factors for Thyroid Cancer

- Sex: females are two to three times more likely to develop thyroid cancer than are males
- Age: adults age 20-60 are at greatest risk for thyroid cancer
- Race: Caucasians are more likely to develop thyroid cancer than are African-Americans
- Low dietary intake of iodine
- Exposure to radiation, especially when radiation exposure occurs in childhood and/or targets the head and neck regions
- Personal or family history of goiter, a noncancerous enlargement of the thyroid gland
- Several inherited conditions increase the risk of thyroid cancer: approximately 20% of all medullary thyroid cancers arise from inheriting an abnormal gene. Other genetic conditions such as Gardner syndrome and familial adenomatous polyposis (FAP) increase one's risk of developing thyroid cancer

Early Detection of Thyroid Cancer

There are currently no recommended screening guidelines for thyroid cancer. People at an increased risk should discuss screening options with their doctors.

Data Highlights

New Thyroid Cancer Cases and Deaths (Table 14.1)

- During 2002-06, 466 thyroid cancer cases were diagnosed in Delaware. Thyroid cancer was the 12th most frequently diagnosed cancer type over these five years, accounting for 2.0 percent of all new cancer cases.
 - Of the 466 thyroid cancer cases diagnosed from 2002-06, 111 cases (23.8 percent) were male. The remaining 355 cases (76.2 percent) were female.
- Due to the infrequency of thyroid cancer deaths among Delawareans and patient confidentiality rules, 2002-06 thyroid cancer rates were not reported at the state or county levels.

Thyroid Cancer Incidence Rates (Table 14.2)

- Delaware's 2002-06 thyroid cancer incidence rate (10.8 per 100,000) was significantly higher than the U.S. rate (9.6 per 100,000).
 - Delaware's 2002-06 thyroid cancer incidence rate for females was three times higher than for males. This same trend is seen at the national level; the 2002-06 U.S. incidence rate for females was 2.9 times higher than for males.
 - At the national level, the 2002-06 thyroid cancer incidence rate for African Americans was significantly higher than for Caucasians. However, at the state level, the incidence rate for African Americans was not significantly higher than for Caucasians.

Trends in Thyroid Cancer Incidence (Figures 14.1, 14.2)

- From 1992-96 to 2002-06, Delaware's thyroid cancer incidence rate increased 111.8 percent. Over the same time, the national rate increased 57.4 percent.
 - From 1992-96 to 2002-06, the largest increase in the state's thyroid cancer rates occurred among African American males (400.0 percent).

- Rates also increased among African American females, Caucasian females and Caucasian males (136.5 percent, 117.7 percent and 132.0 percent, respectively) over these ten years.

Age-Specific Incidence Rates (Table 14.3)

- In Delaware, for 2002-06, thyroid cancer incidence increased with age, with a peak incidence observed among Delawareans ages 65-74. Incidence rates then decreased among Delawareans ages 75 and older.

Stage at Diagnosis of Thyroid Cancer (Tables 14.4 and 14.5, Figure 14.4)

- For 2002-06, 77.9 percent, 18.7 percent and 2.8 percent of thyroid cancer cases diagnosed in Delaware were detected at the local, regional and distant stages, respectively. Comparable percentages for the U.S. were 68.0 percent and 24.0 percent and 6.0, respectively.

Thyroid Cancer Incidence

Table 14.1. Number of Thyroid Cancer Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	466	111	355	392	98	294	65	13	52
Kent	69	13	56	59	11	48	---	---	---
New Castle	317	76	241	260	66	194	50	10	40
Sussex	80	22	58	73	21	52	---	---	---

--- = Cell counts are suppressed for patient confidentiality.
 SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 14.2. Five-Year Average Age-Adjusted Thyroid Cancer Incidence Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

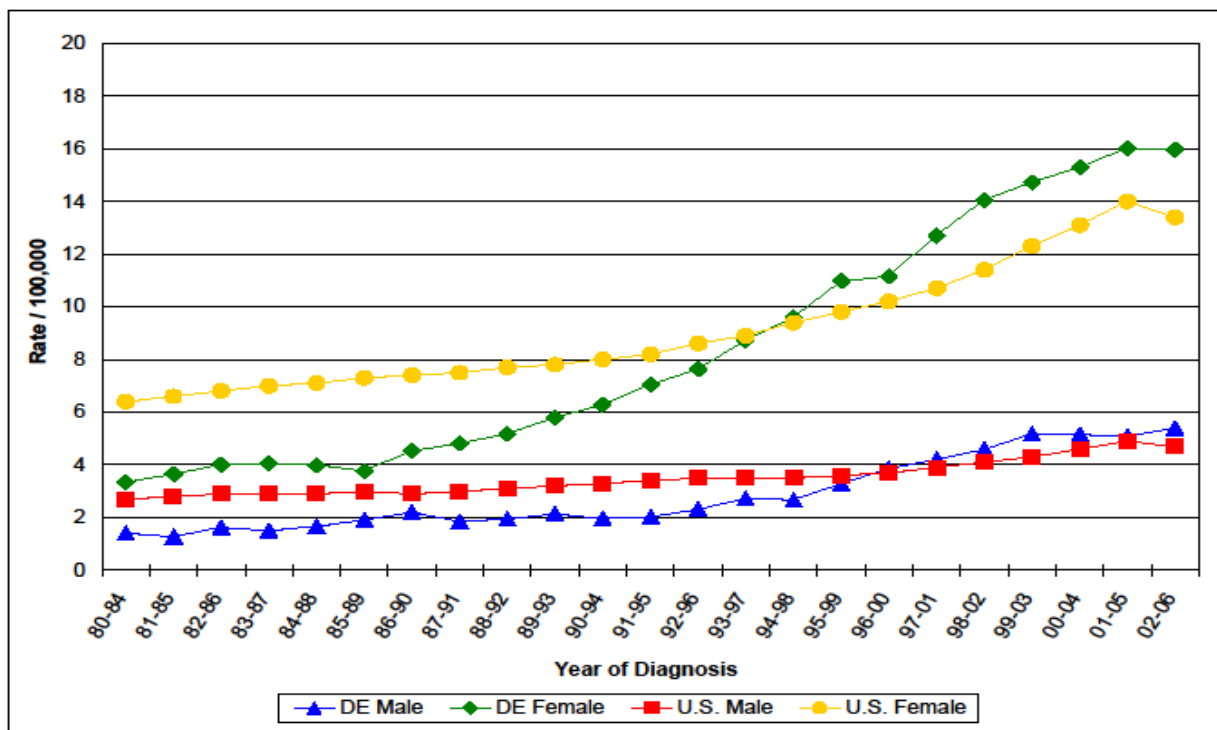
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	9.6 (9.5, 9.7)	4.9 (4.8, 5.0)	14.2 (14.0, 14.4)
Delaware	10.8 (9.8, 11.8)	5.4 (4.4, 6.4)	16.0 (14.3, 17.6)
Kent	10.1 (7.9, 12.8)	---	15.6 (11.8, 20.2)
New Castle	12.2 (10.8, 13.5)	6.2 (0.5, 7.8)	17.5 (15.3, 19.7)
Sussex	8.1 (6.4, 10.1)	4.1 (2.6, 6.2)	12.1 (9.2, 15.6)
CAUCASIAN			
United States	10.1 (10.0, 10.2)	5.2 (5.1, 5.3)	15.0 (14.8, 15.2)
Delaware	11.5 (10.4, 12.7)	5.8 (4.7, 7.1)	17.2 (15.2, 19.1)
Kent	11.3 (8.6, 14.6)	---	17.7 (13.0, 23.5)
New Castle	12.8 (11.3, 14.4)	6.8 (5.2, 8.6)	18.8 (16.2, 21.5)
Sussex	8.7 (6.8, 10.9)	4.4 (2.8, 6.8)	13.0 (9.7, 17.1)
AFRICAN AMERICAN			
United States	5.8 (5.6, 6.0)	2.7 (2.4, 3.0)	8.4 (8.0, 8.8)
Delaware	8.6 (6.6, 10.9)	---	12.3 (9.2, 16.2)
Kent	---	---	---
New Castle	9.6 (7.1, 12.6)	---	13.7 (9.8, 18.7)
Sussex	---	---	---

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

--- = Rate based on fewer than 20 cases.

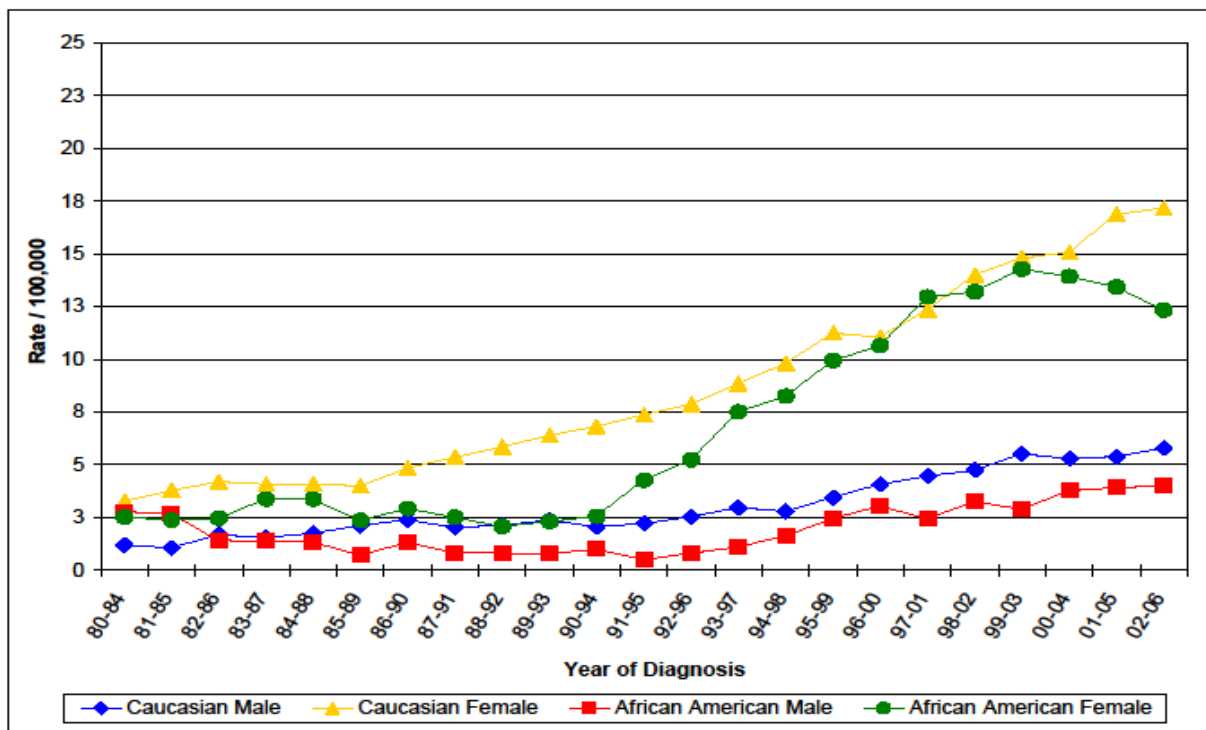
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2006; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 14.1. Five-Year Average Age-Adjusted Thyroid Cancer Incidence Rates* in the United States and Delaware, by Sex: 1980–2006



* = 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, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 14.2. Five-Year Average Age-Adjusted Thyroid Cancer Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = 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, 2009.

Table 14.3. Age-Specific Thyroid Cancer Incidence Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	5.5	---	9.5	6.0	---	10.6	4.0	---	---
40-64	17.6	9.0	25.7	19.1	10.5	27.2	13.3	---	21.6
65-74	24.6	15.3	32.6	25.7	---	34.8	---	---	---
75-84	13.1	---	---	13.7	---	---	---	---	0.0
85+	---	---	---	---	---	---	---	0.0	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 14.3. Age-Specific Thyroid Cancer Incidence Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Thyroid Cancer by Stage at Diagnosis

Table 14.4. Number of Thyroid Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	363	76	287	307	67	240	52	9	43
Regional	87	31	56	73	28	45	11	3	8
Distant	13	4	9	10	3	7	1	1	0
Unknown	3	0	3	2	0	2	1	0	1
Total	466	111	355	392	98	294	65	13	52

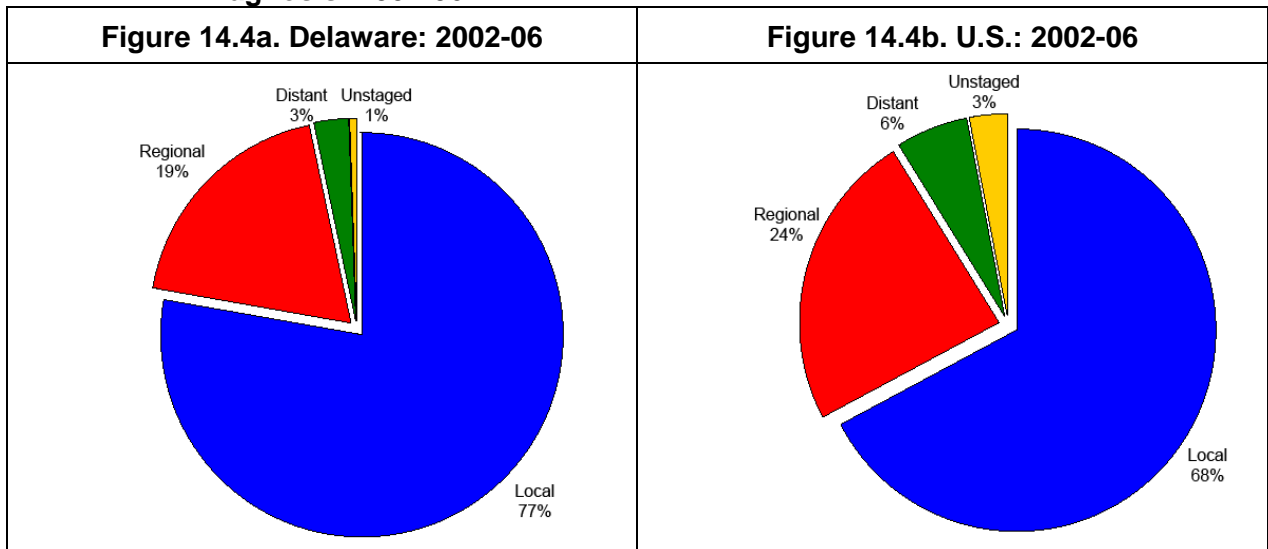
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 14.5. Percentage of Thyroid Cancer Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Local	77.9	68.5	80.9	78.3	68.4	81.6	80.0	69.2	82.7
Regional	18.7	27.9	15.8	18.6	28.6	15.3	16.9	23.1	15.4
Distant	2.8	3.6	2.5	2.6	3.1	2.4	1.5	7.7	0.0
Unknown	0.6	0.0	0.9	0.5	0.0	0.7	1.5	0.0	1.9
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, 2009.

Figure 14.4. Percentage of Thyroid Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Thyroid Cancer Mortality

NOTE: Due to the infrequency of thyroid cancer deaths among Delawareans and patient confidentiality rules, thyroid cancer mortality rates are not published.

15. Urinary Bladder Cancer

Risk Factors and Early Detection

Risk Factors for Urinary Bladder Cancer

- Tobacco use: smokers are more than twice as likely than nonsmokers to develop bladder cancer
- Increasing age: the majority of bladder cancer cases are diagnosed among those ages 65 and older
- Race: Caucasians have the highest bladder cancer incidence while Asians have the lowest bladder cancer incidence
- Sex: bladder cancer incidence among men is four times greater than among women
- Personal history of bladder cancer
- Family history of bladder cancer
- Chemotherapy drugs ifosfamide or cyclophosphamide (Ifex, Cytoxan)
- Radiation therapy to the pelvic region
- Low fluid consumption
- Bladder birth defects
- Urinary schistosomiasis (*Schistosoma haematobium*) that affects the urinary tract; while this parasitic infection is rare in the U.S., it is common in many developing countries
- Chronic ingestion of arsenic in drinking water

Possible Risk Factors for Urinary Bladder Cancer

- History of chronic bladder inflammation (e.g., history of urinary infections, kidney or bladder stones)
- Working in industries with high exposure to aromatic amines; industries with the highest risks include dye, rubber, leather, textiles and paint manufacturing as well as printing companies and truck drivers.

Early Detection of Urinary Bladder Cancer

Routine screening for bladder cancer is not recommended by any professional organization. However, doctors may perform routine screenings for individuals at very high risk for bladder cancer. Reasons for regular bladder cancer screenings may include having a personal history of bladder cancer, certain birth defects of the bladder, or working in certain high-risk professions. The best advice is to know your risk factors and discuss any concerns or symptoms with your doctor.

Bladder cancer screening tests include the following:

- Checking for the presence of blood in the urine (i.e., hematuria). Hematuria may be an early bladder cancer symptom.
- Examining urine for the presence of cancer cells (i.e., urine cytology). While urine cytology may detect some bladder cancer cases, it is generally not considered reliable enough to be used as a general screening tool.
- Various imaging methods (e.g., cystoscopy, MRI, CT-scan, and radiographs) may detect bladder tumors; however, these techniques are more commonly used as diagnostic procedures as opposed to screening methods.
- Newer screening methods (e.g., nuclear matrix protein 22 (NMP22) and telomerase testing) are currently under development to explore their utility as widespread bladder cancer screening tools.

New Urinary Bladder Cancer Cases and Deaths (Tables 15.1 and 15.6)

- In 2002-06, 1,104 urinary bladder cancer cases were diagnosed in Delaware. Bladder cancer was the state's 5th most frequently diagnosed cancer type during this time, accounting for 4.9 percent of all new cancer cases.
 - Of the 1,104 bladder cancer cases diagnosed from 2002-06, 822 cases (74.5 percent) were diagnosed among males. The remaining 282 cases (25.5 percent) were diagnosed among females.
- During 2002-06, 256 Delawareans died from urinary bladder cancer. Bladder cancer was the state's 8th most common cause of cancer mortality, accounting for 2.9 percent of all cancer deaths.
 - Of the state's 256 bladder cancer decedents, 181 (70.7 percent) were male and 75 (29.3 percent) were female.

Bladder Cancer Incidence and Mortality Rates (Tables 15.2 and 15.7)

- Delaware's 2002-06 urinary bladder cancer incidence rate (24.5 per 100,000) was significantly elevated compared to the U.S. rate (21.0 per 100,000).
 - Regardless of race, the 2002-06 male bladder cancer incidence rates were significantly higher than female rates at the national, state, and county levels.
 - Regardless of sex, the 2002-06 bladder cancer incidence rates for African Americans were significantly lower than for their Caucasian counterparts at the national and state levels.
- Delaware's 2002-06 urinary bladder cancer mortality rate (5.8 per 100,000) was significantly higher than the U.S. rate (4.3 per 100,000).
 - Regardless of race, the 2002-06 bladder cancer mortality rates among males were significantly higher than among females at both the state and national levels.
 - At the national level, the 2002-06 bladder cancer mortality rate for African American males was significantly lower than for Caucasian males. However, in Delaware, no significant difference in bladder cancer mortality rates was observed between African American and Caucasian males.
 - At the national level, the 2002-06 bladder cancer mortality rate for African American females was significantly higher than for Caucasian females. However, in Delaware, no significant difference in bladder cancer mortality rates was observed between African American and Caucasian females.

Trends in Urinary Bladder Cancer Incidence and Mortality Rates (Figures 15.1–15.2 and 15.6–15.7)

- From 1992-96 to 2002-06, Delaware's urinary bladder cancer incidence rate increased 8.9 percent while the U.S. rate increased 1.0 percent.
 - During this period, Delaware's bladder cancer incidence rate increased by 9.6 percent among males but decreased by 3.5 percent among females.
 - From 1992-96 to 2002-06, Delaware's bladder cancer incidence rate for Caucasians increased 10.5 percent while the rate for African Americans increased only 0.7 percent.
- Historically, Delaware's bladder mortality rate has been higher than that of the U.S. While rates have trended downward in all areas, the decline has occurred slightly faster at the national level.
 - From 1992-96 to 2002-06, Delaware's bladder cancer mortality rate decreased 1.7 percent while the U.S. rate fell 2.3 percent.
 - Between 1992-96 and 2002-06, the bladder cancer mortality rates among Delaware Caucasian males and females decreased by 8.1 percent and 12.1 percent, respectively.
 - During the same period, the bladder cancer mortality rate decreased 26.5 percent for African American females in Delaware, but increased 13.2 percent for African American males in the state.

Age-Specific Incidence and Mortality Rates (Tables 15.3 and 15.8)

- In Delaware and the U.S., the 2002-06 overall incidence of bladder cancer among males increased with age, from birth through ages 75-84. Bladder cancer incidence rates then decreased somewhat among males ages 85 and older.
 - Among females, the highest bladder cancer incidence rates occurred in the 85 and older age group.
- For 2002-06, Delaware's bladder cancer mortality rate increased with age, with those ages 85 and older having the highest rate. At the U.S. level, however, the highest bladder cancer mortality occurred in those ages 74-85.

Stage at Diagnosis of Urinary Bladder Cancer (Tables 15.4–15.5, Figure 15.4)

- For 2002-06, 54.4 percent, 32.1 percent, 6.5 percent and 3.6 percent of bladder cancer cases were diagnosed at the *in situ*, local, regional and distant stages, respectively. In the U.S., comparable percentages were 50.0 percent, 36.0 percent and 8.0 percent and 4.0 percent, respectively.
 - No substantial differences in staging of bladder cancer at time of diagnosis were detected during 2002-06 between sexes or races in Delaware.

Urinary Bladder Cancer Incidence

Table 15.1. Number of Urinary Bladder Cancer Cases in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	1,104	822	282	1,009	751	258	81	61	20
Kent	183	135	48	165	120	45	16	---	---
New Castle	576	418	158	527	383	144	43	30	13
Sussex	345	269	76	317	248	69	22	---	---

--- = Cell counts are suppressed for patient confidentiality.
 SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 15.2. Five-Year Average Age-Adjusted Urinary Bladder Cancer Incidence Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

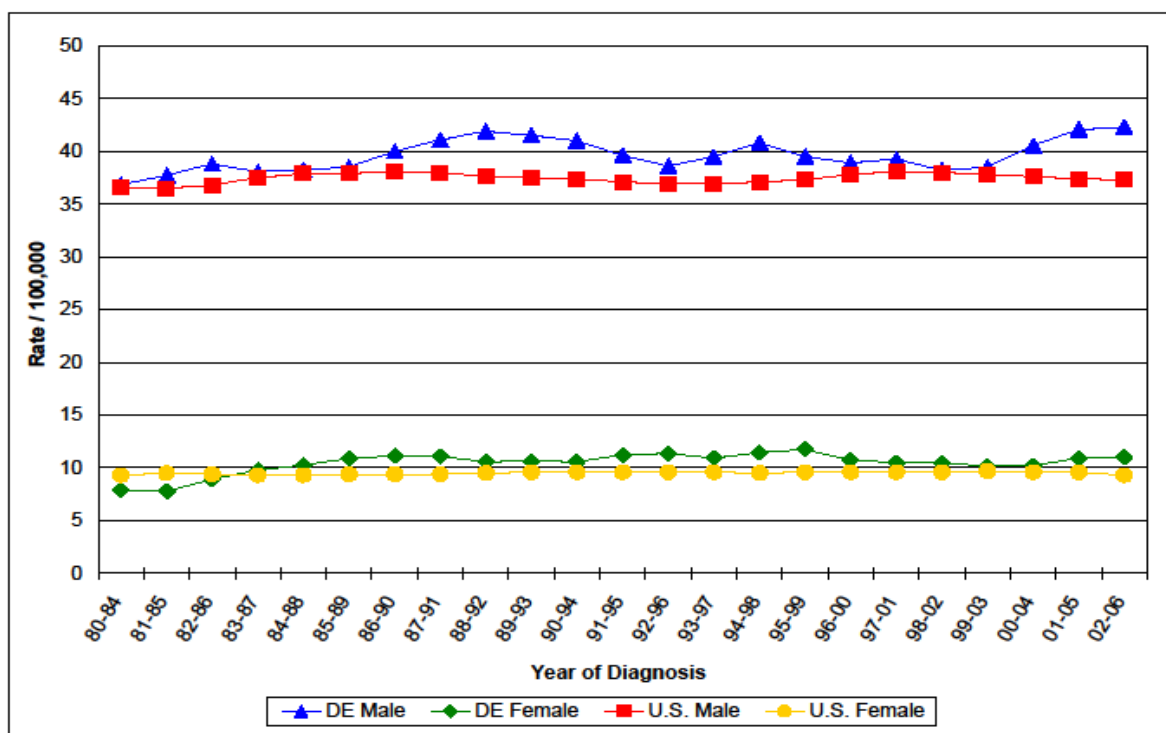
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	21.0 (20.9, 21.1)	37.1 (36.8, 37.4)	9.3 (9.2, 9.4)
Delaware	24.5 (23.1, 26.0)	42.3 (39.4, 45.2)	11.0 (9.7, 12.3)
Kent	27.0 (23.1, 30.9)	46.7 (38.8, 54.6)	12.6 (8.9, 17.2)
New Castle	23.2 (21.3, 25.1)	39.4 (35.6, 43.2)	10.7 (9.0, 12.4)
Sussex	26.8 (24.0, 29.6)	45.9 (40.4, 51.4)	11.0 (8.7, 13.7)
CAUCASIAN			
United States	22.8 (22.6, 23.0)	40.3 (40.0, 40.6)	9.9 (9.8, 10.0)
Delaware	26.2 (24.6, 27.9)	44.9 (41.6, 48.1)	11.9 (10.5, 13.4)
Kent	29.9 (25.3, 34.5)	51.1 (41.9, 60.2)	14.6 (10.7, 19.6)
New Castle	25.0 (22.8, 27.1)	42.9 (38.6, 47.1)	11.7 (9.8, 13.7)
Sussex	26.9 (23.9, 29.8)	46.1 (40.4, 51.8)	10.8 (8.4, 13.6)
AFRICAN AMERICAN			
United States	12.8 (12.4, 13.2)	20.0 (19.2, 20.8)	7.9 (7.5, 8.3)
Delaware	14.1 (11.2, 17.6)	25.3 (19.4, 32.5)	6.0 (3.7, 9.3)
Kent	---	---	---
New Castle	11.6 (8.4, 15.7)	19.3 (13.0, 27.6)	---
Sussex	22.4 (14.1, 34.0)	---	---

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

--- = Rate based on fewer than 20 cases.

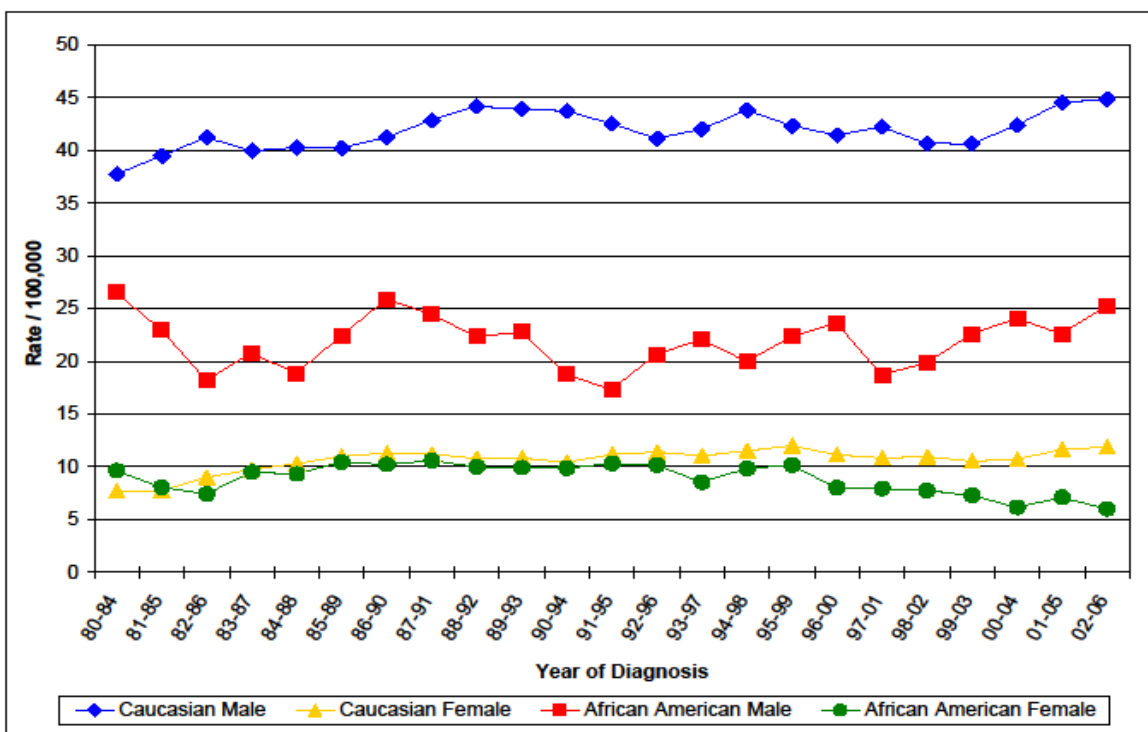
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 15.1. Five-Year Average Age-Adjusted Urinary Bladder Cancer Incidence Rates* in the United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 15.2. Five-Year Average Age-Adjusted Urinary Bladder Cancer Incidence Rates* in Delaware, by Race and Sex: 1980–2006



* = Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 15.3. Age-Specific Urinary Bladder Cancer Incidence Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	22.0	34.8	10.1	25.2	39.1	11.9	10.5	17.7	---
65-74	114.3	196.8	43.3	121.3	206.1	47.4	68.2	131.6	---
75-84	178.9	321.7	79.7	185.9	333.3	81.8	117.0	---	---
85+	155.2	291.3	97.5	168.2	320.3	103.0	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 15.3. Age-Specific Urinary Bladder Cancer Incidence Rates in Delaware, by Race: 2002-2006

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

Urinary Bladder Cancer by Stage at Diagnosis

Table 15.4. Number of Urinary Bladder Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
<i>In situ</i>	600	444	156	556	413	143	39	28	11
Local	354	280	74	324	257	67	28	22	6
Regional	72	50	22	65	44	21	5	4	1
Distant	40	24	16	38	22	16	2	2	0
Unknown	38	24	14	26	15	11	7	5	2
Total	1,104	822	282	1,009	751	258	81	61	20

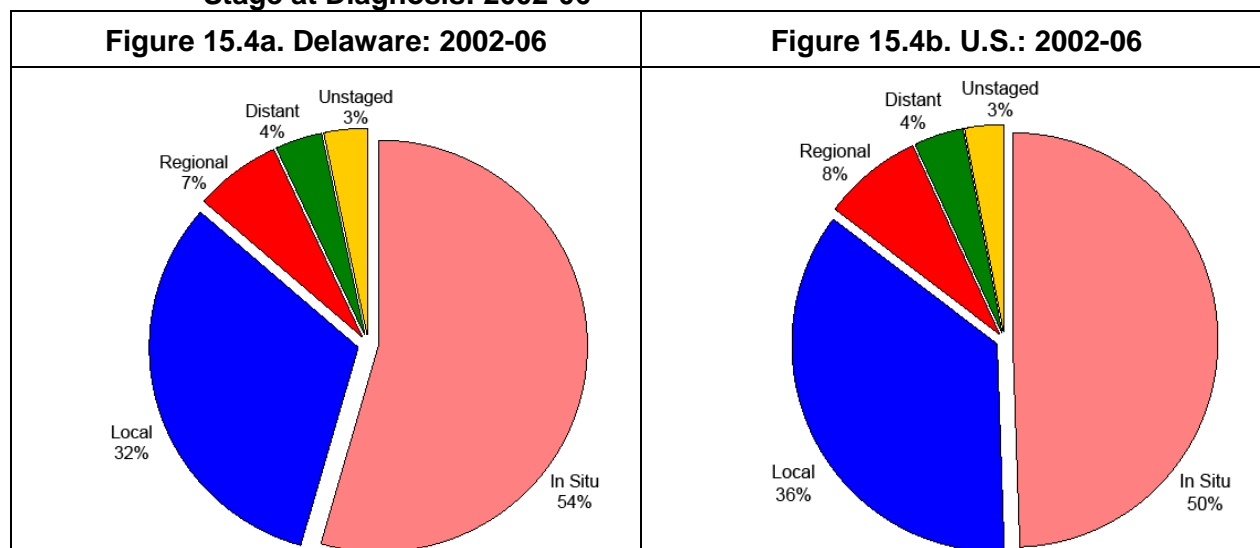
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 15.5. Percentage of Urinary Bladder Cancer Cases in Delaware, by Stage at Diagnosis, Race and Sex: 2002-06

Stage at Diagnosis	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
<i>In situ</i>	54.4	54.0	55.3	55.1	55.0	55.4	48.2	45.9	55.0
Local	32.1	34.1	26.2	32.1	34.2	26.0	34.6	36.1	30.0
Regional	6.5	6.1	7.8	6.4	5.9	8.1	6.2	6.6	5.0
Distant	3.6	2.9	5.7	3.8	2.9	6.2	2.5	3.3	0.0
Unknown	3.4	2.9	5.0	2.6	2.0	4.3	8.6	8.2	10.0
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, 2009.

Figure 15.4. Percentage of Urinary Bladder Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Urinary Bladder Cancer Mortality

Table 15.6. Number of Urinary Bladder Cancer Deaths in Delaware and Counties, by Race and Sex: 2002-06

	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	256	181	75	229	162	67	26	18	8
Kent	36	25	11	31	22	9	---	---	---
New Castle	147	101	46	131	89	42	15	---	---
Sussex	73	55	18	67	51	16	---	---	---

--- = Cell counts are suppressed for patient confidentiality.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 15.7. Five-Year Average Age-Adjusted Urinary Bladder Cancer Mortality Rates* in the United States, Delaware and Counties, by Race and Sex: 2002-06

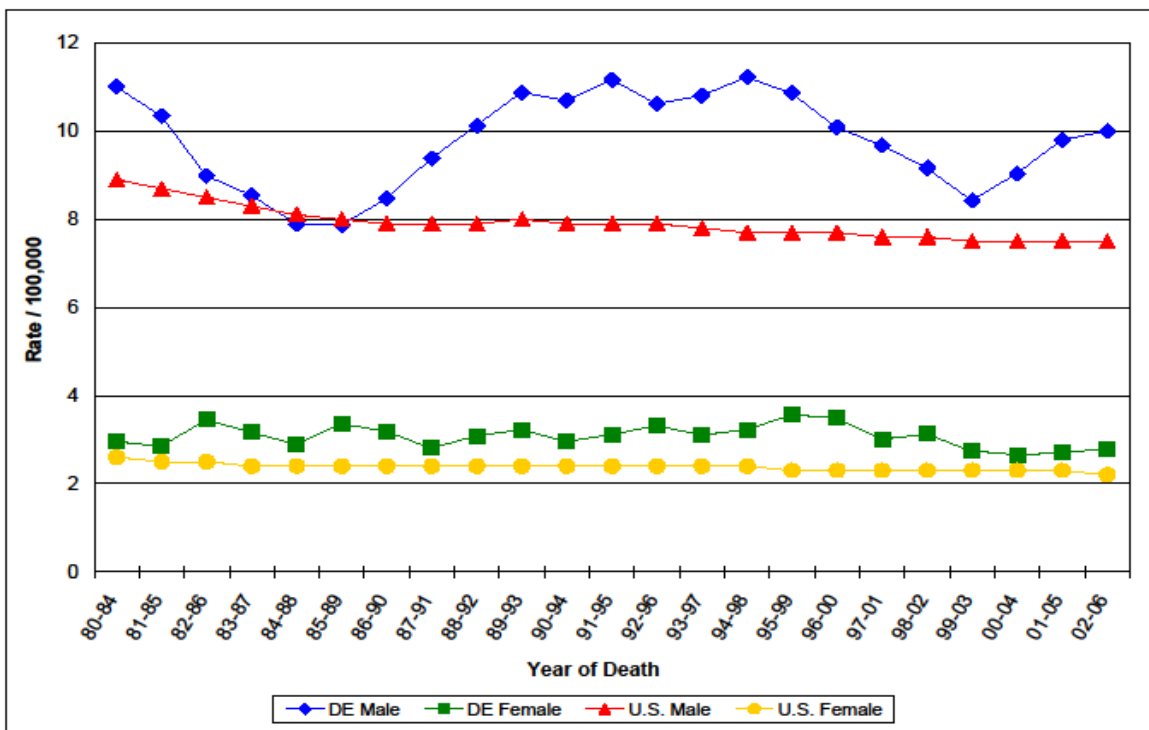
RACE AND REGION	SEX		
	All	Male	Female
ALL RACES			
United States	4.3 (4.3, 4.4)	7.5 (7.5, 7.6)	2.2 (2.2, 2.3)
Delaware	5.8 (5.1, 6.5)	10.0 (8.5, 11.4)	2.8 (2.2, 3.5)
Kent	5.6 (3.9, 7.7)	9.6 (6.2, 14.2)	---
New Castle	6.0 (5.0, 7.0)	10.3 (8.3, 12.3)	3.0 (2.2, 3.9)
Sussex	5.8 (4.5, 7.3)	9.8 (7.4, 12.7)	---
CAUCASIAN			
United States	4.5 (4.5, 4.5)	7.9 (7.8, 8.0)	2.2 (2.2, 2.3)
Delaware	5.9 (5.2, 6.7)	10.2 (8.6, 11.8)	2.9 (2.2, 3.7)
Kent	5.8 (3.9, 8.2)	10.0 (6.3, 15.2)	---
New Castle	6.1 (5.1, 7.2)	10.6 (8.5, 13.0)	3.1 (2.3, 4.2)
Sussex	5.7 (4.5, 7.3)	9.8 (7.3, 12.9)	---
AFRICAN AMERICAN			
United States	3.7 (3.6, 3.9)	5.5 (5.2, 5.7)	2.8 (2.6, 2.9)
Delaware	4.9 (3.2, 7.2)	---	---
Kent	---	---	---
New Castle	---	---	---
Sussex	---	---	---

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

--- = Rate based on fewer than 20 deaths.

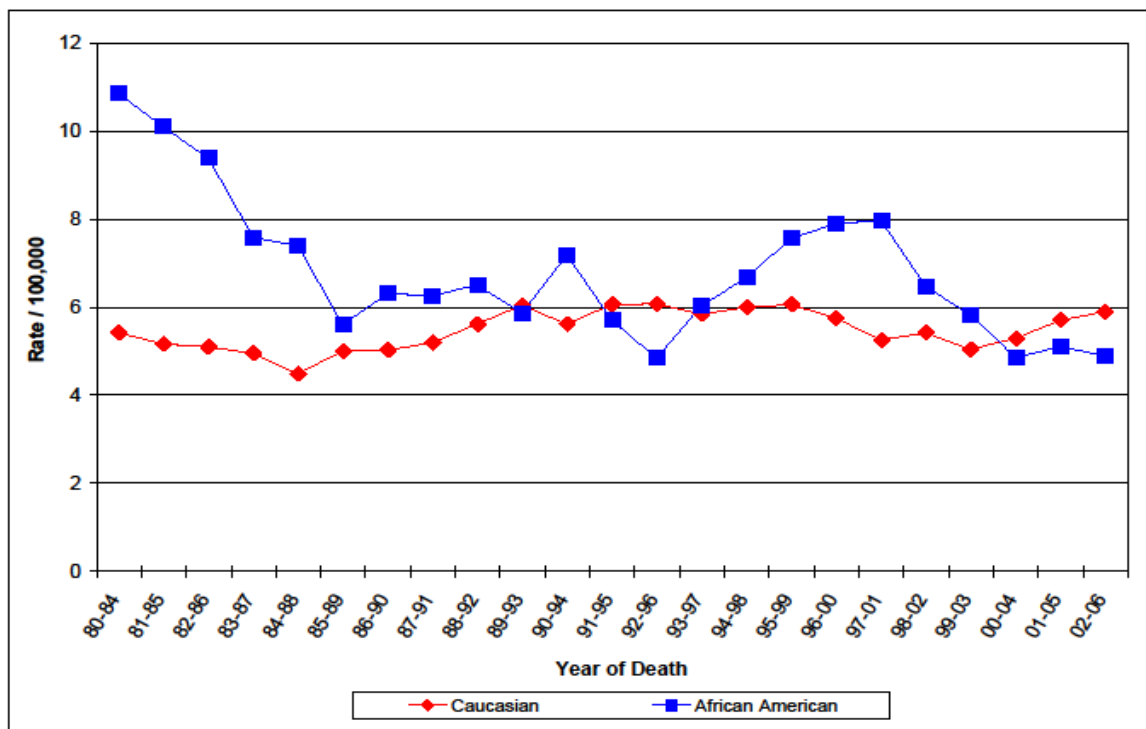
SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 15.5. Five-Year Average Age-Adjusted Urinary Bladder Cancer Mortality Rates* in the United States and Delaware, by Sex: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 15.6. Five-Year Average Age-Adjusted Urinary Bladder Cancer Mortality Rates* in Delaware, by Race: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
 SOURCE: Delaware Health Statistics Center, 2009.

Table 15.8. Age-Specific Urinary Bladder Cancer Mortality Rates* in Delaware, by Race and Sex: 2002-06

Age Group	All Races			Caucasian			African American		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	---	---	---	---	---	---	---	---	---
40-64	2.7	4.3	---	2.7	4.2	---	---	---	---
65-74	21.2	37.9	---	23.3	42.4	---	---	---	---
75-84	51.1	90.0	24.0	52.5	89.5	26.3	---	---	---
85+	82.2	138.0	58.5	82.4	143.0	56.4	---	---	---

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 deaths.

SOURCE: Delaware Health Statistics Center, 2009.

Figure 15.7. Age-Specific Urinary Bladder Cancer Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

16. Uterine Cancer

Risk Factors and Early Detection

Risk Factors for Uterine Cancer

- Increasing age
- Obesity
- Diet high in animal fat
- Personal history of any of the following: diabetes, breast or ovarian cancer, granulosa-theca cell ovarian tumors, polycystic ovarian syndrome (PCOS), atypical endometrial hyperplasia
- Family history of endometrial and colorectal cancers (Lynch syndrome, or HNPCC)
- High levels of estrogen, via natural occurrence or hormone therapy
- Having a higher number of menstrual cycles throughout a woman's life
- Never having children, especially if due to infertility issues
- Treatment with the drug tamoxifen

Possible Risk Factors for Uterine Cancer

- Prior radiation therapy to the pelvic region

Protective Factors 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. The best method of early detection is for individuals to know their risks and report any symptoms to their doctors.

Data Highlights

New Uterine Cancer Cases and Deaths (Tables 16.1 and 16.6)

- During 2002-06, 693 women in Delaware were diagnosed with uterine cancer. Uterine cancer was the 4th most frequently diagnosed cancer among females over this time, accounting for 6.5 percent of all cancer diagnosed among women in the state.
- During 2002-06, 120 Delaware females died from uterine cancer. Uterine cancer was the 8th leading cause of cancer deaths among women over this time, accounting for 2.9 percent of all cancer deaths among females in the state.

Uterine Cancer Incidence and Mortality Rates (Tables 16.2 and 16.7)

- Delaware's 2002-06 uterine cancer incidence rate (28.2 per 100,000) was significantly higher than the U.S. rate (23.3 per 100,000).
 - Delaware's 2002-06 uterine cancer incidence rates did not differ significantly between African American and Caucasian women. At the U.S. level, however, the incidence rate for African American women was significantly lower than that for Caucasian women.
- Delaware's 2002-06 uterine cancer mortality rate (4.7 per 100,000) did not differ significantly from the U.S. rate (4.1 per 100,000).
 - At both the state and national levels, uterine cancer mortality rates among African American females were significantly greater than among Caucasian females.

Trends in Uterine Cancer Incidence and Mortality (Figures 16.1-16.2 and 16.6-16.7)

- Historically, Delaware's uterine cancer incidence rates have been similar to those of the U.S. However, from 1992-96 to 2002-06, Delaware's uterine cancer incidence rate increased 20.0 percent while the U.S. rate increased 8.4 percent. As a result, Delaware's 2002-06 uterine cancer incidence rate was significantly higher than the U.S. rate.
 - Delaware's uterine cancer incidence rate for African American females increased 62.8 percent from 1992-96 to 2002-06. In contrast, Delaware's uterine cancer incidence rate for Caucasian females increased 17.6 percent over the same time.
- Historically, uterine cancer mortality rates have been comparable for Delaware and the U.S. From 1992-96 to 2002-06, Delaware's uterine cancer mortality rate decreased 2.1 percent while the U.S. rate decreased 2.4 percent.
 - In Delaware, the uterine cancer mortality rate for African American women increased by 5.5 percent from 1992-96 to 2002-06. Conversely, the comparable rate for Delawarean Caucasian women fell by 2.4 percent.

Age-Specific Incidence and Mortality Rates (Tables 16.3 and 16.8)

- The 2002-06 age-specific incidence rate for uterine cancer was highest among Delaware females age 65-84.
 - Among Delawarean Caucasian women, uterine cancer incidence rates peaked in the 65-74 year age group then declined somewhat in the 75 and older age groups. Among African American women in Delaware, the greatest incidence occurred in the 75-84 age group.
- The 2002-06 age-specific uterine cancer mortality rate increased with age, peaking among Delaware females age 75 and older. State data were too sparse for meaningful analyses by race.

Stage at Diagnosis of Uterine Cancer (Tables 16.4–16.5, Figures 16.4–16.5)

- In Delaware, from 2002-06, 69.1 percent, 18.2 percent and 8.7 percent of uterine cancers were diagnosed at the local, regional and distant stages, respectively. At the national level, comparable percentages were 69.0 percent, 19.0 percent and 8.0 percent, respectively.
 - In Delaware, from 2002-06, 186 uterine cancer cases (26.8 percent) were diagnosed in the late stages (i.e., regional or distant stage).
 - Delawarean African American females were less likely than their Caucasian counterparts to have their cancer diagnosed at the local stage (59.4 percent v. 71.2 percent, respectively).

Uterine Cancer Incidence

Table 16.1. Number of Uterine Cancer Cases in Delaware and Counties, by Race: 2002-06

	All Female	Caucasian Female	African American Female
Delaware	693	579	101
Kent	118	95	20
New Castle	391	326	59
Sussex	184	158	22

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 16.2. Five-Year Average Age-Adjusted Uterine Cancer Incidence Rates* in the U.S., Delaware and Counties, by Race: 2002-06

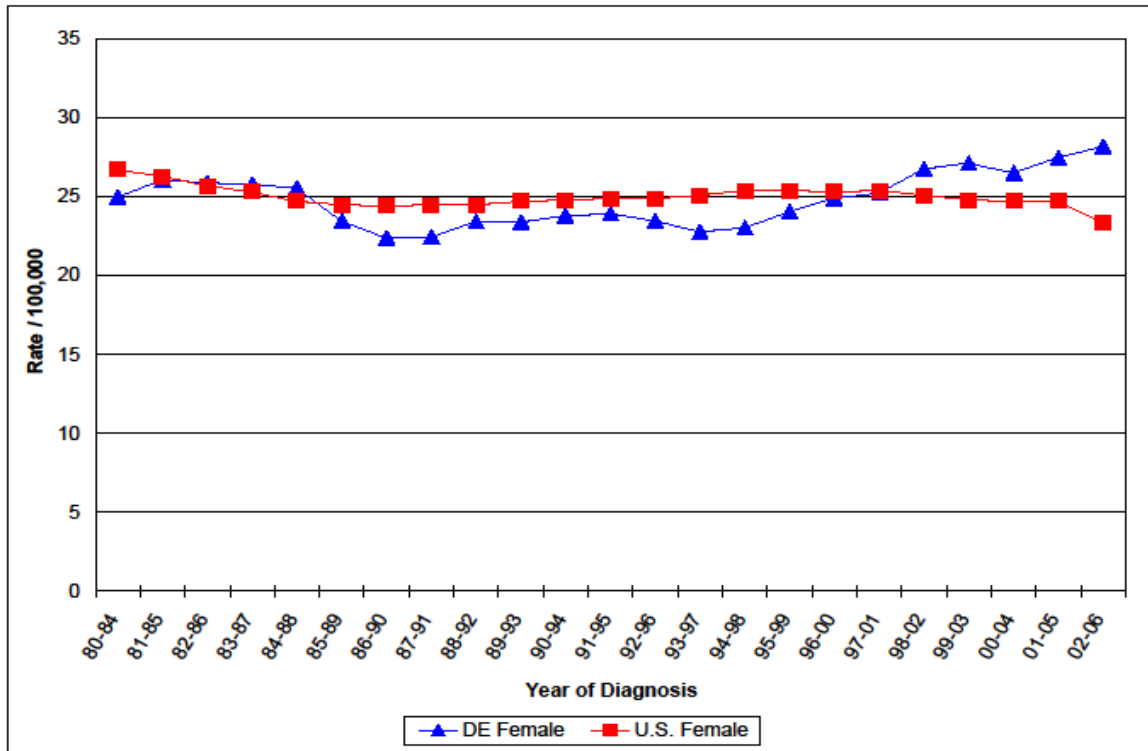
	All Female	Caucasian Female	African American Female
United States	23.3 (23.1, 23.5)	24.2 (24.0, 24.4)	20.3 (19.6, 21.0)
Delaware	28.2 (26.1, 30.3)	28.7 (26.4, 31.0)	28.0 (22.6, 33.5)
Kent	31.0 (25.4, 36.5)	31.5 (25.5, 38.5)	30.3 (18.5, 46.8)
New Castle	27.5 (24.8, 30.2)	28.8 (25.7, 31.9)	24.9 (19.0, 32.1)
Sussex	28.9 (24.7, 33.1)	28.0 (23.6, 32.3)	37.5 (23.5, 56.8)

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

--- = Rate based on fewer than 20 cases.

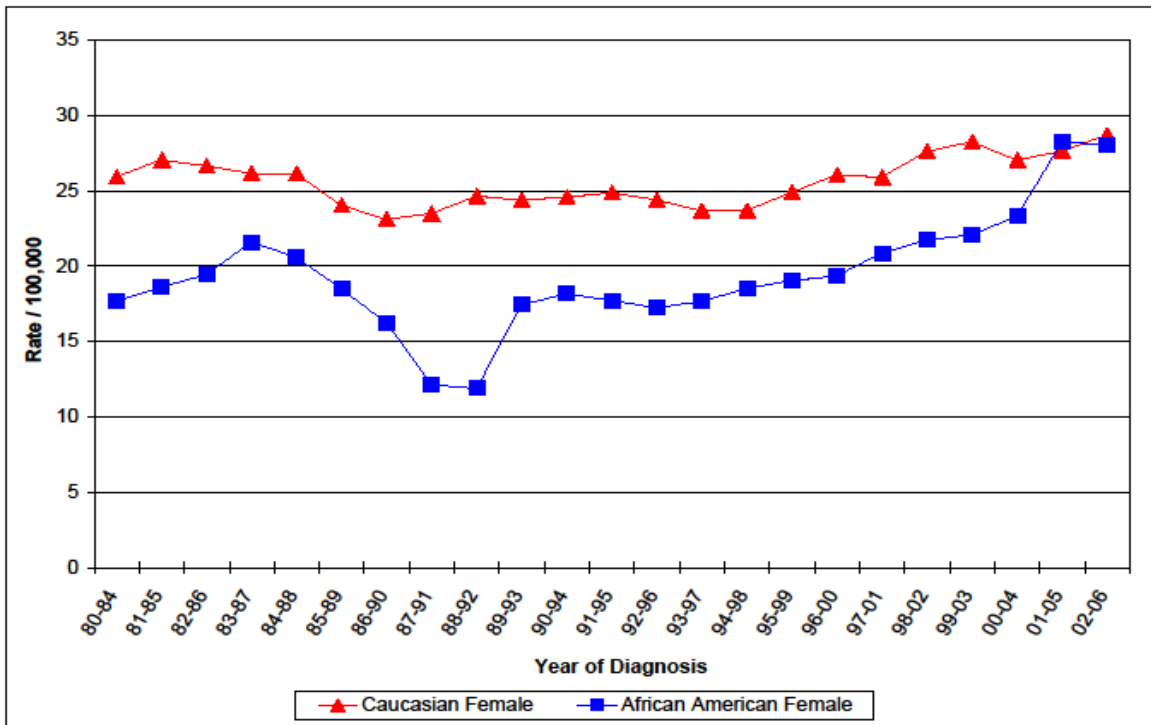
SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 16.1. Five-Year Average Age-Adjusted Uterine Cancer Incidence Rates* in the U.S. and Delaware: 1980–2006



* = 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, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Figure 16.2. Five-Year Average Age-Adjusted Uterine Cancer Incidence Rates* in Delaware, by Race: 1980–2006



* = 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, 2009.

Table 16.3. Age-Specific Uterine Cancer Incidence Rates* in Delaware, by Race: 2002-06

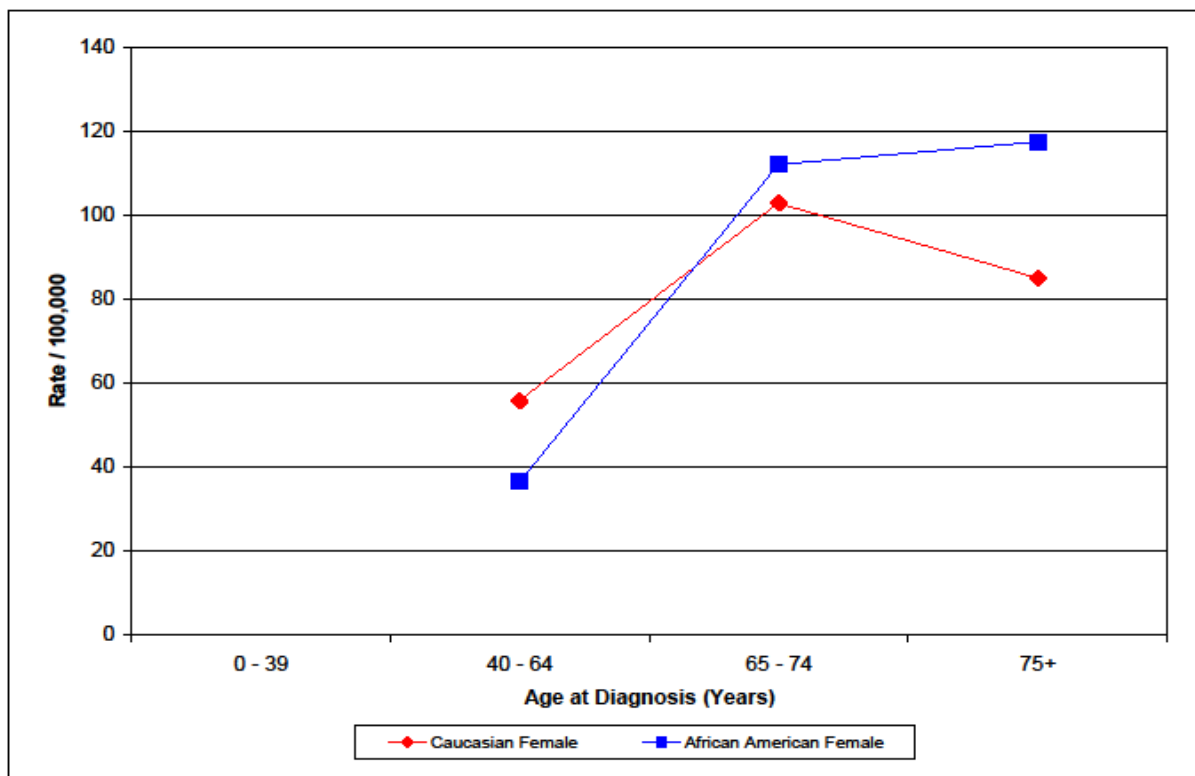
Age Group	All Female	Caucasian Female	African American Female
0-39	1.9	---	---
40-64	51.5	55.7	36.4
65-74	103.4	102.8	112.0
75+	89.7	85.0	117.4

* = Rates are per 100,000 population.

--- = Rate based on fewer than 20 cases.

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 16.3. Age-Specific Uterine Cancer Incidence Rates in Delaware, by Race: 2002-06



NOTE: Rates for either race age 0-39 are not displayed due to patient confidentiality rules.

SOURCE: Delaware Health Statistics Center, 2009.

Uterine Cancer by Stage at Diagnosis

Table 16.4. Number of Uterine Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Female	Caucasian Female	African American Female
Local	479	412	60
Regional	126	110	16
Distant	60	42	18
Unknown	28	15	7
Total	693	579	101

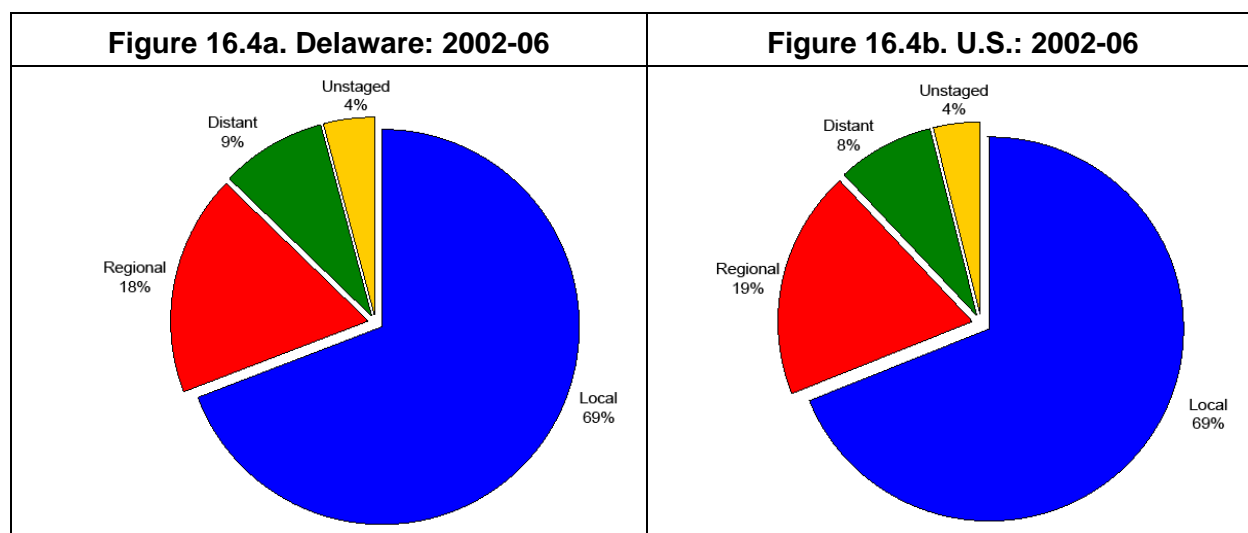
SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table 16.5. Percentage of Uterine Cancer Cases in Delaware, by Stage at Diagnosis and Race: 2002-06

Stage at Diagnosis	All Female	Caucasian Female	African American Female
Local	69.1	71.2	59.4
Regional	18.2	19.0	15.8
Distant	8.7	7.3	17.8
Unknown	4.0	2.6	6.9
Total	100.0	100.0	100.0

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Figure 16.4. Percentage of Uterine Cancer Cases in Delaware and the U.S., by Stage at Diagnosis: 2002-06



SOURCES: Delaware: Delaware Cancer Registry, Delaware's Division of Public Health, 2009; U.S.: Surveillance, Epidemiology, and End Results Program, National Cancer Institute, 2009.

Uterine Cancer Mortality

Table 16.6. Number of Uterine Cancer Deaths in Delaware and Counties, by Race: 2002-06

	All Female	Caucasian Female	African American Female
Delaware	120	87	32
Kent	12	7	---
New Castle	71	52	19
Sussex	37	28	---

--- = Cell counts are suppressed for patient confidentiality.
SOURCE: Delaware Health Statistics Center, 2009.

Table 16.7. Five-Year Average Age-Adjusted Uterine Cancer Mortality Rates* in the U.S., Delaware and Counties, by Race: 2002-06

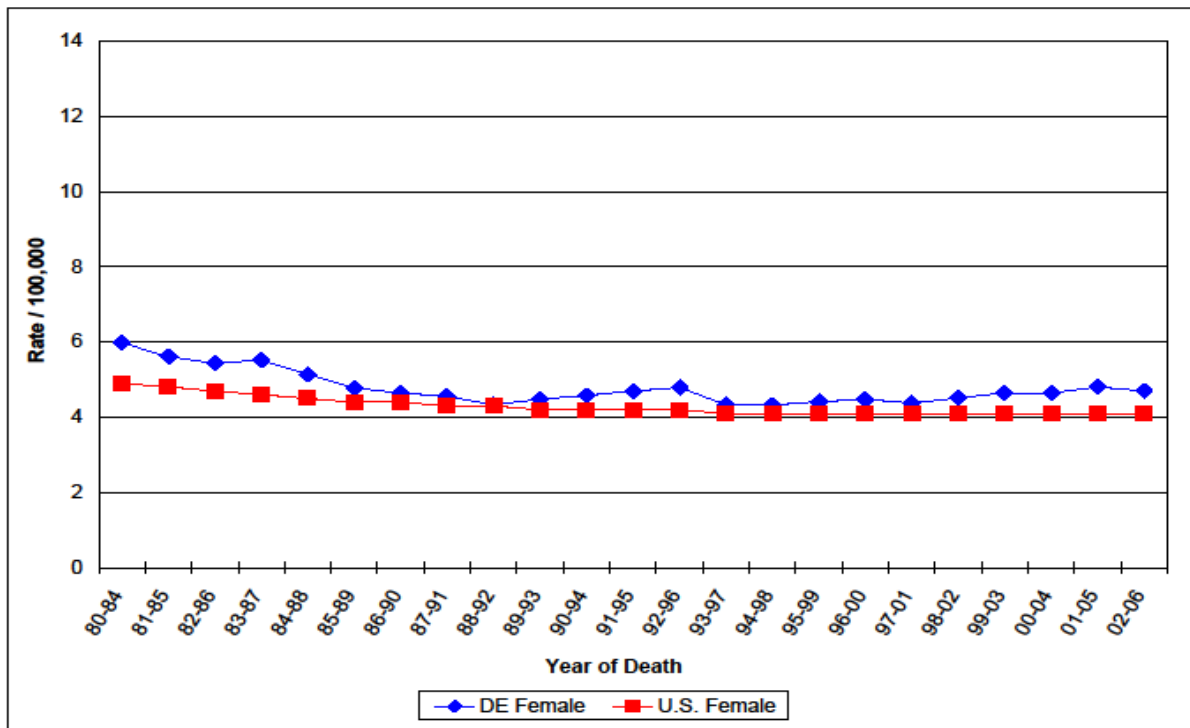
	All Female	Caucasian Female	African American Female
United States	4.1 (4.1, 4.2)	3.9 (3.8, 3.9)	7.2 (7.0, 7.4)
Delaware	4.7 (3.9, 5.6)	4.0 (3.2, 4.9)	9.6 (6.6, 13.6)
Kent	---	---	---
New Castle	4.9 (3.8, 6.2)	4.3 (3.2, 5.6)	---
Sussex	5.3 (3.7, 7.3)	4.5 (3.0, 6.5)	---

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

--- = Rate based on fewer than 20 deaths.

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

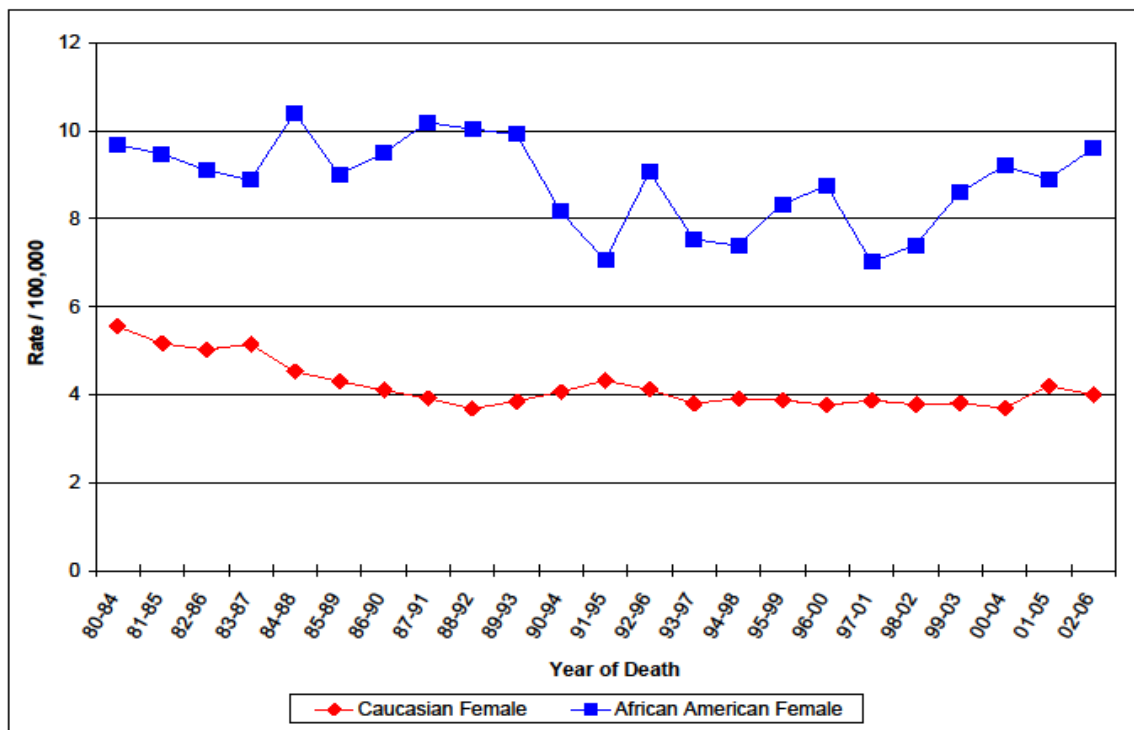
Figure 16.5. Five-Year Average Age-Adjusted Uterine Cancer Mortality Rates* in the U.S. and Delaware: 1980–2006



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

SOURCES: Delaware: Delaware Health Statistics Center, 2009; U.S.: National Center for Health Statistics, 2009.

Figure 16.6. Five-Year Average Age-Adjusted Uterine Cancer Mortality Rates* in Delaware, by Race: 1980–2006



* = Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population.
SOURCE: Delaware Health Statistics Center, 2009.

Table 16.8. Age-Specific Uterine Cancer Mortality Rates* in Delaware, by Race: 2002-06

Age Group	All Female	Caucasian Female	African American Female
0–39	---	---	---
40–64	4.9	4.4	---
65–74	21.9	14.8	---
75+	31.3	30.0	---

* = Rates are per 100,000 population.
--- = Rate based on fewer than 20 deaths.
SOURCE: Delaware Health Statistics Center, 2009.

Figure 16.7. Age-Specific Uterine Cancer Mortality Rates in Delaware, by Race: 2002-06

NOTE: Figure is not displayed because of patient confidentiality rules; the small number of cases precludes the display of data.

17. 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

Complete methods are found in Appendix G. Highlights are described below.

Cancer Cases

- 97.4% of 22,760 cancer cases were successfully geocoded to a census tract based on residence at the time of diagnosis.
- 599 cases were eliminated from the census tract-level analysis because they could not accurately be assigned to the census tract in which they were diagnosed.
- This final analysis is of 22,161 cases diagnosed between 2002 and 2006.

Census Tracts

- Delaware is divided into 197 census tracts, of which 196 are populated.
- The least populated census tract (10.00) had an average annual number of 626 residents between 2002 and 2006. The most populous census tract (148.06) had 13,027 residents. The average number of residents per census tract for 2002-2006 was 4,224.

Rate calculations

- Census tract populations were calculated using estimates from the Delaware Population Consortium (DPC) and the 2000 Census.
- DPH staff used 2000 Census data to calculate the proportion that each 5-year age group contributed to the overall census tract population. This was necessary to age-adjust the rates.
- All rates are presented as five-year annual age-adjusted rates per 100,000. Since some census tracts will have an older population than others, and because the risk of cancer increases with age, age-adjustment allows comparison of the rates in census tracts without the influence of age.
- Confidence intervals were calculated for each rate. See Appendix H (“How to Interpret Cancer Rates by Census Tract”) for more information about confidence intervals.

Results

Appendix I lists the cancer incidence rates by census tract along with their confidence intervals. Census tracts having rates that are significantly higher or lower than the state average are noted in yellow and blue shading, respectively. For 2002-06:

- 45 of the census tracts have statistically significant higher cancer incidence rates compared with the state's average rate of 507.0 per 100,000;
- 22 of the census tracts have significantly lower cancer incidence rates compared to the state's average rate;
- 129 of the census tracts were not significantly different from the state's average rate.

Maps showing the cancer incidence rates by census tract grouped by quintile, and whether the rates are statistically significantly higher or lower than the state average rate, are provided in Appendixes J and K, respectively.

The table below provides more information about the census tracts that had significantly higher cancer incidence rates than the state average.

Table 17.1. Cancer Types that were Statistically Significantly Higher than the State Average, in the 45 Elevated Census Tracts (CTs), Delaware 2002-2006

Cancer Type	Number of Census Tracts in Which Statistically Elevated	Average Number of Cases in these CTs	Major Known Risk Factors
Prostate	16	31	Family history, African American race, diet, obesity
Lung	11	30	Tobacco, radon, asbestos, workplace exposures
Colorectal	9	18	History of bowel disease, family history, diet, smoking, alcohol, diabetes
Breast	8	26	Genetics, family history, early menarche, recent use of birth control pills, hormone therapy
Other	6	13	
Ovarian	5	6	Obesity, tubal ligation (protective factor), fertility drugs, hormone therapy
Oral	4	7	Tobacco, alcohol, UV light, HPV, nutrition
NHL*	3	8	Radiation, weakened immune system, certain infections
Bladder	2	11	Smoking, workplace exposures
Esophagus	3	5	Tobacco, alcohol, overweight, diet, dry cleaning chemicals
Larynx	4	4	Tobacco, alcohol, diet, HPV, genetics, workplace exposure
Leukemia	3	6	Genetics, diet, alcohol, tobacco, sun, radiation, chemical exposure
Pancreas	2	6	Tobacco, obesity, diabetes, hepatitis, alcohol, workplace exposures, family history
Melanoma	4	14	UV light, moles, fair skin, family history
Kidney	1	8	Smoking, overweight, workplace exposures, family history, hypertension, medications
Myeloma	3	5	Family history, overweight, radiation, workplace exposures
Thyroid	2	7	Lack of iodine, radiation, genetic conditions
Brain	1	5	Radiation therapy, certain genetic conditions
Stomach	1	4	Certain infections, diet, tobacco, obesity, family history
Liver	1	4	Hepatitis, alcohol, genetics, workplace exposures, steroids, arsenic in drinking water
Uterine	1	8	Radiation, diabetes, diet, obesity, estrogen therapy

* non-Hodgkin Lymphoma

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APPENDIX A HISPANIC CANCER RATES

Hispanic cancer rates were not calculated for this report because several methodological issues prevent Hispanic rates from being fairly compared with cancer rates for Caucasians and African Americans. 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 1997, the DPC began releasing studies on special topics of interest, including Hispanic population estimates. Because the estimates are calculated from mortality, fertility, labor force and migration statistics, and because these statistics are based on a small population of Hispanics, the DPC urged that the Hispanic population estimates presented in its studies be used with caution (Delaware Population Consortium. *Delawareans of Hispanic Origin, 1991–1998*. Population Study Series. PS-00-01, April 2000). For these reasons, Hispanic population estimates are not included in the DPC's annual Delaware population projections. In less-populated areas, such as small states, and especially in subsets of the population (for example, for one sex or one county), even a small inaccuracy can result in substantial errors in Hispanic cancer rates.
- **Inaccurate recording of Hispanic ethnicity on death certificates**—race and Hispanic origin are treated as distinct concepts and reported separately on death certificates and to the Delaware Cancer Registry, in accordance with guidelines from the federal Office of Management and Budget. To assess the completeness of the reporting of Hispanic ethnicity, expected numbers of cancer cases and deaths in the Hispanic population were calculated and compared with the actual (observed) reports. Because the Hispanic population is younger than the overall Delaware population, and because cancer rates increase with age, the expected values were age-adjusted to ensure comparability. There were 97 deaths from cancer reported on death certificates between 2002 and 2006, but 283 deaths were expected. Similarly, 423 incident cancer cases were reported to the registry, but 1,054 cases were expected. Although this analysis is a cursory attempt to estimate the degree of underreporting of Hispanic ethnicity, it demonstrates the possibility of significantly inaccurate Hispanic cancer rates.
- **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 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.

To illustrate the impact of these statistical concepts on the calculation of Hispanic cancer rates, five-year average annual age-adjusted cancer rates were compared for three racial/ethnic groups, along with their 95-percent confidence intervals.

As shown in the tables below, the small numerators and denominators for the Hispanic population produced wider confidence intervals than those for Caucasian and African American populations.

Table A1. Cancer Cases, Population and Age-Adjusted Cancer Incidence Rates in Delaware: 2002-06

Race/Ethnicity	Total Cases (2002-06)	Total Population (2002-06)	Age-Adjusted Incidence Rate per 100,000	95% Confidence Interval	
				Lower	Upper
Hispanic	423	250,453	421.6	381.4	461.7
Caucasian	18,838	3,132,579	501.7	494.6	508.9
African American	3,470	862,434	538.3	520.4	556.2

SOURCE: Delaware Cancer Registry, Delaware's Division of Public Health, 2009.

Table A2. Cancer Deaths, Population and Age-Adjusted Cancer Mortality Rates in Delaware: 2002-06

Race/Ethnicity	Total Deaths (2002-06)	Total Population (2002-06)	Age-Adjusted Mortality Rate per 100,000	95% Confidence Interval	
				Lower	Upper
Hispanic	97	250,453	113.3	91.8	138.2
Caucasian	7,283	3,132,579	190.4	186.0	194.8
African American	1,363	862,434	229.0	216.8	241.2

SOURCE: Delaware Health Statistics Center, 2009.

APPENDIX B INCIDENCE AND MORTALITY METHODOLOGY

Appendix B describes the materials, data sources and statistical methods that were used to generate the counts and age-adjusted and age-specific incidence and mortality rates included in this report.

DATA SOURCES

Incidence Data:

Delaware Cancer Registry

This report includes incident cancer cases that were diagnosed among Delawareans between January 1, 2002, and December 31, 2006, and reported to the Delaware Cancer Registry (DCR) by November 2009. Incidence trends were based on cancer diagnoses from January 1, 1980 to December 31, 2006, reported to DCR by November 2009. In total, 22,760 cases of malignant cancer were diagnosed among Delawareans from 2002-06. This number includes individuals with cancers diagnosed at more than one site, also known as multiple primaries.

The DCR adheres to reporting procedures consistent with those adopted by the American Cancer Society (ACS) and the National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) Program. Currently, rate calculation procedures exclude all cases of benign brain cancers and *in situ* cancer, except *in situ* bladder cancer. *In situ* bladder cancer cases were included in rate analyses because of the difficulty in distinguishing between the two cancer categories based on the language used by pathologists.

The International Classification of Diseases for Oncology, Second Edition (ICD-O-2) was used to describe the topography (primary anatomic site) and morphology (histology) for cancers reported between 1988 and 2000. Cancers diagnosed between 2001 and 2006 were coded using the International Classification of Diseases for Oncology, Third Edition (ICD-O-3). The topography code defines both the site of the tumor and the cancer type. Five-digit morphology codes were used to describe tumor histology and behavior. The first four digits of the morphology codes define the histology of the cancer, and the fifth digit indicates whether the cancer was malignant, benign, *in situ* or uncertain. Consistent with the publication of the Centers for Disease Control and Prevention's (CDC) U.S. Cancer Statistics, Kaposi's sarcoma and mesothelioma were considered separate sites, based on histology codes.

SEER Program

SEER data were used to compare Delaware's incidence and mortality rates with U.S. rates. Established in 1971, SEER collects, analyzes and disseminates data for cancer control, diagnosis and treatment. SEER uses several population-based registries that are representative of the different regions in the U.S. to produce cancer incidence statistics.

Historically, Delaware's cancer incidence rates have been compared to SEER 9 U.S. cancer incidence rates. SEER 9 incidence rates are calculated using data from the nine registries that have provided data to SEER since 1974–75. These registries include Atlanta, Connecticut, Detroit, Hawaii, Iowa, New Mexico, San Francisco-Oakland, Seattle-Puget Sound and Utah.

In 2009, the Delaware Division of Public Health (DPH) and the Delaware Cancer Consortium elected to begin comparing Delaware's cancer incidence rates to SEER 17 U.S. cancer incidence rates. SEER 17 rates are calculated using data from all 17 population-based registries that currently submit data to SEER (Atlanta, Connecticut, Detroit, Hawaii, Iowa, New Mexico,

San Francisco-Oakland, Los Angeles, San Jose-Monterey, Greater California, Seattle-Puget Sound, Utah, rural Georgia, Alaska, Kentucky, Louisiana, and New Jersey).

The primary benefit of using SEER 17 U.S. comparison rates is that these rates are calculated from a more representative subsample of the U.S. population. Additionally, SEER 17 U.S. cancer incidence rates are referenced in an increasing number of cancer surveillance reports. By including SEER 17 U.S. cancer incidence rates in this and all future editions of *"Cancer Incidence and Mortality in Delaware"*, DPH will publish cancer surveillance statistics that are more consistent with other national-level publications. Therefore, please note that all U.S. cancer incidence rates from 1980-2005 appearing in this report represent SEER 9 incidence rates. U.S. cancer incidence rates for 2002-06 represent SEER 17 incidence rates.

Mortality Data:

Delaware Health Statistics Center

Cancer mortality data were provided by the Delaware Health Statistics Center. The data file was compiled from all death certificates filed in Delaware between 1980 and 2006. Five-year average annual age-adjusted mortality rates were based on deaths that occurred between 2002 and 2006. Trends in cancer mortality were presented for deaths that occurred between 1980 and 2006.

Underlying cause-of-death codes were based on the International Classification of Diseases, Ninth Edition (ICD-9) for deaths that occurred between 1980 and 1998. The International Classification of Diseases, Tenth Edition (ICD-10) was used to code deaths that occurred between 1999 and 2006. To determine the underlying cause of death, the sequence of events leading to the individual's death and recorded on the death certificate are 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 were obtained from the National Center for Health Statistics and used to make comparisons between cancer mortality rates at the state and national levels. U.S. death data were compiled from all death certificates filed in the 50 states and the District of Columbia between 1980 and 2006. Cancer deaths were coded in accordance with World Health Organization regulations, which stipulate that cancer deaths be coded using the most current revision of the International Classification of Diseases. Accordingly, deaths that occurred prior to 1999 were coded using ICD-9. Beginning with 1999, deaths were coded using ICD-10.

Population Data:

Standard Population

The year 2000 standard U.S. population was used for age-adjustment of incidence and mortality rates. Age-adjustment of incidence and mortality rates enable comparisons among populations that have different age structures (e.g., Delaware vs. the U.S.).

Population Estimates, 2002-06

Cancer incidence and mortality rates for the U.S. are calculated using SEER population estimates and are based on the numbers estimated by the census. Delaware rates were based on population estimates provided by the Delaware Population Consortium. Population data for Delaware are presented in appendix D.

RISK FACTORS AND EARLY DETECTION

Cancer risk factor and prevention information are included at the beginning of each chapter of this report. The following three web sites were used as primary resources for cancer risk factor and prevention data: (1) The American Cancer Society (www.cancer.org); (2) The National Cancer Institute (www.cancer.gov); and (3) WebMD (www.webmd.com).

Behavioral Risk Factor Surveillance System (BRFSS)

Behavioral Risk Factor Surveillance System data provide estimates of risk factor prevalence across Delaware and the nation. The most recently available risk factor data from BRFSS are from 2008. 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

Direct Standardization and Age-Adjusted 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. To enable comparisons that were independent of the age distribution of the population of Delaware, age-adjusted rates were calculated (Anderson & Rosenberg, 1998; Klein & Schoenborn, 2001; Goodman & Wilkens, 1994). Age-adjusted rates represent the theoretical cancer rate in a population with an age distribution identical to the reference or standard population.

Age-adjusted incidence and mortality rates for Delaware were computed using an external reference population with a fixed standard age distribution (i.e., the year 2000 standard U.S. population). This process involved calculating the age-specific incidence or mortality rates for the residents of Delaware and then applying (or multiplying) these rates to the proportion of individuals in the same age group in the reference population. The individual age-specific rates were then summed to obtain the overall age-adjusted rate.

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

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

Where 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 and 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 the risk of cancer incidence and mortality were assessed using age-specific rates. Age-specific rates were calculated by dividing the number of cancer cases or deaths that occurred during a specific time period among five age groups (0–39, 40–64, 65–74, 75–84, and 85 and older). The total number of cases or deaths for each of the five age groups was then divided by the total population of the age group in Delaware during the same time period. Rates were expressed per 100,000 of the population.

Race- and Sex-Specific Incidence and Mortality Rates

Race- and sex-specific incidence and mortality rates were calculated to assess how cancer patterns differed across subgroups within the state. These rates were 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. 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 statistics can be estimated by the standard error used to calculate the 95-percent confidence interval. Confidence intervals were calculated using SEER*Stat, using the method developed by Tiwari, et al. 2006.

Stage at Diagnosis

The stage at diagnosis describes the extent to which cancers had spread from the site of origin by the time of diagnosis. SEER summary staging was used to define the stage at diagnosis for all incident cancer cases. Cancer cases diagnosed between 1980 and 2000 were coded according to Summary Stage 1977; cases diagnosed between 2001 and 2003 were coded using the codes for Summary Stage 2000. Beginning in 2004, SEER Summary Stage 2000 was derived using the Collaborative Staging Algorithm.

Three categories were used to code the stage for any particular cancer site:

- **Local:** tumor is invasive but confined to the organ of origin.
- **Regional:** tumor has extended beyond the 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 begun growing at a new site in the body.

OTHER TECHNICAL INFORMATION

Suppression of Data

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 fewer than six cases were suppressed. Additionally, age-adjusted incidence and mortality rates based on fewer than 25 cases or deaths were suppressed. Suppressing incidence and mortality statistics based on a small number of new cancer cases or deaths helps protect patient privacy and confidentiality (Coughlin et al., 1999; McLaughlin, 2002). Furthermore, cancer rates based on a very small number of cases are inherently unstable and cannot be reliably interpreted.

Definition of Race

Race-specific statistics in this report were limited to Caucasian and African American cancer counts and rates. Race groupings did not take into account residents' ethnicity. For incidence and mortality rates, the total population included people of Hispanic ethnicity and those of unknown race.

**APPENDIX C
PRIMARY CANCER SITE DEFINITIONS**

Cancer Site	ICD-O-3 Site	ICD-O-3 Histology
All malignant cancers	C000–C809*	
Breast	C500-C509	Excluding 9590-9989
Cervical	C530-C539	Excluding 9590-9989
Colon and rectum	C180-C189, C260	Excluding 9590-9989
Hodgkin Lymphoma **	C000-C809	9650-9667
Leukemia		
	C420-C421, C424	9823, 9827
	C000-C809	9826, 9835-9837, 9820, 9832-9834, 9940, 9840, 9861, 9866, 9867, 9871-9874, 9895-9897, 9910, 9920, 9891, 9863, 9875, 9876, 9945, 9946, 9860, 9930, 9801, 9805, 9931, 9733, 9742, 9800, 9831, 9870, 9948, 9933, 9964
Lung and bronchus	C340-C349	Excluding 9590-9989
Myeloma	C000-C809	9731-9732, 9734
Non-Hodgkin Lymphoma (NHL) **		
NHL: Nodal	C024, C098- C099, C111, C142, C379, C422, C770- C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9729-9729, 9823, 9827
NHL: Extranodal	All sites except C024, C098- C099, C111, C142, C379, C422, C770- C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9729-9729
Prostate	C619	Excluding 9590-9989
Stomach	C160-C169	Excluding 9590-9989
Thyroid	C739	Excluding 9590-9989
Urinary Bladder	C670-C679	Excluding 9590-9989
Uterine	C540-C549, C559	Excluding 9590-9989

* The category "All malignant cancers" included *in situ* bladder cancers.

** Methodology for the assignment of Hodgkin lymphoma and non-Hodgkin lymphoma was modified beginning in reporting period 2001-2005 to include consideration of histology as well as primary site. Incidence rates for these two types of cancer increased as a result of this change.

**APPENDIX D
DELAWARE POPULATION ESTIMATES: 1980–2005**

Years	TOTAL POPULATION																	Total	
	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+
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
1996–2000	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
1997–2001	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
1998–2002	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
1999–2003	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
2000–2004	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
2001–2005	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
2002–2006	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

SOURCE: Delaware Population Consortium, October 2009.

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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	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
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	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
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	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
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	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
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

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	1,333,910
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	67,187	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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	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
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

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	37,934	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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	68,509	71,176	77,157	71,577	69,120	56,766	60,849	67,403	67,128	59,057	48,388	35,892	26,367	20,800	16,146	11,841	7,995	6,499	842,670
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	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
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

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	28,040	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
1996-2000	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
1997-2001	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
1998-2002	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
1999-2003	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
2000-2004	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
2001-2005	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
2002-2006	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

SOURCE: Delaware Population Consortium, October 2009.

APPENDIX E BEHAVIORAL RISK FACTORS

The Behavioral Risk Factor Surveillance System (BRFSS) survey was developed to monitor the statewide prevalence of behavioral risk factors among adults that relate to 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 annually 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.

Data related to specific cancers are included in those sections of this report (e.g., smoking prevalence is in the lung cancer section, mammogram prevalence is in the breast cancer section).

In Delaware, BRFSS is a collaborative effort between Delaware's Division of Public Health (DPH) and the CDC. The data provided below relate specifically to risk factor prevalence and cancer screening practices among Delawareans. More information about Delaware's BRFSS is available at the state website:

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

General information on the national BRFSS is available at <http://www.cdc.gov/brfss/>.

Overweight/Obesity

Being overweight or obese is a risk factor for several cancers, including female breast (in postmenopausal females), 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 2008 BRFSS:

- In Delaware, 63.8 percent of adults ages 18 and over were overweight or obese. At the national level, 63.2 percent of adults were overweight or obese. This difference was not statistically significant.
 - The prevalence of overweight/obese people in Delaware differed significantly by sex: 70.4 percent of males and 57.4 percent of females were overweight or obese.
 - Significantly more Delawarean African Americans were overweight/obese than Caucasians (75.1 percent vs. 63.0 percent, respectively).
 - The state's prevalence of overweight/obese was highest among adults ages 30 to 79 years (68.7 percent). This number was significantly higher than the percent of overweight/obese adults ages 18-29 (49.7 percent) and those age 80 and older (48.0 percent).
 - In Kent, New Castle and Sussex counties, 68.0 percent, 60.8 percent and 68.5 percent of adults, respectively, were overweight/obese.
 - No significant differences in overweight/obese prevalence were observed by education level or income level.

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, as well as improved overall well-being.

BRFSS questions examine the intensity, duration and frequency of activity reported by respondents. Respondents are considered “physically active” if they engage in 30 or more minutes of moderate activity at least five days per week or 20 or more minutes of vigorous activity at least three days per week. Physical activity questions are included in the BRFSS survey on an alternating-year basis; therefore, no physical activity data are available for 2008.

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. Dietary behavior questions are included in the BRFSS survey on an alternating-year basis; therefore, dietary behavior data are not available for 2008. According to 2007 data, however, only 21.4 percent of Delawareans reported eating five or more servings of fruits and vegetables on a daily basis.

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 BY CENSUS TRACT METHODOLOGY

Geocoding Validation Process

When a cancer case is submitted to the Delaware Cancer Registry (DCR), geocoding software assigns the case to a census tract based on patient address at time of diagnosis. The accuracy of census tract assignment is entirely dependent on the accuracy and quality of patient address data. Several street address issues increase the likelihood of incorrect census tract assignment. For example, incorrectly spelled street names, multiple streets with

the same name, incorrect or missing directional street information (e.g., North vs. South), and recently created streets that are not yet embedded within the geocoding software may result in inaccurate census tract assignment. Cancer cases with non-physical addresses (e.g., rural route and P.O. Boxes) are also difficult to accurately assign to census tracts.

Accurate census tract assignment is necessary for valid rate calculation at the census tract level. Therefore, prior to incidence rate calculation, the Delaware Division of Public Health (DPH) and the DCR conducted a multi-phase data validation process designed to verify that cancer cases had been accurately assigned to the census tract in which they were diagnosed.

The geocoding validation process included all cancer cases diagnosed in Delaware in 2002-2006. The first phase involved a case-level quality review of street address data. DCR staff began by correcting obvious street misspellings. Next, using Accurint[®], a Lexis Nexis[®] service, DCR staff assigned a valid physical street address to P.O. Box addresses where possible. DCR staff also used Accurint to assign a valid physical street address to rural addresses where possible.

Next, DCR submitted a data file containing the remaining rural address cases to BCC Data Services. BCC Data Services utilized LACSLink software, which supports the conversion of rural addresses to street addresses. Using LACSLink, BCC Data Services successfully assigned valid physical street address data to an additional 66 cases with rural address data.

The second phase of the validation process focused on improving the accuracy of existing census tract data. Although the majority of DCR records had previously been assigned to a census tract when they were originally submitted to the DCR, the original census tract variable was associated with a fair degree of unreliability. To facilitate review of census tract data, the DCR contracted with Tele Atlas, a provider of digital map services. Tele Atlas performed a thorough check of the entire 2000-2006 cancer data file. Census tract data were corrected for N=3,950 cases that had previously been assigned to an incorrect census tract. Following receipt of the appended data file from Tele Atlas, the DCR conducted a final quality review of the file and updated their files accordingly.

Preliminary Analyses

Preliminary analyses were performed on one raw data file created for DPH by the DCR; the file included all cancer cases diagnosed in Delaware between January 1, 2002 and December 31, 2006 (N=24,854).

Per reporting guidelines mandated by the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute, cancer incidence rates *exclude* benign tumors, non-urinary bladder *in situ* tumors, and basal and squamous cell cancers. However, state cancer registries may still collect data on these tumors for tracking purposes. Therefore, the raw data file was analyzed to identify cases belonging to one of these categories. A total of 2,094 cases of benign tumors, non-urinary bladder *in situ* tumors, and basal and squamous cell cancers were eliminated from the file. Cases involving malignant tumors, as well as cases involving tumors with an unknown behavior code, were retained for further analyses.

The remaining 22,760 records were sorted by the variable "census tract certainty" (CTC). CTC codes are assigned using the following scale:

- **1** = Census tract assignment was based on complete and valid physical street address
- **2** = Census tract assignment was based on residence ZIP + 4
- **3** = Census tract assignment was based on residence ZIP + 2
- **4** = Census tract assignment was based on residence ZIP code only

Because they were assigned to a census tract based on complete street address data, cases with CTC=1 were considered to have the most accurate census tract data. Alternately, cases with a CTC > 1 were assigned to a census tract using the best available address data. If a physical street address was not available, the case was assigned to a census tract using a variation of the 5-digit ZIP code data. Cases with CTC=2 were considered to have the second-most accurate census tract data because census tract assignment was based on the extended ZIP + 4 code; this code provided a more precise geographic location than did the 5-digit ZIP code alone.

Correspondingly, cases with CTC=3 or 4 were considered to have comparatively less accurate census tract data as census tract assignment was based on less specific variations of ZIP code data (ZIP+2 and ZIP code only, respectively).

A total of 707 cases had a CTC value > 1; these cases were pulled for individual review by DPH epidemiologists. Using publicly-available online map tools (e.g., Google Maps, MapQuest, and American Fact Finder (a service of the United States Census Bureau)), DPH epidemiologists re-assigned 55 of the 707 cases to a valid census tract; the CTC codes for these 55 cases were changed to 1 in the master data file. For another 53 cases, DPH epidemiologists confirmed the initial census tract assignment as accurate; the CTC codes for these cases were also changed to "1" in the master data file.

The remaining 599 records with CTC > 1 had incomplete or ambiguous address data, including P.O. Boxes, rural addresses, or unmappable street addresses. These 599 cases could not be accurately assigned to the census tract in which they were diagnosed; therefore, these cases were excluded from rate calculations at the census tract level. However, these 599 cases were retained for rate calculation at the state level. Table 1, below, shows the distribution of excluded cancer cases, by county of diagnosis.

Table 1: Excluded Cancer Cases, by County of Diagnosis

County	Number of Cases Excluded
New Castle	71
Kent	57
Sussex	471
Total	599

Note that Sussex County was disproportionately represented in the 599 cases excluded from census tract analyses. As a result, 2002-2006 incidence rates for Sussex County census tracts are suppressed to a greater extent than are incidence rates for census tracts in New Castle and Kent Counties.

In the future, fewer cases will be excluded from rate calculations due to unmappable street addresses. The DCR has developed new protocol to ensure that when cases with P.O. Box and rural addresses are first reported to the registry, they are immediately flagged for additional follow-up and supplementation with physical address data.

Calculating Five-Year Population Estimates, by Census Tract

Delaware is subdivided into 197 census tracts. Note that census tracts do not follow a consecutive numbering scheme. New Castle County includes tracts 1.00 through 169.02. Kent County is comprised of tracts 401.00 through 431.00, and Sussex County includes tracts 501.01 through 519.00.

Census tract populations were calculated using estimates from the Delaware Population Consortium (DPC) and the 2000 Census. DPC census tract population estimates were available for all years 2002 through 2006. DPH staff used 2000 Census data to calculate the proportion that each 5-year age group contributed to the overall census tract population. These proportions were applied to DPC-based census tract estimates to yield annual population estimates by census tract, broken down by 5-year age groups. DPH staff repeated this process for male and female populations to obtain gender-specific 2002-2006 population estimates by 5-year age groups for each census tract.

Denominators for years 2002 through 2006 were summed to obtain the 2002-2006 population for each census tract. Five-year (2002-2006) population estimates ranged in size from 3,132 for Census Tract 10 to 65,136 for Census Tract 148.06. Both of these census tracts are located in New Castle County.

Calculating Age-Adjusted Incidence Rates, by Census Tract

Census tract-level incidence rates were calculated from a modified dataset including N=22,161 cases diagnosed between 2002 and 2006¹. Within the cancer data file, cross-tabulations (age group x census tract) were performed to determine the number of cancer cases diagnosed by census tract and the age groups in which they were diagnosed. These frequencies were used to calculate crude and age-adjusted 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 demographic characteristics of the population. Age-adjusted incidence rates take

¹ The modified sample size reflected the N=599 cases that were eliminated from census tract-level analyses because they could not accurately be assigned to the census tract in which they were diagnosed.

into account the age distribution of the population at risk; age-adjusted incidence rates are useful for comparing rates between two populations that differ in age composition.

To calculate crude incidence rates, the number of cancer cases diagnosed in a particular age group in a particular census tract was divided by the population size for that specific cohort; these values were then multiplied by 100,000 (see Equation 1). To determine the 2002-2002 crude incidence rate for an entire census tract, the number of cancer cases diagnosed in a census tract over the 5-year period was divided by the total population of the census tract for the same 5-year period, and this value was multiplied by 100,000.

Equation 1: 2002-2002 Crude All Site Incidence Rate, 40-44 year olds, Census Tract 425.00

$$\frac{(\text{No. cancer cases (2002 – 2006) among 40 – 44 year olds in CT425.00})}{(\text{2002 – 2006 population, 40 – 44 year olds in CT425.00})} = \frac{(2)}{(1195)} \times 100,000 = 167.3 \text{ per } 100,000$$

To calculate age-adjusted incidence rates, crude incidence rates for each age group were multiplied by the appropriate 2000 U.S. Standard Million Population weight². Table 2 displays the U.S. Standard Million population weights, by age group. Age-adjusted incidence rates for each of the 18 age groups were summed to yield the age-adjusted incidence rate for an entire census tract.

Table 2: U.S. Standard Million Population Weights, by Age Group

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

Source: Centers for Disease Control and Prevention, National Center for Health Statistics

Calculating the Age-Adjusted Incidence Rate for the State of Delaware

The average annual age-adjusted cancer incidence rate for the state of Delaware was calculated from the full dataset including N=22,161 cases diagnosed between 2002 and 2006. Cross-tabulations (age group x census tract) were performed to determine the number of cancer cases diagnosed in the state and the age groups in which they were diagnosed. Using the process described above, frequencies were used to calculate crude and age-adjusted incidence rates at the state level.

Calculating 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

² Published by the Centers of Disease Control and Prevention and the National Center for Health Statistics.

of this, a confidence interval is sometimes called the “margin of error.” Confidence intervals were calculated for all census tract-level incidence rates, as well as for the state incidence rate.

When incidence rates were based on more than 100 cases, 95% confidence intervals were 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 = the age-adjusted incidence rate for a particular census tract.

When incidence rates were based on fewer than 100 cases, 95% confidence intervals were 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 = the age-adjusted incidence rate for a particular census tract, and L and U = values published by the National Center for Health Statistics for the specific purpose of calculating 95% confidence intervals for rates computed from fewer than 100 cases³.

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 large degree of uncertainty.

The width of a confidence interval is influenced by two factors: (a) the number of cancer cases in the population under consideration 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 very large population in which many cases were diagnosed, we would expect the confidence interval for the rate will be very narrow.

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 the incidence rate in one area overlaps with the confidence interval for an incidence rate in another area, the rates are not significantly different from one another. Researchers interpret a non-significant difference as “no meaningful difference” between rates. Even though the two rates 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.

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 significantly different. When the rate for one area is significantly different from the rate for another area, the difference between the rates is larger than would be expected by chance alone.

DPH compared the all-site incidence rate for each census tract to the all-site incidence rate for the state of Delaware. This allowed DPH to identify any census tracts with incidence rates that are higher or lower than the incidence rate for Delaware as a whole. If the confidence interval for a census tract incidence rate overlapped with the confidence interval for the state incidence rate, the census tract rate was not significantly different from the state rate. If the confidence interval for a census tract rate did not overlap with the confidence interval for the state

³ 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.

rate, the census tract rate was 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 and all color-coded maps.

Supplemental Information

Incidence rates for nine census tracts were based on fewer than 25 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 very wide confidence interval. When confidence intervals are wide, they are more likely to overlap with the confidence intervals of incidence rates from other areas; this means that it is more difficult to establish a significant difference between incidence rates. For this reason, rates based on fewer than 25 cases should especially be interpreted with caution. To assist interpretation, incidence rates calculated from fewer than 25 cases are denoted in both the rate table and color-coded maps.

APPENDIX H INTERPRETING CANCER RATES BY CENSUS TRACT

In brief:

- Cancer rates in census tracts will change year to year because of the small population in those census tracts. For this reason, the rates are uncertain, subject to fluctuation 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. This is a standard statistical method.
- Only if the confidence intervals of the cancer rate in a census tract and the state as a whole do not overlap, can we say that there is enough confidence to call the rate in the census tract significantly different from the state.
- 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. You should look at that table to determine if the rate in a particular census tract is significantly different from the state.

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 year, it would not be unusual to find the comparison different (perhaps even reversed) the following year. In Delaware, we publish 5-year cancer rates (for example, 2001-2005) to allow for better understanding of cancer patterns among small populations. Cancer rates for 5-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 big, there is a lot of uncertainty in the cancer rate. If the difference between the upper confidence limit and lower confidence limit is very small, there is not much uncertainty in the cancer rate at all.

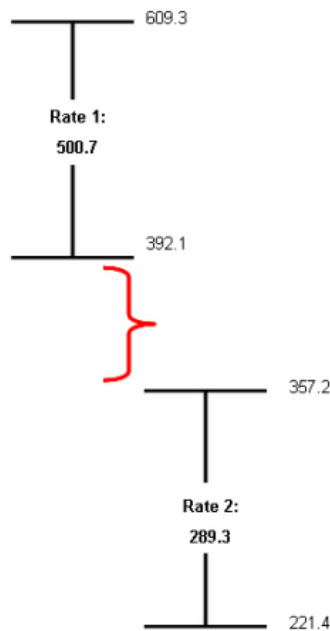
The width of a confidence interval depends on two things: (a) the number of people living in that area and (b) the number of cancer cases diagnosed in that area.

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. An even 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.

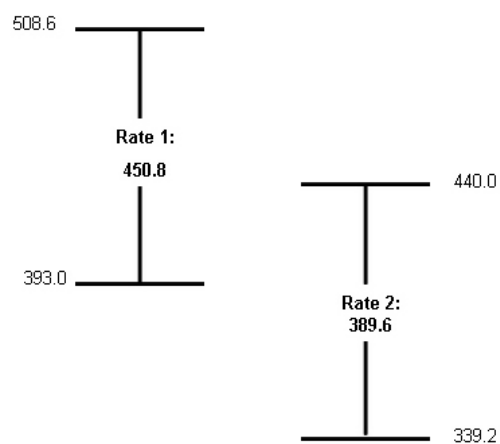
On the other hand, when a cancer rate is calculated for a very large area (like a state or a country), many people live in that area. The odds are that in such a large area, more people will have been diagnosed with cancer compared to a smaller area. When a cancer rate is calculated for a large area, 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 rates for census tracts to the cancer rate for the state of Delaware. This means that we were able to tell if any census tracts had a 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 very 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 over-estimate or under-estimate the actual rate of cancer in a census tract.

**APPENDIX I
2002-2006 CANCER INCIDENCE RATES BY CENSUS TRACT**

Yellow = Incidence rate is significantly **higher** than the state rate.

Blue = Incidence rate is significantly **lower** than the state rate.

* = Incidence rate is based on fewer than 25 cases.

Delaware 2002 – 2006 Average Annual Age-Adjusted All Site Cancer Incidence Rates, by Census Tract			
Census Tract	2002-2006 Average Annual Age-Adjusted All-Site Incidence Rate	Lower Confidence Limit	Upper Confidence Limit
1.00*	542.3	331.3	837.5
2.00	552.6	461.1	644.2
3.00	503.2	386.7	643.8
4.00	611.0	498.8	723.1
5.00	564.1	441.3	730.6
6.01	566.3	434.1	725.9
6.02	725.4	595.6	855.2
7.00*	656.5	358.9	1101.5
8.00*	267.0	138.0	466.4
9.00	617.6	448.7	829.0
10.00*	505.0	268.9	863.5
11.00	268.3	222.0	314.6
12.00	317.8	224.9	436.2
13.00	368.9	305.0	432.8
14.00	437.9	345.6	547.3
15.00	504.4	396.1	633.2
16.00	515.5	378.8	685.5
17.00	527.7	423.2	632.2
19.00	574.4	387.5	819.9
20.00*	538.6	294.4	903.7
21.00	592.7	442.6	777.2
22.00	571.2	415.0	766.8
23.00	619.0	471.2	798.4
24.00	455.7	373.8	537.6
25.00	599.0	485.2	731.5
26.00	581.0	466.0	715.8
27.00	515.3	352.5	727.5
101.01	476.4	383.0	569.7
101.02	507.0	405.0	626.9
102.00	671.6	513.7	862.7
103.00	602.8	489.9	733.9
104.00	534.9	439.6	630.2
105.00	499.1	423.6	574.6
107.00	580.5	480.7	680.3
108.00	444.8	374.0	515.5
109.00	435.2	347.1	538.8
110.00	591.5	486.6	696.5
111.00	503.4	406.2	600.7

112.01	619.2	474.8	793.8
112.02	706.8	579.8	833.8
112.03	622.3	515.4	729.3
112.04	529.3	432.2	626.5
112.05	755.2	597.9	941.2
112.06	589.6	499.7	679.6
113.00	453.3	365.0	556.6
114.00	481.8	399.6	564.0
115.00	524.9	423.2	643.8
116.00	515.4	423.6	607.2
117.00	509.3	432.9	585.6
118.00	387.9	325.2	450.6
119.00	385.4	319.4	451.4
120.00	604.0	508.9	699.1
121.00	486.2	388.3	601.1
122.00	670.4	556.9	783.9
123.00	485.5	369.6	626.2
124.00	529.9	433.9	626.0
125.00	594.3	503.6	685.0
126.00	481.9	384.9	595.9
127.00	651.0	557.9	744.0
129.00	560.1	460.3	659.9
130.00	608.0	472.1	770.8
131.00	703.7	565.8	864.9
132.00	525.8	407.5	667.7
133.00	579.2	457.8	722.9
134.00	481.3	380.5	600.7
135.01	445.2	391.7	498.6
135.03	662.0	569.8	754.2
135.04	740.4	633.4	847.4
136.04	566.3	461.4	671.2
136.07	496.1	419.5	572.7
136.08	604.6	450.2	795.0
136.09	453.6	392.6	514.7
136.10	553.3	456.3	650.3
136.11	461.4	376.0	546.9
136.12	584.1	484.5	683.8
136.13	615.9	517.3	714.4
137.00	611.7	493.7	749.4
138.00	436.2	357.1	515.2
139.01	673.8	541.1	829.2
139.02	846.0	724.1	967.9
140.00	738.3	608.4	868.3

141.00	610.7	500.5	720.9
142.00	440.7	321.4	589.7
143.00	455.0	377.6	532.3
144.02	429.2	338.2	537.3
144.03	432.0	338.6	543.2
144.04	491.2	393.9	605.1
145.01	421.5	284.4	601.7
145.02*	305.8	174.8	496.7
147.02	585.3	438.4	765.6
147.03	451.5	371.7	531.3
147.05	600.1	501.7	698.5
147.06	668.4	465.6	929.6
148.03	534.5	438.8	630.1
148.05	652.6	538.7	766.6
148.06	776.7	683.0	870.4
148.07	701.7	575.1	828.3
148.08	480.6	386.4	574.7
149.02	749.6	633.1	866.1
149.03	857.6	691.3	1051.8
149.04	545.6	442.2	649.0
149.05	540.3	454.2	626.5
150.00	604.3	496.6	711.9
151.00	565.3	468.5	662.1
152.00	634.4	535.8	733.0
154.00	614.7	498.5	749.9
155.00	577.8	452.9	726.5
156.00	674.9	537.5	836.6
158.00	669.5	510.9	861.8
159.00	687.6	559.7	815.5
160.00	864.4	700.9	1054.5
161.00	429.0	332.5	544.8
162.00	590.2	466.6	736.6
163.01	661.6	540.7	782.5
163.02	642.6	521.4	763.8
163.03	526.5	439.2	613.7
164.01	618.7	498.7	758.8
164.02	642.9	514.9	793.0
166.01	638.8	546.0	731.6
166.02	456.9	369.5	544.3
166.03	599.6	482.7	736.1
166.04	793.6	665.3	921.9
168.01	314.6	247.9	393.8
168.02	600.4	478.9	743.3

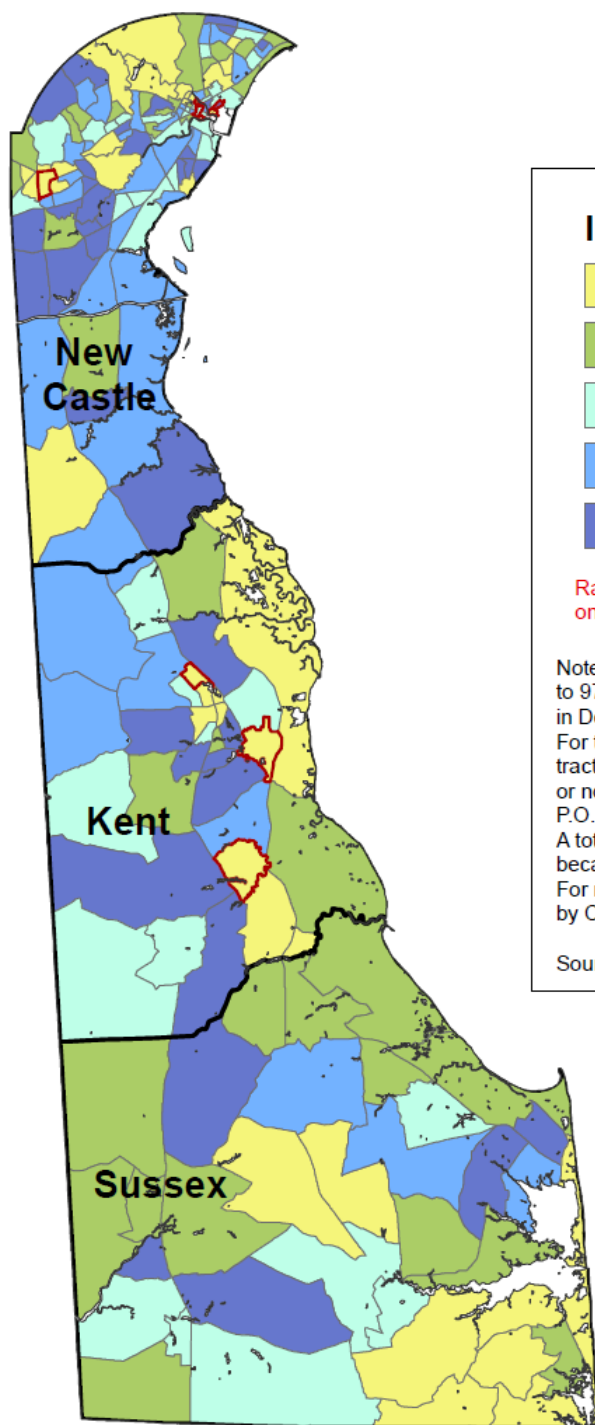
169.01	648.4	512.6	809.3
169.02	759.2	597.2	951.7
401.00	647.3	546.0	748.5
402.01	603.1	486.1	720.2
402.02	520.0	452.2	587.8
402.03	466.1	370.7	578.5
404.00	343.6	222.4	507.3
405.00	655.0	561.4	748.6
406.00*	171.0	103.0	267.1
407.00	522.9	430.5	615.3
408.00	439.8	359.4	520.2
409.00	300.3	240.2	370.9
410.00	515.6	424.9	606.4
411.00*	126.6	50.9	260.9
412.00	659.5	530.4	810.7
413.00	363.5	262.0	491.4
414.00	378.4	291.4	483.2
415.00	578.1	478.3	677.8
416.00	510.5	406.0	633.6
417.01	749.7	628.9	870.5
417.02	801.6	650.4	952.7
418.01	608.5	524.1	692.8
418.02	817.5	647.2	1018.9
419.00	621.3	512.4	730.2
420.00	581.4	452.3	735.7
421.00	504.4	405.1	620.7
422.01	691.7	574.6	808.8
422.02	593.3	498.3	688.2
424.00	510.2	407.0	631.7
425.00	420.6	327.9	531.4
426.00	435.4	337.4	553.0
427.00*	267.0	163.1	412.4
428.00	680.9	582.0	779.9
429.00	688.5	567.8	809.2
430.00	538.9	447.3	630.5
431.00	576.1	450.0	726.7
501.01	478.9	388.8	583.6
501.02	514.1	449.8	578.3
501.03	495.6	399.0	592.3
502.00	582.4	454.9	734.6
503.01	463.0	390.6	535.4
503.02	655.4	534.5	776.2
504.01	465.3	366.0	583.3

504.02	500.4	444.5	556.3
504.03	676.7	541.3	835.8
504.04	511.3	439.6	583.1
505.01	380.1	303.6	470.0
505.02	410.9	352.0	469.8
506.01	536.0	429.3	661.1
506.02	540.0	455.6	624.5
507.01	492.2	397.7	602.3
507.02	500.9	456.8	545.0
508.01	462.4	366.7	575.6
508.02	606.1	499.4	712.8
508.03	539.8	467.8	611.8
509.00	463.7	407.4	519.9
510.01	717.3	638.1	796.6
510.02	584.6	516.0	653.2
510.03	725.5	607.0	844.0
511.00	259.2	212.0	306.4
512.00	312.5	268.4	356.6
513.01	447.9	380.7	515.0
513.02	303.4	226.6	397.9
513.03	491.2	410.7	571.7
513.04	449.9	386.6	513.2
514.00	362.4	270.7	475.3
515.00	387.0	309.9	477.3
517.01	725.7	594.8	856.7
517.02	523.5	432.8	614.2
518.01	572.5	473.3	671.6
518.02	567.3	464.9	669.6
519.00	472.6	385.1	560.2
State of	507.0	500.4	513.6

APPENDIX J

**MAPS OF 2002-2006 CANCER RATES BY CENSUS TRACT,
COLOR CODED BY INCIDENCE RATE QUINTILES**

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006



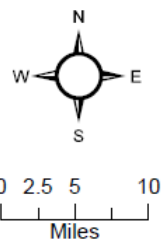
Incidence Rates

	126.65 - 453.64
	453.65 - 515.39
	515.40 - 581.35
	581.36 - 648.45
	648.46 - 864.37

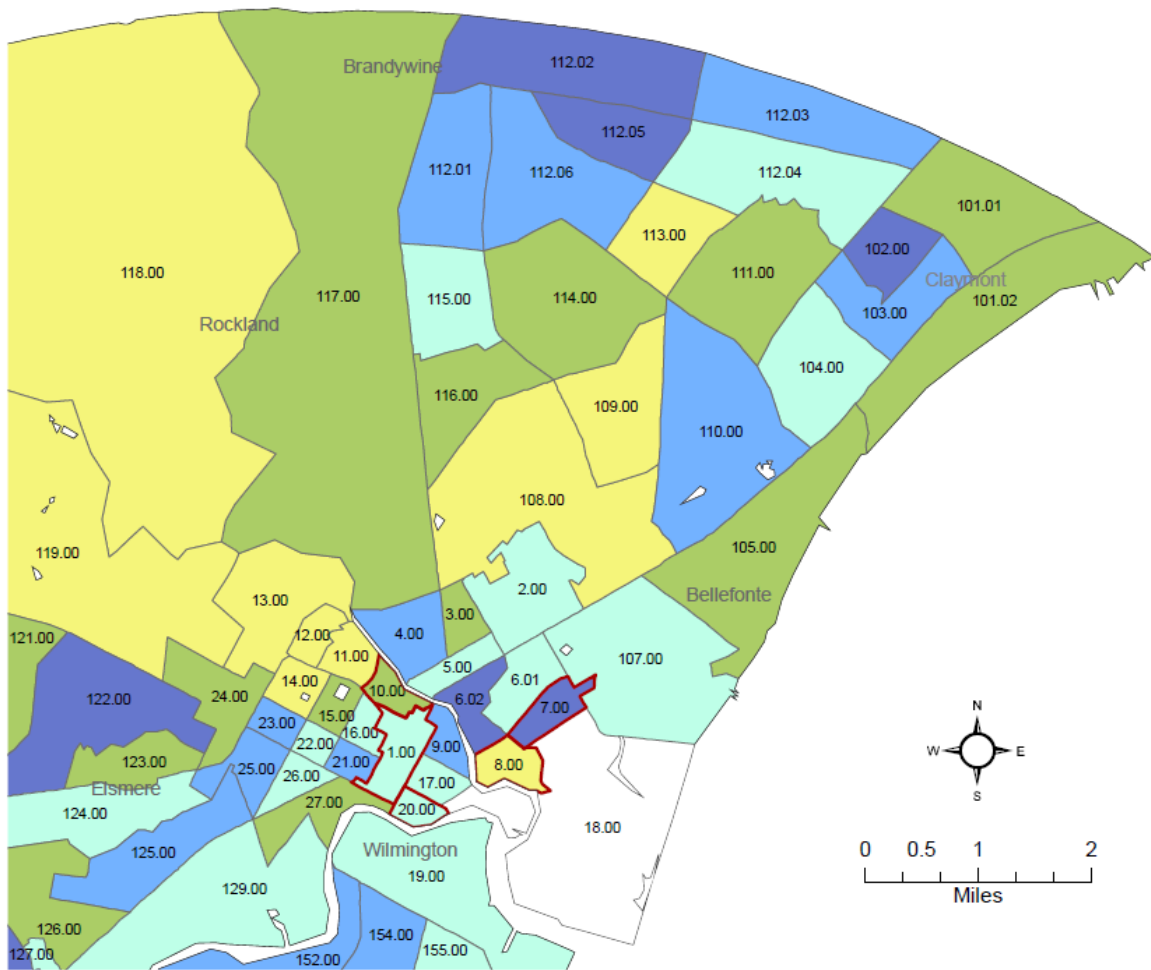
Rates for tracts bounded in red are based on fewer than 25 cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry



Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Wilmington and Northeastern New Castle County



Incidence Rates

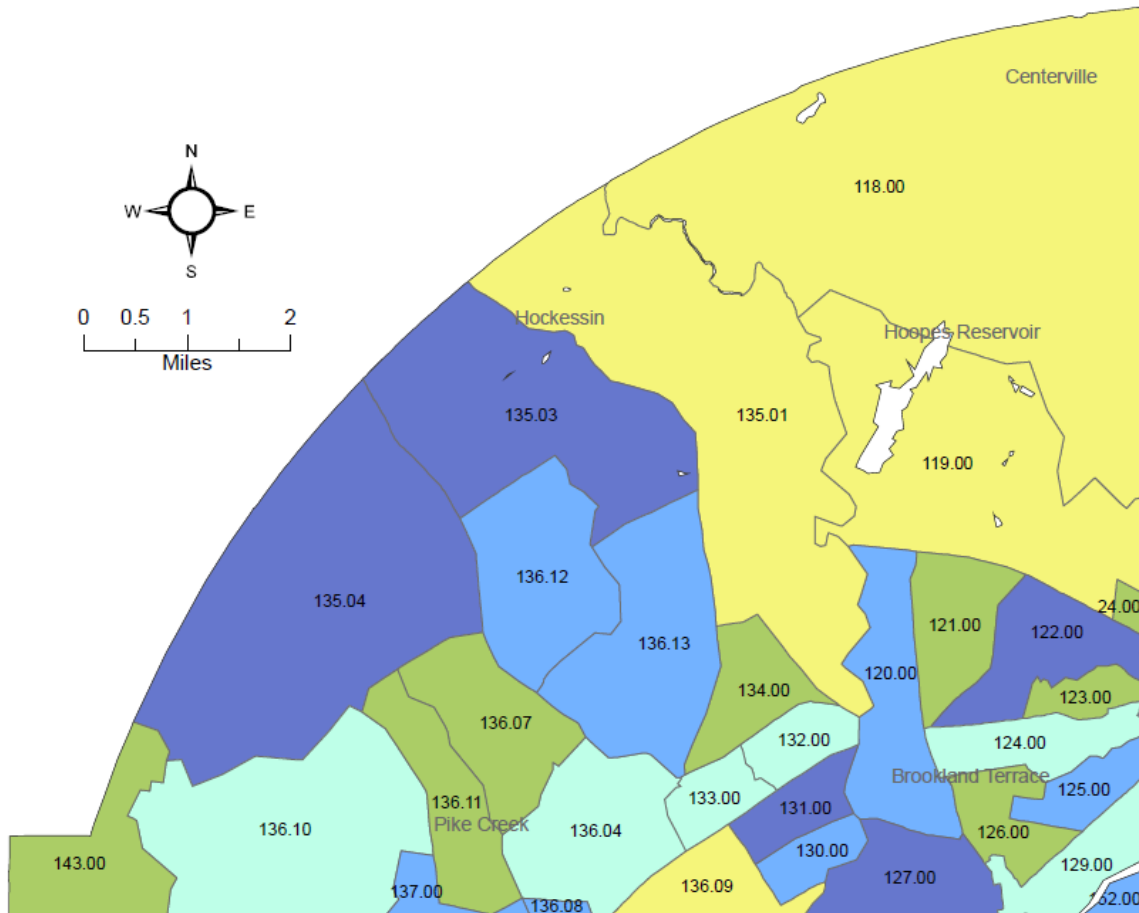
- 126.65 - 453.64**
- 453.65 - 515.39**
- 515.40 - 581.35**
- 581.36 - 648.45**
- 648.46 - 864.37**

Rates for tracts bounded in red are based on fewer than 25 cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Hockessin and Northwestern New Castle County



Incidence Rates

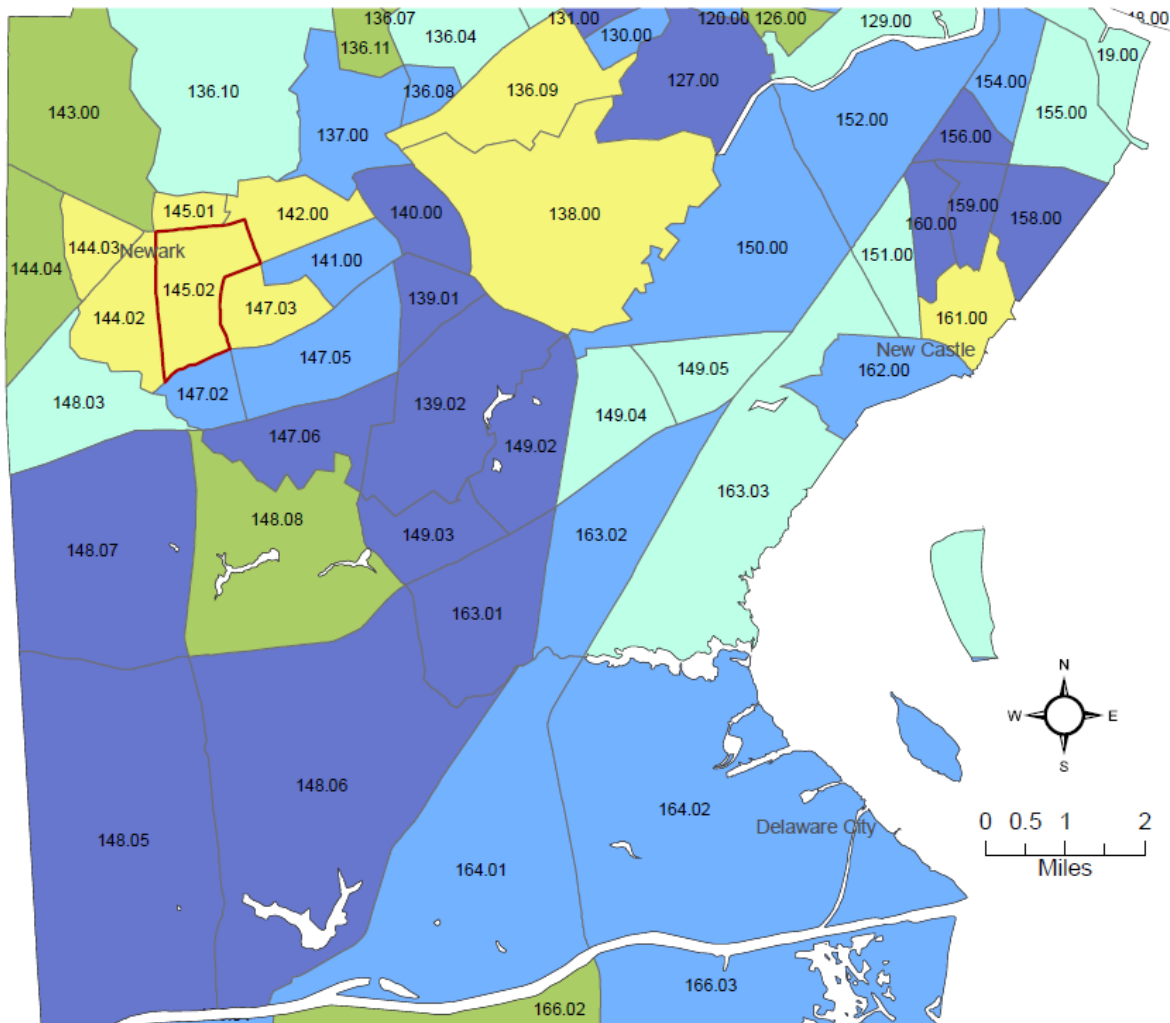
- 126.65 - 453.64
- 453.65 - 515.39
- 515.40 - 581.35
- 581.36 - 648.45
- 648.46 - 864.37

Rates for tracts bounded in red are based on fewer than 25 cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Newark, New Castle and Central New Castle County



Incidence Rates

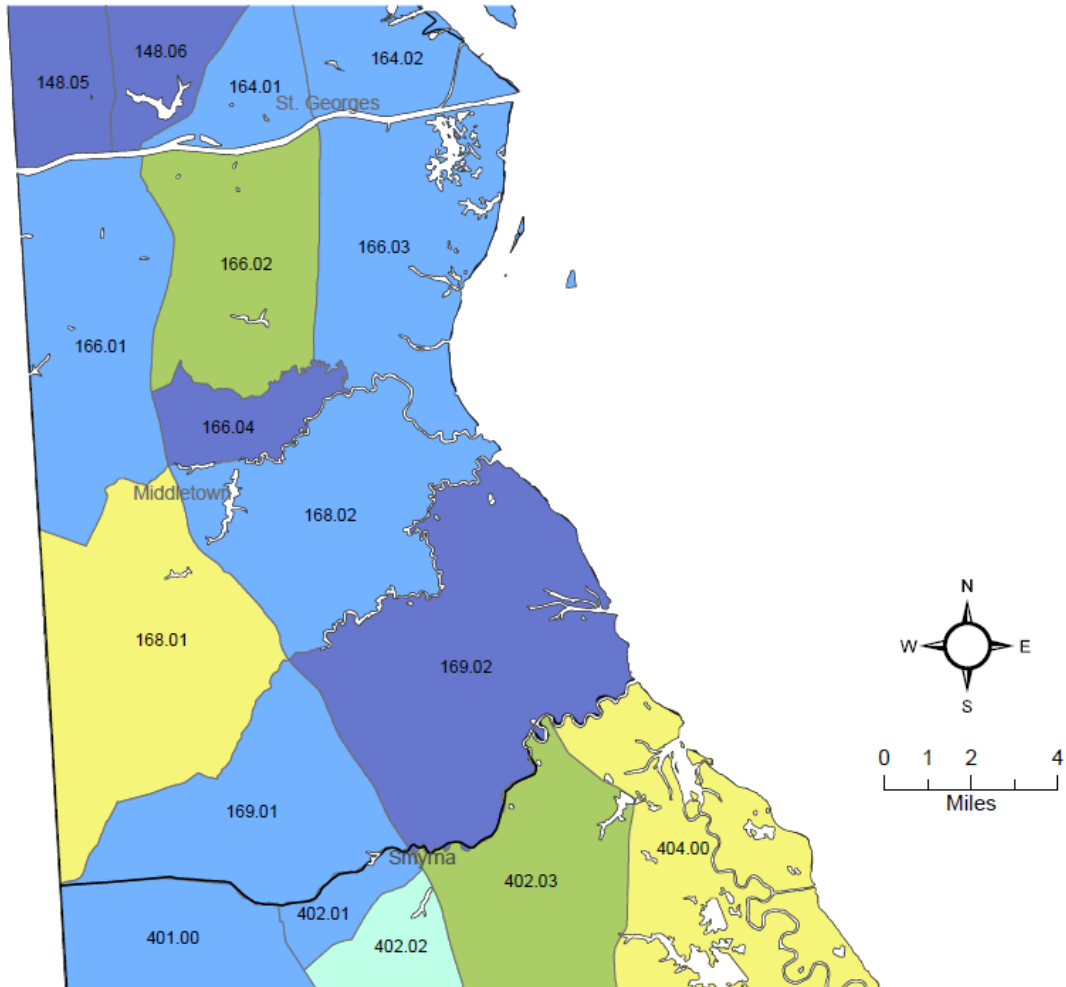
- 126.65 - 453.64
- 453.65 - 515.39
- 515.40 - 581.35
- 581.36 - 648.45
- 648.46 - 864.37

Rates for tracts bounded in red are based on fewer than 25 cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Southern New Castle County



Incidence Rates

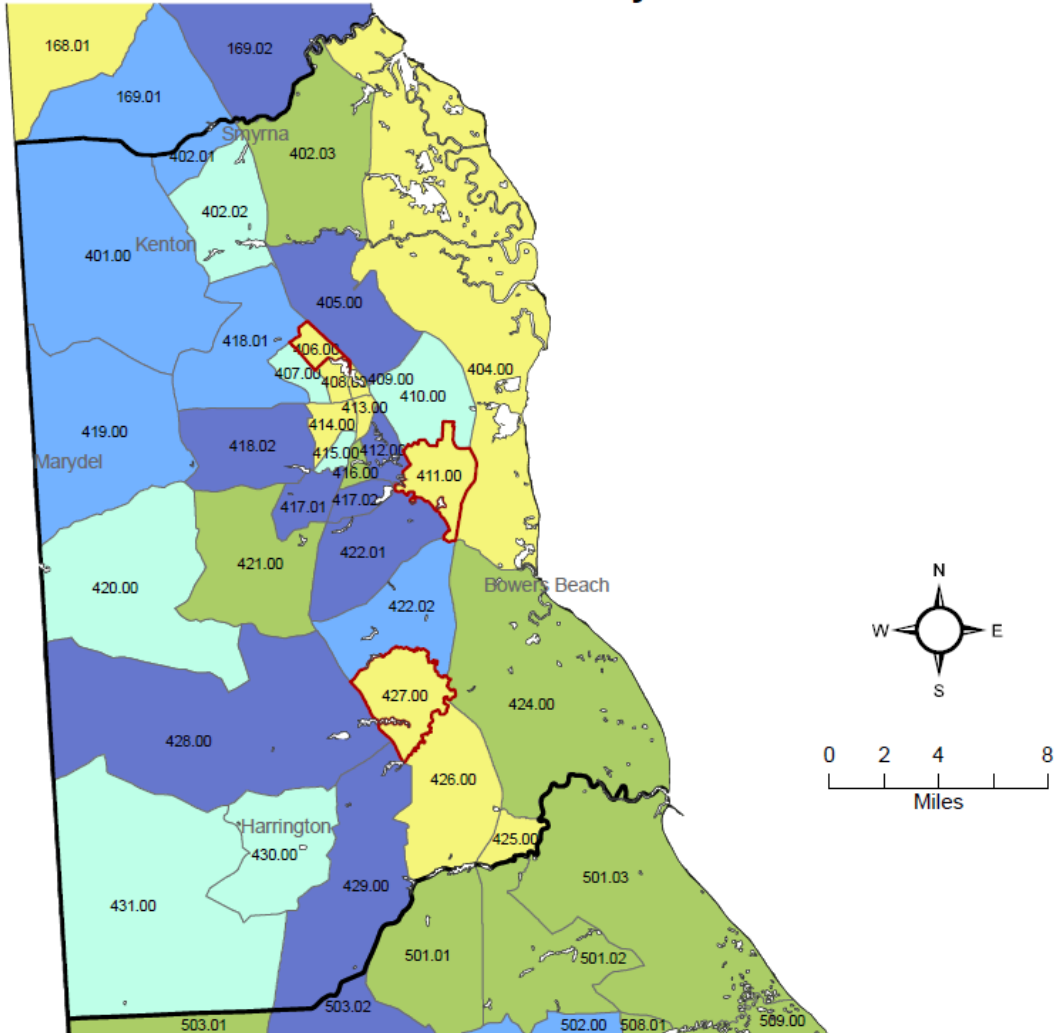
- 126.65 - 453.64
- 453.65 - 515.39
- 515.40 - 581.35
- 581.36 - 648.45
- 648.46 - 864.37

Rates for tracts bounded in red are based on fewer than 25 cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Kent County



Incidence Rates

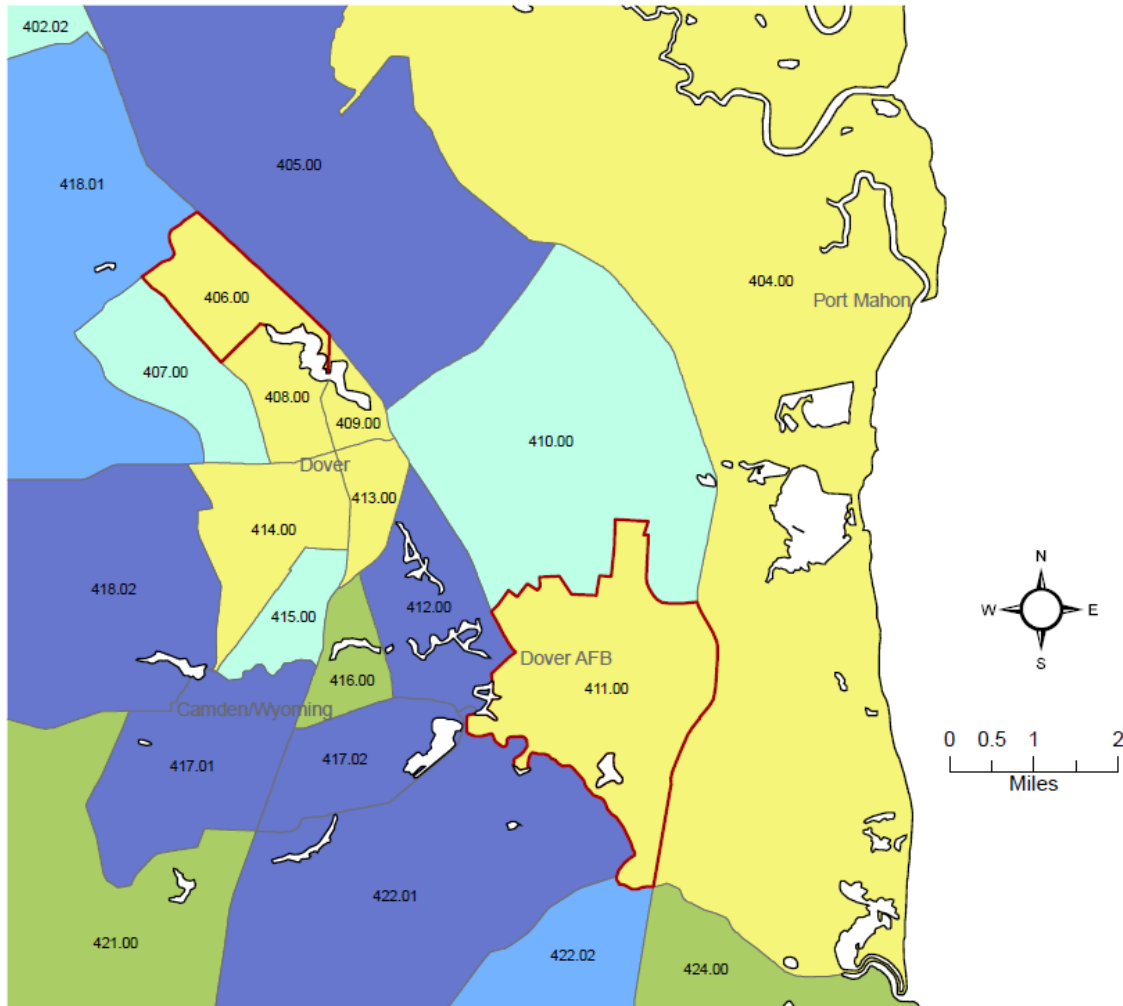
- 126.65 - 453.64
- 453.65 - 515.39
- 515.40 - 581.35
- 581.36 - 648.45
- 648.46 - 864.37

Rates for tracts bounded in red are based on fewer than 25 cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Greater Dover



Incidence Rates

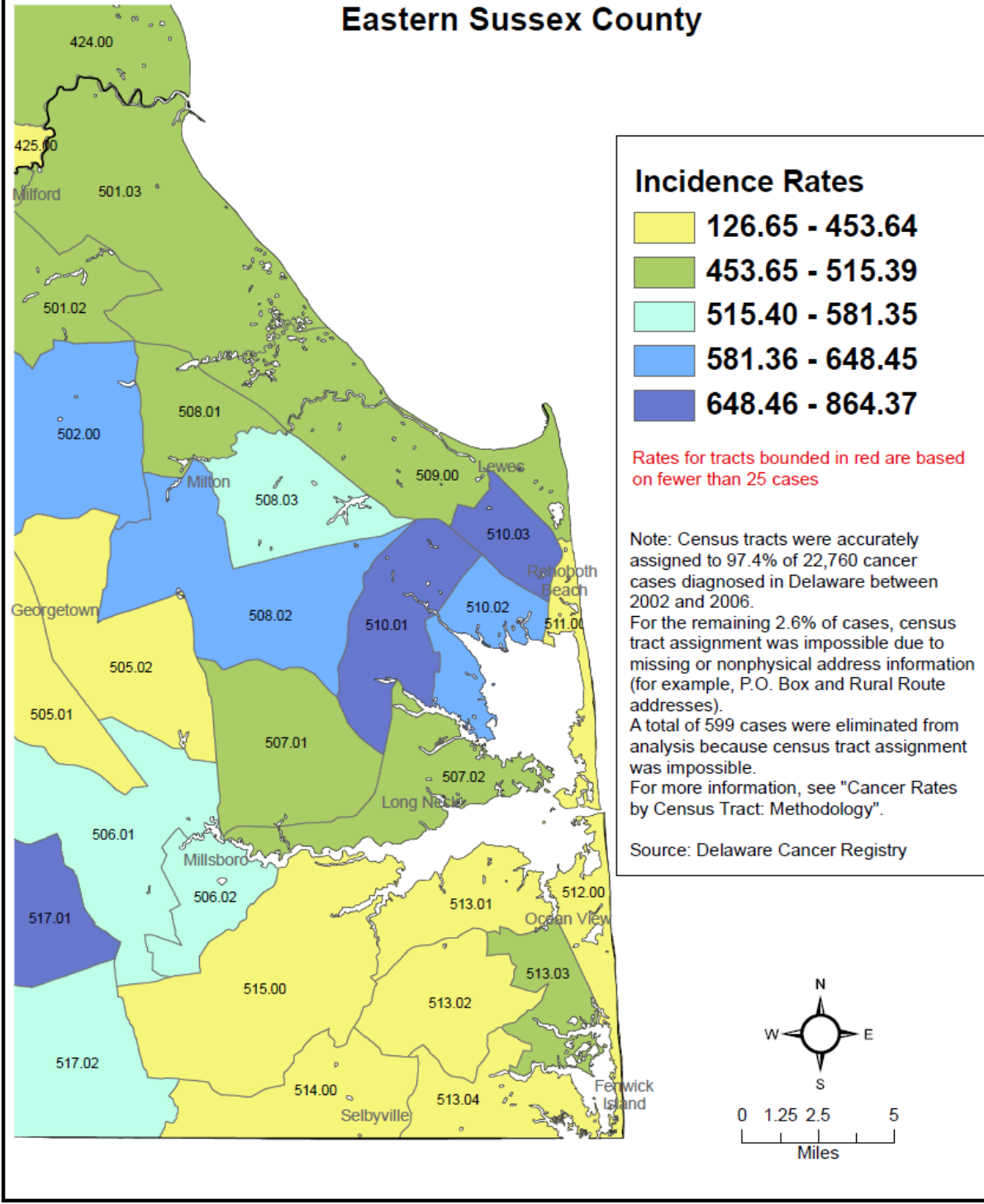
- 126.65 - 453.64**
- 453.65 - 515.39**
- 515.40 - 581.35**
- 581.36 - 648.45**
- 648.46 - 864.37**

Rates for tracts bounded in red are based on fewer than 25 cases

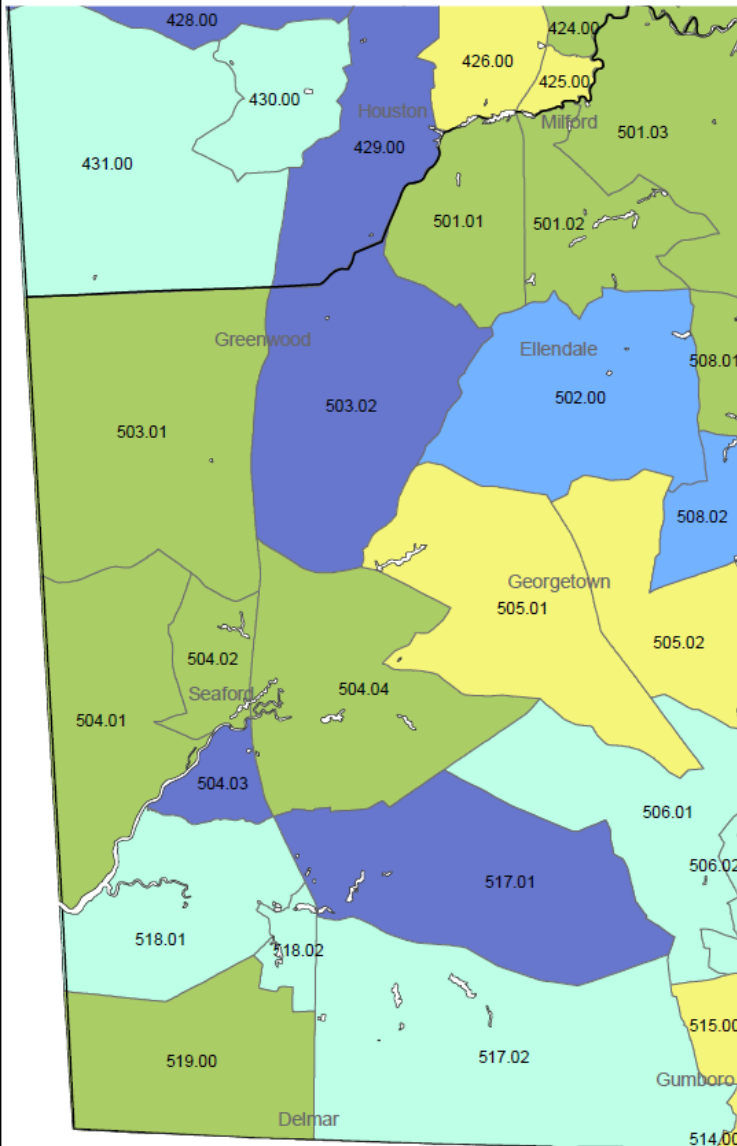
Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Eastern Sussex County



Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Western Sussex County



Incidence Rates

- 126.65 - 453.64
- 453.65 - 515.39
- 515.40 - 581.35
- 581.36 - 648.45
- 648.46 - 864.37

Rates for tracts bounded in red are based on fewer than 25 cases

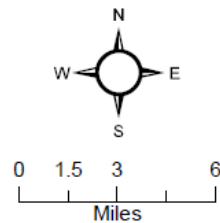
Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006.

For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses).

A total of 599 cases were eliminated from analysis because census tract assignment was impossible.

For more information, see "Cancer Rates by Census Tract: Methodology".

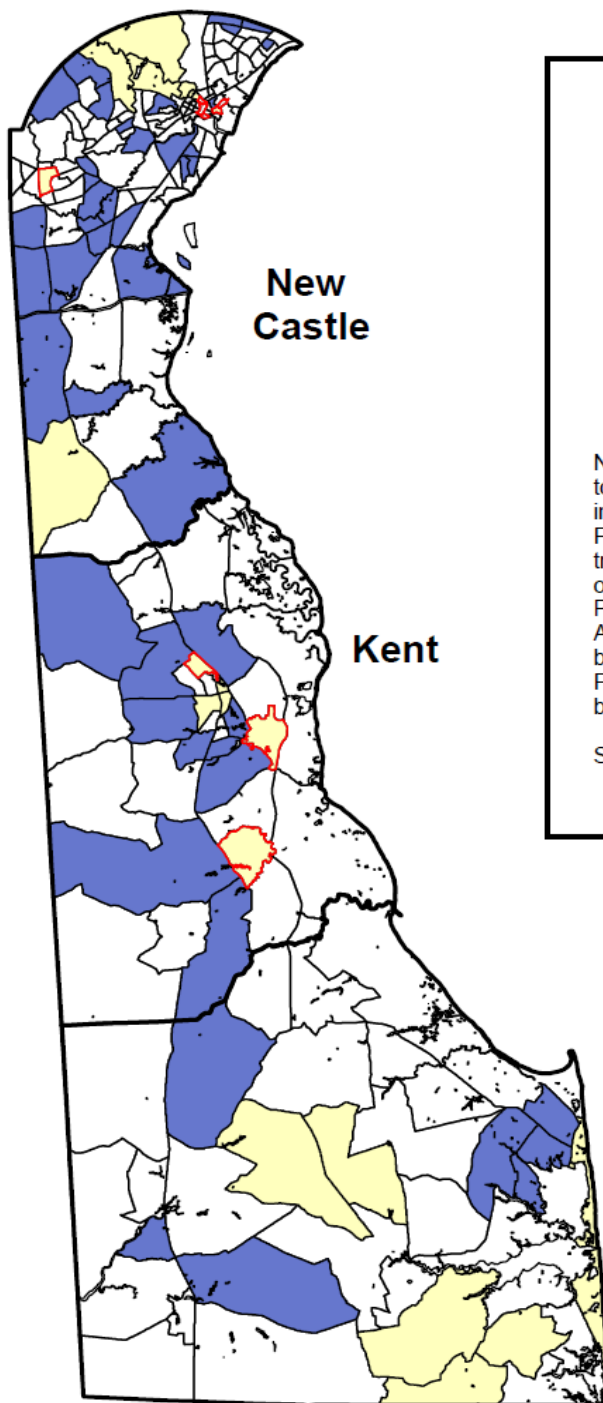
Source: Delaware Cancer Registry



APPENDIX K

**MAPS OF 2002-2006 CANCER RATES BY CENSUS TRACT,
COLOR CODED BY SIGNIFICANTLY HIGHER AND LOWER RATES COMPARED
TO STATE AVERAGE RATE**

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006



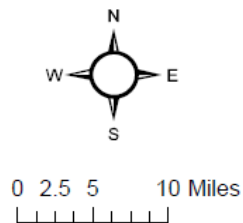
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer than 25 Cases

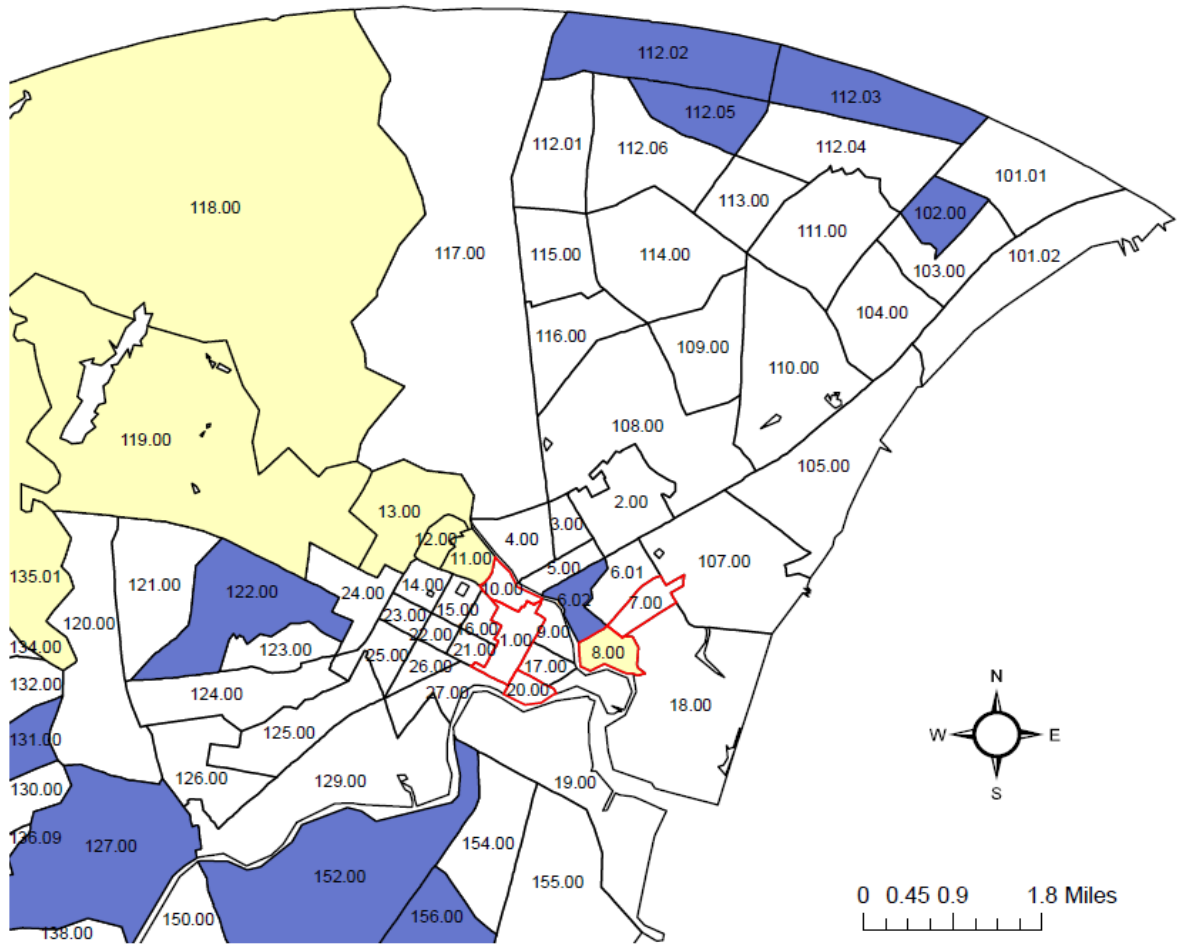
Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Sussex



Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Wilmington and Northeastern New Castle County



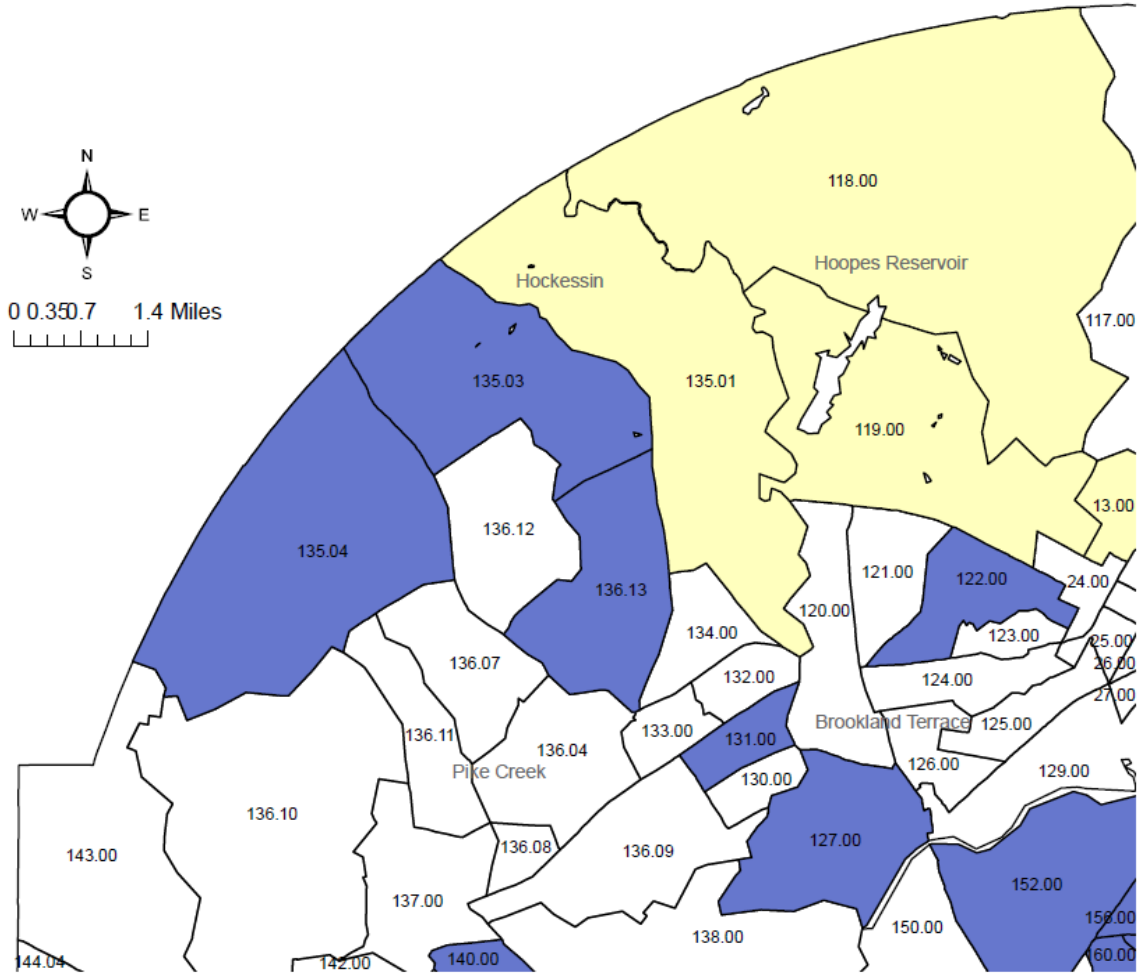
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer than 25 Cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Hockessin and Northwestern New Castle County



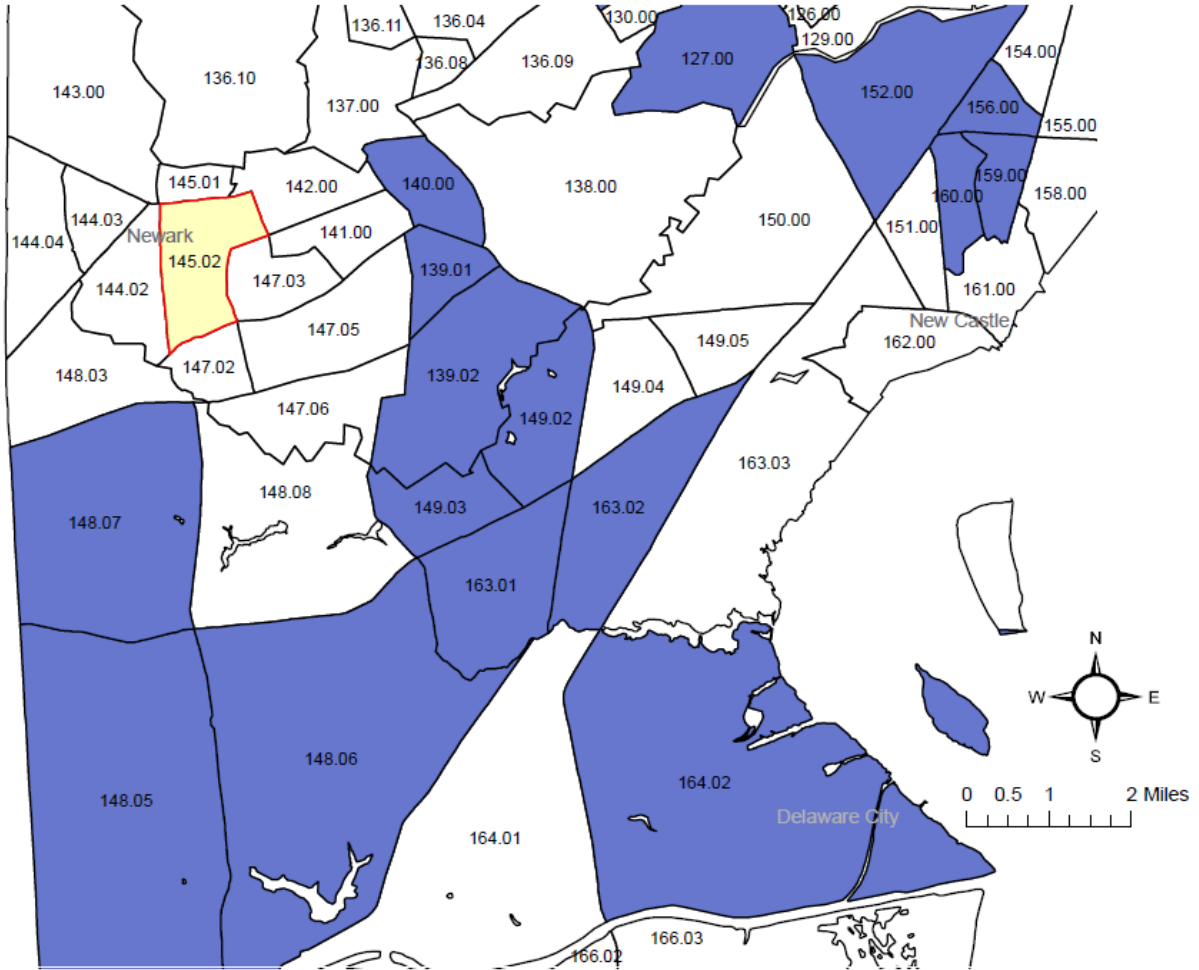
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer than 25 Cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Newark, New Castle, and Central New Castle County



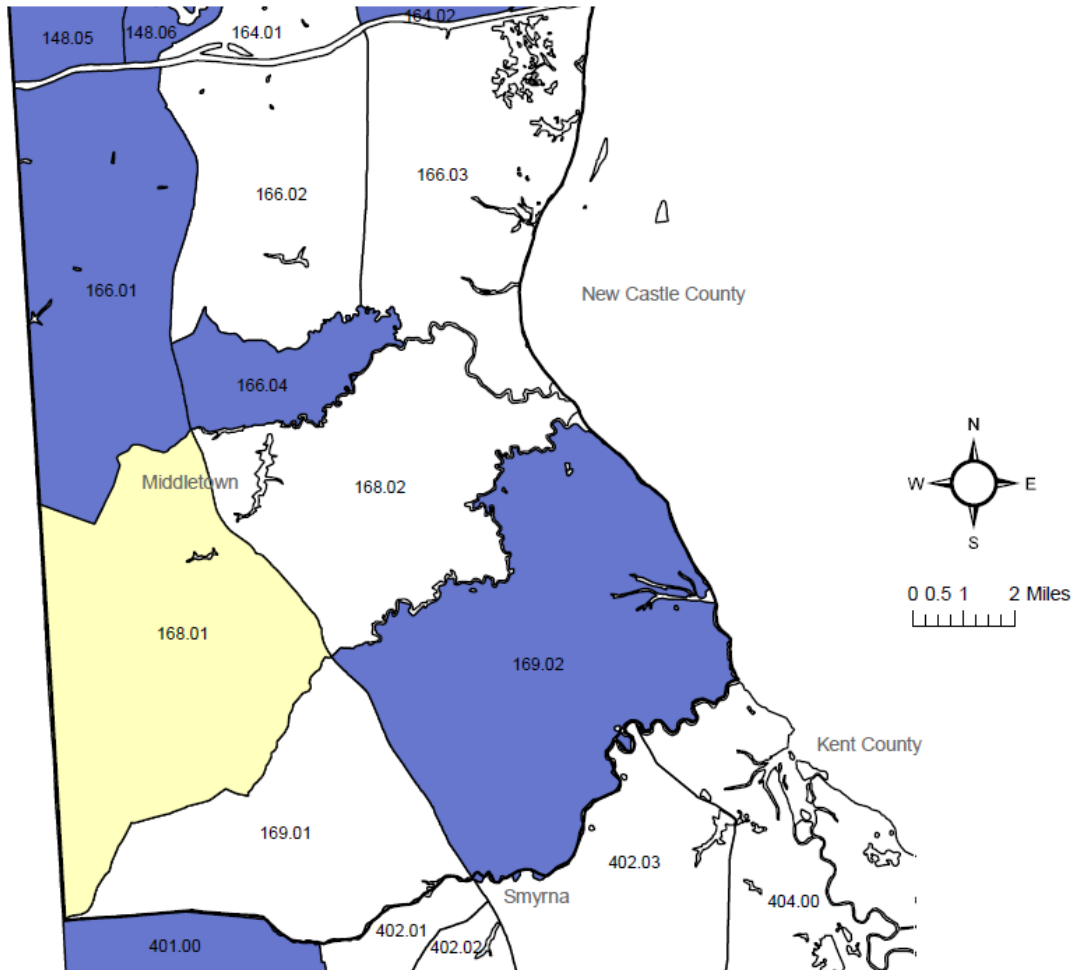
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer than 25 Cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Southern New Castle County



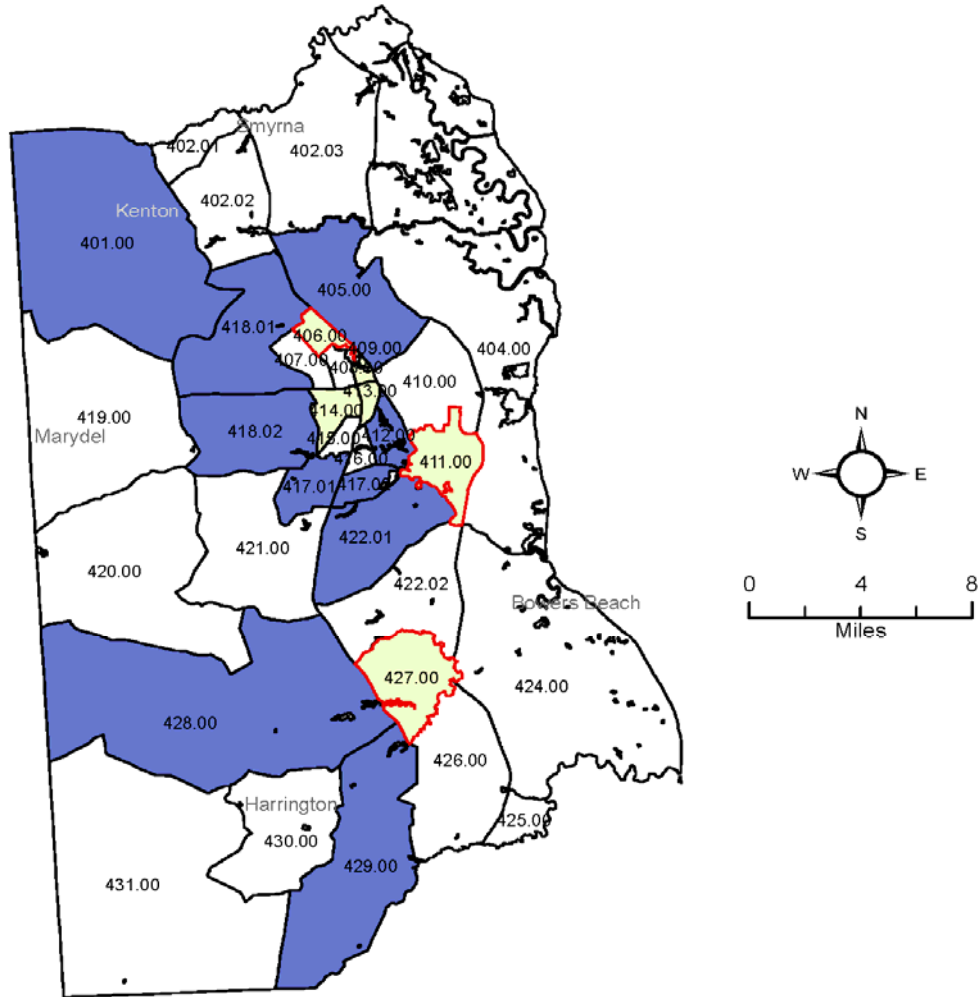
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer than 25 Cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Kent County



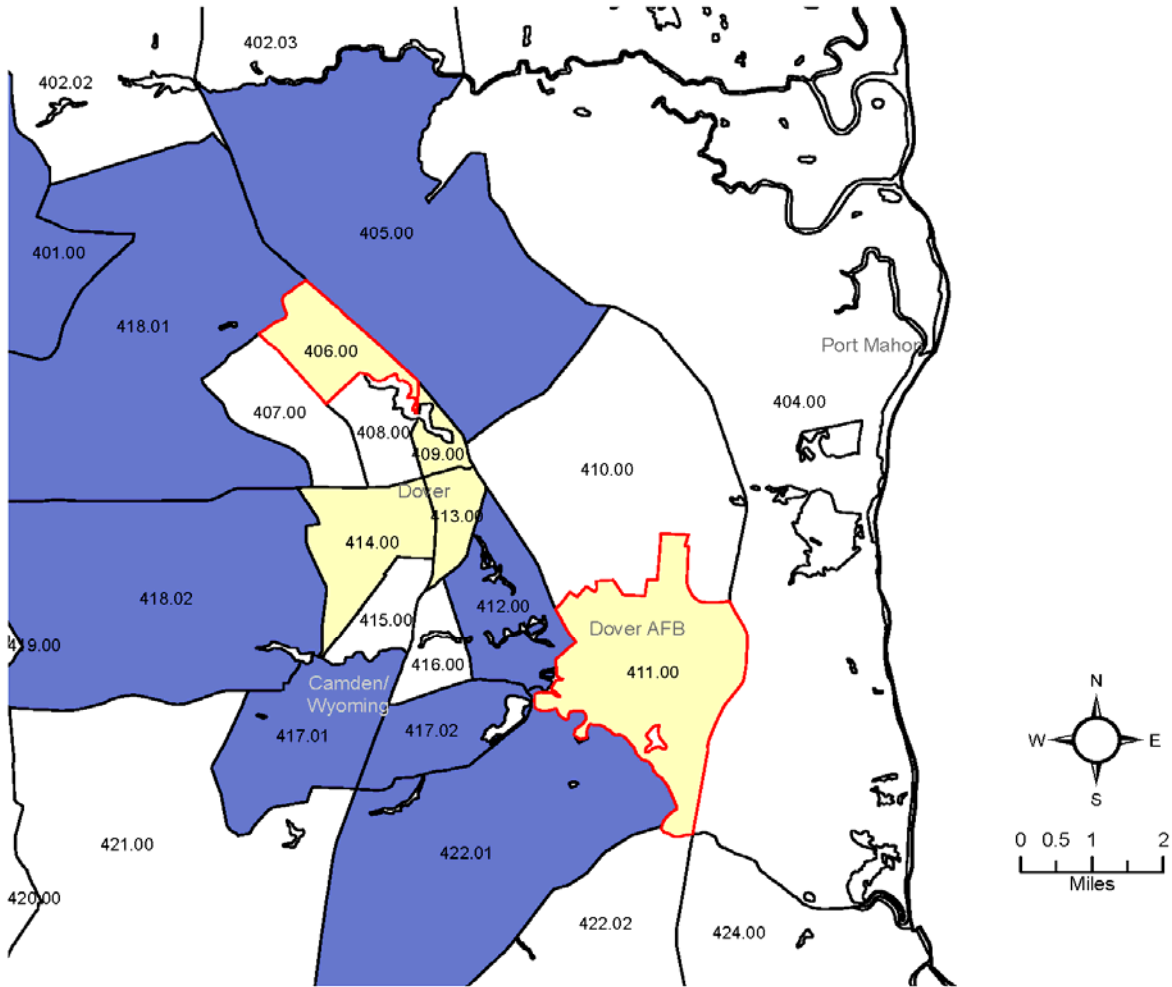
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer Than 25 Cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Greater Dover



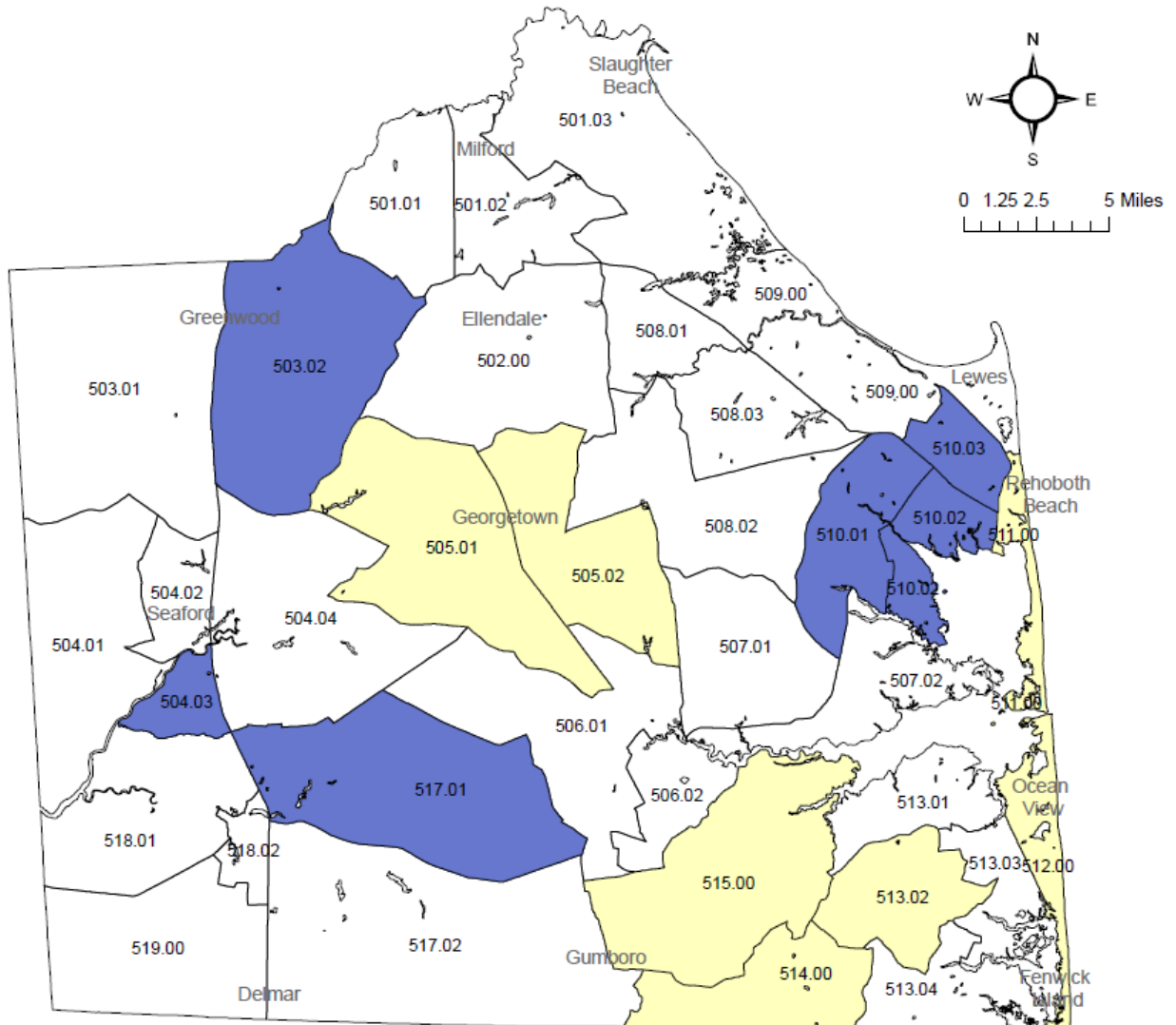
Legend

- Not significantly different
- Significantly Higher Rates
- Significantly Lower Rates
- Fewer than 25 Cases

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry

Delaware Five-Year Age-Adjusted Cancer Incidence Rates, by Census Tract, 2002-2006 Sussex County



Legend

- Significantly Lower Rates
- Significantly Higher Rates
- Not Significantly Different

Note: Census tracts were accurately assigned to 97.4% of 22,760 cancer cases diagnosed in Delaware between 2002 and 2006. For the remaining 2.6% of cases, census tract assignment was impossible due to missing or nonphysical address information (for example, P.O. Box and Rural Route addresses). A total of 599 cases were eliminated from analysis because census tract assignment was impossible. For more information, see "Cancer Rates by Census Tract: Methodology".

Source: Delaware Cancer Registry



**DELAWARE HEALTH
AND SOCIAL SERVICES**
Division of Public Health

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