

Pennsylvania Cancer Incidence and Mortality 2015

**Division of Health
Informatics**

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**PENNSYLVANIA
CANCER INCIDENCE and MORTALITY
2015**

Division of Health Informatics
Pennsylvania Cancer Registry
Pennsylvania Cancer Control Program
Harrisburg, Pennsylvania

INTRODUCTION

The “Pennsylvania Cancer Incidence and Mortality” annual report has been produced since the Pennsylvania Cancer Registry (PCR) began collecting statewide cancer incidence data back in 1985. This is the 31st edition of this report. The publication contains many tables, charts and data highlights covering 23 primary cancer sites. Data is analyzed by sex, race, age and stage of the disease. Page iv contains a section titled Organization of the Report, which should help readers better navigate this large report.

Cancer incidence data that appear in this report were collected by the PCR, located in the Bureau of Health Statistics and Registries. The PCR is a full participant in the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC). This report only includes cancer cases and cancer deaths among Pennsylvania residents. Data for 2015 was submitted by hospitals, pathology laboratories, radiation treatment centers, medical oncology centers, physician offices, nursing homes/hospices, autopsy reports, death certificates and other hospital outpatient units/surgery centers across the commonwealth.

By utilizing information collected by the PCR, the Department of Health can develop programs to better address Pennsylvania’s cancer program needs. Registry data can be used to plan and evaluate cancer control measures in the areas of risk assessment, prevention, early detection, patient care, public and professional education, and clinical research.

The Division of Health Informatics welcomes comments and suggestions on the content and format of this report. Staff are available to answer questions regarding the report, including utilization and limitations of the data. Please address all comments, questions, requests for additional data, etc. to:

**Division of Health Informatics
Pennsylvania Department of Health
2150 Herr St., Second floor
Harrisburg, PA 17103**

This report and many other health statistics are available online at: www.statistics.health.pa.gov.

The Pennsylvania Department of Health is an equal opportunity provider of grants, contracts, services and employment.

Organization of the Report

“Pennsylvania Cancer Incidence and Mortality” is divided into 24 sections – an All Sites section plus 23 sections for each major cancer site. These 23 sites comprise approximately 93 percent of the invasive cases for both males and females diagnosed among Pennsylvania residents and reported to the registry during 2015. All other sites, such as bones and joints, soft tissue, eye, miscellaneous reticuloendothelial, and other ill-defined and unknown sites accounted for approximately 7 percent of all new cancer cases.

The first page of each section presents Data Highlights. This provides a summary of descriptive incidence and mortality analyses shown in this report and may include some comparisons to observations from national data sets. These pages also include a subsection titled Risk Factors, which includes information on factors known to be associated with an increase in incidence rates. While there are many types of associations cited in the epidemiological literature, only those factors are listed for which there are consistent findings and well-documented associations. Certain associations are not listed if a more direct association can be provided. For example, the association of higher incidence rates of lung cancer in lower socioeconomic males can be explained by the higher prevalence of cigarette smokers in these groups. Another part of the Data Highlights page, Early Detection, provides a summary of the availability and effectiveness of early detection methods. Where applicable, the current recommendations of the American Cancer Society are described. Also included on the Data Highlights page of each section is a paired bar chart that displays average annual Age-adjusted incidence rates and mortality rates by sex and race for 2011-2015. Adjusted rates used in this report were calculated by the direct method, using 19 five-year age groups corresponding to those age categories in the 2000 U.S. standard population (see Technical Notes).

Throughout the report, data are presented for males and females and are stratified by race. Race data are shown for white and black categories. According to the 2015 state population estimates, blacks represented 11.7 percent of Pennsylvania’s population and 67.2 percent of residents of races other than white. Cancer cases or deaths of other and unknown sex or race were included in the appropriate “TOTAL” categories only.

Cancer incidence and death trends from 2006 through 2015 are shown in both tables and charts. The tables include annual cases, deaths and Age-adjusted rates by sex and race. For the annual Age-adjusted rates, the confidence intervals were calculated at the 95% confidence level to reflect the reliability of the rates. Average annual Age-specific rates and incidence counts for 2011-2015 by sex and race are also presented in tables and charts. Tables displaying Age-specific incidence or death rates include a “TOTAL” category for all ages. The rates for the all ages category are crude, that is, not adjusted for age. While crude rates are useful for describing the disease burden in a particular population, they should not be used for comparing rates between different populations. Information on stage of disease at diagnosis by sex and race for 2015 is also presented and includes the unknown or unstaged category. The stage of disease at the time of diagnosis represents the Surveillance, Epidemiology, and End Results (SEER) Program’s Summary Stage 2000.

The county-specific analyses include average annual Age-adjusted incidence and mortality rates by sex for each of the 67 counties and the entire state for 2011 through 2015. The confidence intervals, at the 95% confidence level, are displayed for these average annual Age-adjusted rates. The numbers of cancer cases and deaths in the county tables represent the total occurrences among residents throughout the five-year period of 2011-2015. Maps showing significant differences between the overall statewide Age-adjusted rate and the Age-adjusted rate of the individual counties for both cancer incidence and cancer mortality were added to the report beginning with the 2014 version. When applicable, maps are available for both males and females. Comparable Age-adjusted rates for the United States, shown in the heading of each map, are provided by the SEER Program. The number of cancer cases or number of deaths in each county is symbolized on the maps using graduated symbols. A larger circle indicates a larger amount of cases/deaths.



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CANCER INCIDENCE and MORTALITY by SITE

All Cancer Sites

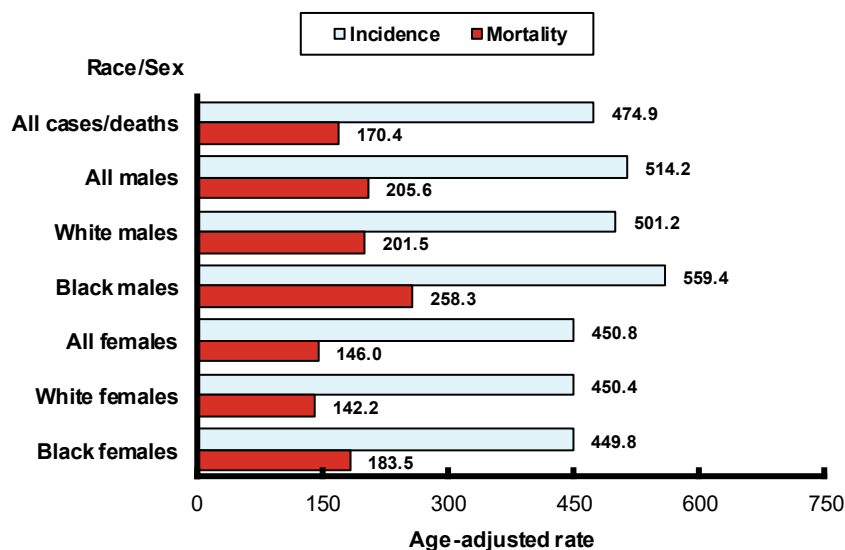
Data Highlights

IMPORTANT: Unless noted, only invasive (and in situ urinary bladder) cancers are included in the counts of cancer cases and in the calculation of all rates. Also, all age-adjusted rates are computed using the 2000 U.S. standard population.

During 2015, a total of 77,993 new invasive cancer cases were diagnosed among Pennsylvania residents and reported to the Pennsylvania Cancer Registry. Compared to 2014, there were 1,826 more invasive cancers diagnosed during 2015. The average annual age-adjusted incidence rate for all invasive cancers combined covering the five-year period of 2011-2015 was 14 percent higher among males (514.2 per 100,000) compared to females (450.8). Black males had the highest average annual age-adjusted incidence rate for that period among the four sex/race groups (559.4), followed by white males (501.2) – a difference of about 12 percent. For the period 2011-2015, the difference between rates for white and black females was less than 1 percent. Annual age-adjusted cancer incidence rates were consistently higher among black males compared to white males since 2006, while differences between white and black females were small. Black females, however, had significantly higher annual rates than whites in 2009 and 2010. Annual age-adjusted incidence rates among white females generally had an upward trend during the years 2006-2015. The incidence rates for white and black males had an overall downward trend from 2006 to 2015. Since 2006, the incidence rate for black males has decreased by 15 percent from 636.4 to 538.6. The cancer incidence rates among white males had a high of 576.6 in 2006, followed by a decrease from 2007 to 2010 and a small increase in 2011. The rate has fluctuated in recent years but has been lower than the 2011 rate.

The risk of developing cancer rose dramatically with age. During the period 2011-2015, about 69 percent of all cancer cases were diagnosed among residents aged 60 and over. Staging data for 2015 by sex and race (Figure 1-C) show that white and black males had a higher percentage of primary cancer cases (excluding lymphomas) diagnosed at the distant stage compared to white and black females.

FIGURE 1
**Average Annual Age-Adjusted
Incidence and Death Rates***
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

The average annual age-adjusted cancer death rate for 2011-2015 among males (205.6 per 100,000) was about 41 percent higher than the rate for females (146.0). The cancer death rate of 258.3 for black males was, by far, the highest among the four sex/race groups.

The 2015 age-adjusted death rate (165.9) for all cancers among all residents was the lowest recorded between 2006 and 2015. This was also true for black males, white males, black females and white females.

Risk Factors

Risk factors are not always known and can vary among the different types of cancer. According to the American Cancer Society, tobacco products, diets high in saturated fat, obesity, excess radiation/sunlight/indoor tanning, lack of physical activity, nutritional deficiencies, excess alcohol use, occupational exposure to certain chemicals, some infectious diseases, family history of cancer, inherited syndromes, reproductive history/hormonal status and immunosuppression are some of the suggestive risk factors associated with cancer.

Early Detection

According to the American Cancer Society, many cancers can be found early through routine or regular screening. Experts recommend having a health exam by a physician, periodic mammograms, Pap-tests and pelvic exams, examinations for changes in skin appearance, and colon/rectal exams.

All Cancer Sites: INCIDENCE (Invasive)

**TABLE
1-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	77,993	474.6 (471.3-477.9)	38,849	511.3 (506.2-516.4)	33,932	501.6 (496.3-506.9)	3,250	538.6 (520.1-557.1)	39,139	452.7 (448.2-457.2)	34,471	456.5 (451.7-461.3)	3,546	443.8 (429.2-458.4)
2014	76,167	469.0 (465.7-472.3)	37,269	498.9 (493.8-504.0)	32,597	488.8 (483.5-494.1)	3,277	557.4 (538.3-576.5)	38,896	452.8 (448.3-457.3)	34,179	453.2 (448.4-458.0)	3,508	453.0 (438.0-468.0)
2013	76,208	474.6 (471.2-478.0)	37,459	509.7 (504.5-514.9)	32,884	499.7 (494.3-505.1)	3,195	564.0 (544.4-583.6)	38,746	454.2 (449.7-458.7)	34,171	455.4 (450.6-460.2)	3,503	460.5 (445.3-475.7)
2012	74,171	467.4 (464.0-470.8)	36,472	504.9 (499.7-510.1)	31,540	486.4 (481.0-491.8)	2,903	521.5 (502.5-540.5)	37,695	444.5 (440.0-449.0)	32,591	437.9 (433.1-442.7)	3,267	433.9 (419.0-448.8)
2011	76,784	489.5 (486.0-493.0)	39,004	548.2 (542.8-553.6)	33,991	530.9 (525.3-536.5)	3,319	618.1 (597.1-639.1)	37,780	450.0 (445.5-454.5)	33,333	449.1 (444.3-453.9)	3,379	457.9 (442.5-473.3)
2010	74,523	482.1 (478.6-485.6)	37,532	539.6 (534.1-545.1)	32,604	525.3 (519.6-531.0)	2,971	577.3 (556.5-598.1)	36,990	443.4 (438.9-447.9)	32,619	445.8 (441.0-450.6)	3,383	479.0 (462.9-495.1)
2009	74,595	496.3 (492.7-499.9)	37,394	558.9 (553.2-564.6)	32,762	539.8 (534.0-545.6)	3,124	664.6 (641.3-687.9)	37,200	455.4 (450.8-460.0)	33,051	452.2 (447.3-457.1)	3,228	476.5 (460.1-492.9)
2008	74,280	501.5 (497.9-505.1)	37,527	575.5 (569.7-581.3)	33,315	562.1 (556.1-568.1)	3,069	670.7 (647.0-694.4)	36,752	453.7 (449.1-458.3)	32,763	450.7 (445.8-455.6)	3,122	469.1 (452.6-485.6)
2007	74,056	504.5 (500.9-508.1)	37,986	594.5 (588.5-600.5)	33,381	574.4 (568.2-580.6)	3,013	670.3 (646.4-694.2)	36,067	447.3 (442.7-451.9)	32,296	445.9 (441.0-450.8)	2,889	438.0 (422.0-454.0)
2006	72,858	499.4 (495.8-503.0)	37,366	592.4 (586.4-598.4)	33,133	576.6 (570.4-582.8)	2,848	636.4 (613.0-659.8)	35,491	441.3 (436.7-445.9)	31,728	438.7 (433.9-443.5)	2,888	441.1 (425.0-457.2)

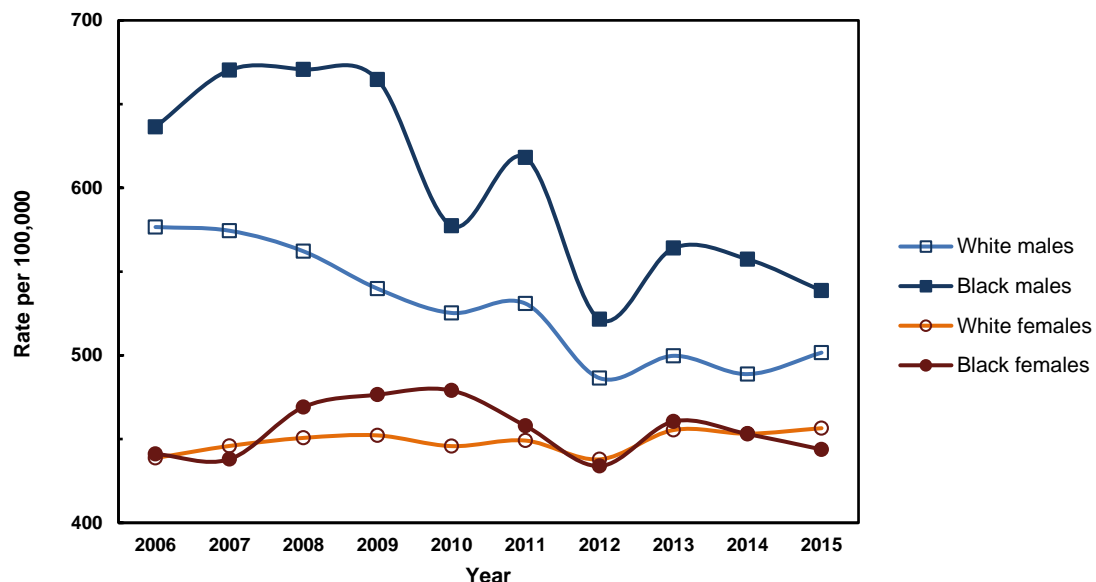
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above or below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). With the exception of urinary bladder cancers, all in situ cancer cases are excluded.

**FIGURE
1-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

All Cancer Sites: INCIDENCE (Invasive)

**TABLE
1-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

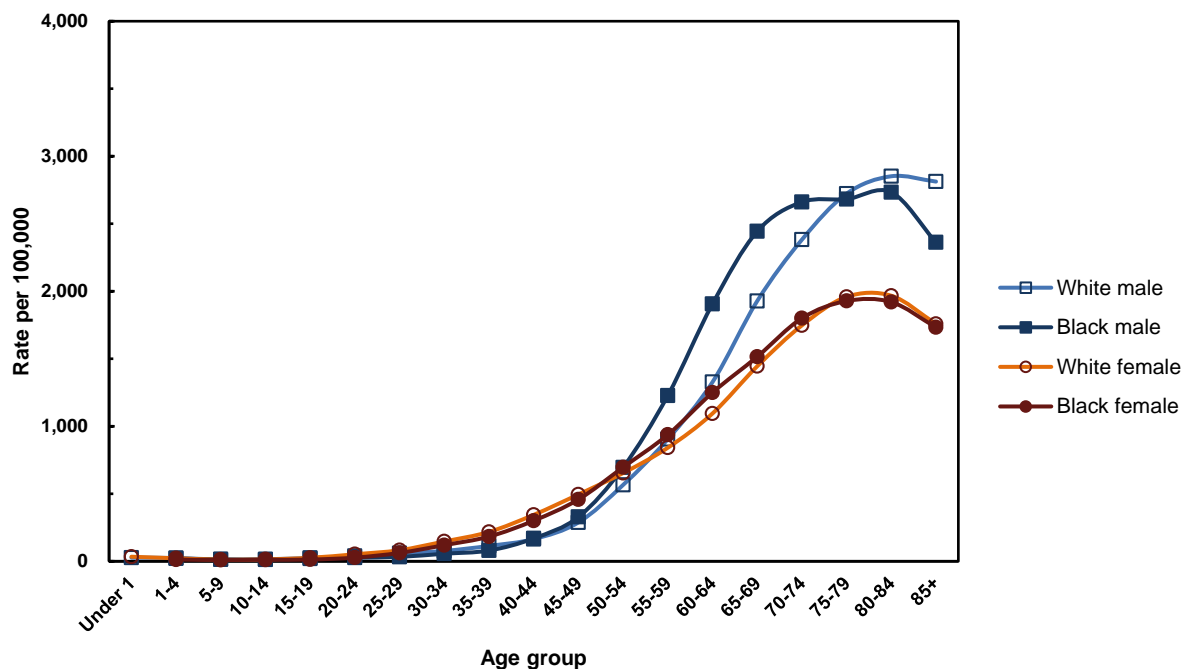
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	597.0	605.8	633.6	451.5	588.6	622.7	450.1
Under 1	29.9	27.9	26.6	ND	32.1	33.5	ND
1-4	22.6	24.2	23.9	20.4	21.1	22.2	12.6
5-9	12.5	13.3	12.8	13.9	11.7	12.0	9.4
10-14	14.3	15.0	14.9	12.2	13.6	14.0	11.2
15-19	23.8	23.7	24.7	18.6	23.9	25.6	12.7
20-24	42.1	37.0	39.0	25.8	47.2	51.8	26.9
25-29	67.3	55.4	59.3	32.8	79.3	81.9	61.9
30-34	107.9	73.8	76.6	55.9	142.3	146.6	119.3
35-39	161.0	109.0	113.8	79.5	212.7	217.3	182.7
40-44	252.1	166.1	164.1	169.4	337.1	343.8	300.6
45-49	394.3	293.6	287.5	327.9	492.6	494.9	457.7
50-54	623.3	584.9	565.4	694.7	660.3	653.4	696.2
55-59	898.0	947.7	904.7	1,227.3	850.4	841.1	937.3
60-64	1,247.7	1,398.0	1,327.1	1,906.1	1,107.2	1,094.6	1,249.2
65-69	1,707.3	1,997.7	1,927.5	2,443.3	1,447.5	1,444.3	1,514.9
70-74	2,063.4	2,439.5	2,381.8	2,660.7	1,749.1	1,747.1	1,800.2
75-79	2,309.7	2,770.2	2,722.7	2,682.1	1,959.9	1,958.5	1,927.8
80-84	2,349.8	2,907.2	2,851.7	2,733.0	1,982.2	1,966.7	1,919.6
85+	2,146.8	2,863.5	2,812.1	2,361.5	1,803.7	1,758.1	1,732.7

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on all invasive and in situ urinary bladder cancers. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions of the National Cancer Institute's SEER program.

**FIGURE
1-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

All Cancer Sites: INCIDENCE (Invasive)

**TABLE
1-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	381,323	189,053	164,944	15,944	192,256	168,745	17,203
Under 1	214	102	75	9	112	90	9
1-4	651	355	262	47	296	231	28
5-9	465	252	188	38	213	167	25
10-14	554	297	231	34	257	206	30
15-19	1,015	515	424	59	500	422	38
20-24	1,840	822	678	87	1,017	871	88
25-29	2,789	1,163	1,001	90	1,624	1,327	173
30-34	4,200	1,442	1,217	133	2,757	2,267	299
35-39	5,845	1,973	1,686	170	3,872	3,180	422
40-44	10,181	3,332	2,749	380	6,848	5,752	731
45-49	17,371	6,389	5,333	756	10,982	9,291	1,156
50-54	29,979	13,817	11,612	1,589	16,162	13,737	1,793
55-59	41,930	21,627	18,220	2,463	20,301	17,471	2,187
60-64	50,360	27,253	23,128	2,909	23,104	20,069	2,380
65-69	54,233	29,966	26,163	2,540	24,266	21,537	2,124
70-74	48,411	26,052	23,127	1,863	22,358	19,997	1,855
75-79	41,581	21,526	19,373	1,297	20,054	18,082	1,533
80-84	34,641	17,031	15,536	862	17,610	15,999	1,183
85+	35,054	15,134	13,939	617	19,919	18,047	1,149

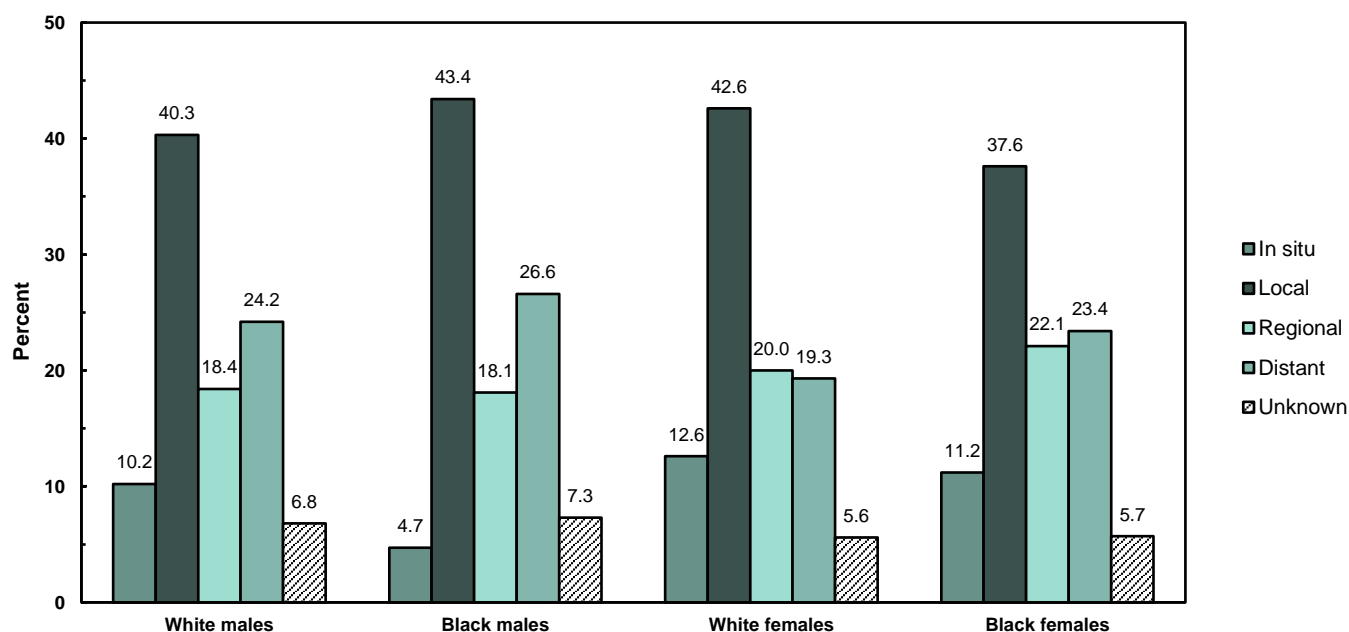
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: With the exception of urinary bladder cancers, all in situ cancer cases are excluded.

**FIGURE
1-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTES: Lymphomas were excluded. Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 72,745 - 93.3%

All Cancer Sites: MORTALITY

**TABLE
1-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	28,517	165.9 (164.0-167.8)	14,851	200.4 (197.2-203.6)	13,193	197.0 (193.6-200.4)	1,237	237.1 (223.9-250.3)	13,666	141.7 (139.3-144.1)	11,926	138.4 (135.9-140.9)	1,360	169.8 (160.8-178.8)
2014	28,558	168.3 (166.3-170.3)	14,841	202.9 (199.6-206.2)	13,146	198.8 (195.4-202.2)	1,313	252.0 (238.4-265.6)	13,717	143.7 (141.3-146.1)	11,977	139.7 (137.2-142.2)	1,377	177.4 (168.0-186.8)
2013	28,418	169.4 (167.4-171.4)	14,631	203.4 (200.1-206.7)	12,932	198.1 (194.7-201.5)	1,318	263.3 (249.1-277.5)	13,787	146.0 (143.6-148.4)	12,069	141.7 (139.2-144.2)	1,386	183.4 (173.7-193.1)
2012	28,627	173.1 (171.1-175.1)	14,711	208.7 (205.3-212.1)	13,079	203.9 (200.4-207.4)	1,272	265.2 (250.6-279.8)	13,916	148.7 (146.2-151.2)	12,118	143.4 (140.8-146.0)	1,463	195.6 (185.6-205.6)
2011	28,637	175.5 (173.5-177.5)	14,705	212.9 (209.5-216.3)	13,228	210.3 (206.7-213.9)	1,303	276.3 (261.3-291.3)	13,932	150.4 (147.9-152.9)	12,366	148.1 (145.5-150.7)	1,413	192.8 (182.7-202.9)
2010	28,809	179.4 (177.3-181.5)	14,773	218.1 (214.6-221.6)	13,287	216.4 (212.7-220.1)	1,358	298.0 (282.2-313.8)	14,036	153.0 (150.5-155.5)	12,556	152.4 (149.7-155.1)	1,354	193.1 (182.8-203.4)
2009	28,680	183.0 (180.9-185.1)	14,680	224.4 (220.8-228.0)	13,224	221.1 (217.3-224.9)	1,337	307.1 (290.6-323.6)	14,000	154.9 (152.3-157.5)	12,529	152.6 (149.9-155.3)	1,379	202.2 (191.5-212.9)
2008	28,699	187.0 (184.8-189.2)	14,773	233.2 (229.4-237.0)	13,415	231.4 (227.5-235.3)	1,254	297.0 (280.6-313.4)	13,926	156.6 (154.0-159.2)	12,575	155.5 (152.8-158.2)	1,247	185.8 (175.5-196.1)
2007	28,756	191.5 (189.3-193.7)	14,694	242.0 (238.1-245.9)	13,311	239.7 (235.6-243.8)	1,284	310.0 (293.0-327.0)	14,062	160.3 (157.7-162.9)	12,649	158.4 (155.6-161.2)	1,321	200.7 (189.9-211.5)
2006	28,955	194.8 (192.6-197.0)	14,720	246.2 (242.2-250.2)	13,279	242.6 (238.5-246.7)	1,347	335.1 (317.2-353.0)	14,235	164.1 (161.4-166.8)	12,814	162.1 (159.3-164.9)	1,332	204.3 (193.3-215.3)

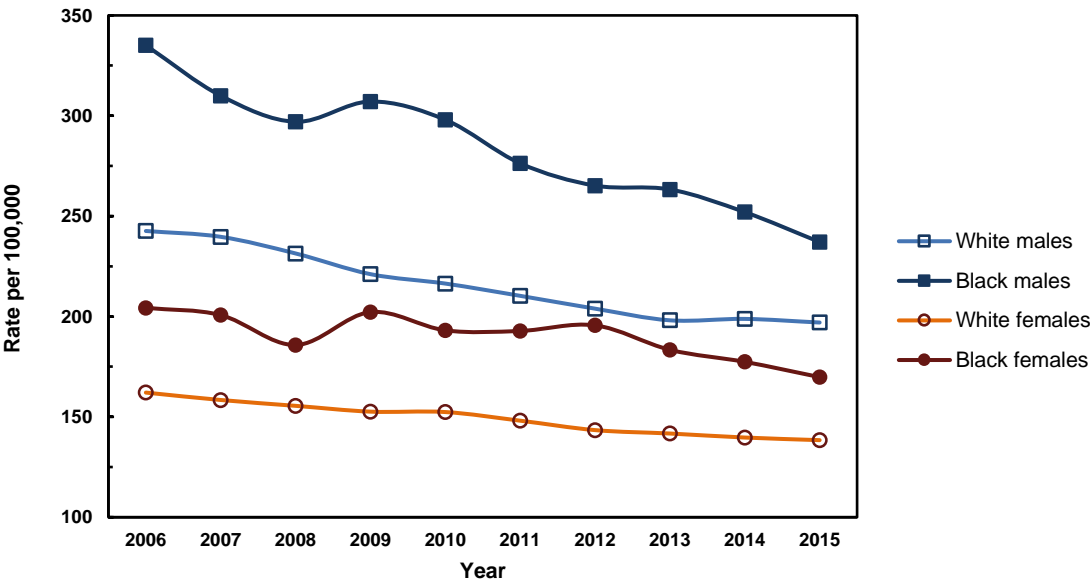
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
1-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

All Cancer Sites: MORTALITY

**TABLE
1-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	142,757	223.5	73,739	236.3	65,578	251.9	6,443	182.4	69,018	211.3	60,456	223.1	6,999	183.1
Under 1	7	ND	5	ND	5	ND	0	ND	2	ND	0	ND	1	ND
1-4	54	1.9	27	1.8	19	1.7	5	ND	27	1.9	22	2.1	2	ND
5-9	89	2.4	56	2.9	48	3.3	4	ND	33	1.8	24	1.7	6	ND
10-14	72	1.9	39	2.0	32	2.1	4	ND	33	1.7	27	1.8	2	ND
15-19	107	2.5	60	2.8	39	2.3	10	3.2	47	2.2	36	2.2	8	ND
20-24	218	5.0	139	6.3	107	6.2	18	5.3	79	3.7	61	3.6	13	4.0
25-29	242	5.8	127	6.0	109	6.5	14	5.1	115	5.6	77	4.8	24	8.6
30-34	415	10.7	182	9.3	147	9.2	22	9.2	233	12.0	182	11.8	27	10.8
35-39	727	20.0	316	17.5	252	17.0	43	20.1	411	22.6	308	21.0	75	32.5
40-44	1,530	37.9	642	32.0	513	30.6	86	38.3	888	43.7	698	41.7	121	49.8
45-49	3,240	73.5	1,516	69.7	1,275	68.7	189	82.0	1,724	77.3	1,351	72.0	290	114.8
50-54	6,785	141.1	3,492	147.8	2,919	142.1	443	193.7	3,293	134.5	2,673	127.1	490	190.3
55-59	11,038	236.4	5,968	261.5	5,072	251.8	704	350.8	5,070	212.4	4,190	201.7	739	316.7
60-64	14,753	365.5	8,241	422.7	7,059	405.1	962	630.3	6,512	312.1	5,465	298.1	888	466.1
65-69	17,419	548.4	9,644	642.9	8,485	625.1	939	903.2	7,775	463.8	6,721	450.7	872	621.9
70-74	18,576	791.7	10,062	942.2	8,956	922.3	870	1,242.5	8,514	666.0	7,486	654.0	861	835.5
75-79	19,063	1,058.9	10,048	1,293.1	9,062	1,273.6	771	1,594.4	9,015	881.1	8,014	868.0	822	1,033.7
80-84	20,179	1,368.8	10,362	1,768.8	9,482	1,740.5	691	2,190.8	9,817	1,105.0	8,899	1,093.9	750	1,217.0
85+	28,240	1,729.5	12,810	2,423.8	11,995	2,419.9	667	2,552.9	15,430	1,397.2	14,222	1,385.5	1,008	1,520.1

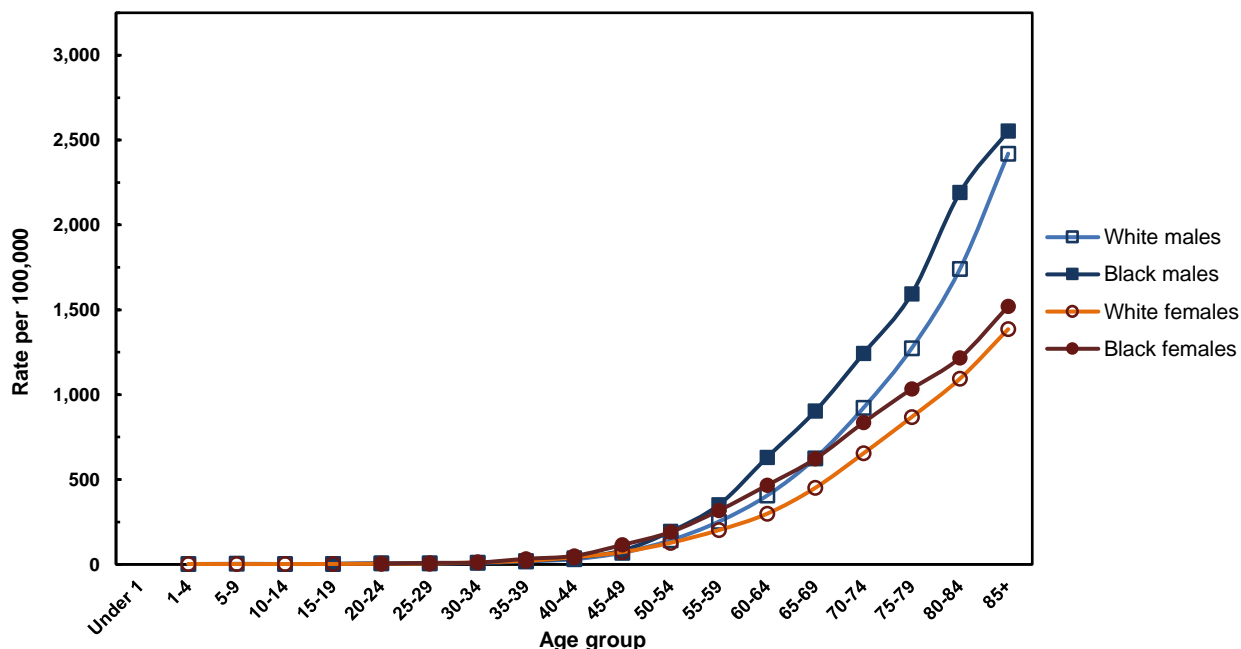
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
1-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



All Cancer Sites: INCIDENCE (Invasive)

**TABLE
1-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	381,323	189,053	514.2	(511.9-516.5)	192,256	450.8	(448.8-452.8)								
Adams	3,132	1,565	489.4	(465.2-513.6)	1,567	451.4	(429.0-473.8)	Juniata	714	349	439.5	(393.4-485.6)	365	437.7	(392.8-482.6)
Allegheny	38,893	18,317	514.5	(507.0-522.0)	20,574	470.8	(464.4-477.2)	Lackawanna	6,562	3,288	502.1	(484.9-519.3)	3,274	428.7	(414.0-443.4)
Armstrong	2,308	1,155	497.6	(468.9-526.3)	1,153	454.9	(428.6-481.2)	Lancaster	14,035	6,956	464.9	(454.0-475.8)	7,078	418.8	(409.0-428.6)
Beaver	5,735	2,775	508.8	(489.9-527.7)	2,960	460.1	(443.5-476.7)	Lawrence	3,020	1,518	519.2	(493.1-545.3)	1,501	445.8	(423.2-468.4)
Bedford	1,610	834	483.1	(450.3-515.9)	776	432.9	(402.4-463.4)	Lebanon	4,073	1,968	473.2	(452.3-494.1)	2,105	450.1	(430.9-469.3)
Berks	11,628	5,948	514.0	(500.9-527.1)	5,679	433.9	(422.6-445.2)	Lehigh	10,414	5,176	529.2	(514.8-543.6)	5,238	454.5	(442.2-466.8)
Blair	4,033	2,020	507.1	(485.0-529.2)	2,013	433.6	(414.7-452.5)	Luzerne	10,679	5,329	538.8	(524.3-553.3)	5,350	462.7	(450.3-475.1)
Bradford	2,037	1,025	491.0	(460.9-521.1)	1,012	463.6	(435.0-492.2)	Lycoming	3,715	1,777	508.7	(485.0-532.4)	1,938	489.1	(467.3-510.9)
Bucks	19,441	9,780	524.2	(513.8-534.6)	9,661	454.2	(445.1-463.3)	McKean	1,250	616	452.6	(416.9-488.3)	634	443.0	(408.5-477.5)
Butler	5,722	2,912	523.3	(504.3-542.3)	2,810	454.6	(437.8-471.4)	Mercer	3,942	2,033	537.5	(514.1-560.9)	1,909	463.9	(443.1-484.7)
Cambria	4,772	2,451	528.9	(508.0-549.8)	2,321	446.8	(428.6-465.0)	Mifflin	1,499	781	510.2	(474.4-546.0)	718	429.4	(398.0-460.8)
Cameron	195	109	571.1	(463.9-678.3)	86	444.4	(350.5-538.3)	Monroe	4,717	2,439	506.5	(486.4-526.6)	2,278	432.3	(414.5-450.1)
Carbon	2,174	1,094	498.3	(468.8-527.8)	1,080	454.6	(427.5-481.7)	Montgomery	24,178	11,807	513.7	(504.4-523.0)	12,369	453.9	(445.9-461.9)
Centre	3,307	1,715	472.7	(450.3-495.1)	1,592	412.5	(392.2-432.8)	Montour	678	357	621.6	(557.1-686.1)	321	463.7	(413.0-514.4)
Chester	13,856	6,934	506.5	(494.6-518.4)	6,921	445.7	(435.2-456.2)	Northampton	9,811	5,031	572.9	(557.1-588.7)	4,779	467.3	(454.1-480.5)
Clarion	1,151	592	488.7	(449.3-528.1)	559	422.6	(387.6-457.6)	Northumberland	3,113	1,595	513.8	(488.6-539.0)	1,518	451.7	(429.0-474.4)
Clearfield	2,536	1,321	499.2	(472.3-526.1)	1,215	421.6	(397.9-445.3)	Perry	1,331	681	497.9	(460.5-535.3)	650	443.9	(409.8-478.0)
Clinton	1,122	548	472.4	(432.8-512.0)	574	460.3	(422.6-498.0)	Philadelphia	40,637	19,751	581.5	(573.4-589.6)	20,882	465.9	(459.6-472.2)
Columbia	2,106	1,051	541.8	(509.0-574.6)	1,055	475.4	(446.7-504.1)	Pike	1,649	862	428.3	(399.7-456.9)	787	392.4	(365.0-419.8)
Crawford	2,839	1,449	519.3	(492.6-546.0)	1,390	461.5	(437.2-485.8)	Potter	589	330	509.9	(454.9-564.9)	259	391.6	(343.9-439.3)
Cumberland	6,629	3,171	453.2	(437.4-469.0)	3,458	426.3	(412.1-440.5)	Schuylkill	4,950	2,544	529.1	(508.5-549.7)	2,406	456.2	(438.0-474.4)
Dauphin	7,434	3,600	490.4	(474.4-506.4)	3,834	437.1	(423.3-450.9)	Snyder	1,084	545	471.9	(432.3-511.5)	539	413.8	(378.9-448.7)
Delaware	16,690	8,148	550.0	(538.1-561.9)	8,541	468.1	(458.2-478.0)	Somerset	2,499	1,335	495.5	(468.9-522.1)	1,164	424.1	(399.7-448.5)
Elk	1,187	629	572.6	(527.9-617.3)	558	487.0	(446.6-527.4)	Sullivan	297	151	539.8	(453.7-625.9)	146	524.5	(439.4-609.6)
Erie	7,761	3,816	486.3	(470.9-501.7)	3,945	443.5	(429.7-457.3)	Susquehanna	1,364	708	462.5	(428.4-496.6)	656	441.0	(407.3-474.7)
Fayette	4,488	2,213	501.7	(480.8-522.6)	2,275	457.0	(438.2-475.8)	Tioga	1,376	713	490.1	(454.1-526.1)	663	452.2	(417.8-486.6)
Forest	205	118	394.3	(323.2-465.4)	87	373.5	(295.0-452.0)	Union	1,085	563	434.3	(398.4-470.2)	522	398.3	(364.1-432.5)
Franklin	4,193	2,218	480.2	(460.2-500.2)	1,975	381.7	(364.9-398.5)	Venango	1,843	1,014	550.8	(516.9-584.7)	829	419.0	(390.5-447.5)
Fulton	478	231	458.4	(399.3-517.5)	247	492.0	(430.6-553.4)	Warren	1,372	714	484.5	(449.0-520.0)	658	447.4	(413.2-481.6)
Greene	1,145	549	467.5	(428.4-506.6)	596	488.2	(449.0-527.4)	Washington	7,009	3,460	520.3	(503.0-537.6)	3,549	469.9	(454.4-485.4)
Huntingdon	1,280	627	415.4	(382.9-447.9)	653	445.7	(411.5-479.9)	Wayne	1,675	870	455.0	(424.8-485.2)	805	433.2	(403.3-463.1)
Indiana	2,294	1,162	446.6	(420.9-472.3)	1,132	405.1	(381.5-428.7)	Westmoreland	12,606	6,100	498.4	(485.9-510.9)	6,506	470.3	(458.9-481.7)
Jefferson	1,489	806	535.5	(498.5-572.5)	683	419.9	(388.4-451.4)	Wyoming	918	459	501.0	(455.2-546.8)	459	479.8	(435.9-523.7)
								York	12,769	6,350	507.7	(495.2-520.2)	6,419	459.4	(448.2-470.6)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. With the exception of urinary bladder cancers, all in situ cancer cases are excluded.

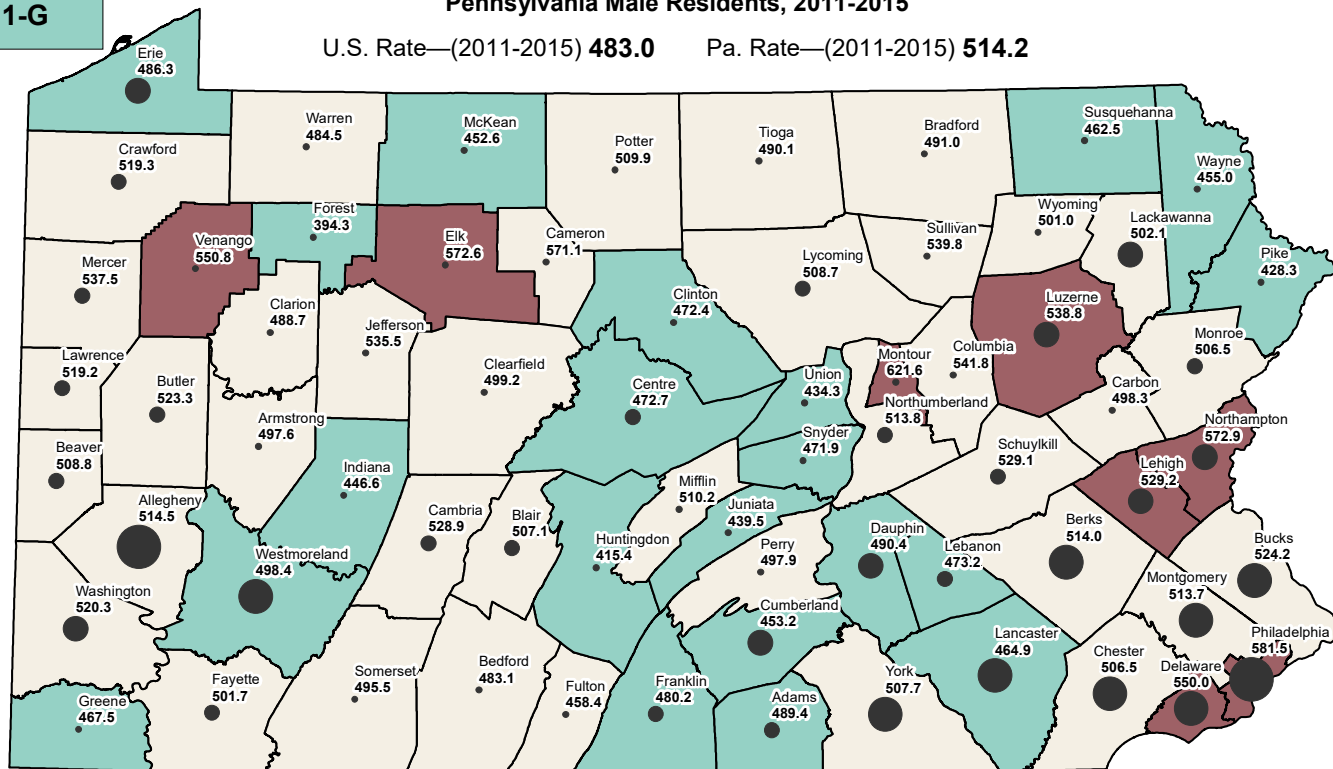
All Cancer Sites: INCIDENCE (Invasive)

MAP
1-G

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **483.0**

Pa. Rate—(2011-2015) **514.2**



Significantly higher

Significantly lower

Not significantly
different

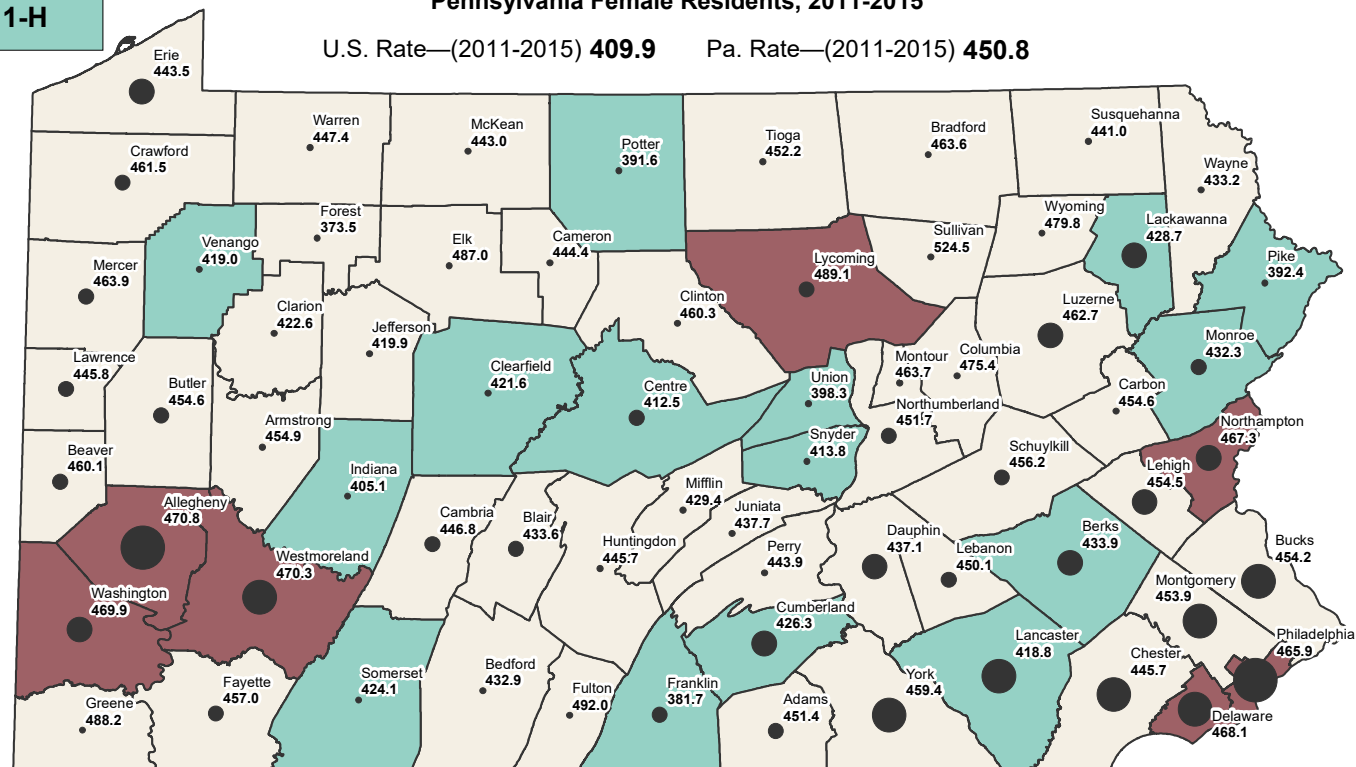
Significance not determined—
less than 20 observed cases

MAP
1-H

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **409.9**

Pa. Rate—(2011-2015) **450.8**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

All Cancer Sites: MORTALITY

**TABLE
1-1**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	142,757	73,739	205.6	(204.1-207.1)	69,018	146.0	(144.9-147.1)								
Adams	1,165	627	200.2	(184.5-215.9)	538	141.8	(129.8-153.8)	Juniata	293	152	191.7	(161.2-222.2)	141	147.1	(122.8-171.4)
Allegheny	15,080	7,582	212.5	(207.7-217.3)	7,498	150.6	(147.2-154.0)	Lackawanna	2,726	1,404	216.5	(205.2-227.8)	1,322	149.9	(141.8-158.0)
Armstrong	860	447	193.5	(175.6-211.4)	413	142.9	(129.1-156.7)	Lancaster	5,187	2,697	180.2	(173.4-187.0)	2,490	132.3	(127.1-137.5)
Beaver	2,299	1,254	225.5	(213.0-238.0)	1,045	138.9	(130.5-147.3)	Lawrence	1,238	648	217.8	(201.0-234.6)	590	150.0	(137.9-162.1)
Bedford	580	312	182.5	(162.2-202.8)	268	130.4	(114.8-146.0)	Lebanon	1,599	846	204.0	(190.3-217.7)	753	139.1	(129.2-149.0)
Berks	4,132	2,208	194.9	(186.8-203.0)	1,924	134.4	(128.4-140.4)	Lehigh	3,700	1,889	195.4	(186.6-204.2)	1,811	140.6	(134.1-147.1)
Blair	1,525	833	209.0	(194.8-223.2)	692	131.9	(122.1-141.7)	Luzerne	4,185	2,191	224.6	(215.2-234.0)	1,994	150.7	(144.1-157.3)
Bradford	803	398	192.3	(173.4-211.2)	405	167.1	(150.8-183.4)	Lycoming	1,415	735	209.4	(194.3-224.5)	680	153.4	(141.9-164.9)
Bucks	6,527	3,351	189.3	(182.9-195.7)	3,176	137.2	(132.4-142.0)	McKean	490	256	191.8	(168.3-215.3)	234	145.1	(126.5-163.7)
Butler	1,993	1,096	204.3	(192.2-216.4)	897	130.6	(122.1-139.1)	Mercer	1,472	796	208.7	(194.2-223.2)	676	142.1	(131.4-152.8)
Cambria	1,796	941	202.9	(189.9-215.9)	855	140.1	(130.7-149.5)	Mifflin	631	349	226.5	(202.7-250.3)	282	151.3	(133.6-169.0)
Cameron	67	39	208.6	(143.1-274.1)	28	107.3	(67.6-147.0)	Monroe	1,715	942	212.3	(198.7-225.9)	773	146.9	(136.5-157.3)
Carbon	891	454	216.7	(196.8-236.6)	437	170.5	(154.5-186.5)	Montgomery	8,270	4,076	180.7	(175.2-186.2)	4,194	137.2	(133.0-141.4)
Centre	1,076	588	173.3	(159.3-187.3)	488	116.0	(105.7-126.3)	Montour	231	125	219.7	(181.2-258.2)	106	136.0	(110.1-161.9)
Chester	4,492	2,286	178.5	(171.2-185.8)	2,206	133.3	(127.7-138.9)	Northampton	3,378	1,772	204.0	(194.5-213.5)	1,606	139.8	(133.0-146.6)
Clarion	446	252	212.8	(186.5-239.1)	194	135.7	(116.6-154.8)	Northumberland	1,214	650	212.5	(196.2-228.8)	564	142.8	(131.0-154.6)
Clearfield	1,032	557	216.1	(198.2-234.0)	475	144.0	(131.0-157.0)	Perry	515	298	230.2	(204.1-256.3)	217	142.3	(123.4-161.2)
Clinton	497	275	237.4	(209.3-265.5)	222	156.1	(135.6-176.6)	Philadelphia	16,004	7,835	246.6	(241.1-252.1)	8,169	173.7	(169.9-177.5)
Columbia	728	377	201.6	(181.2-222.0)	351	140.1	(125.4-154.8)	Pike	580	312	160.1	(142.3-177.9)	268	129.5	(114.0-145.0)
Crawford	1,095	598	222.3	(204.5-240.1)	497	153.6	(140.1-167.1)	Potter	261	145	226.9	(190.0-263.8)	116	150.6	(123.2-178.0)
Cumberland	2,407	1,238	181.3	(171.2-191.4)	1,169	130.7	(123.2-138.2)	Schuylkill	2,068	1,088	230.2	(216.5-243.9)	980	160.1	(150.1-170.1)
Dauphin	2,668	1,343	192.3	(182.0-202.6)	1,325	142.9	(135.2-150.6)	Snyder	395	222	203.0	(176.3-229.7)	173	121.0	(103.0-139.0)
Delaware	6,148	3,055	211.4	(203.9-218.9)	3,093	154.1	(148.7-159.5)	Somerset	957	533	198.8	(181.9-215.7)	424	129.5	(117.2-141.8)
Elk	450	247	228.5	(200.0-257.0)	203	145.9	(125.8-166.0)	Sullivan	111	55	211.2	(155.4-267.0)	56	164.8	(121.6-208.0)
Erie	3,140	1,586	209.3	(199.0-219.6)	1,554	159.4	(151.5-167.3)	Susquehanna	502	281	199.5	(176.2-222.8)	221	131.8	(114.4-149.2)
Fayette	1,860	983	225.9	(211.8-240.0)	877	154.9	(144.6-165.2)	Tioga	509	268	187.0	(164.6-209.4)	241	147.0	(128.4-165.6)
Forest	101	60	208.5	(155.7-261.3)	41	164.2	(113.9-214.5)	Union	409	202	163.1	(140.6-185.6)	207	131.6	(113.7-149.5)
Franklin	1,635	887	192.8	(180.1-205.5)	748	129.9	(120.6-139.2)	Venango	775	432	237.5	(215.1-259.9)	343	150.5	(134.6-166.4)
Fulton	190	90	179.5	(142.4-216.6)	100	184.5	(148.3-220.7)	Warren	566	292	197.2	(174.6-219.8)	274	163.3	(144.0-182.6)
Greene	483	262	234.7	(206.3-263.1)	221	161.2	(139.9-182.5)	Washington	2,779	1,436	218.5	(207.2-229.8)	1,343	155.8	(147.5-164.1)
Huntingdon	516	277	192.0	(169.4-214.6)	239	147.6	(128.9-166.3)	Wayne	700	370	195.6	(175.7-215.5)	330	164.7	(146.9-182.5)
Indiana	864	466	186.8	(169.8-203.8)	398	122.6	(110.6-134.6)	Westmoreland	4,929	2,559	208.4	(200.3-216.5)	2,370	148.2	(142.2-154.2)
Jefferson	606	316	217.6	(193.6-241.6)	290	157.5	(139.4-175.6)	Wyoming	350	202	234.9	(202.5-267.3)	148	138.4	(116.1-160.7)
								York	4,451	2,396	199.1	(191.1-207.1)	2,055	137.2	(131.3-143.1)

SOURCE: Pennsylvania Death Certificate Dataset

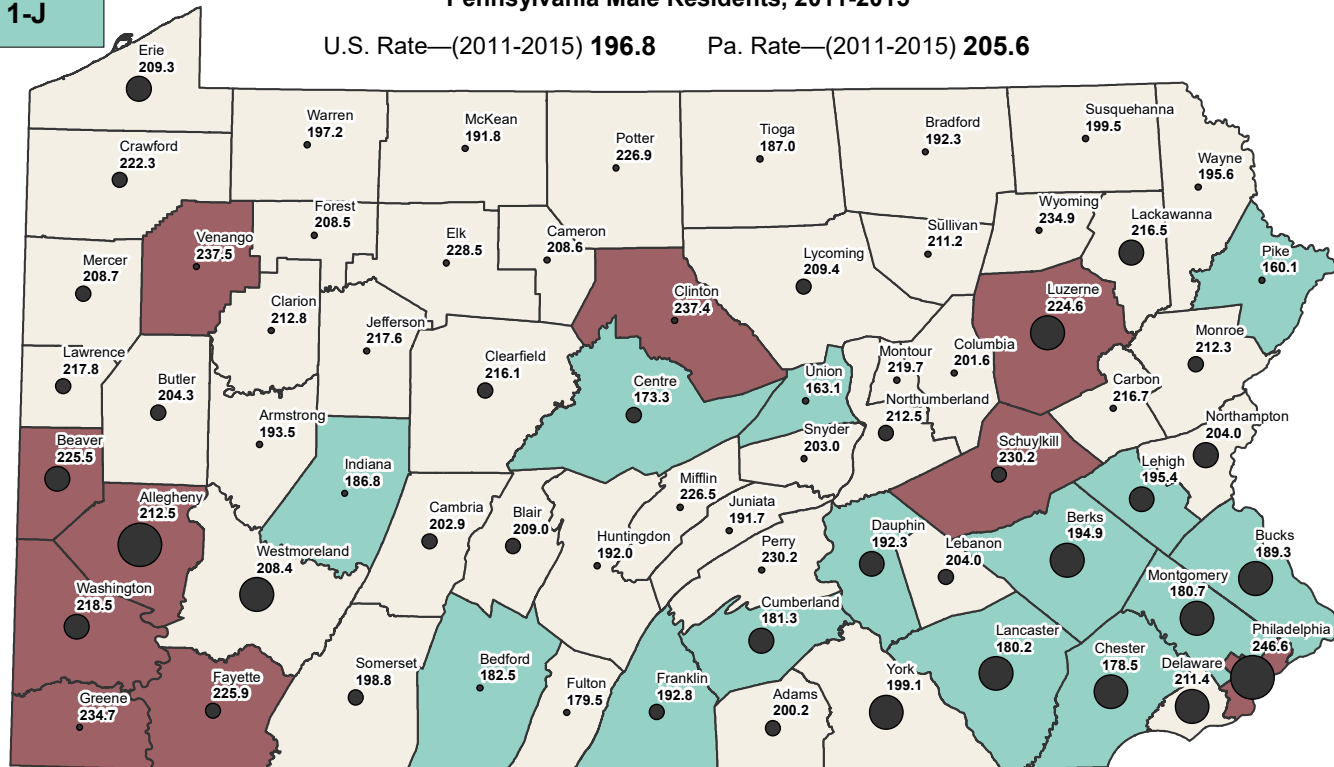
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

All Cancer Sites: MORTALITY

MAP
1-J

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **196.8** Pa. Rate—(2011-2015) **205.6**



Significantly higher

Significantly lower

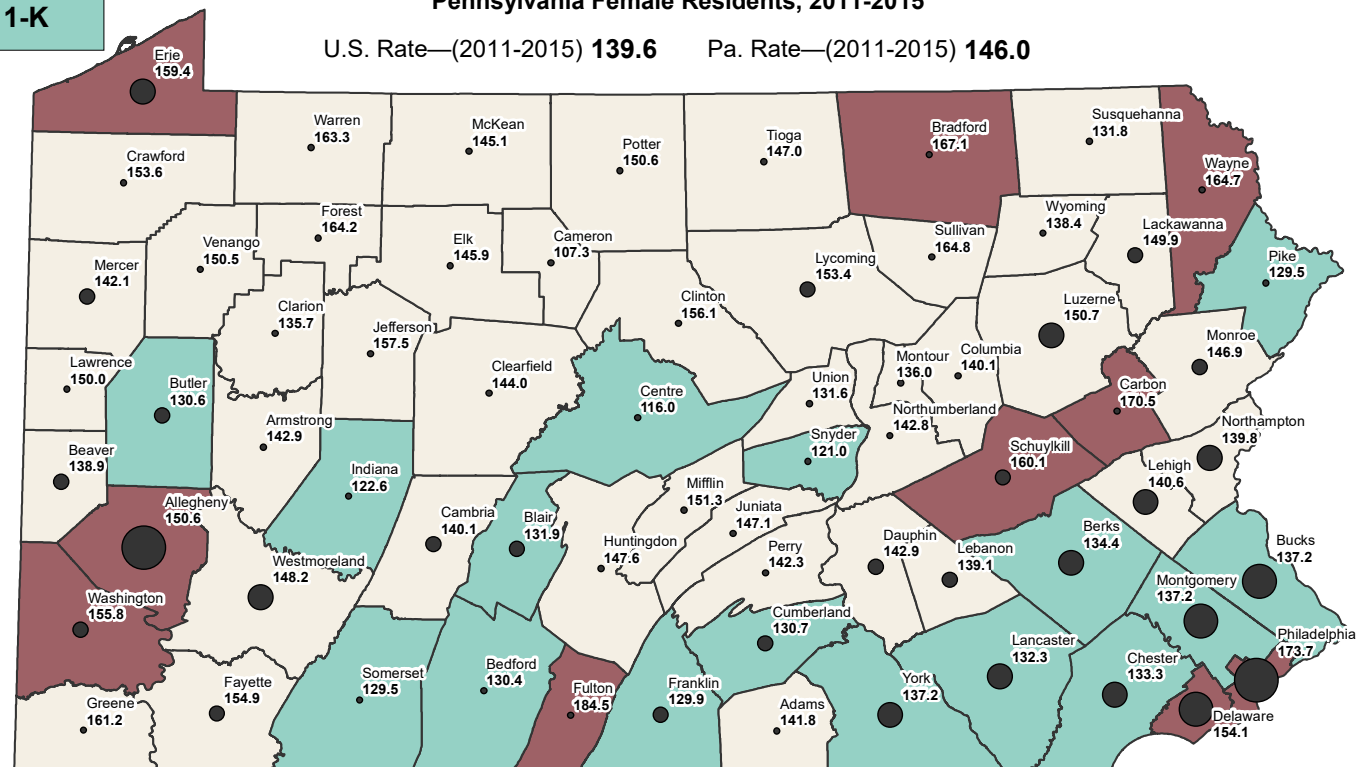
Not significantly
different

Significance not determined—
less than 20 observed cases

MAP
1-K

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **139.6** Pa. Rate—(2011-2015) **146.0**



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Oral Cavity and Pharynx

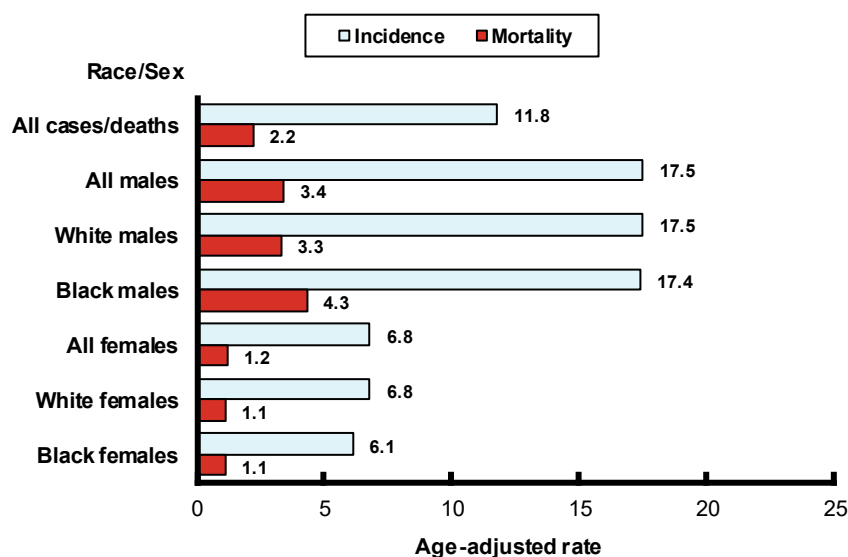
Data Highlights

There were 1,929 cases of invasive cancer of the oral cavity and pharynx diagnosed in 2015 among Pennsylvania residents. The average annual age-adjusted incidence rate for 2011-2015 was dramatically higher among males compared to females (17.5 versus 6.8 per 100,000, respectively). The 2011-2015 average annual age-adjusted incidence rate among black males was 17.4 per 100,000, which was not significantly different when compared to the rate of 17.5 for white males. According to the American Cancer Society, excessive use of alcohol, in combination with tobacco products, is the primary risk factor of this disease. Many new cases and deaths may be directly prevented with a reduction in these risk factors.

The annual age-adjusted incidence rate for black males increased from 2006 until 2008 but again decreased in 2009 and 2010, when rates were lower than white males. The rate has since fluctuated. In 2011, the incidence rate for black males increased drastically to its highest point during the 10-year period 2006-2015, before decreasing in 2012, increasing in 2013, and again decreasing in 2014 and 2015. Rates for black females did not have any obvious trends. Among white males and white females, the rates increased slowly throughout the period 2006-2015. The incidence rates for all Pennsylvania residents rose steadily with age, with 87 percent of the invasive cases diagnosed among those aged 50 years and older during the 2011-2015 period. Among the four sex/race groups, average annual age-specific incidence rates for 2011-2015 were noticeably higher for black males, ages 65-79. Black residents had a higher percentage of cases diagnosed at the distant stage compared to whites. Among black males, 30.9 percent of the cases in 2015 were diagnosed at the distant stage compared to 20.9 percent among white males. Distant stage diagnoses among black females represented 27.5 percent of cases compared to 15.2 percent for white females.

In 2015, there were 399 deaths among residents due to cancers of the oral cavity and pharynx. As observed with the incidence rates, average annual age-adjusted death rates for 2011-2015 were higher among males compared to females. The 2011-2015 average annual age-adjusted death rate for males was 3.4 per 100,000 compared to 1.2 for females. During the period 2006-2014, black males had the highest death rates for this cancer among the four sex/race groups. In 2015, however, the death rate among white males surpassed the rate among black males. Due to small annual death counts, data for black females were considered statistically unreliable and do not appear in Figure 2-D. Overall, the annual rates for all four sex/race groups during 2006-2015 showed no discernible trends.

FIGURE 2
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, excessive use of alcohol, cigarette/cigar/pipe smoking, smokeless tobacco, betel quid, gutka, human papilloma virus infection, excess sunlight (e.g., lip cancers), poor nutrition, immune system suppression, graft-versus-host disease, Fanconi anemia, dyskeratosis congenital, and lichen planus are associated with oral cavity and pharynx cancers.

Early Detection

Many pre-cancers of the oral cavity and pharynx can be found early during routine screening by health professionals. However, there is insufficient evidence whether palpation and inspection of the oral cavity in asymptomatic persons reduces mortality. The American Cancer Society recommends a complete oral exam be included in a periodic health examination.

Cancer of the Oral Cavity and Pharynx: INCIDENCE (Invasive)

**TABLE
2-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,929	11.6 (11.1-12.1)	1,324	17.0 (16.1-17.9)	1,186	17.2 (16.2-18.2)	97	15.0 (12.0-18.0)	605	6.8 (6.3-7.3)	535	6.9 (6.3-7.5)	50	6.1 (4.4-7.8)
2014	1,957	11.9 (11.4-12.4)	1,364	17.7 (16.8-18.6)	1,218	17.8 (16.8-18.8)	104	17.0 (13.7-20.3)	593	6.8 (6.3-7.3)	527	6.9 (6.3-7.5)	47	5.7 (4.1-7.3)
2013	1,927	11.9 (11.4-12.4)	1,341	17.7 (16.8-18.6)	1,203	17.8 (16.8-18.8)	103	18.1 (14.6-21.6)	585	6.7 (6.2-7.2)	517	6.7 (6.1-7.3)	48	6.1 (4.4-7.8)
2012	1,887	11.7 (11.2-12.2)	1,275	17.1 (16.2-18.0)	1,149	17.1 (16.1-18.1)	83	15.8 (12.4-19.2)	612	7.1 (6.5-7.7)	528	6.9 (6.3-7.5)	53	6.8 (5.0-8.6)
2011	1,844	11.7 (11.2-12.2)	1,296	17.9 (16.9-18.9)	1,134	17.5 (16.5-18.5)	117	21.3 (17.4-25.2)	548	6.4 (5.9-6.9)	489	6.4 (5.8-7.0)	41	5.6 (3.9-7.3)
2010	1,729	11.1 (10.6-11.6)	1,188	16.5 (15.6-17.4)	1,074	16.8 (15.8-17.8)	72	13.3 (10.2-16.4)	541	6.4 (5.9-6.9)	466	6.3 (5.7-6.9)	54	7.5 (5.5-9.5)
2009	1,668	11.1 (10.6-11.6)	1,146	16.8 (15.8-17.8)	1,031	16.8 (15.8-17.8)	80	15.8 (12.3-19.3)	522	6.3 (5.8-6.8)	457	6.2 (5.6-6.8)	48	7.1 (5.1-9.1)
2008	1,684	11.4 (10.9-11.9)	1,125	16.9 (15.9-17.9)	990	16.4 (15.4-17.4)	98	20.1 (16.1-24.1)	559	6.8 (6.2-7.4)	514	7.0 (6.4-7.6)	30	4.4 (2.8-6.0)
2007	1,599	11.0 (10.5-11.5)	1,081	16.5 (15.5-17.5)	969	16.4 (15.4-17.4)	86	18.4 (14.5-22.3)	518	6.4 (5.8-7.0)	449	6.2 (5.6-6.8)	51	7.6 (5.5-9.7)
2006	1,534	10.5 (10.0-11.0)	1,057	16.2 (15.2-17.2)	954	16.1 (15.1-17.1)	81	16.9 (13.2-20.6)	477	5.9 (5.4-6.4)	417	5.8 (5.2-6.4)	38	5.7 (3.9-7.5)

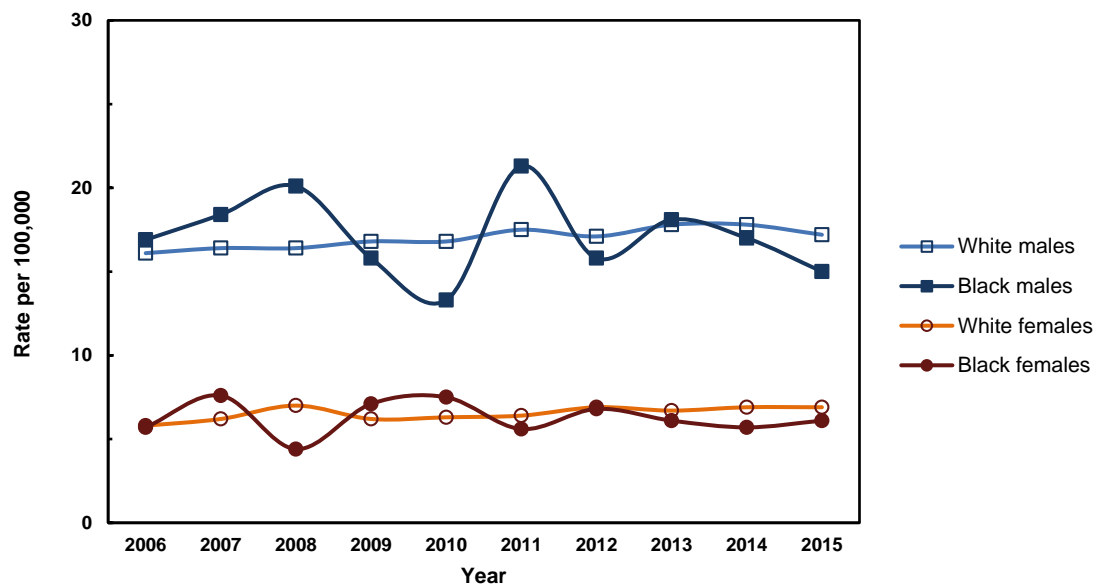
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
2-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Oral Cavity and Pharynx: INCIDENCE (Invasive)

**TABLE
2-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

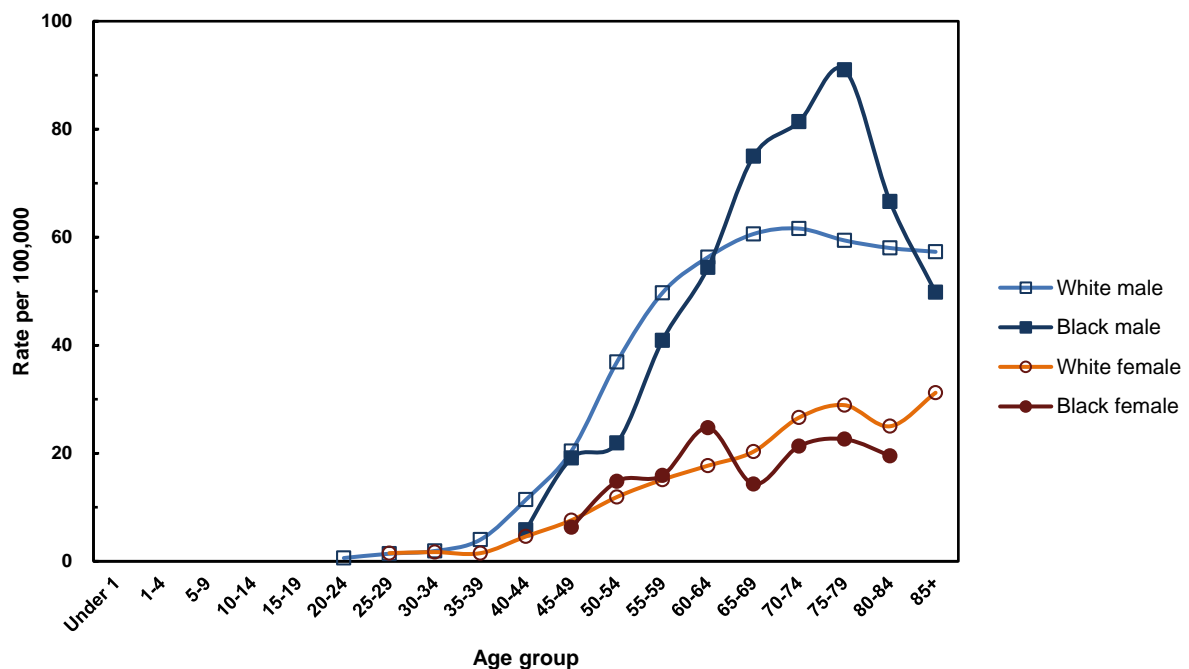
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	14.9	21.2	22.6	14.3	9.0	9.6	6.3
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	0.3	ND	ND	ND	ND	ND	ND
15-19	0.4	0.5	ND	ND	ND	ND	ND
20-24	0.6	0.7	0.6	ND	0.5	ND	ND
25-29	1.4	1.4	1.4	ND	1.4	1.5	ND
30-34	1.8	1.8	1.9	ND	1.8	1.7	ND
35-39	2.8	4.0	4.0	ND	1.6	1.5	ND
40-44	7.5	10.6	11.4	5.8	4.5	4.6	ND
45-49	13.7	20.3	20.4	19.1	7.4	7.6	6.3
50-54	23.5	35.2	36.9	21.9	12.2	11.9	14.8
55-59	31.6	48.9	49.7	40.9	15.1	15.1	15.9
60-64	36.5	55.7	56.3	54.4	18.5	17.7	24.7
65-69	39.6	61.7	60.6	75.0	19.9	20.3	14.3
70-74	43.0	63.3	61.6	81.4	26.1	26.6	21.3
75-79	43.4	62.5	59.4	91.0	28.8	28.9	22.6
80-84	38.6	59.4	58.0	66.6	24.9	25.0	19.5
85+	39.7	58.1	57.3	49.8	30.9	31.2	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
2-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Oral Cavity and Pharynx: INCIDENCE (Invasive)

**TABLE
2-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	9,544	6,600	5,890	504	2,943	2,596	239
Under 1	1	1	0	0	0	0	0
1-4	0	0	0	0	0	0	0
5-9	2	0	0	0	2	2	0
10-14	13	8	7	0	5	4	1
15-19	16	10	8	1	6	6	0
20-24	27	16	11	5	11	7	3
25-29	59	30	24	3	29	24	2
30-34	70	36	30	5	34	26	3
35-39	102	72	59	5	30	22	5
40-44	304	213	191	13	91	77	9
45-49	605	441	378	44	164	143	16
50-54	1,130	831	757	50	299	251	38
55-59	1,476	1,115	1,001	82	361	313	37
60-64	1,472	1,085	981	83	387	324	47
65-69	1,259	925	822	78	334	303	20
70-74	1,009	676	598	57	333	304	22
75-79	782	486	423	44	295	267	18
80-84	569	348	316	21	221	203	12
85+	648	307	284	13	341	320	6

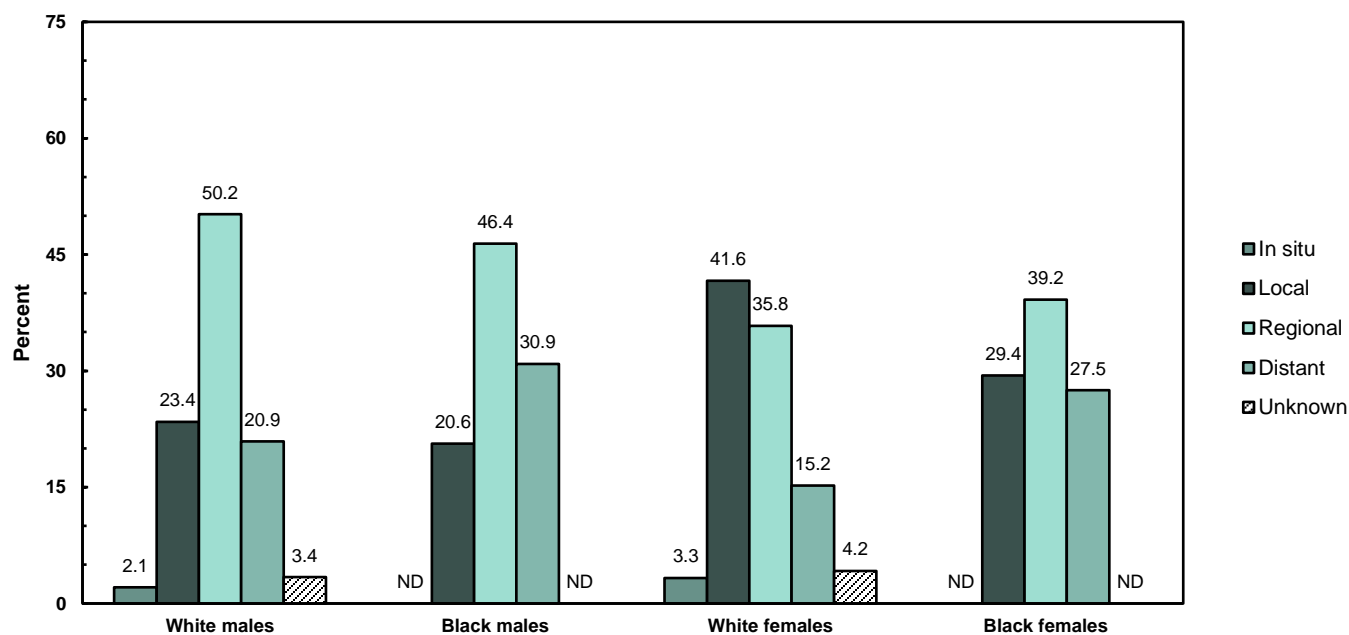
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
2-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 1,895 - 98.2%

Cancer of the Oral Cavity and Pharynx: MORTALITY

**TABLE
2-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	399	2.3 (2.1-2.5)	283	3.7 (3.3-4.1)	258	3.7 (3.2-4.2)	21	3.6 (2.1-5.1)	116	1.2 (1.0-1.4)	98	1.1 (0.9-1.3)	10	ND
2014	407	2.4 (2.2-2.6)	290	3.9 (3.5-4.3)	249	3.7 (3.2-4.2)	31	6.0 (3.9-8.1)	117	1.2 (1.0-1.4)	106	1.2 (1.0-1.4)	10	ND
2013	344	2.0 (1.8-2.2)	243	3.2 (2.8-3.6)	208	3.0 (2.6-3.4)	24	4.7 (2.8-6.6)	101	1.1 (0.9-1.3)	90	1.0 (0.8-1.2)	7	ND
2012	351	2.1 (1.9-2.3)	225	3.1 (2.7-3.5)	192	2.9 (2.5-3.3)	21	3.9 (2.2-5.6)	126	1.3 (1.1-1.5)	113	1.3 (1.1-1.5)	8	ND
2011	329	2.0 (1.8-2.2)	227	3.2 (2.8-3.6)	207	3.2 (2.8-3.6)	17	ND	102	1.1 (0.9-1.3)	90	1.1 (0.9-1.3)	10	ND
2010	360	2.2 (2.0-2.4)	244	3.4 (3.0-3.8)	215	3.3 (2.9-3.7)	26	5.1 (3.1-7.1)	116	1.3 (1.1-1.5)	108	1.3 (1.1-1.5)	7	ND
2009	344	2.2 (2.0-2.4)	238	3.5 (3.1-3.9)	208	3.4 (2.9-3.9)	26	5.7 (3.5-7.9)	106	1.1 (0.9-1.3)	97	1.1 (0.9-1.3)	9	ND
2008	372	2.4 (2.2-2.6)	242	3.7 (3.2-4.2)	211	3.6 (3.1-4.1)	25	5.4 (3.3-7.5)	130	1.5 (1.2-1.8)	115	1.4 (1.1-1.7)	13	ND
2007	341	2.3 (2.1-2.5)	231	3.7 (3.2-4.2)	202	3.5 (3.0-4.0)	25	5.5 (3.3-7.7)	110	1.3 (1.1-1.5)	94	1.2 (1.0-1.4)	15	ND
2006	322	2.2 (2.0-2.4)	224	3.5 (3.0-4.0)	203	3.5 (3.0-4.0)	18	ND	98	1.1 (0.9-1.3)	87	1.1 (0.9-1.3)	11	ND

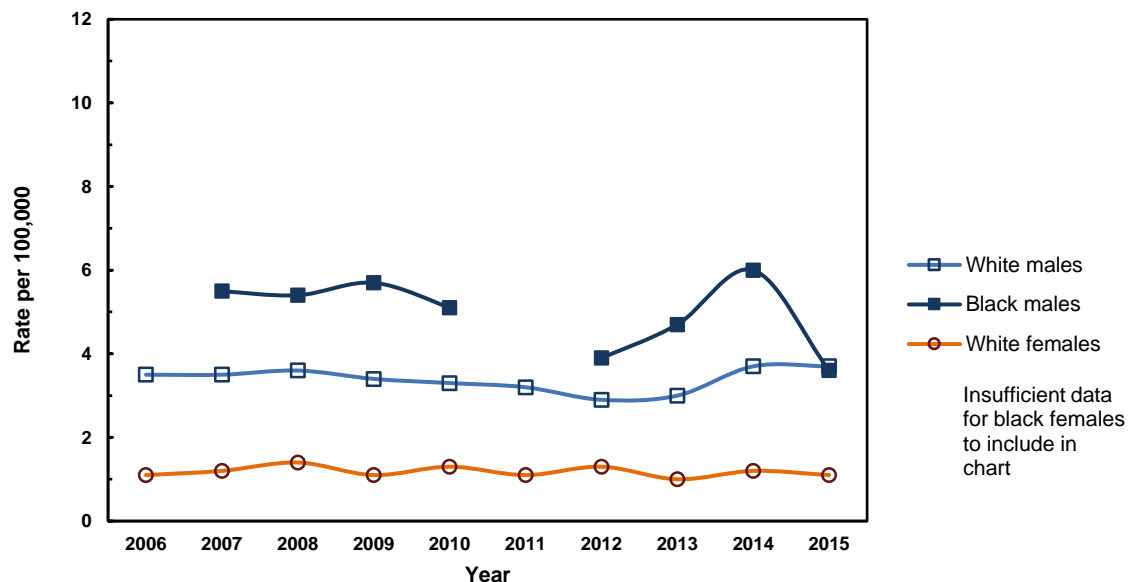
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
2-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Oral Cavity and Pharynx: MORTALITY

**TABLE
2-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	1,830	2.9	1,268	4.1	1,114	4.3	114	3.2	562	1.7	497	1.8	45	1.2
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	3	ND	3	ND	0	ND	1	ND	0	ND	0	ND	0	ND
25-29	5	ND	5	ND	5	ND	0	ND	0	ND	0	ND	0	ND
30-34	8	ND	6	ND	4	ND	1	ND	2	ND	1	ND	1	ND
35-39	9	ND	7	ND	6	ND	1	ND	2	ND	2	ND	0	ND
40-44	22	0.5	17	0.8	14	0.8	0	ND	5	ND	5	ND	0	ND
45-49	59	1.3	53	2.4	44	2.4	6	ND	6	ND	5	ND	0	ND
50-54	147	3.1	107	4.5	96	4.7	9	ND	40	1.6	33	1.6	4	ND
55-59	222	4.8	170	7.4	156	7.7	12	6.0	52	2.2	43	2.1	7	ND
60-64	256	6.3	195	10.0	166	9.5	23	15.1	61	2.9	49	2.7	9	ND
65-69	200	6.3	151	10.1	133	9.8	15	14.4	49	2.9	40	2.7	9	ND
70-74	226	9.6	166	15.5	141	14.5	14	20.0	60	4.7	54	4.7	2	ND
75-79	192	10.7	126	16.2	110	15.5	13	26.9	66	6.5	61	6.6	5	ND
80-84	199	13.5	125	21.3	109	20.0	13	41.2	74	8.3	68	8.4	3	ND
85+	282	17.3	137	25.9	130	26.2	6	ND	145	13.1	136	13.2	5	ND

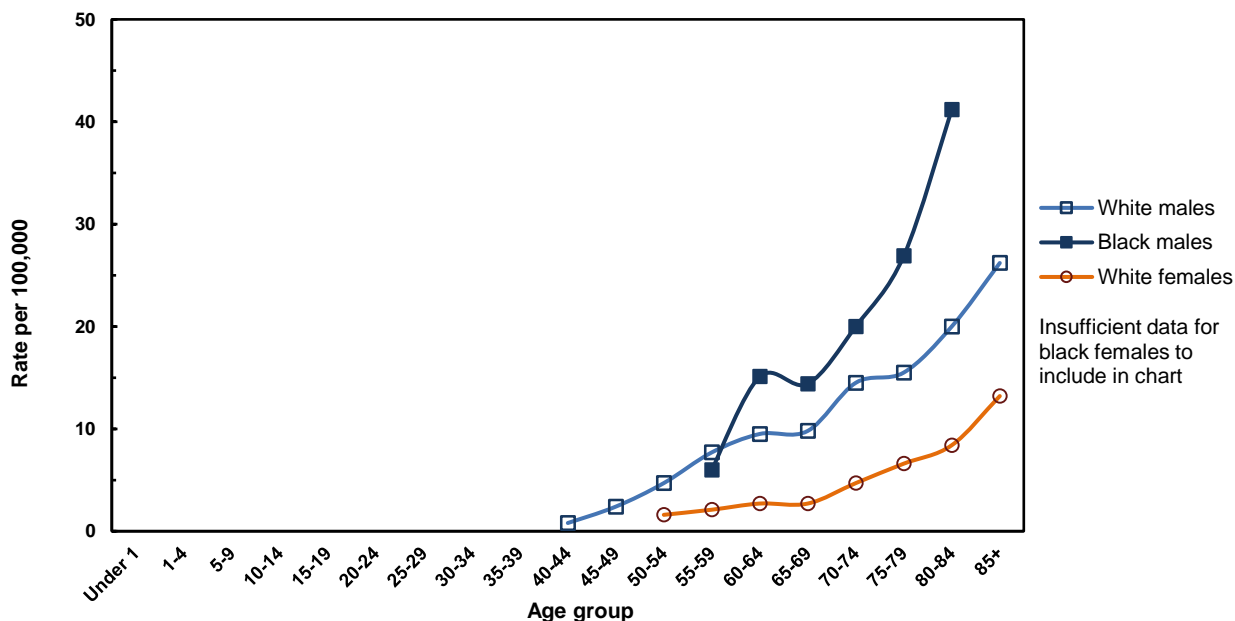
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
2-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Oral Cavity and Pharynx: INCIDENCE (Invasive)

**TABLE
2-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	9,544	6,600	17.5	(17.1-17.9)	2,943	6.8	(6.6-7.0)								
Adams	89	62	19.7	(14.8-24.6)	27	7.7	(4.8-10.6)	Juniata	16	13	ND		3	ND	
Allegheny	934	634	17.7	(16.3-19.1)	300	6.7	(5.9-7.5)	Lackawanna	208	149	22.3	(18.7-25.9)	59	7.6	(5.7-9.5)
Armstrong	67	49	21.8	(15.7-27.9)	18	ND		Lancaster	334	229	15.0	(13.1-16.9)	105	6.1	(4.9-7.3)
Beaver	145	96	17.6	(14.1-21.1)	49	8.0	(5.8-10.2)	Lawrence	83	61	20.3	(15.2-25.4)	21	5.8	(3.3-8.3)
Bedford	35	23	13.5	(8.0-19.0)	12	ND		Lebanon	84	56	13.5	(10.0-17.0)	28	5.1	(3.2-7.0)
Berks	276	194	16.1	(13.8-18.4)	82	6.0	(4.7-7.3)	Lehigh	253	176	17.8	(15.2-20.4)	77	6.2	(4.8-7.6)
Blair	114	84	21.3	(16.7-25.9)	30	6.6	(4.2-9.0)	Luzerne	296	210	20.9	(18.1-23.7)	86	7.6	(6.0-9.2)
Bradford	51	34	15.6	(10.4-20.8)	17	ND		Lycoming	86	61	17.1	(12.8-21.4)	25	5.9	(3.6-8.2)
Bucks	494	338	17.2	(15.4-19.0)	156	7.0	(5.9-8.1)	McKean	46	30	21.4	(13.7-29.1)	16	ND	
Butler	138	87	14.2	(11.2-17.2)	51	7.5	(5.4-9.6)	Mercer	88	57	15.5	(11.5-19.5)	31	6.7	(4.3-9.1)
Cambria	125	84	18.0	(14.2-21.8)	41	7.6	(5.3-9.9)	Mifflin	31	20	12.3	(6.9-17.7)	11	ND	
Cameron	4	2	ND		2	ND		Monroe	119	90	17.5	(13.9-21.1)	29	5.3	(3.4-7.2)
Carbon	54	36	14.7	(9.9-19.5)	18	ND		Montgomery	516	359	15.0	(13.4-16.6)	157	5.7	(4.8-6.6)
Centre	88	66	17.8	(13.5-22.1)	22	5.8	(3.4-8.2)	Montour	20	15	ND		5	ND	
Chester	347	229	15.8	(13.8-17.8)	118	7.4	(6.1-8.7)	Northampton	257	175	19.6	(16.7-22.5)	82	7.7	(6.0-9.4)
Clarion	24	20	16.1	(9.0-23.2)	4	ND		Northumberland	80	56	17.7	(13.1-22.3)	24	6.8	(4.1-9.5)
Clearfield	67	51	19.5	(14.1-24.9)	16	ND		Perry	35	23	17.5	(10.3-24.7)	12	ND	
Clinton	29	18	ND		11	ND		Philadelphia	937	628	17.8	(16.4-19.2)	309	6.9	(6.1-7.7)
Columbia	65	50	25.5	(18.4-32.6)	15	ND		Pike	62	44	23.0	(16.2-29.8)	18	ND	
Crawford	69	52	19.3	(14.1-24.5)	17	ND		Potter	12	5	ND		7	ND	
Cumberland	193	135	18.9	(15.7-22.1)	58	7.1	(5.3-8.9)	Schuylkill	122	80	15.8	(12.3-19.3)	42	7.9	(5.5-10.3)
Dauphin	187	121	16.1	(13.2-19.0)	66	7.4	(5.6-9.2)	Snyder	23	19	ND		4	ND	
Delaware	434	302	20.0	(17.7-22.3)	132	7.2	(6.0-8.4)	Somerset	68	50	18.0	(13.0-23.0)	18	ND	
Elk	23	13	ND		10	ND		Sullivan	5	1	ND		4	ND	
Erie	201	139	17.5	(14.6-20.4)	62	7.1	(5.3-8.9)	Susquehanna	39	27	17.1	(10.6-23.6)	12	ND	
Fayette	118	83	18.4	(14.4-22.4)	35	7.0	(4.7-9.3)	Tioga	36	25	17.8	(10.8-24.8)	11	ND	
Forest	8	5	ND		3	ND		Union	38	30	20.8	(13.4-28.2)	8	ND	
Franklin	90	72	15.8	(12.2-19.4)	18	ND		Venango	45	34	16.3	(10.8-21.8)	11	ND	
Fulton	11	9	ND		2	ND		Warren	31	23	15.4	(9.1-21.7)	8	ND	
Greene	33	25	20.3	(12.3-28.3)	8	ND		Washington	208	143	20.9	(17.5-24.3)	65	8.2	(6.2-10.2)
Huntingdon	32	24	14.5	(8.7-20.3)	8	ND		Wayne	45	30	15.7	(10.1-21.3)	15	ND	
Indiana	56	36	13.0	(8.8-17.2)	20	6.6	(3.7-9.5)	Westmoreland	303	211	17.7	(15.3-20.1)	92	6.6	(5.3-7.9)
Jefferson	42	28	19.7	(12.4-27.0)	14	ND		Wyoming	24	15	ND		9	ND	
								York	351	254	19.2	(16.8-21.6)	97	6.9	(5.5-8.3)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

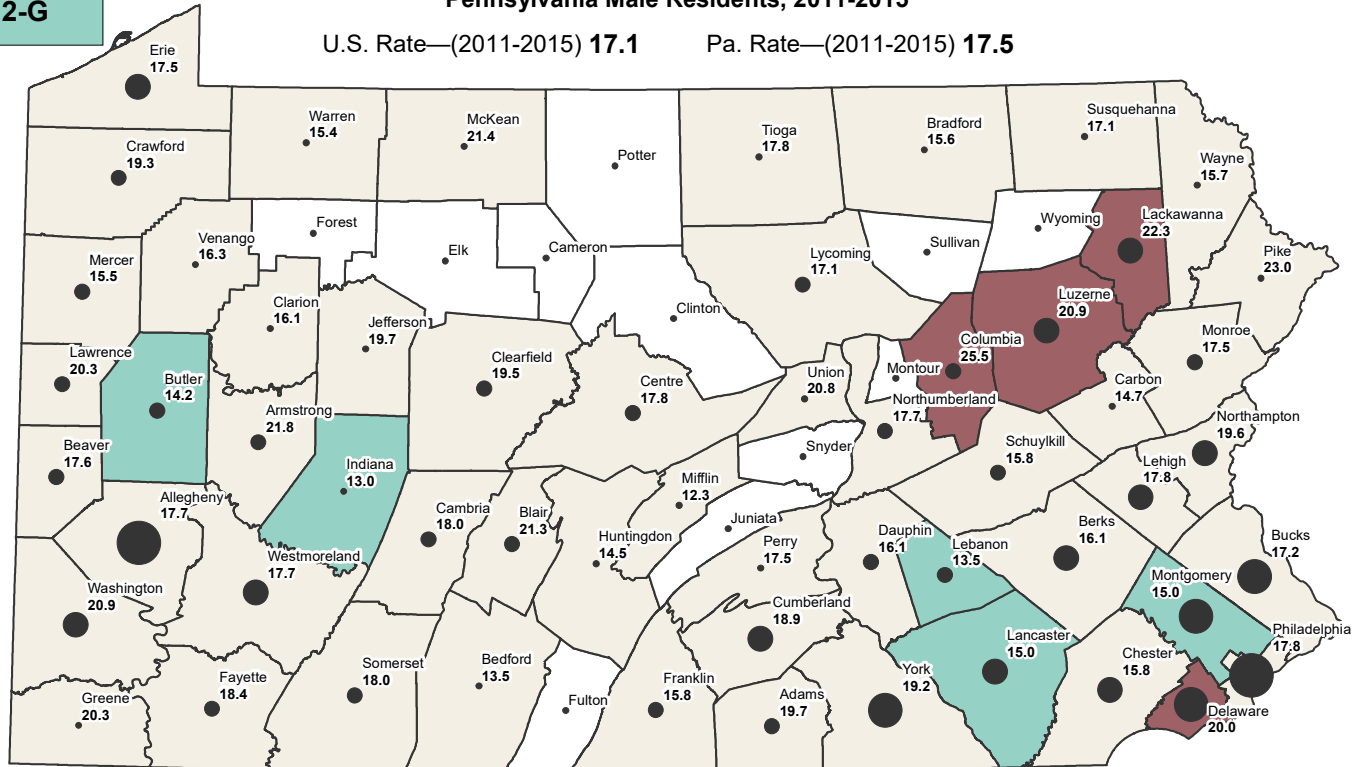
Cancer of the Oral Cavity and Pharynx: INCIDENCE (Invasive)

**MAP
2-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) 17.1

Pa. Rate—(2011-2015) 17.5



Significantly higher

Significantly lower

Not significantly
different

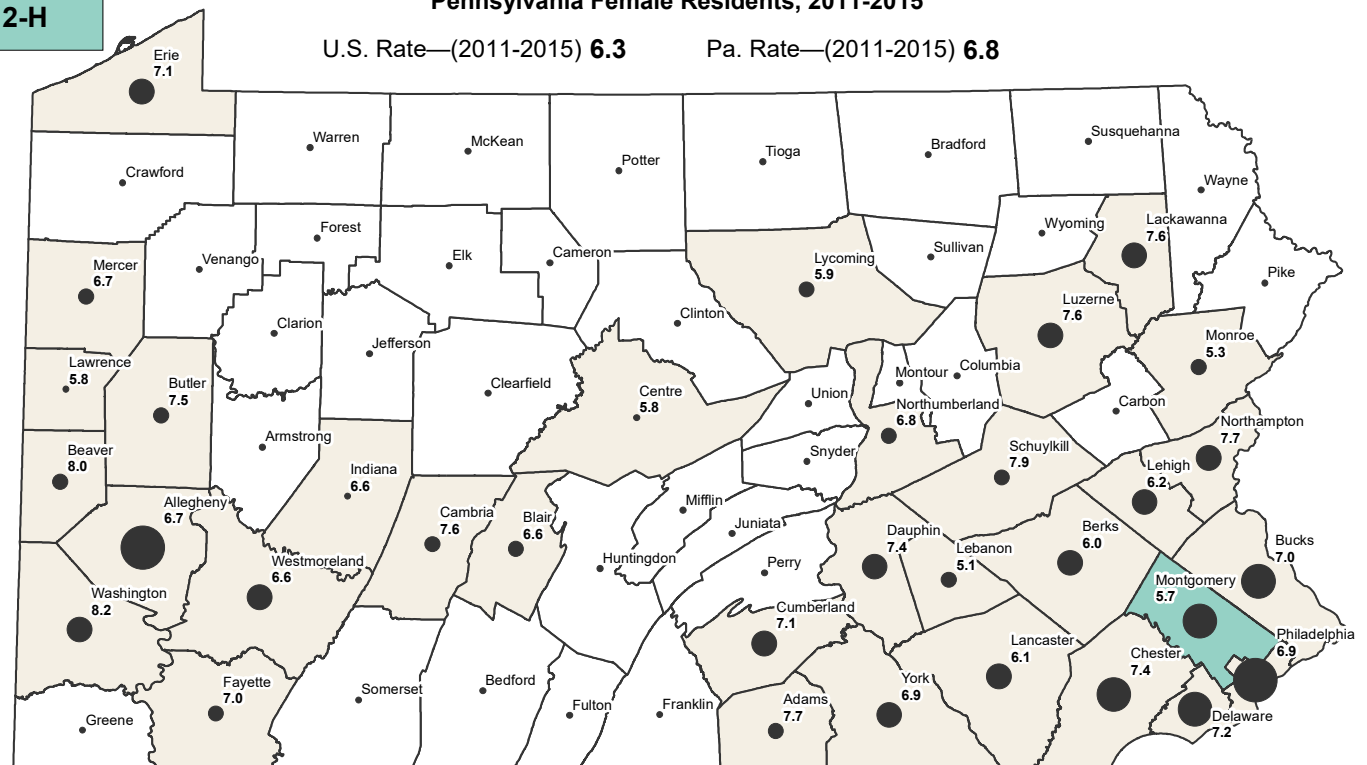
Significance not determined—
less than 20 observed cases

**MAP
2-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) 6.3

Pa. Rate—(2011-2015) 6.8



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Oral Cavity and Pharynx: MORTALITY

**TABLE
2-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	1,830	1,268	3.4	(3.2-3.6)	562	1.2	(1.1-1.3)								
Adams	13	9	ND		4	ND		Juniata	1	1	ND		0	ND	
Allegheny	161	110	3.1	(2.5-3.7)	51	1.0	(0.7-1.3)	Lackawanna	49	33	4.8	(3.2-6.4)	16	ND	
Armstrong	10	5	ND		5	ND		Lancaster	64	43	3.0	(2.1-3.9)	21	1.0	(0.6-1.4)
Beaver	20	13	ND		7	ND		Lawrence	27	19	ND		8	ND	
Bedford	6	5	ND		1	ND		Lebanon	24	18	ND		6	ND	
Berks	48	30	2.6	(1.7-3.5)	18	ND		Lehigh	56	42	4.4	(3.1-5.7)	14	ND	
Blair	22	16	ND		6	ND		Luzerne	78	56	5.5	(4.1-6.9)	22	1.8	(1.0-2.6)
Bradford	7	2	ND		5	ND		Lycoming	20	14	ND		6	ND	
Bucks	85	52	2.6	(1.9-3.3)	33	1.4	(0.9-1.9)	McKean	6	5	ND		1	ND	
Butler	27	20	3.4	(1.9-4.9)	7	ND		Mercer	12	8	ND		4	ND	
Cambria	28	21	4.2	(2.4-6.0)	7	ND		Mifflin	12	8	ND		4	ND	
Cameron	0	0	ND		0	ND		Monroe	11	9	ND		2	ND	
Carbon	16	13	ND		3	ND		Montgomery	104	69	3.0	(2.3-3.7)	35	1.0	(0.7-1.3)
Centre	10	7	ND		3	ND		Montour	3	2	ND		1	ND	
Chester	54	41	3.0	(2.1-3.9)	13	ND		Northampton	44	26	3.0	(1.8-4.2)	18	ND	
Clarion	6	4	ND		2	ND		Northumberland	13	7	ND		6	ND	
Clearfield	15	11	ND		4	ND		Perry	7	6	ND		1	ND	
Clinton	4	3	ND		1	ND		Philadelphia	187	132	4.0	(3.3-4.7)	55	1.1	(0.8-1.4)
Columbia	11	6	ND		5	ND		Pike	10	7	ND		3	ND	
Crawford	17	14	ND		3	ND		Potter	6	4	ND		2	ND	
Cumberland	28	19	ND		9	ND		Schuylkill	23	14	ND		9	ND	
Dauphin	37	24	3.2	(1.9-4.5)	13	ND		Snyder	6	4	ND		2	ND	
Delaware	77	54	3.6	(2.6-4.6)	23	1.1	(0.7-1.5)	Somerset	13	11	ND		2	ND	
Elk	4	2	ND		2	ND		Sullivan	1	0	ND		1	ND	
Erie	37	23	2.9	(1.7-4.1)	14	ND		Susquehanna	9	8	ND		1	ND	
Fayette	25	17	ND		8	ND		Tioga	10	7	ND		3	ND	
Forest	3	3	ND		0	ND		Union	3	2	ND		1	ND	
Franklin	18	17	ND		1	ND		Venango	9	5	ND		4	ND	
Fulton	3	2	ND		1	ND		Warren	9	9	ND		0	ND	
Greene	3	2	ND		1	ND		Washington	33	19	ND		14	ND	
Huntingdon	5	3	ND		2	ND		Wayne	6	5	ND		1	ND	
Indiana	11	4	ND		7	ND		Westmoreland	64	45	3.5	(2.5-4.5)	19	ND	
Jefferson	11	7	ND		4	ND		Wyoming	5	5	ND		0	ND	
								York	83	66	4.9	(3.7-6.1)	17	ND	

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

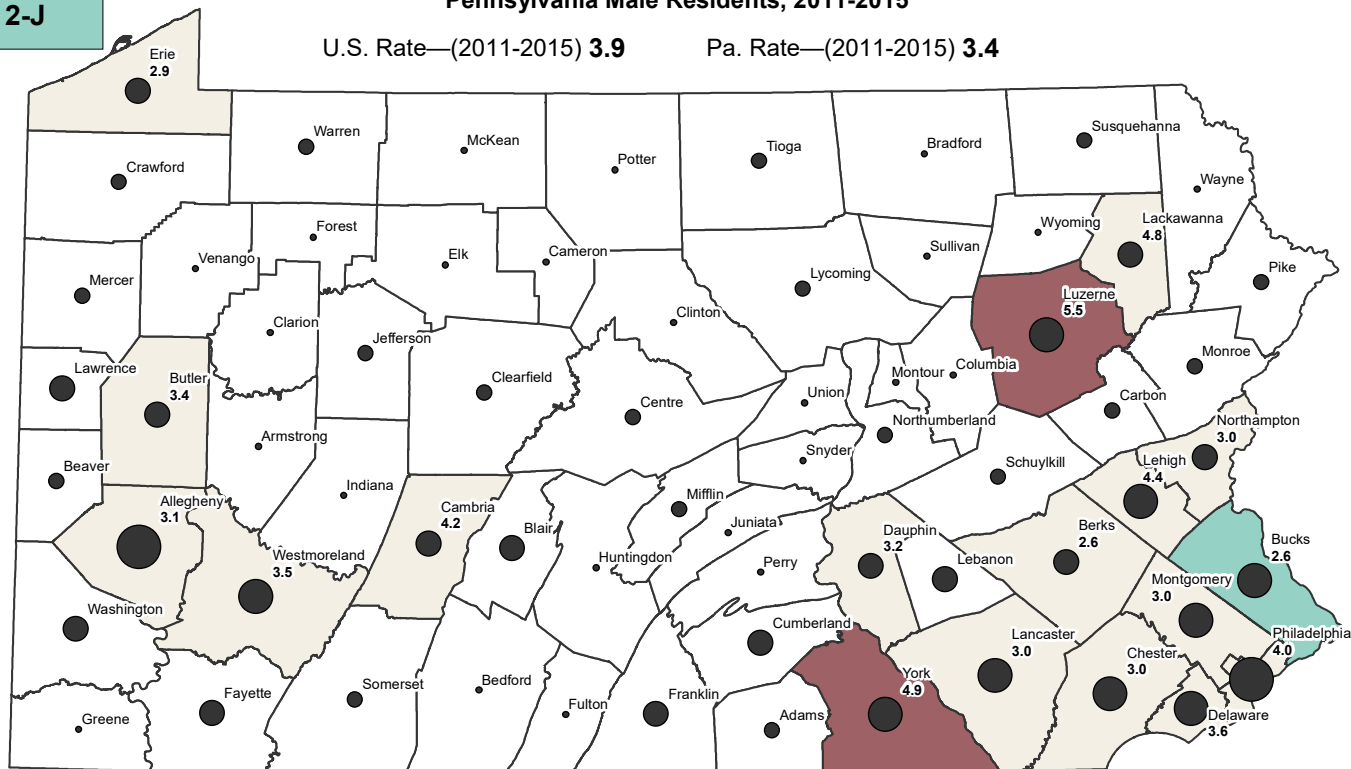
Cancer of the Oral Cavity and Pharynx: MORTALITY

**MAP
2-J**

**Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates
Pennsylvania Male Residents, 2011-2015**

U.S. Rate—(2011-2015) **3.9**

Pa. Rate—(2011-2015) **3.4**



Significantly higher

Significantly lower

Not significantly
different

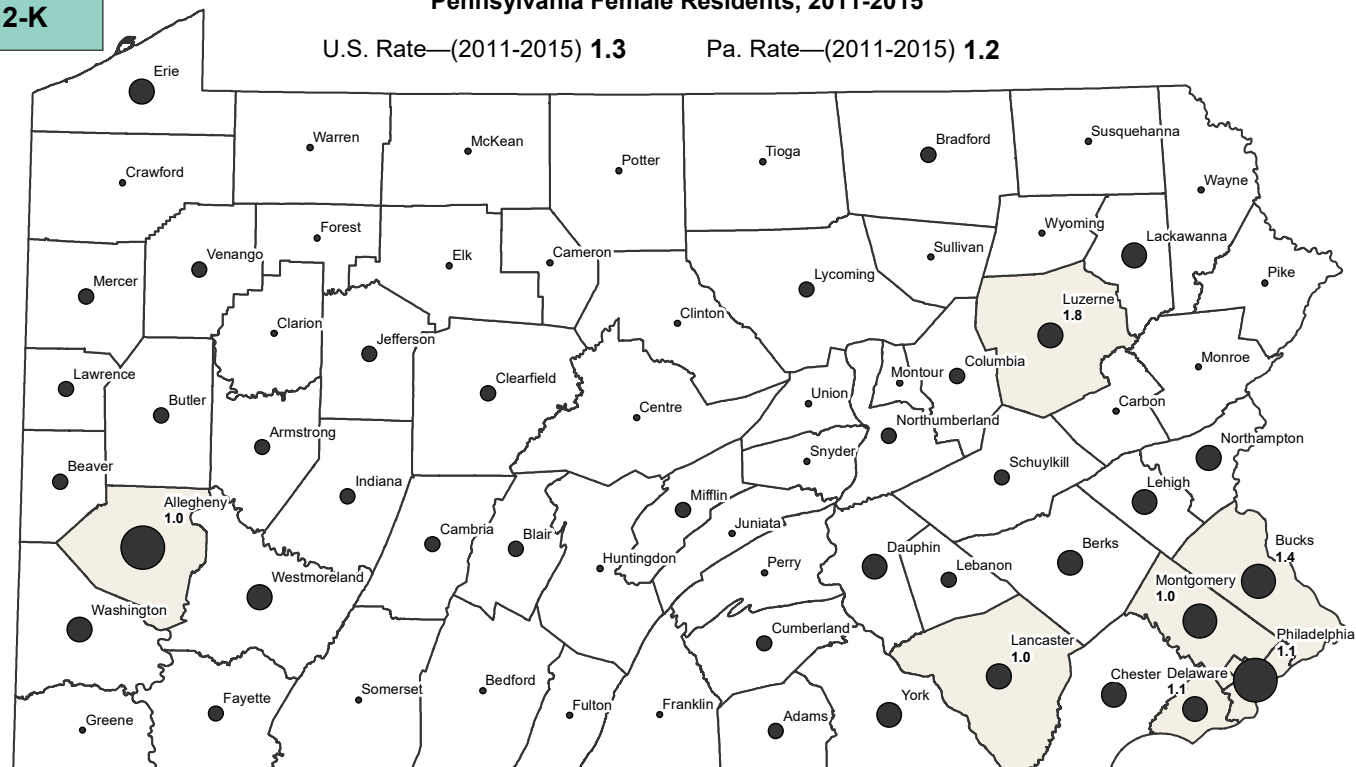
Significance not determined—
less than 20 observed cases

**MAP
2-K**

**Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates
Pennsylvania Female Residents, 2011-2015**

U.S. Rate—(2011-2015) **1.3**

Pa. Rate—(2011-2015) **1.2**



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Esophagus

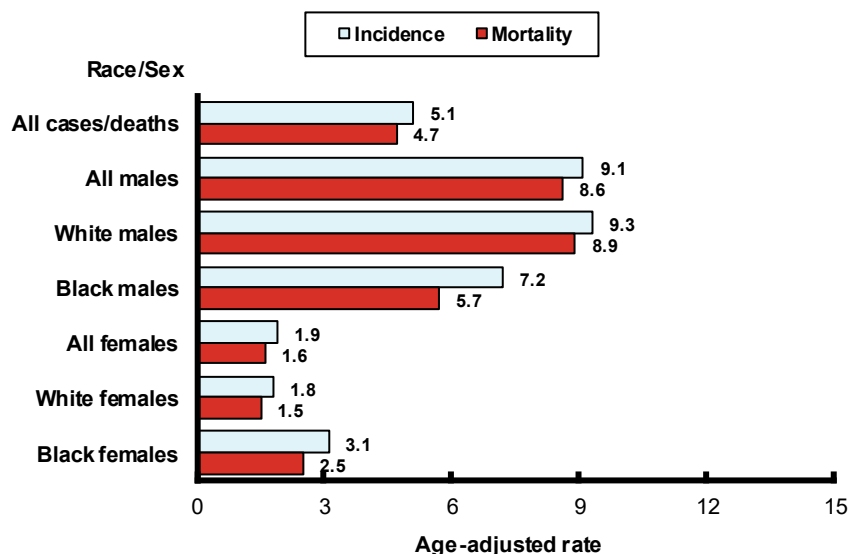
Data Highlights

As with other tobacco and alcohol-related cancers, males had a much higher average annual (2011-2015) age-adjusted incidence rate, 9.1 per 100,000, compared to 1.9 for females. In 2015, there were 896 cases of invasive esophageal cancer diagnosed among Pennsylvania residents, a slight increase compared to the 871 invasive cases diagnosed and reported in the previous year, 2014. According to the American Cancer Society, heavy consumption of alcohol and tobacco, in addition to poor nutrition, are major risk factors of esophageal cancer. A reduction of these risk factors would lead to significant declines in cancer incidence and mortality.

Annual age-adjusted incidence rates by sex and race for the period 2006-2015 were difficult to interpret and had no obvious trends. Annual age-adjusted rates for black males over the period 2006-2015 were lower than the corresponding rates for white males. The average annual age-specific incidence rates for the five-year period of 2011-2015 were higher among males compared to females, especially for ages 55 and over. Approximately 76 percent of invasive esophageal cancers were diagnosed among those age 60 and older during the 2011-2015 period.

In 2015, most cases of esophageal cancer were diagnosed at advanced stages (regional or distant stages) – about 75 percent of cases among white males and 70 percent among white females. Early stage (in situ or local) cancers accounted for 17 percent of esophagus cases among white males and 19 percent among white females. In Pennsylvania, reported five-year relative survival rates are very poor – 19.3 percent for all invasive stages (2008-2014). This is reflected in the population-based death rates compared to the incidence rates. The 2011-2015 average annual age-adjusted death rate for the total population was 4.7 per 100,000, very close to the average annual incidence rate of 5.1. As observed for the incidence rates, females had a lower annual age-adjusted death rate in 2011-2015 compared to males (1.6 versus 8.6). The annual age-adjusted death rates among white males and females have not changed much since 2006. Rates among black males have decreased overall since 2006. Recent trends were inconclusive for black females. Among Pennsylvania residents, the total number of deaths in 2015 for esophageal cancers was 804 – a decrease from the prior year, 2014, when there were 820 deaths.

FIGURE 3
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, gastroesophageal reflux disease, Barrett's esophagus, cigarette/cigar/pipe smoking, smokeless tobacco, excessive use of alcohol, obesity/overeating, nutritional deficiencies, achalasia, tylosis, Plummer-Vinson syndrome, occupational exposure to chemicals, frequent drinking of very hot liquids, injury to the esophagus, and human papillomavirus are some of the suggestive risk factors associated with esophagus cancer.

Early Detection

According to the American Cancer Society, in the United States, mass screening is not recommended. However, endoscopic methods can be used for high risk individuals, such as those with Barrett's esophagus.

Cancer of the Esophagus: INCIDENCE (Invasive)

**TABLE
3-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	896	5.2 (4.9-5.5)	710	9.1 (8.4-9.8)	657	9.4 (8.7-10.1)	37	5.6 (3.8-7.4)	186	1.9 (1.6-2.2)	159	1.9 (1.6-2.2)	25	3.1 (1.9-4.3)
2014	871	5.1 (4.8-5.4)	687	9.0 (8.3-9.7)	633	9.2 (8.5-9.9)	46	8.2 (5.8-10.6)	184	1.9 (1.6-2.2)	159	1.9 (1.6-2.2)	18	ND
2013	866	5.2 (4.9-5.5)	685	9.2 (8.5-9.9)	633	9.5 (8.8-10.2)	39	6.6 (4.5-8.7)	181	2.0 (1.7-2.3)	143	1.7 (1.4-2.0)	32	4.3 (2.8-5.8)
2012	829	5.0 (4.7-5.3)	643	8.7 (8.0-9.4)	577	8.7 (8.0-9.4)	40	8.1 (5.6-10.6)	186	2.0 (1.7-2.3)	157	1.9 (1.6-2.2)	23	3.0 (1.8-4.2)
2011	839	5.1 (4.8-5.4)	677	9.2 (8.5-9.9)	625	9.5 (8.8-10.2)	42	7.6 (5.3-9.9)	162	1.8 (1.5-2.1)	134	1.6 (1.3-1.9)	21	2.8 (1.6-4.0)
2010	794	5.0 (4.7-5.3)	610	8.7 (8.0-9.4)	559	8.8 (8.1-9.5)	37	7.3 (4.9-9.7)	184	2.0 (1.7-2.3)	147	1.8 (1.5-2.1)	35	5.1 (3.4-6.8)
2009	827	5.4 (5.0-5.8)	655	9.7 (9.0-10.4)	613	9.9 (9.1-10.7)	30	6.6 (4.2-9.0)	172	2.0 (1.7-2.3)	144	1.8 (1.5-2.1)	25	3.7 (2.2-5.2)
2008	872	5.8 (5.4-6.2)	676	10.3 (9.5-11.1)	624	10.4 (9.6-11.2)	44	10.0 (7.0-13.0)	196	2.2 (1.9-2.5)	166	2.0 (1.7-2.3)	25	3.6 (2.2-5.0)
2007	822	5.5 (5.1-5.9)	637	10.0 (9.2-10.8)	587	10.0 (9.2-10.8)	38	8.5 (5.8-11.2)	185	2.1 (1.8-2.4)	162	2.0 (1.7-2.3)	20	3.1 (1.7-4.5)
2006	819	5.5 (5.1-5.9)	633	9.9 (9.1-10.7)	588	10.1 (9.3-10.9)	33	7.2 (4.7-9.7)	186	2.2 (1.9-2.5)	164	2.1 (1.8-2.4)	20	3.0 (1.7-4.3)

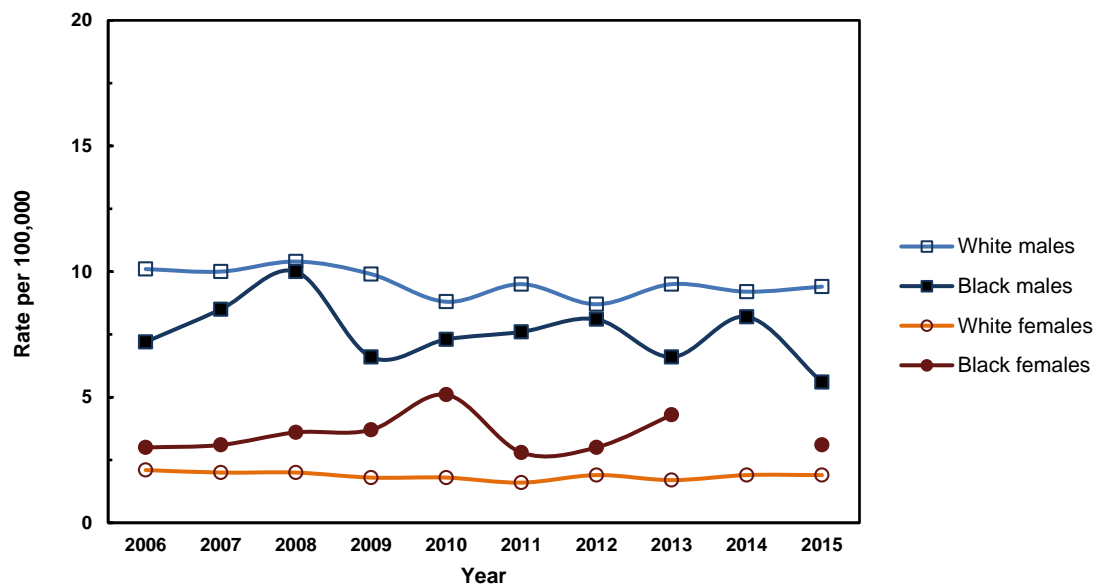
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
3-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Esophagus: INCIDENCE (Invasive)

**TABLE
3-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

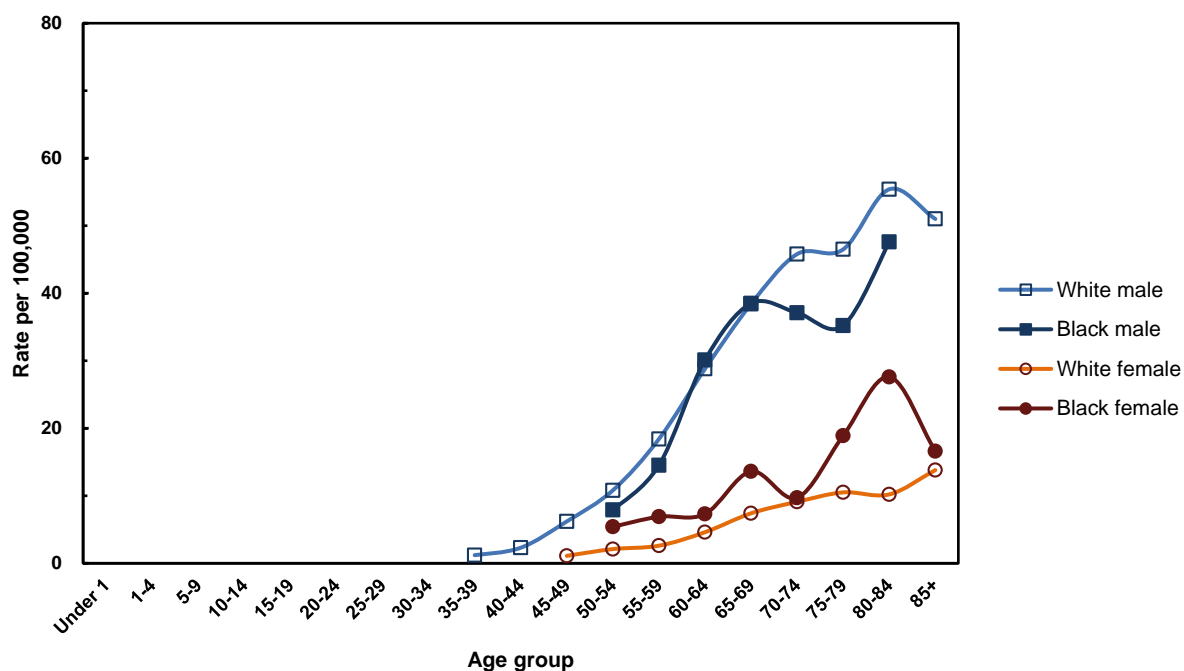
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	6.7	10.9	12.0	5.8	2.8	2.8	3.1
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	ND	ND	ND	ND	ND	ND	ND
25-29	ND	ND	ND	ND	ND	ND	ND
30-34	ND	ND	ND	ND	ND	ND	ND
35-39	0.6	1.0	1.2	ND	ND	ND	ND
40-44	1.2	2.0	2.3	ND	ND	ND	ND
45-49	3.3	5.5	6.2	ND	1.1	1.1	ND
50-54	6.4	10.5	10.8	7.9	2.4	2.1	5.4
55-59	10.3	17.9	18.4	14.5	3.0	2.6	6.9
60-64	16.5	28.8	28.8	30.1	4.9	4.6	7.3
65-69	22.2	38.1	38.4	38.5	8.0	7.4	13.6
70-74	25.6	45.1	45.8	37.1	9.3	9.1	9.7
75-79	26.3	46.2	46.5	35.2	11.2	10.5	18.9
80-84	28.6	54.5	55.4	47.6	11.6	10.2	27.6
85+	25.8	50.0	51.0	ND	14.3	13.8	16.6

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
3-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Esophagus: INCIDENCE (Invasive)

**TABLE
3-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	4,301	3,402	3,125	204	899	752	119
Under 1	0	0	0	0	0	0	0
1-4	0	0	0	0	0	0	0
5-9	0	0	0	0	0	0	0
10-14	0	0	0	0	0	0	0
15-19	1	1	1	0	0	0	0
20-24	0	0	0	0	0	0	0
25-29	3	3	3	0	0	0	0
30-34	9	6	4	1	3	3	0
35-39	20	19	18	1	1	1	0
40-44	50	41	39	2	9	8	1
45-49	144	120	115	5	24	21	2
50-54	306	247	221	18	59	45	14
55-59	480	409	370	29	71	54	16
60-64	664	561	502	46	103	84	14
65-69	705	571	521	40	134	110	19
70-74	601	482	445	26	119	104	10
75-79	474	359	331	17	115	97	15
80-84	422	319	302	15	103	83	17
85+	422	264	253	4	158	142	11

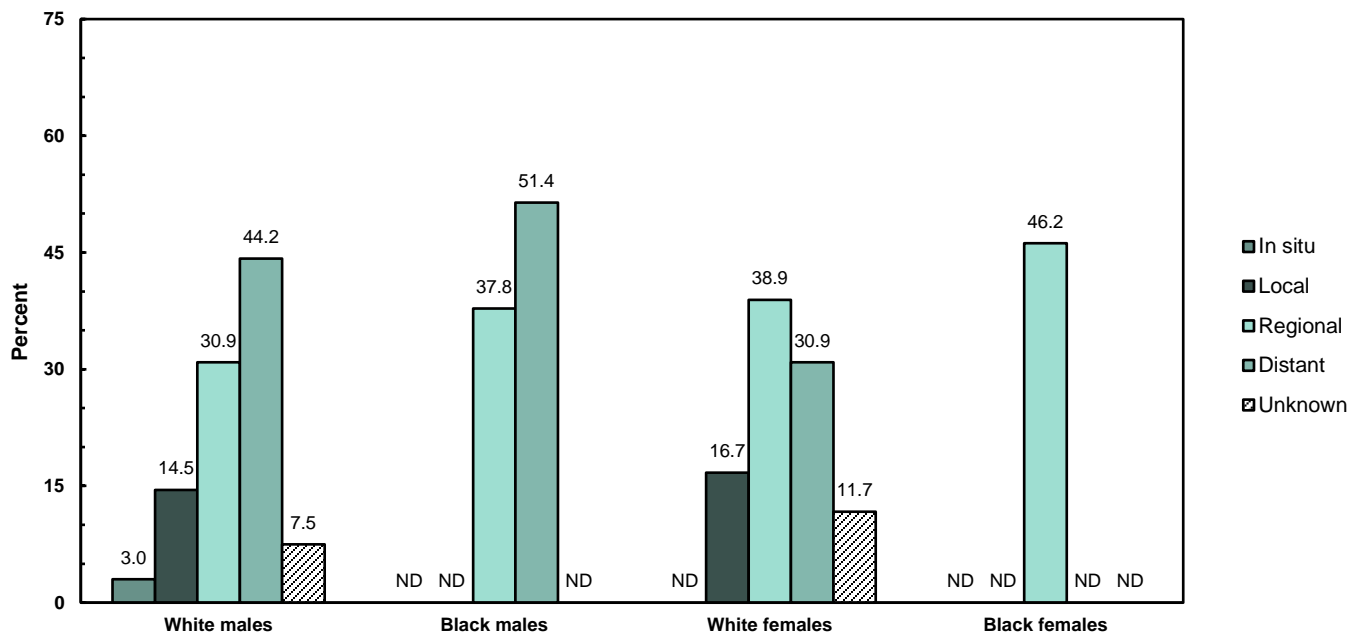
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
3-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 862 - 96.2%

Cancer of the Esophagus: MORTALITY

**TABLE
3-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	804	4.6 (4.3-4.9)	655	8.5 (7.8-9.2)	614	8.9 (8.2-9.6)	26	4.9 (3.0-6.8)	149	1.5 (1.3-1.7)	127	1.4 (1.2-1.6)	18	ND
2014	820	4.8 (4.5-5.1)	646	8.5 (7.8-9.2)	600	8.7 (8.0-9.4)	37	6.3 (4.3-8.3)	174	1.8 (1.5-2.1)	146	1.7 (1.4-2.0)	25	3.0 (1.8-4.2)
2013	794	4.8 (4.5-5.1)	637	8.7 (8.0-9.4)	596	8.9 (8.2-9.6)	34	6.7 (4.4-9.0)	157	1.7 (1.4-2.0)	144	1.7 (1.4-2.0)	12	ND
2012	776	4.6 (4.3-4.9)	634	8.7 (8.0-9.4)	602	9.1 (8.4-9.8)	22	4.3 (2.5-6.1)	142	1.4 (1.2-1.6)	124	1.3 (1.1-1.5)	16	ND
2011	779	4.8 (4.5-5.1)	623	8.8 (8.1-9.5)	588	9.1 (8.4-9.8)	33	6.4 (4.2-8.6)	156	1.7 (1.4-2.0)	129	1.5 (1.2-1.8)	25	3.4 (2.1-4.7)
2010	769	4.8 (4.5-5.1)	576	8.2 (7.5-8.9)	552	8.7 (8.0-9.4)	22	4.6 (2.7-6.5)	193	2.0 (1.7-2.3)	163	1.9 (1.6-2.2)	30	4.1 (2.6-5.6)
2009	787	5.0 (4.7-5.3)	639	9.5 (8.8-10.2)	593	9.6 (8.8-10.4)	45	9.6 (6.8-12.4)	148	1.6 (1.3-1.9)	135	1.6 (1.3-1.9)	12	ND
2008	735	4.8 (4.5-5.1)	593	9.0 (8.3-9.7)	555	9.2 (8.4-10.0)	35	7.8 (5.2-10.4)	142	1.5 (1.3-1.7)	121	1.4 (1.2-1.6)	17	ND
2007	764	5.1 (4.7-5.5)	613	9.7 (8.9-10.5)	569	9.9 (9.1-10.7)	40	8.6 (5.9-11.3)	151	1.7 (1.4-2.0)	136	1.7 (1.4-2.0)	14	ND
2006	769	5.2 (4.8-5.6)	596	9.5 (8.7-10.3)	554	9.7 (8.9-10.5)	41	9.5 (6.6-12.4)	173	2.0 (1.7-2.3)	151	1.9 (1.6-2.2)	22	3.3 (1.9-4.7)

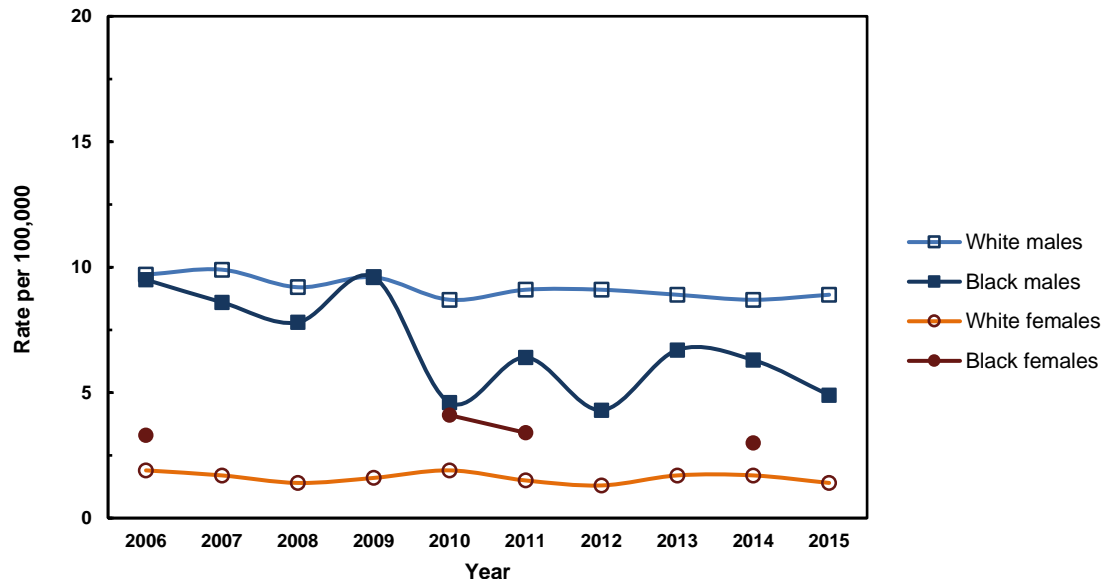
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
3-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Esophagus: MORTALITY

**TABLE
3-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	3,973	6.2	3,195	10.2	3,000	11.5	152	4.3	778	2.4	670	2.5	96	2.5
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
25-29	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
30-34	5	ND	4	ND	4	ND	0	ND	1	ND	1	ND	0	ND
35-39	13	0.4	11	0.6	9	ND	2	ND	2	ND	2	ND	0	ND
40-44	39	1.0	35	1.7	32	1.9	3	ND	4	ND	4	ND	0	ND
45-49	110	2.5	92	4.2	88	4.7	3	ND	18	0.8	13	0.7	5	ND
50-54	219	4.6	186	7.9	172	8.4	14	6.1	33	1.3	24	1.1	8	ND
55-59	427	9.1	353	15.5	327	16.2	21	10.5	74	3.1	57	2.7	16	6.9
60-64	551	13.7	477	24.5	440	25.2	25	16.4	74	3.5	60	3.3	11	5.8
65-69	624	19.6	521	34.7	489	36.0	25	24.0	103	6.1	86	5.8	16	11.4
70-74	557	23.7	456	42.7	425	43.8	24	34.3	101	7.9	85	7.4	14	13.6
75-79	483	26.8	393	50.6	368	51.7	17	35.2	90	8.8	82	8.9	8	ND
80-84	449	30.5	350	59.7	336	61.7	13	41.2	99	11.1	88	10.8	9	ND
85+	494	30.3	315	59.6	308	62.1	5	ND	179	16.2	168	16.4	9	ND

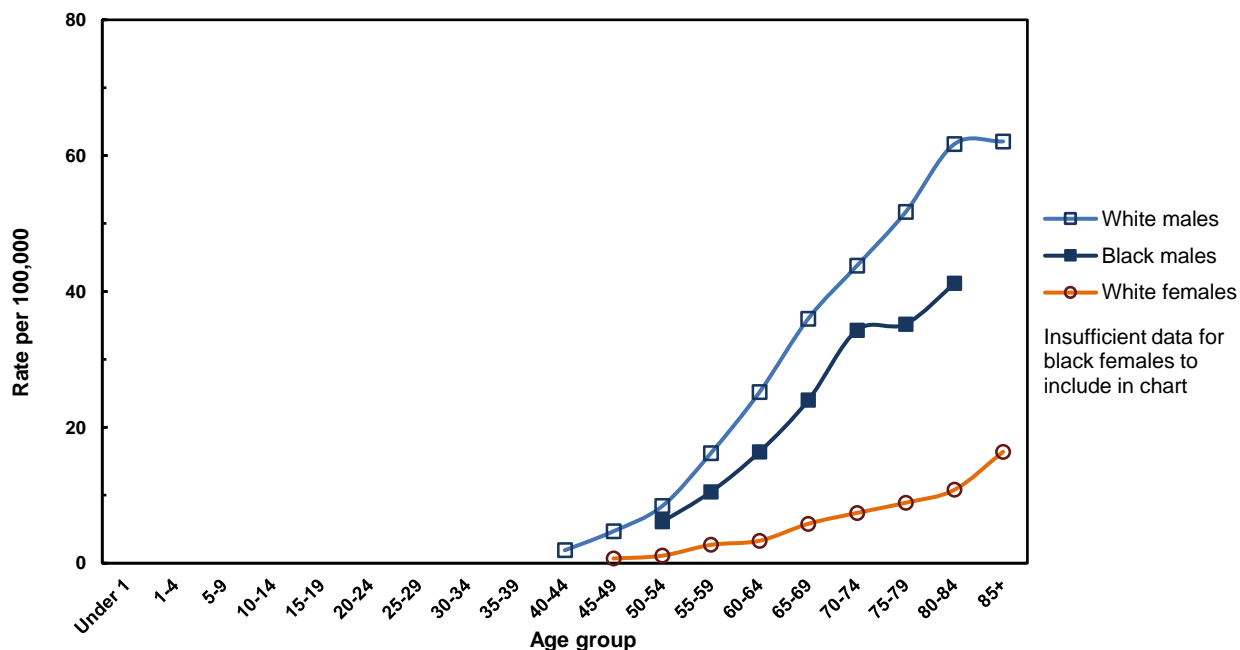
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
3-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Esophagus: INCIDENCE (Invasive)

**TABLE
3-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	4,301	3,402	9.1	(8.8-9.4)	899	1.9	(1.8-2.0)								
Adams	36	29	8.4	(5.3-11.5)	7	ND		Juniata	11	10	ND		1	ND	
Allegheny	408	317	8.6	(7.7-9.5)	91	1.9	(1.5-2.3)	Lackawanna	96	78	11.3	(8.8-13.8)	18	ND	
Armstrong	20	17	ND		3	ND		Lancaster	128	110	7.2	(5.9-8.5)	18	ND	
Beaver	55	43	7.6	(5.3-9.9)	12	ND		Lawrence	41	31	9.9	(6.4-13.4)	10	ND	
Bedford	21	16	ND		5	ND		Lebanon	45	36	8.7	(5.9-11.5)	9	ND	
Berks	135	109	9.4	(7.6-11.2)	26	1.9	(1.2-2.6)	Lehigh	106	87	9.1	(7.2-11.0)	19	ND	
Blair	57	45	10.2	(7.2-13.2)	12	ND		Luzerne	160	133	12.9	(10.7-15.1)	27	2.4	(1.5-3.3)
Bradford	19	16	ND		3	ND		Lycoming	41	32	8.6	(5.6-11.6)	9	ND	
Bucks	238	190	9.7	(8.3-11.1)	48	2.1	(1.5-2.7)	McKean	17	15	ND		2	ND	
Butler	61	55	9.5	(7.0-12.0)	6	ND		Mercer	43	36	9.6	(6.5-12.7)	7	ND	
Cambria	49	39	8.5	(5.8-11.2)	10	ND		Mifflin	22	18	ND		4	ND	
Cameron	3	3	ND		0	ND		Monroe	75	55	11.5	(8.5-14.5)	20	3.9	(2.2-5.6)
Carbon	20	16	ND		4	ND		Montgomery	232	178	7.8	(6.7-8.9)	54	1.6	(1.2-2.0)
Centre	44	37	10.2	(6.9-13.5)	7	ND		Montour	11	10	ND		1	ND	
Chester	144	111	8.0	(6.5-9.5)	33	2.1	(1.4-2.8)	Northampton	102	78	8.7	(6.8-10.6)	24	2.3	(1.4-3.2)
Clarion	16	12	ND		4	ND		Northumberland	43	36	11.9	(8.0-15.8)	7	ND	
Clearfield	37	30	10.9	(7.0-14.8)	7	ND		Perry	20	15	ND		5	ND	
Clinton	11	9	ND		2	ND		Philadelphia	430	303	9.0	(8.0-10.0)	127	2.7	(2.2-3.2)
Columbia	26	21	11.9	(6.8-17.0)	5	ND		Pike	19	14	ND		5	ND	
Crawford	41	34	12.4	(8.2-16.6)	7	ND		Potter	18	17	ND		1	ND	
Cumberland	77	60	8.5	(6.3-10.7)	17	ND		Schuylkill	68	54	10.9	(8.0-13.8)	14	ND	
Dauphin	74	54	7.7	(5.6-9.8)	20	2.1	(1.2-3.0)	Snyder	12	10	ND		2	ND	
Delaware	150	122	8.0	(6.6-9.4)	28	1.4	(0.9-1.9)	Somerset	27	25	8.5	(5.2-11.8)	2	ND	
Elk	12	11	ND		1	ND		Sullivan	1	1	ND		0	ND	
Erie	85	67	8.7	(6.6-10.8)	18	ND		Susquehanna	19	15	ND		4	ND	
Fayette	48	42	9.0	(6.3-11.7)	6	ND		Tioga	14	10	ND		4	ND	
Forest	1	0	ND		1	ND		Union	15	13	ND		2	ND	
Franklin	49	43	9.7	(6.8-12.6)	6	ND		Venango	28	22	13.2	(7.7-18.7)	6	ND	
Fulton	7	6	ND		1	ND		Warren	24	18	ND		6	ND	
Greene	13	10	ND		3	ND		Washington	81	63	9.2	(6.9-11.5)	18	ND	
Huntingdon	13	9	ND		4	ND		Wayne	32	22	10.2	(5.9-14.5)	10	ND	
Indiana	17	13	ND		4	ND		Westmoreland	139	110	8.6	(7.0-10.2)	29	1.9	(1.2-2.6)
Jefferson	20	17	ND		3	ND		Wyoming	9	8	ND		1	ND	
								York	165	136	10.7	(8.9-12.5)	29	1.9	(1.2-2.6)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

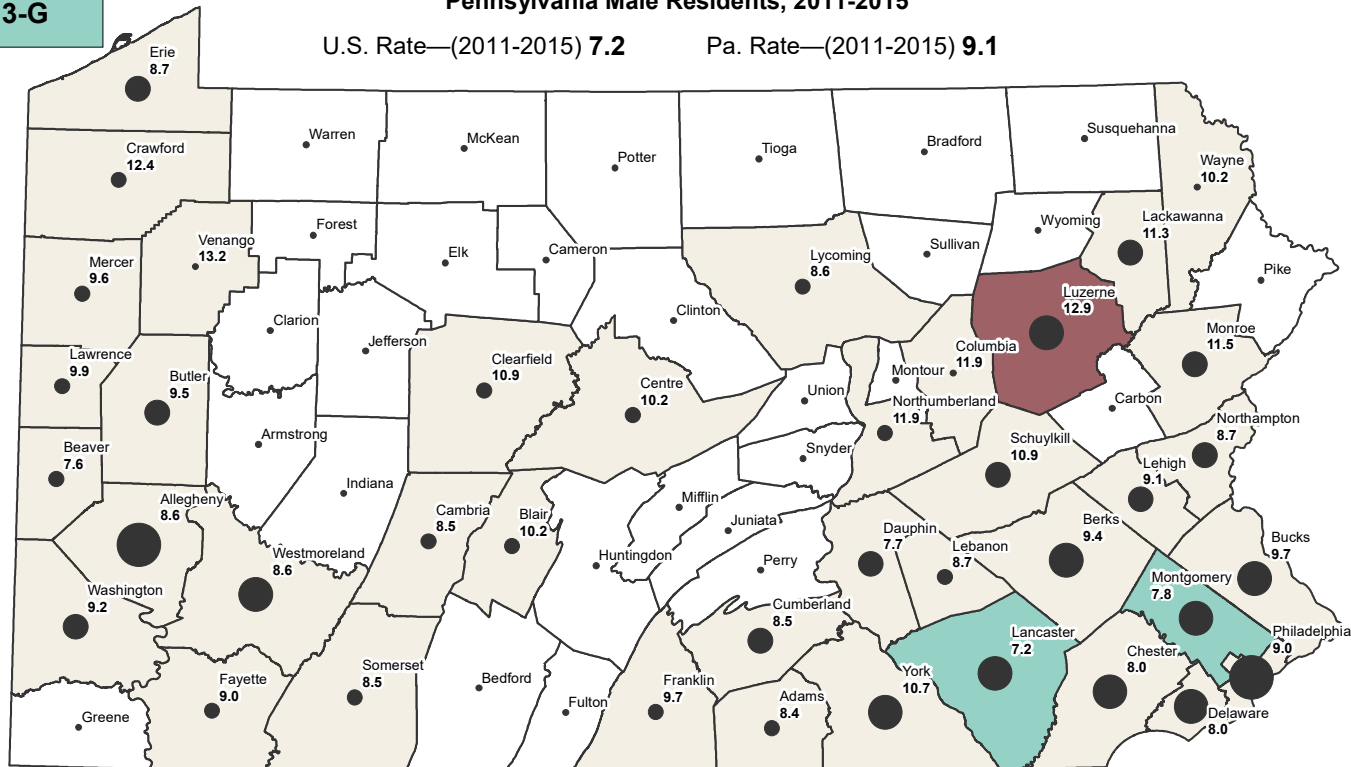
Cancer of the Esophagus: INCIDENCE (Invasive)

**MAP
3-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) 7.2

Pa. Rate—(2011-2015) 9.1



Significantly higher

Significantly lower

Not significantly different

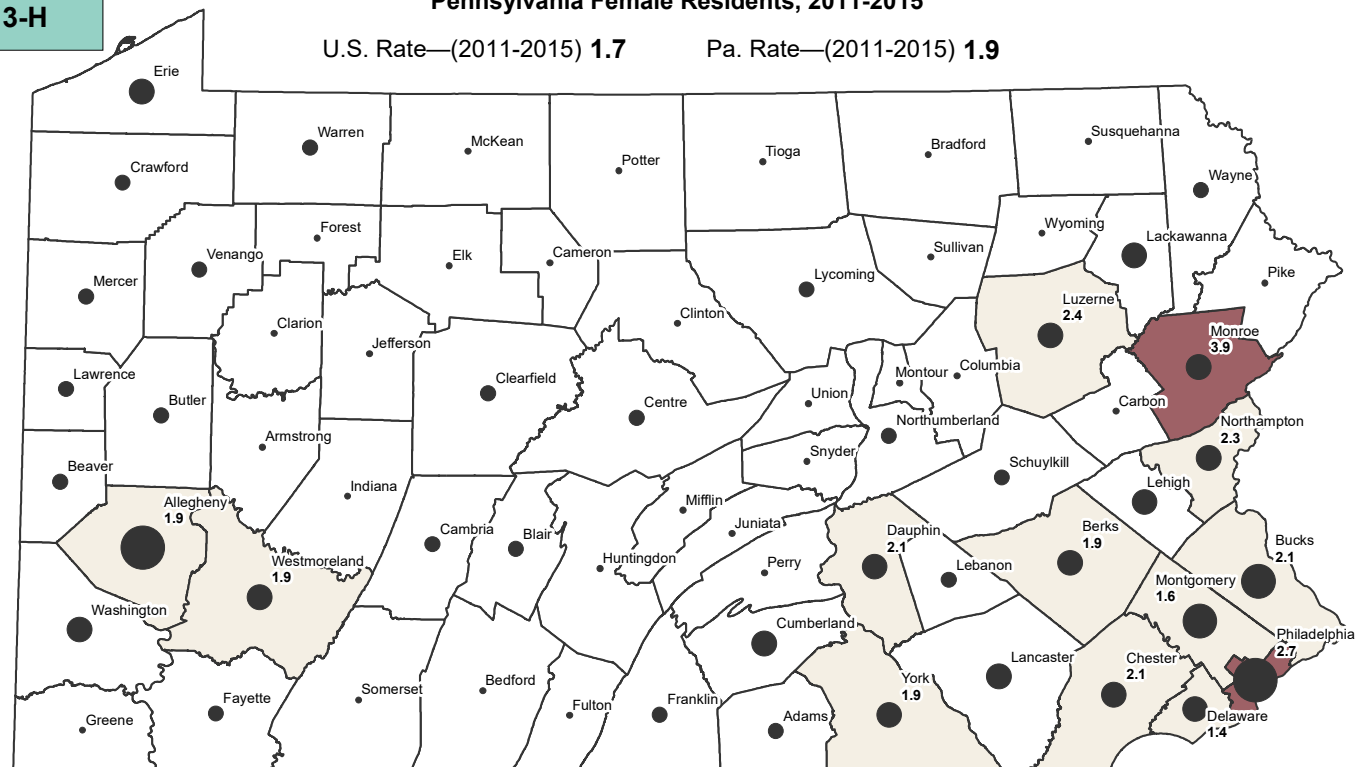
Significance not determined—less than 20 observed cases

**MAP
3-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) 1.7

Pa. Rate—(2011-2015) 1.9



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Esophagus: MORTALITY

**TABLE
3-1**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	3,973	3,195	8.6	(8.3-8.9)	778	1.6	(1.5-1.7)								
Adams	42	34	10.6	(7.0-14.2)	8	ND		Juniata	11	9	ND		2	ND	
Allegheny	382	299	8.1	(7.2-9.0)	83	1.7	(1.3-2.1)	Lackawanna	100	83	12.0	(9.4-14.6)	17	ND	
Armstrong	24	20	8.5	(4.8-12.2)	4	ND		Lancaster	116	96	6.2	(5.0-7.4)	20	1.1	(0.6-1.6)
Beaver	59	46	8.1	(5.8-10.4)	13	ND		Lawrence	39	31	9.8	(6.4-13.2)	8	ND	
Bedford	20	18	ND		2	ND		Lebanon	48	39	9.2	(6.3-12.1)	9	ND	
Berks	116	102	8.9	(7.2-10.6)	14	ND		Lehigh	99	83	8.5	(6.7-10.3)	16	ND	
Blair	53	41	10.2	(7.1-13.3)	12	ND		Luzerne	147	118	11.4	(9.3-13.5)	29	2.2	(1.4-3.0)
Bradford	20	17	ND		3	ND		Lycoming	39	30	7.8	(5.0-10.6)	9	ND	
Bucks	187	154	8.1	(6.8-9.4)	33	1.4	(0.9-1.9)	McKean	14	12	ND		2	ND	
Butler	69	59	10.3	(7.7-12.9)	10	ND		Mercer	50	41	10.9	(7.6-14.2)	9	ND	
Cambria	44	36	7.8	(5.3-10.3)	8	ND		Mifflin	17	16	ND		1	ND	
Cameron	2	2	ND		0	ND		Monroe	50	35	7.5	(5.0-10.0)	15	ND	
Carbon	19	14	ND		5	ND		Montgomery	215	174	7.7	(6.6-8.8)	41	1.2	(0.8-1.6)
Centre	38	30	8.5	(5.5-11.5)	8	ND		Montour	10	8	ND		2	ND	
Chester	126	100	7.6	(6.1-9.1)	26	1.5	(0.9-2.1)	Northampton	78	57	6.5	(4.8-8.2)	21	1.8	(1.0-2.6)
Clarion	10	8	ND		2	ND		Northumberland	37	31	10.3	(6.7-13.9)	6	ND	
Clearfield	33	24	8.1	(4.9-11.3)	9	ND		Perry	11	10	ND		1	ND	
Clinton	15	14	ND		1	ND		Philadelphia	389	282	8.5	(7.5-9.5)	107	2.2	(1.8-2.6)
Columbia	25	22	12.2	(7.1-17.3)	3	ND		Pike	19	15	ND		4	ND	
Crawford	41	35	12.9	(8.6-17.2)	6	ND		Potter	11	11	ND		0	ND	
Cumberland	73	59	8.0	(6.0-10.0)	14	ND		Schuylkill	70	56	11.5	(8.5-14.5)	14	ND	
Dauphin	60	44	6.1	(4.3-7.9)	16	ND		Snyder	9	8	ND		1	ND	
Delaware	146	114	7.7	(6.3-9.1)	32	1.6	(1.0-2.2)	Somerset	43	37	13.7	(9.3-18.1)	6	ND	
Elk	10	7	ND		3	ND		Sullivan	1	1	ND		0	ND	
Erie	86	71	9.3	(7.1-11.5)	15	ND		Susquehanna	17	16	ND		1	ND	
Fayette	47	41	8.6	(6.0-11.2)	6	ND		Tioga	9	8	ND		1	ND	
Forest	1	1	ND		0	ND		Union	17	14	ND		3	ND	
Franklin	40	34	7.4	(4.9-9.9)	6	ND		Venango	24	23	11.9	(7.0-16.8)	1	ND	
Fulton	6	5	ND		1	ND		Warren	24	21	13.4	(7.7-19.1)	3	ND	
Greene	16	14	ND		2	ND		Washington	66	56	8.2	(6.1-10.3)	10	ND	
Huntingdon	12	8	ND		4	ND		Wayne	22	17	ND		5	ND	
Indiana	16	14	ND		2	ND		Westmoreland	135	110	8.7	(7.1-10.3)	25	1.6	(1.0-2.2)
Jefferson	22	17	ND		5	ND		Wyoming	13	11	ND		2	ND	
								York	163	132	10.8	(9.0-12.6)	31	2.0	(1.3-2.7)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

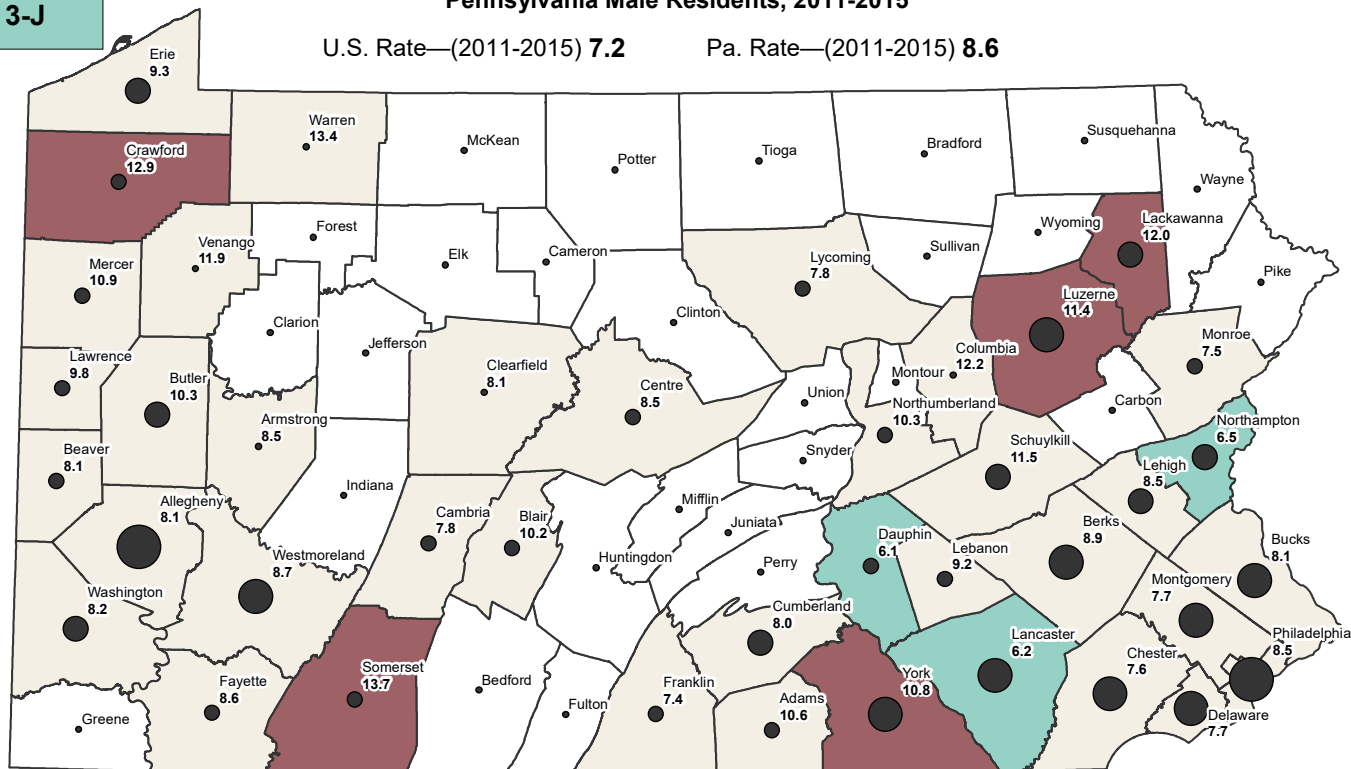
Cancer of the Esophagus: MORTALITY

**MAP
3-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) 7.2

Pa. Rate—(2011-2015) 8.6



Significantly higher

Significantly lower

Not significantly different

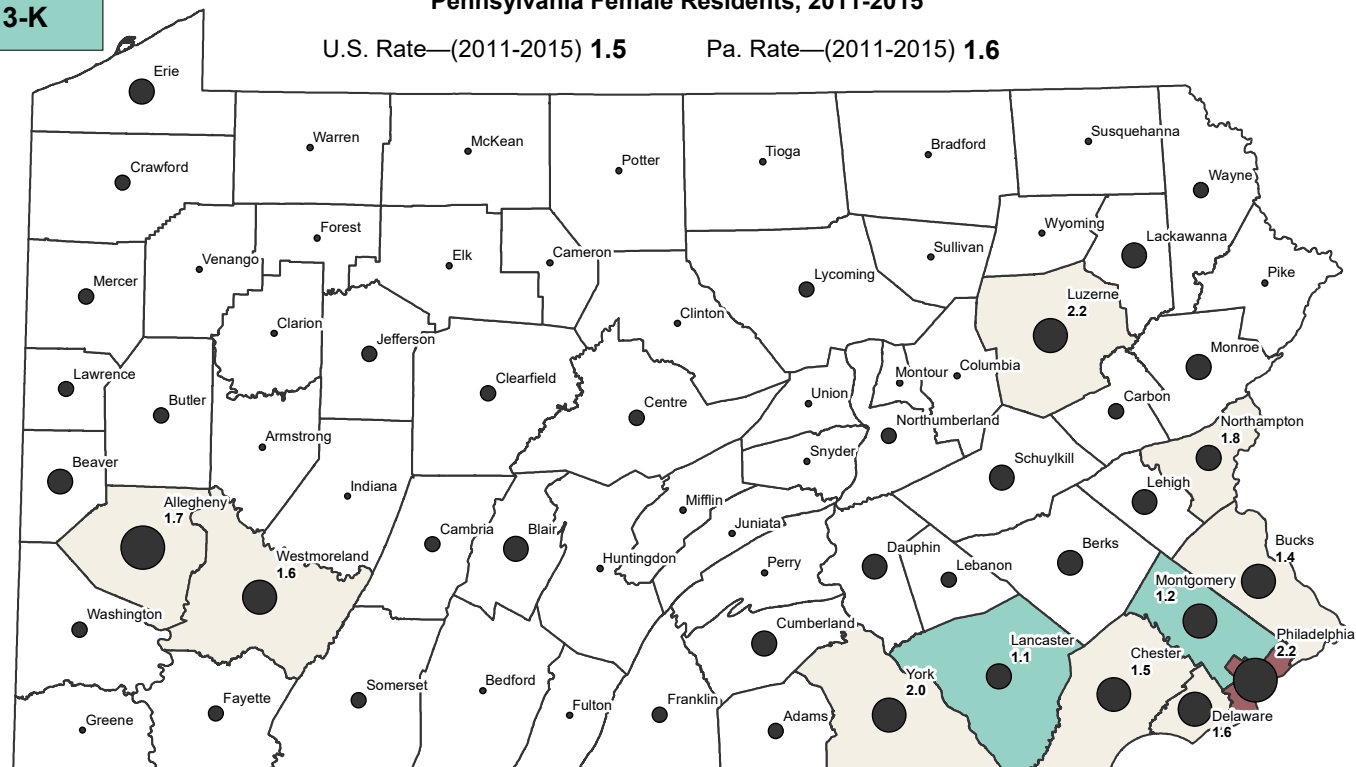
Significance not determined—less than 20 observed cases

**MAP
3-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) 1.5

Pa. Rate—(2011-2015) 1.6



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Stomach

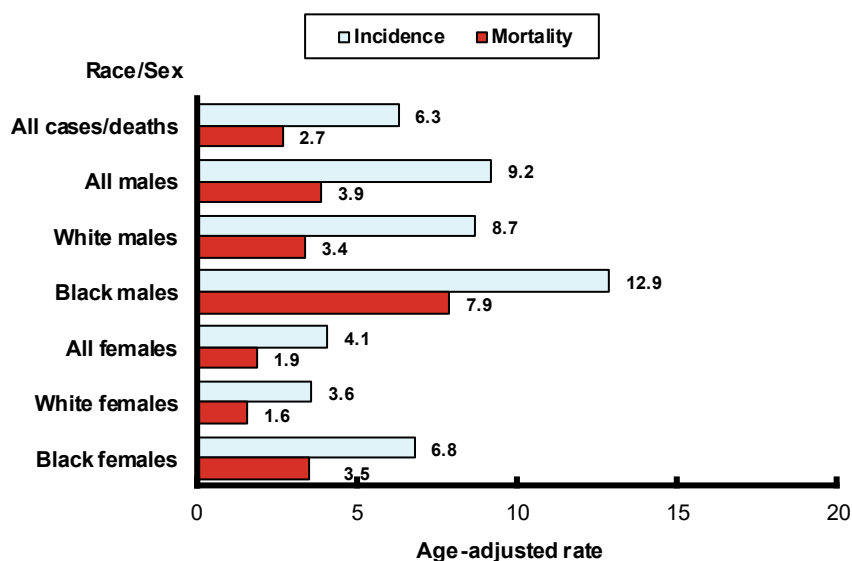
Data Highlights

The 2011-2015 average annual age-adjusted incidence rate for invasive stomach cancer was more than twice as high among males compared to females (9.2 per 100,000 versus 4.1, respectively). Black males had the highest average annual age-adjusted incidence rate (12.9) compared to the other three sex/race groups. The lowest average annual rate (3.6) was recorded for white females and was about 47 percent lower than the next lowest rate (6.8) recorded for black females.

There were 1,002 new cases of invasive stomach cancer diagnosed among residents of the state in 2015 – a decrease of 8 percent from the 1092 cases recorded during 2014. During the 2006-2015 period, the annual age-adjusted incidence rate for white males was highest in 2008 at 10.5 and lowest in 2015 at 8.2. Among white females, the incidence rate was highest in 2006 at 4.2 but has since been lower. The annual rate for black males decreased from a high of 18.5 in 2008 to a low of 11.2 in 2012. Annual rates for black females displayed no evident trends. Stomach cancer incidence rose steeply with advanced age. During the period of 2011-2015, approximately 76 percent of the cases were diagnosed among Pennsylvania residents 60 years of age or older.

In 2015, about 62 percent of stomach cancer cases were diagnosed at regional or distant stages. Survival rates at the late stage are typically poor for stomach cancer in Pennsylvania. The five-year net survival rate for the period 2008-2014 was 16.7 percent. Approximately 29 percent of the cases were diagnosed at the early stage (in situ or local) in 2015. In Pennsylvania, as in the rest of the United States, the death rates have generally been slowly declining for many years. In 2015, there were 420 resident deaths for an age-adjusted rate of 2.5 per 100,000 – the lowest rate observed over the 10-year period 2006-2015. The 2015 annual age-adjusted death rate for males (3.6) was over two times the rate for females (1.7). Annual age-adjusted death rates between 2006 and 2015 have generally been on the decline for all four sex/race groups, however, the rates have fluctuated more among black males and black females.

FIGURE 4
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, gastric infections (*Helicobacter pylori*), stomach lymphoma, diets low in fresh fruits and vegetables (but high in smoked/salted fish/meats, pickled vegetables and cured meats), tobacco use, obesity, previous stomach surgery, pernicious anemia, menetrier disease (hypertrophic gastropathy), type A blood, inherited cancer syndromes, family history, stomach polyps, Epstein-Barr viruses, occupations in coal/metal/rubber industries and common variable immune deficiency (CVID) are some of the suggestive risk factors associated with stomach cancer.

Early Detection

According to the American Cancer Society, mass screening is not done in the United States. However, endoscopic methods can be used for high risk individuals.

Cancer of the Stomach: INCIDENCE (Invasive)

**TABLE
4-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,002	6.0 (5.6-6.4)	651	8.7 (8.0-9.4)	545	8.2 (7.5-8.9)	74	13.4 (10.3-16.5)	351	3.9 (3.5-4.3)	300	3.7 (3.3-4.1)	34	4.5 (3.0-6.0)
2014	1,092	6.6 (6.2-7.0)	703	9.5 (8.8-10.2)	600	9.0 (8.3-9.7)	72	13.6 (10.5-16.7)	389	4.3 (3.9-4.7)	306	3.7 (3.3-4.1)	57	7.6 (5.6-9.6)
2013	993	6.1 (5.7-6.5)	665	9.2 (8.5-9.9)	560	8.6 (7.9-9.3)	76	14.4 (11.2-17.6)	328	3.7 (3.3-4.1)	272	3.3 (2.9-3.7)	39	5.3 (3.6-7.0)
2012	1,001	6.2 (5.8-6.6)	632	8.8 (8.1-9.5)	544	8.4 (7.7-9.1)	59	11.2 (8.3-14.1)	369	4.1 (3.7-4.5)	284	3.5 (3.1-3.9)	57	7.8 (5.8-9.8)
2011	1,062	6.6 (6.2-7.0)	666	9.6 (8.9-10.3)	592	9.4 (8.6-10.2)	56	11.5 (8.5-14.5)	396	4.4 (4.0-4.8)	312	3.8 (3.4-4.2)	65	8.9 (6.7-11.1)
2010	1,131	7.1 (6.7-7.5)	724	10.5 (9.7-11.3)	633	10.2 (9.4-11.0)	73	15.3 (11.8-18.8)	407	4.5 (4.1-4.9)	325	4.0 (3.6-4.4)	65	9.1 (6.9-11.3)
2009	1,030	6.7 (6.3-7.1)	638	9.7 (8.9-10.5)	552	9.2 (8.4-10.0)	71	16.7 (12.8-20.6)	392	4.4 (4.0-4.8)	323	4.0 (3.6-4.4)	55	8.1 (6.0-10.2)
2008	1,111	7.3 (6.9-7.7)	721	11.2 (10.4-12.0)	619	10.5 (9.7-11.3)	81	18.5 (14.5-22.5)	390	4.4 (4.0-4.8)	314	3.9 (3.5-4.3)	60	9.1 (6.8-11.4)
2007	1,037	6.9 (6.5-7.3)	660	10.6 (9.8-11.4)	562	9.9 (9.1-10.7)	72	16.9 (13.0-20.8)	377	4.3 (3.9-4.7)	310	3.9 (3.5-4.3)	52	7.7 (5.6-9.8)
2006	1,064	7.2 (6.8-7.6)	663	10.7 (9.9-11.5)	586	10.3 (9.5-11.1)	59	14.3 (10.7-17.9)	401	4.6 (4.1-5.1)	334	4.2 (3.7-4.7)	55	8.4 (6.2-10.6)

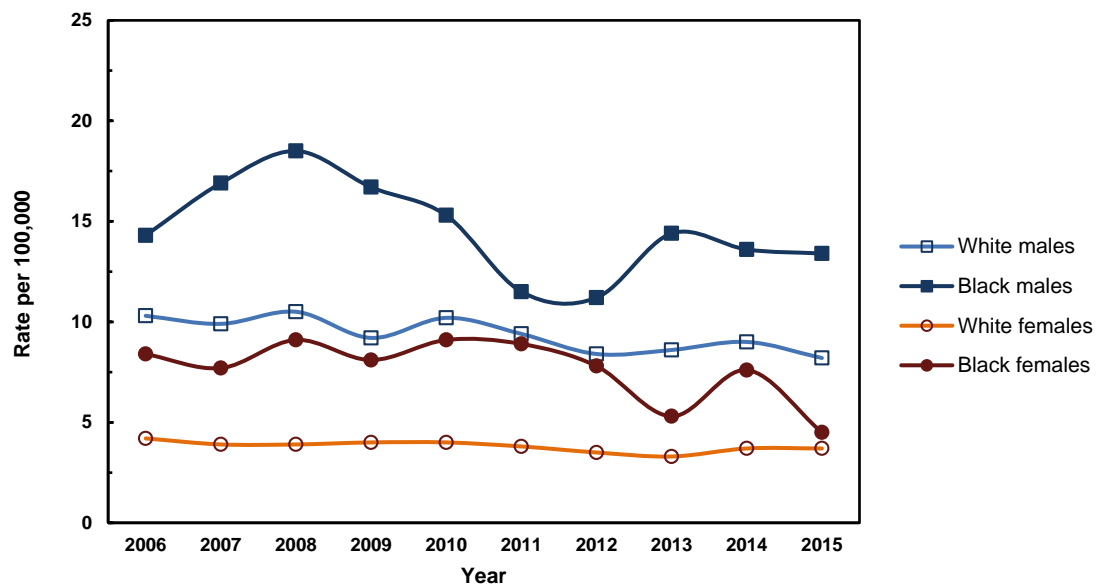
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
4-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Stomach: INCIDENCE (Invasive)

**TABLE
4-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

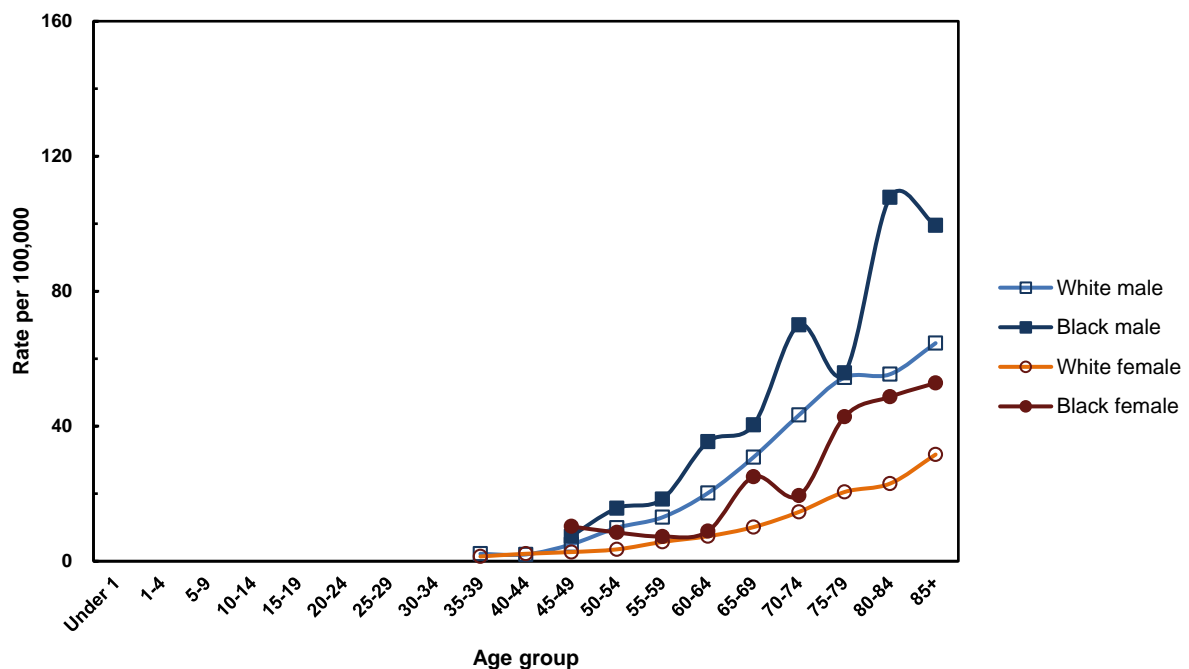
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	8.1	10.6	10.9	9.5	5.6	5.4	6.6
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	ND	ND	ND	ND	ND	ND	ND
25-29	0.4	0.5	ND	ND	ND	ND	ND
30-34	0.6	0.6	ND	ND	0.7	ND	ND
35-39	1.8	2.0	2.2	ND	1.6	1.4	ND
40-44	2.4	2.3	2.0	ND	2.4	2.2	ND
45-49	4.6	5.2	5.0	7.4	3.9	2.7	10.3
50-54	7.5	11.0	9.9	15.7	4.1	3.5	8.5
55-59	9.8	13.7	13.0	18.4	6.0	5.7	7.3
60-64	14.7	21.7	20.2	35.4	8.1	7.4	8.9
65-69	21.1	31.5	30.8	40.4	11.8	10.1	25.0
70-74	28.7	44.9	43.3	70.0	15.2	14.6	19.4
75-79	37.3	56.5	54.4	55.8	22.7	20.5	42.8
80-84	39.1	59.4	55.4	107.8	25.7	23.0	48.7
85+	44.7	67.5	64.6	99.5	33.8	31.6	52.8

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
4-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Stomach: INCIDENCE (Invasive)

**TABLE
4-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	5,150	3,317	2,841	337	1,833	1,474	252
Under 1	2	0	0	0	2	2	0
1-4	0	0	0	0	0	0	0
5-9	0	0	0	0	0	0	0
10-14	1	0	0	0	1	1	0
15-19	2	2	1	1	0	0	0
20-24	9	4	3	1	5	5	0
25-29	18	10	7	1	8	6	1
30-34	25	12	8	3	13	6	6
35-39	65	36	32	4	29	20	2
40-44	95	46	34	5	49	37	7
45-49	201	114	92	17	87	51	26
50-54	360	259	204	36	101	73	22
55-59	457	313	261	37	144	119	17
60-64	594	424	352	54	170	136	17
65-69	670	473	418	42	197	151	35
70-74	674	480	420	49	194	167	20
75-79	671	439	387	27	232	189	34
80-84	576	348	302	34	228	187	30
85+	730	357	320	26	373	324	35

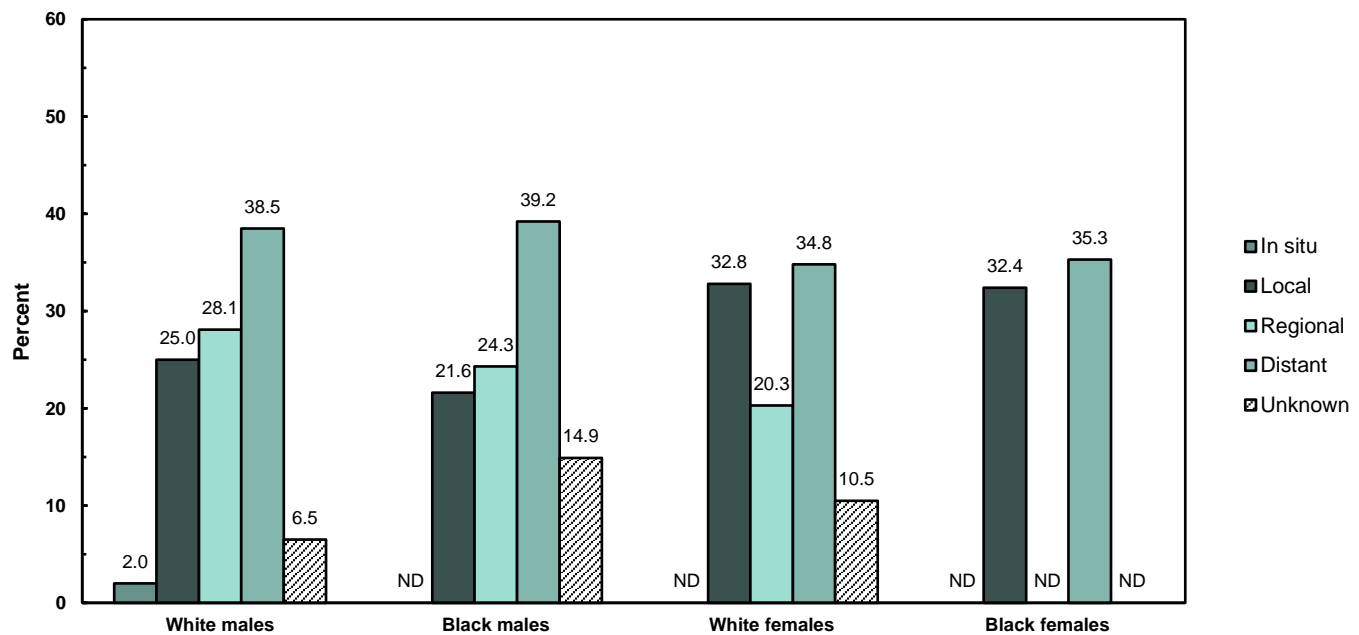
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
4-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 982 - 98.0%

Cancer of the Stomach: MORTALITY

**TABLE
4-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	420	2.5 (2.3-2.7)	264	3.6 (3.2-4.0)	216	3.3 (2.9-3.7)	37	7.2 (4.9-9.5)	156	1.7 (1.4-2.0)	120	1.4 (1.1-1.7)	23	2.9 (1.7-4.1)
2014	467	2.8 (2.5-3.1)	286	4.0 (3.5-4.5)	223	3.4 (3.0-3.8)	38	7.8 (5.3-10.3)	181	1.9 (1.6-2.2)	142	1.6 (1.3-1.9)	19	ND
2013	441	2.7 (2.4-3.0)	271	3.8 (3.3-4.3)	215	3.3 (2.9-3.7)	35	6.8 (4.5-9.1)	170	1.8 (1.5-2.1)	135	1.5 (1.2-1.8)	25	3.6 (2.2-5.0)
2012	476	2.9 (2.6-3.2)	286	4.1 (3.6-4.6)	223	3.5 (3.0-4.0)	44	8.6 (6.1-11.1)	190	2.0 (1.7-2.3)	153	1.7 (1.4-2.0)	29	4.0 (2.5-5.5)
2011	460	2.8 (2.5-3.1)	264	3.9 (3.4-4.4)	211	3.4 (2.9-3.9)	43	9.0 (6.3-11.7)	196	2.0 (1.7-2.3)	158	1.8 (1.5-2.1)	33	4.5 (3.0-6.0)
2010	521	3.3 (3.0-3.6)	307	4.6 (4.1-5.1)	245	4.0 (3.5-4.5)	47	10.2 (7.3-13.1)	214	2.3 (2.0-2.6)	174	2.0 (1.7-2.3)	31	4.4 (2.9-5.9)
2009	497	3.2 (2.9-3.5)	307	4.7 (4.2-5.2)	255	4.3 (3.8-4.8)	45	10.8 (7.6-14.0)	190	2.0 (1.7-2.3)	162	1.9 (1.6-2.2)	25	3.3 (2.0-4.6)
2008	517	3.4 (3.1-3.7)	312	4.9 (4.4-5.4)	268	4.6 (4.0-5.2)	36	9.3 (6.3-12.3)	205	2.2 (1.9-2.5)	166	1.9 (1.6-2.2)	31	4.5 (2.9-6.1)
2007	543	3.6 (3.3-3.9)	311	5.2 (4.6-5.8)	266	4.8 (4.2-5.4)	38	9.7 (6.6-12.8)	232	2.6 (2.3-2.9)	190	2.3 (2.0-2.6)	34	5.2 (3.5-6.9)
2006	534	3.6 (3.3-3.9)	321	5.4 (4.8-6.0)	266	4.8 (4.2-5.4)	46	11.3 (8.0-14.6)	213	2.4 (2.1-2.7)	171	2.1 (1.8-2.4)	36	5.5 (3.7-7.3)

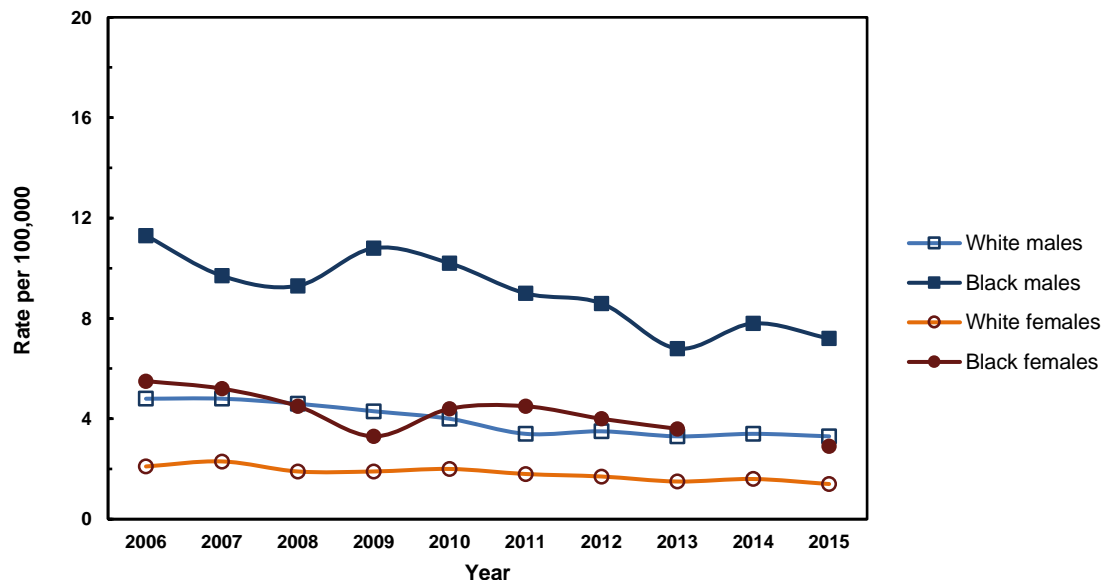
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
4-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Stomach: MORTALITY

**TABLE
4-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	2,264	3.5	1,371	4.4	1,088	4.2	197	5.6	893	2.7	708	2.6	129	3.4
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	2	ND	1	ND	0	ND	0	ND	1	ND	0	ND	0	ND
25-29	4	ND	1	ND	1	ND	0	ND	3	ND	2	ND	1	ND
30-34	7	ND	4	ND	1	ND	1	ND	3	ND	1	ND	1	ND
35-39	23	0.6	14	0.8	10	0.7	1	ND	9	ND	6	ND	2	ND
40-44	41	1.0	28	1.4	22	1.3	4	ND	13	0.6	9	ND	2	ND
45-49	68	1.5	36	1.7	23	1.2	10	4.3	32	1.4	17	0.9	10	4.0
50-54	131	2.7	89	3.8	65	3.2	13	5.7	42	1.7	28	1.3	7	ND
55-59	157	3.4	103	4.5	73	3.6	22	11.0	54	2.3	40	1.9	10	4.3
60-64	192	4.8	135	6.9	100	5.7	25	16.4	57	2.7	43	2.3	7	ND
65-69	229	7.2	170	11.3	134	9.9	29	27.9	59	3.5	45	3.0	10	7.1
70-74	300	12.8	203	19.0	157	16.2	34	48.6	97	7.6	86	7.5	8	ND
75-79	287	15.9	167	21.5	132	18.6	20	41.4	120	11.7	93	10.1	19	23.9
80-84	295	20.0	176	30.0	151	27.7	21	66.6	119	13.4	94	11.6	21	34.1
85+	528	32.3	244	46.2	219	44.2	17	65.1	284	25.7	244	23.8	31	46.7

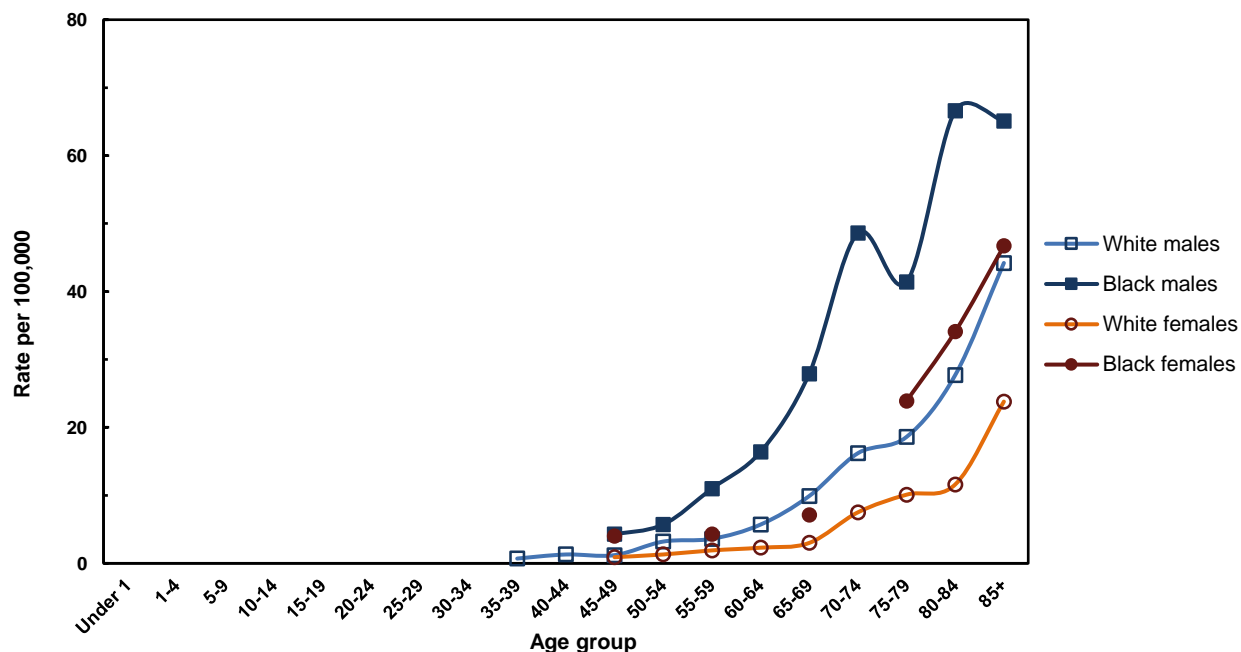
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
4-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Stomach: INCIDENCE (Invasive)

**TABLE
4-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	5,150	3,317	9.2	(8.9-9.5)	1,833	4.1	(3.9-4.3)								
Adams	44	27	8.1	(5.0-11.2)	17	ND		Juniata	10	7	ND		3	ND	
Allegheny	555	368	10.4	(9.3-11.5)	187	3.8	(3.3-4.3)	Lackawanna	90	64	9.8	(7.4-12.2)	26	3.0	(1.8-4.2)
Armstrong	42	29	13.5	(8.6-18.4)	13	ND		Lancaster	208	134	9.2	(7.6-10.8)	74	4.2	(3.2-5.2)
Beaver	74	52	9.2	(6.7-11.7)	22	2.7	(1.6-3.8)	Lawrence	33	21	7.1	(4.1-10.1)	12	ND	
Bedford	27	17	ND		10	ND		Lebanon	48	33	7.8	(5.1-10.5)	15	ND	
Berks	159	114	9.8	(8.0-11.6)	45	3.5	(2.5-4.5)	Lehigh	155	101	10.6	(8.5-12.7)	54	4.5	(3.3-5.7)
Blair	71	39	10.2	(7.0-13.4)	32	6.1	(4.0-8.2)	Luzerne	175	112	11.5	(9.4-13.6)	63	4.7	(3.5-5.9)
Bradford	34	19	ND		15	ND		Lycoming	41	28	7.8	(4.9-10.7)	13	ND	
Bucks	210	139	7.3	(6.1-8.5)	71	3.2	(2.5-3.9)	McKean	14	8	ND		6	ND	
Butler	75	50	8.8	(6.4-11.2)	25	3.8	(2.3-5.3)	Mercer	46	30	7.6	(4.9-10.3)	16	ND	
Cambria	86	56	11.9	(8.8-15.0)	30	5.0	(3.2-6.8)	Mifflin	20	16	ND		4	ND	
Cameron	2	2	ND		0	ND		Monroe	65	42	10.3	(7.2-13.4)	23	4.6	(2.7-6.5)
Carbon	29	20	9.7	(5.4-14.0)	9	ND		Montgomery	301	188	8.2	(7.0-9.4)	113	3.9	(3.2-4.6)
Centre	40	25	7.2	(4.4-10.0)	15	ND		Montour	6	3	ND		3	ND	
Chester	172	106	7.9	(6.4-9.4)	66	4.1	(3.1-5.1)	Northampton	149	88	10.3	(8.1-12.5)	61	6.2	(4.6-7.8)
Clarion	12	10	ND		2	ND		Northumberland	39	28	9.7	(6.1-13.3)	11	ND	
Clearfield	31	17	ND		14	ND		Perry	20	15	ND		5	ND	
Clinton	10	9	ND		1	ND		Philadelphia	679	393	12.3	(11.1-13.5)	286	6.2	(5.5-6.9)
Columbia	25	11	ND		14	ND		Pike	22	16	ND		6	ND	
Crawford	32	20	7.6	(4.3-10.9)	12	ND		Potter	1	1	ND		0	ND	
Cumberland	80	54	7.4	(5.4-9.4)	26	3.2	(2.0-4.4)	Schuylkill	81	44	9.0	(6.3-11.7)	37	6.6	(4.5-8.7)
Dauphin	97	64	9.1	(6.9-11.3)	33	3.6	(2.4-4.8)	Snyder	7	4	ND		3	ND	
Delaware	193	129	8.9	(7.4-10.4)	64	3.5	(2.6-4.4)	Somerset	45	32	11.9	(7.8-16.0)	13	ND	
Elk	12	7	ND		5	ND		Sullivan	3	3	ND		0	ND	
Erie	90	61	7.9	(5.9-9.9)	29	3.0	(1.9-4.1)	Susquehanna	13	8	ND		5	ND	
Fayette	68	45	10.1	(7.1-13.1)	23	4.2	(2.5-5.9)	Tioga	19	17	ND		2	ND	
Forest	2	1	ND		1	ND		Union	10	8	ND		2	ND	
Franklin	49	32	7.2	(4.7-9.7)	17	ND		Venango	20	16	ND		4	ND	
Fulton	3	2	ND		1	ND		Warren	17	11	ND		6	ND	
Greene	18	12	ND		6	ND		Washington	85	52	7.9	(5.8-10.0)	33	4.2	(2.8-5.6)
Huntingdon	15	7	ND		8	ND		Wayne	19	14	ND		5	ND	
Indiana	23	13	ND		10	ND		Westmoreland	160	105	8.5	(6.9-10.1)	55	3.6	(2.6-4.6)
Jefferson	21	15	ND		6	ND		Wyoming	8	6	ND		2	ND	
								York	140	97	7.9	(6.3-9.5)	43	3.0	(2.1-3.9)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

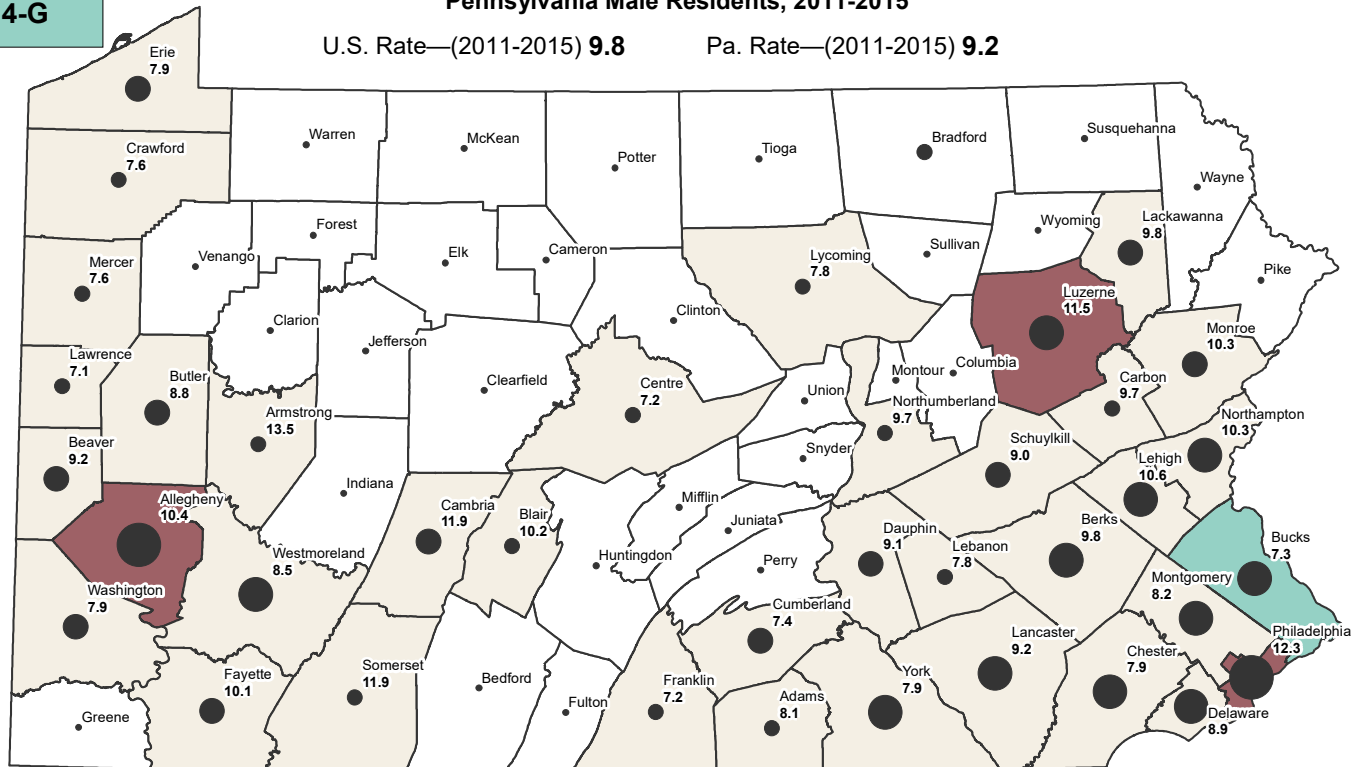
Cancer of the Stomach: INCIDENCE (Invasive)

**MAP
4-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **9.8**

Pa. Rate—(2011-2015) **9.2**



Significantly higher

Significantly lower

Not significantly different

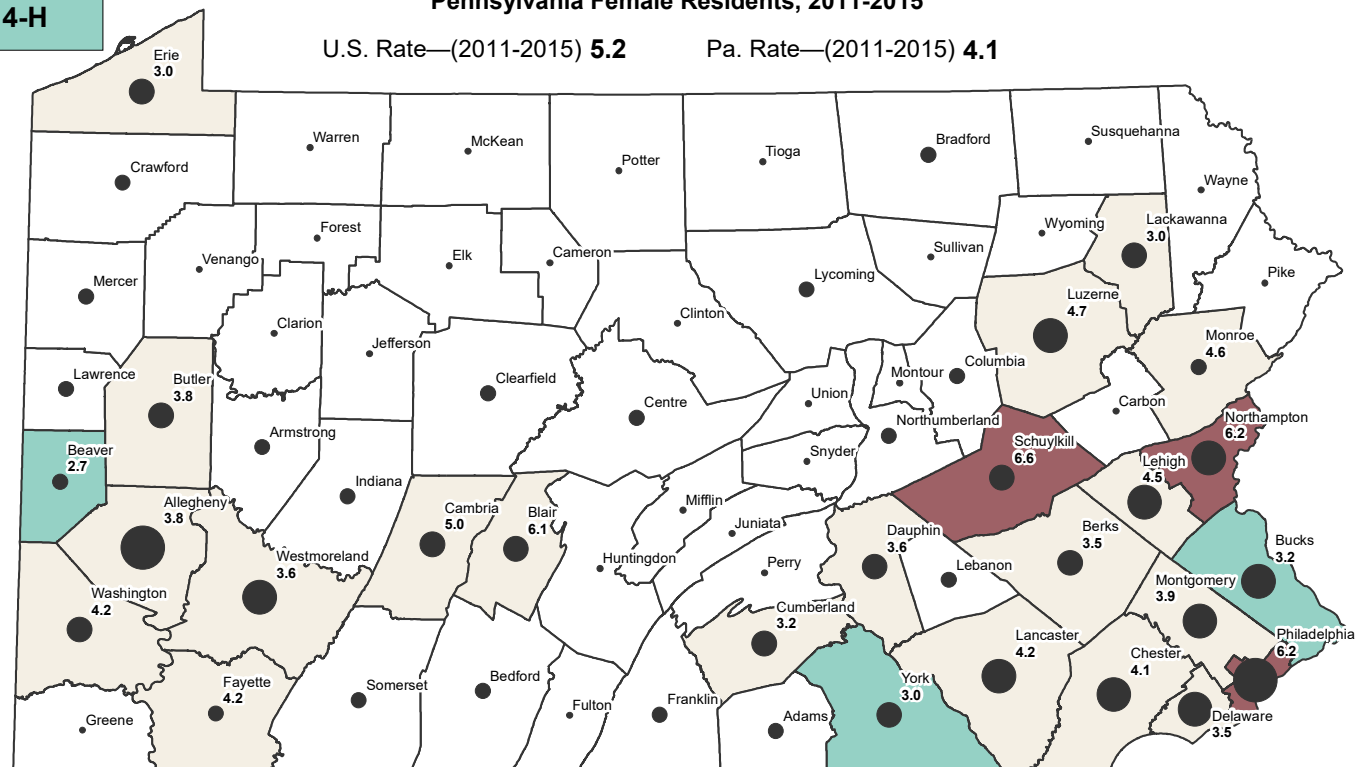
Significance not determined—less than 20 observed cases

**MAP
4-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **5.2**

Pa. Rate—(2011-2015) **4.1**



The symbol, ●, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Stomach: MORTALITY

**TABLE
4-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	2,264	1,371	3.9	(3.7-4.1)	893	1.9	(1.8-2.0)								
Adams	18	8	ND		10	ND		Juniata	2	1	ND		1	ND	
Allegheny	265	169	4.8	(4.1-5.5)	96	1.8	(1.4-2.2)	Lackawanna	44	31	4.8	(3.1-6.5)	13	ND	
Armstrong	17	9	ND		8	ND		Lancaster	88	57	3.9	(2.9-4.9)	31	1.6	(1.0-2.2)
Beaver	30	20	3.6	(2.0-5.2)	10	ND		Lawrence	14	8	ND		6	ND	
Bedford	9	3	ND		6	ND		Lebanon	15	7	ND		8	ND	
Berks	63	44	4.1	(2.9-5.3)	19	ND		Lehigh	68	48	5.0	(3.6-6.4)	20	1.5	(0.8-2.2)
Blair	27	17	ND		10	ND		Luzerne	75	40	4.2	(2.9-5.5)	35	2.7	(1.8-3.6)
Bradford	12	8	ND		4	ND		Lycoming	24	13	ND		11	ND	
Bucks	102	62	3.4	(2.6-4.2)	40	1.7	(1.2-2.2)	McKean	6	2	ND		4	ND	
Butler	26	19	ND		7	ND		Mercer	13	8	ND		5	ND	
Cambria	38	20	4.3	(2.4-6.2)	18	ND		Mifflin	6	4	ND		2	ND	
Cameron	1	1	ND		0	ND		Monroe	31	23	5.9	(3.5-8.3)	8	ND	
Carbon	13	10	ND		3	ND		Montgomery	126	72	3.2	(2.5-3.9)	54	1.8	(1.3-2.3)
Centre	17	10	ND		7	ND		Montour	3	1	ND		2	ND	
Chester	72	36	2.7	(1.8-3.6)	36	2.2	(1.5-2.9)	Northampton	57	39	4.8	(3.3-6.3)	18	ND	
Clarion	3	2	ND		1	ND		Northumberland	16	12	ND		4	ND	
Clearfield	18	8	ND		10	ND		Perry	4	3	ND		1	ND	
Clinton	1	1	ND		0	ND		Philadelphia	349	204	6.4	(5.5-7.3)	145	3.1	(2.6-3.6)
Columbia	8	3	ND		5	ND		Pike	6	5	ND		1	ND	
Crawford	13	8	ND		5	ND		Potter	2	2	ND		0	ND	
Cumberland	39	22	3.3	(1.9-4.7)	17	ND		Schuylkill	22	13	ND		9	ND	
Dauphin	37	28	4.3	(2.7-5.9)	9	ND		Snyder	5	1	ND		4	ND	
Delaware	93	58	4.0	(3.0-5.0)	35	1.6	(1.1-2.1)	Somerset	14	9	ND		5	ND	
Elk	8	4	ND		4	ND		Sullivan	0	0	ND		0	ND	
Erie	42	20	2.7	(1.5-3.9)	22	2.2	(1.3-3.1)	Susquehanna	4	3	ND		1	ND	
Fayette	28	17	ND		11	ND		Tioga	5	4	ND		1	ND	
Forest	2	1	ND		1	ND		Union	4	2	ND		2	ND	
Franklin	19	13	ND		6	ND		Venango	9	6	ND		3	ND	
Fulton	0	0	ND		0	ND		Warren	9	4	ND		5	ND	
Greene	5	2	ND		3	ND		Washington	36	19	ND		17	ND	
Huntingdon	7	5	ND		2	ND		Wayne	4	2	ND		2	ND	
Indiana	11	4	ND		7	ND		Westmoreland	92	55	4.5	(3.3-5.7)	37	2.3	(1.6-3.0)
Jefferson	13	6	ND		7	ND		Wyoming	3	2	ND		1	ND	
								York	51	33	2.8	(1.8-3.8)	18	ND	

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

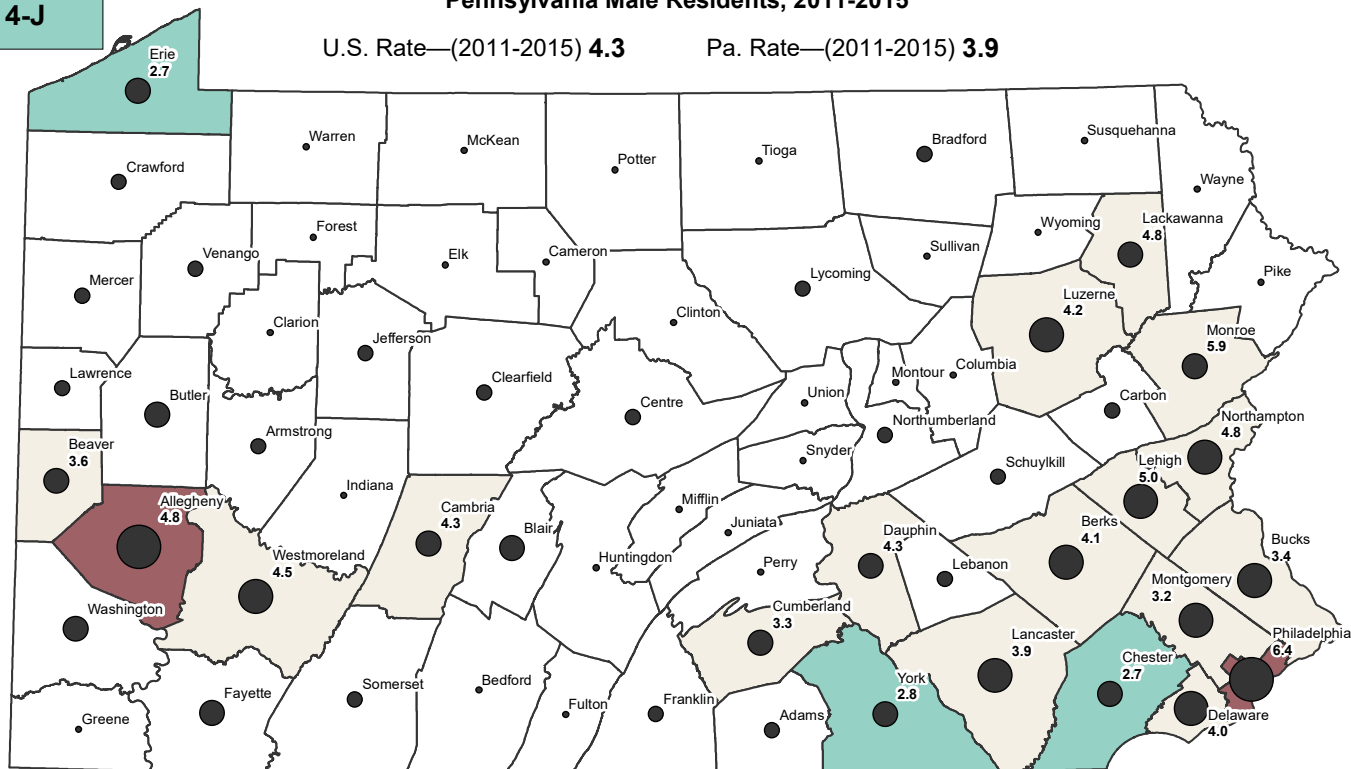
Cancer of the Stomach: MORTALITY

**MAP
4-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **4.3**

Pa. Rate—(2011-2015) **3.9**



Significantly higher

Significantly lower

Not significantly different

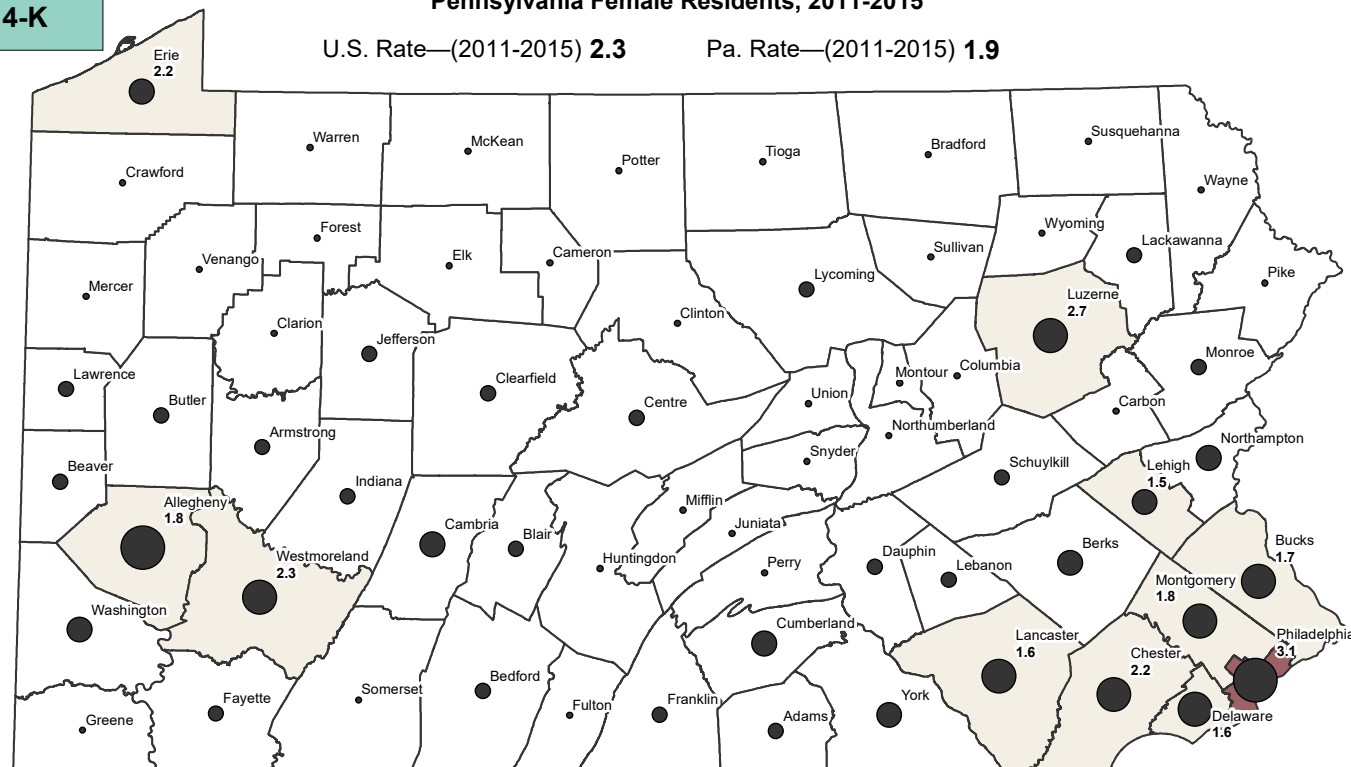
Significance not determined—less than 20 observed cases

**MAP
4-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **2.3**

Pa. Rate—(2011-2015) **1.9**



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Colon and Rectum

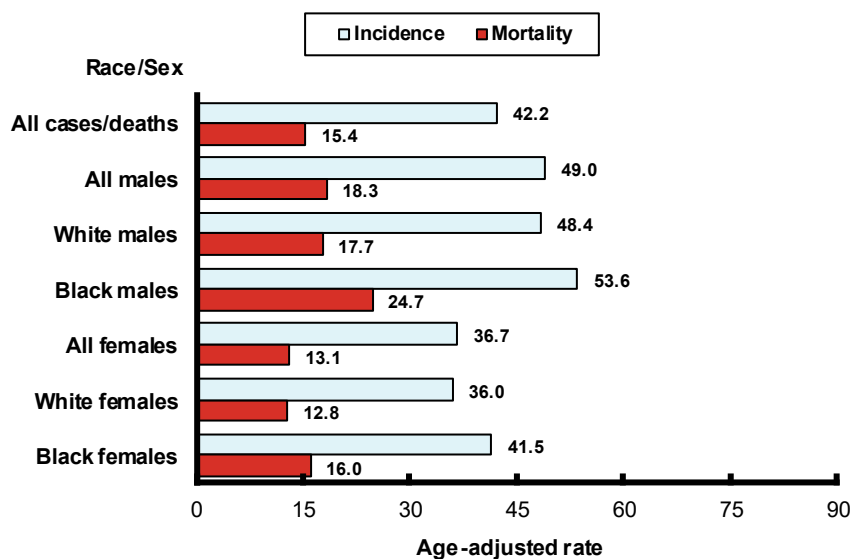
Data Highlights

There were 6,873 cases of invasive colon and rectum cancers diagnosed among residents in 2015, an increase of about 3 percent from 2014, when there were 6,676 cases recorded. It was also the third most common cancer site among males and among females, accounting for approximately 9 percent of all the new invasive cancer cases recorded for 2015.

The average annual age-adjusted incidence rate for colon and rectum cancers during the period of 2011-2015 was 34 percent higher among males (49.0 per 100,000) compared to females (36.7). Black males had the highest average annual incidence rate (53.6) among the four sex/race groups, and white females had the lowest rate (36.0). Annual age-adjusted incidence rates during the 10 years from 2006 to 2015 showed that the incidence rates for each of the four sex/race groups have declined. Age-adjusted incidence rates for black females reached a 10-year low in 2015 while white males, white females and black males reached a 10-year low in 2014. Compared to 2006, the 2015 incidence rates among white males decreased by about 23 percent to 48.9. Among black males, the rate decreased by 22 percent to 52.3. Similarly, among white females, the rate decreased by 23 percent to 35.3 and for black females by 26 percent to 39.3. During the period of 2011-2015, 91 percent of the invasive colon/rectum cancer cases were diagnosed among Pennsylvania residents 50 years of age or older.

In 2015, there were 2,557 residents who died of colon and rectum cancers – an increase from the 2,533 resident deaths in 2014. The average annual age-adjusted death rates for 2011-2015 showed males (18.3 per 100,000) with higher rates than females (13.1). Of the four sex/race groups, black males had the highest death rate (24.7) for colon and rectum cancers. When colon and rectum cancers are detected and treated at an early stage, the five-year survival rate is very good. The five-year net survival rate for Pennsylvania residents diagnosed with cancer of the colon and rectum between 2008 and 2014 was 89.2 percent. In 2015, 41 percent of colon/rectum cancers were diagnosed at the early stage (in situ or local), and 53 percent of the cases were diagnosed at the late stage (regional or distant). Between 2006 and 2015, annual age-adjusted death rates generally declined among each of the four sex/race groups.

FIGURE 5
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, etiological factors are not precisely known; diets high in red meats and processed meats are associated. Common risk factors include obesity, lack of physical activity, smoking, heavy alcohol use, type 2 diabetes, adenomatous polyps, familial adenomatous polyposis, inflammatory bowel disease (Crohn's disease/ulcerative colitis), family history and inherited cancer syndromes.

Early Detection

Regular screening can discover colorectal cancer early when it is often curable, and it can even detect polyps or growths that can be removed before they develop into cancer. The American Cancer Society recommends various examination schedules starting at age 45, including the Guaiac-based fecal occult blood test (gFOBT), fecal immunochemical test (FIT), flexible sigmoidoscopy (FSIG), double-contrast barium enema, CT colonography or colonoscopy, and stool DNA test.

Cancer of the Colon and Rectum: INCIDENCE (Invasive)

**TABLE
5-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	6,873	41.9 (40.9-42.9)	3,612	49.0 (47.4-50.6)	3,209	48.9 (47.2-50.6)	299	52.3 (46.4-58.2)	3,260	35.9 (34.7-37.1)	2,853	35.3 (34.0-36.6)	312	39.3 (34.9-43.7)
2014	6,676	40.5 (39.5-41.5)	3,445	46.8 (45.2-48.4)	3,082	47.0 (45.3-48.7)	269	47.1 (41.5-52.7)	3,231	35.3 (34.1-36.5)	2,790	34.1 (32.8-35.4)	353	45.2 (40.5-49.9)
2013	6,913	42.3 (41.3-43.3)	3,554	49.2 (47.6-50.8)	3,170	48.9 (47.2-50.6)	285	53.1 (46.9-59.3)	3,359	36.8 (35.6-38.0)	2,961	36.3 (35.0-37.6)	319	41.2 (36.7-45.7)
2012	6,851	42.5 (41.5-43.5)	3,490	48.8 (47.2-50.4)	3,060	47.5 (45.8-49.2)	295	55.1 (48.8-61.4)	3,361	37.4 (36.1-38.7)	2,923	36.4 (35.1-37.7)	309	41.1 (36.5-45.7)
2011	7,017	44.0 (43.0-45.0)	3,588	51.3 (49.6-53.0)	3,163	50.0 (48.3-51.7)	324	60.9 (54.3-67.5)	3,429	38.3 (37.0-39.6)	3,050	38.0 (36.7-39.3)	305	41.1 (36.5-45.7)
2010	6,867	43.7 (42.7-44.7)	3,411	50.2 (48.5-51.9)	3,067	50.4 (48.6-52.2)	262	52.5 (46.1-58.9)	3,456	38.4 (37.1-39.7)	3,088	38.3 (36.9-39.7)	294	41.8 (37.0-46.6)
2009	7,315	47.6 (46.5-48.7)	3,692	56.0 (54.2-57.8)	3,295	54.9 (53.0-56.8)	314	67.8 (60.3-75.3)	3,623	41.0 (39.7-42.3)	3,214	40.1 (38.7-41.5)	336	49.7 (44.4-55.0)
2008	7,480	49.5 (48.4-50.6)	3,724	58.2 (56.3-60.1)	3,349	57.4 (55.5-59.3)	303	69.0 (61.2-76.8)	3,756	43.1 (41.7-44.5)	3,376	42.6 (41.2-44.0)	315	46.9 (41.7-52.1)
2007	7,739	52.1 (50.9-53.3)	3,784	60.5 (58.6-62.4)	3,410	59.7 (57.7-61.7)	283	65.8 (58.1-73.5)	3,954	45.8 (44.4-47.2)	3,585	45.5 (44.0-47.0)	291	44.6 (39.5-49.7)
2006	8,004	54.1 (52.9-55.3)	3,920	63.5 (61.5-65.5)	3,559	63.1 (61.0-65.2)	287	67.4 (59.6-75.2)	4,084	47.2 (45.8-48.6)	3,639	46.1 (44.6-47.6)	346	53.0 (47.4-58.6)

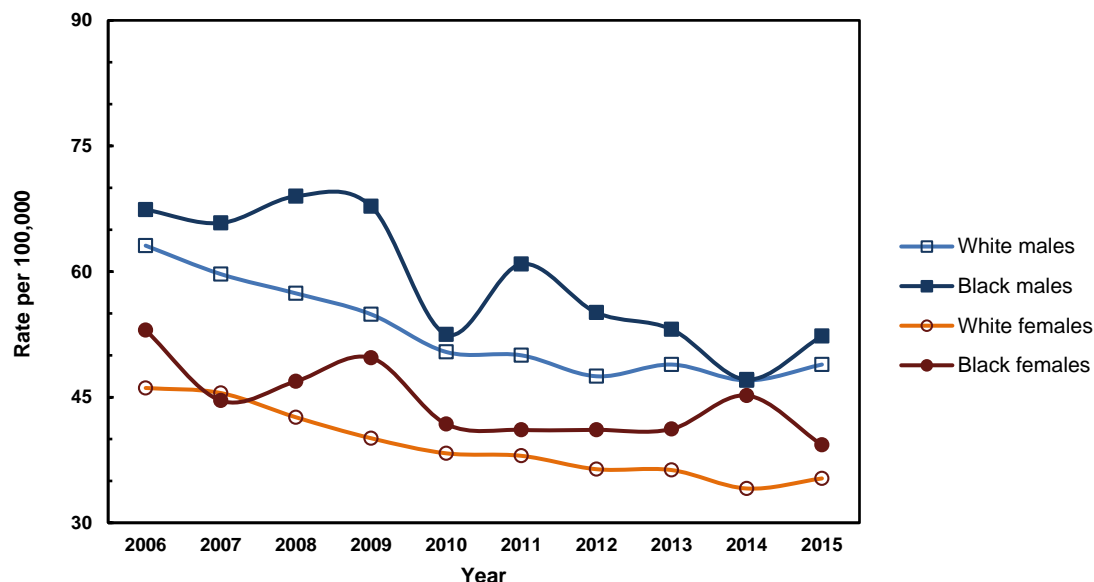
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
5-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Colon and Rectum: INCIDENCE (Invasive)

**TABLE
5-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

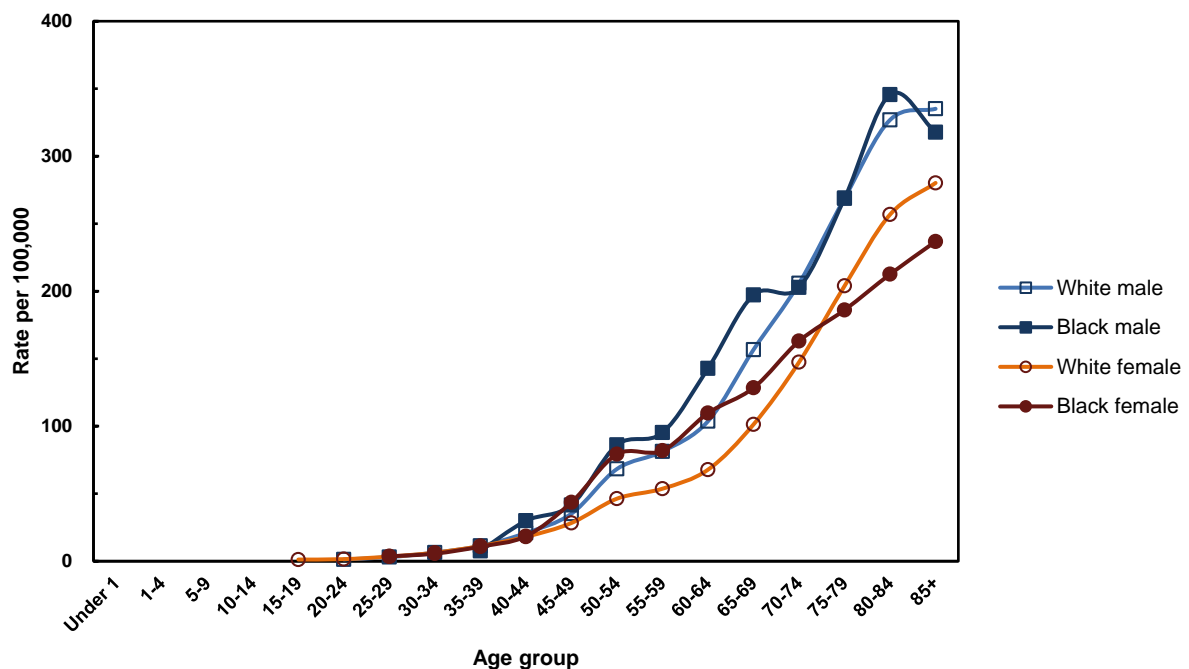
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	53.7	56.7	60.3	41.7	50.9	53.8	41.8
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	0.8	0.6	ND	ND	0.9	1.2	ND
20-24	1.3	1.3	1.3	ND	1.4	1.5	ND
25-29	3.1	2.9	3.0	ND	3.2	3.4	3.6
30-34	6.0	5.8	6.4	ND	6.1	6.3	5.6
35-39	11.0	10.7	11.3	7.5	11.3	11.2	10.8
40-44	19.7	21.6	20.9	29.9	17.9	18.1	18.5
45-49	33.0	35.7	35.2	41.6	30.3	28.3	43.6
50-54	60.2	70.4	68.3	86.1	50.4	46.3	79.2
55-59	69.7	83.2	81.3	95.2	56.8	53.7	81.9
60-64	89.3	108.2	103.7	142.8	71.7	67.8	109.7
65-69	130.5	159.7	156.7	197.2	104.3	101.3	128.4
70-74	174.8	205.9	205.8	202.8	148.9	147.4	163.0
75-79	230.9	269.5	268.9	268.8	201.6	203.9	186.1
80-84	284.0	329.8	326.9	345.6	253.8	256.8	212.6
85+	298.9	336.0	335.1	317.7	281.1	280.2	236.8

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
5-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Colon and Rectum: INCIDENCE (Invasive)

**TABLE
5-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	34,330	17,689	15,684	1,472	16,640	14,577	1,598
Under 1	0	0	0	0	0	0	0
1-4	0	0	0	0	0	0	0
5-9	0	0	0	0	0	0	0
10-14	7	4	4	0	3	3	0
15-19	32	13	8	2	19	19	0
20-24	59	28	22	5	31	25	6
25-29	127	61	51	3	66	55	10
30-34	233	114	101	8	118	97	14
35-39	399	193	168	16	206	164	25
40-44	797	433	351	67	364	302	45
45-49	1,452	776	652	96	676	532	110
50-54	2,895	1,662	1,402	197	1,233	974	204
55-59	3,253	1,898	1,637	191	1,355	1,116	191
60-64	3,605	2,109	1,807	218	1,496	1,244	209
65-69	4,144	2,396	2,127	205	1,748	1,511	180
70-74	4,102	2,199	1,998	142	1,903	1,687	168
75-79	4,157	2,094	1,913	130	2,063	1,883	148
80-84	4,187	1,932	1,781	109	2,255	2,089	131
85+	4,880	1,776	1,661	83	3,104	2,876	157

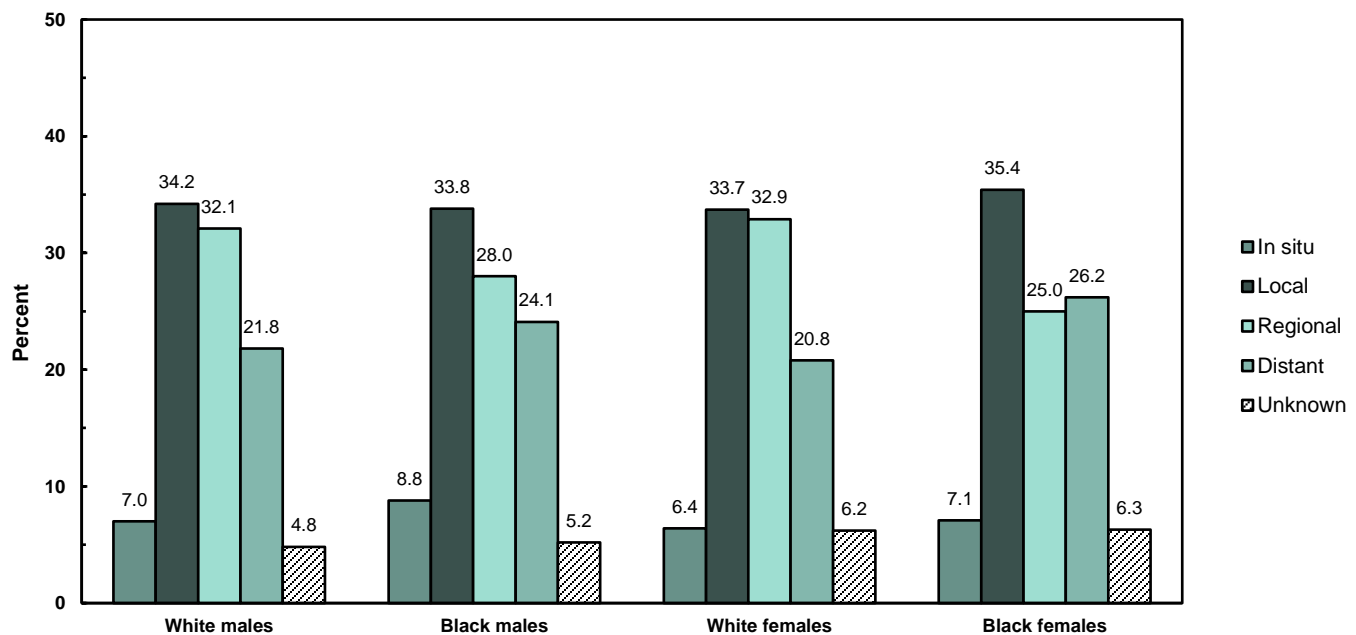
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
5-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 6,608 - 96.1%

Cancer of the Colon and Rectum: MORTALITY

**TABLE
5-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,557	14.9 (14.3-15.5)	1,295	17.7 (16.7-18.7)	1,160	17.5 (16.5-18.5)	98	19.5 (15.6-23.4)	1,262	12.8 (12.1-13.5)	1,090	12.2 (11.5-12.9)	134	17.2 (14.3-20.1)
2014	2,533	14.9 (14.3-15.5)	1,286	17.7 (16.7-18.7)	1,132	17.3 (16.3-18.3)	117	21.5 (17.6-25.4)	1,247	12.6 (11.9-13.3)	1,111	12.4 (11.7-13.1)	101	12.7 (10.2-15.2)
2013	2,653	15.8 (15.2-16.4)	1,312	18.5 (17.5-19.5)	1,138	17.7 (16.7-18.7)	136	27.3 (22.7-31.9)	1,341	13.5 (12.8-14.2)	1,190	13.3 (12.5-14.1)	116	14.9 (12.2-17.6)
2012	2,612	15.7 (15.1-16.3)	1,301	18.6 (17.6-19.6)	1,129	17.7 (16.7-18.7)	127	26.7 (22.1-31.3)	1,311	13.5 (12.8-14.2)	1,166	13.3 (12.5-14.1)	122	16.6 (13.7-19.5)
2011	2,575	15.6 (15.0-16.2)	1,292	18.9 (17.9-19.9)	1,143	18.3 (17.2-19.4)	135	28.7 (23.9-33.5)	1,283	13.2 (12.5-13.9)	1,131	12.8 (12.1-13.5)	139	19.0 (15.8-22.2)
2010	2,755	16.9 (16.3-17.5)	1,370	20.2 (19.1-21.3)	1,227	20.0 (18.9-21.1)	136	29.9 (24.9-34.9)	1,385	14.4 (13.6-15.2)	1,246	14.3 (13.5-15.1)	128	18.4 (15.2-21.6)
2009	2,749	17.3 (16.7-17.9)	1,410	21.6 (20.5-22.7)	1,265	21.2 (20.0-22.4)	139	32.5 (27.1-37.9)	1,339	14.0 (13.3-14.7)	1,192	13.6 (12.8-14.4)	136	19.9 (16.6-23.2)
2008	2,783	18.0 (17.3-18.7)	1,379	21.9 (20.7-23.1)	1,241	21.5 (20.3-22.7)	129	31.1 (25.7-36.5)	1,404	15.2 (14.4-16.0)	1,279	15.2 (14.4-16.0)	109	16.2 (13.2-19.2)
2007	2,822	18.8 (18.1-19.5)	1,365	22.8 (21.6-24.0)	1,232	22.5 (21.2-23.8)	128	30.5 (25.2-35.8)	1,457	16.2 (15.4-17.0)	1,328	16.1 (15.2-17.0)	125	19.0 (15.7-22.3)
2006	2,884	19.3 (18.6-20.0)	1,437	24.5 (23.2-25.8)	1,271	23.6 (22.3-24.9)	156	41.0 (34.6-47.4)	1,447	16.0 (15.2-16.8)	1,311	15.8 (14.9-16.7)	125	19.3 (15.9-22.7)

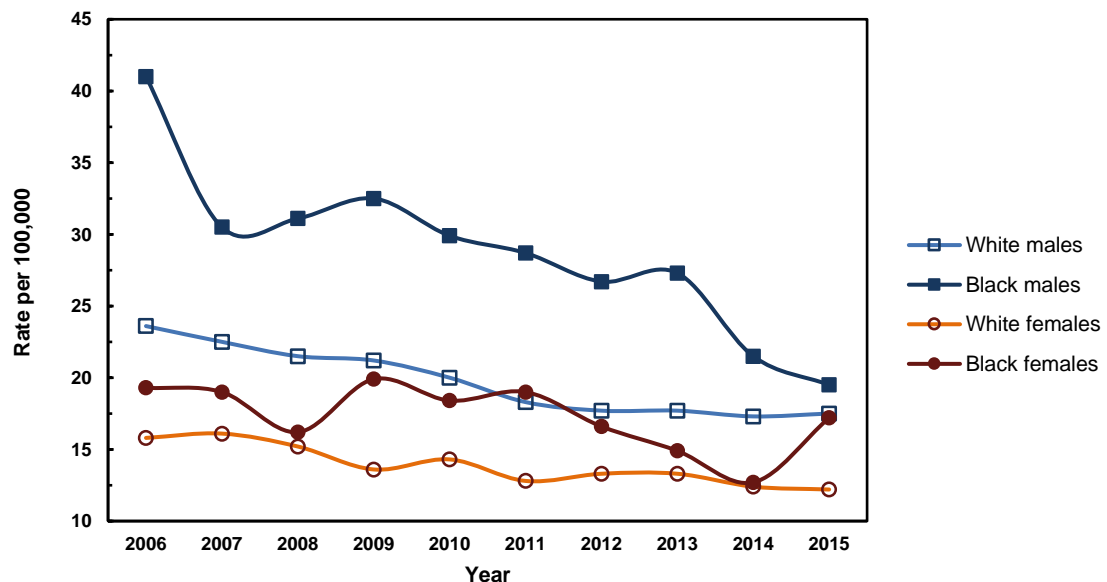
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
5-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Colon and Rectum: MORTALITY

**TABLE
5-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	12,930	20.2	6,486	20.8	5,702	21.9	613	17.4	6,444	19.7	5,688	21.0	612	16.0
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	1	ND	1	ND	0	ND	1	ND	0	ND	0	ND	0	ND
20-24	8	ND	6	ND	3	ND	2	ND	2	ND	2	ND	0	ND
25-29	17	0.4	12	0.6	9	ND	2	ND	5	ND	4	ND	0	ND
30-34	49	1.3	23	1.2	17	1.1	6	ND	26	1.3	22	1.4	2	ND
35-39	94	2.6	56	3.1	48	3.2	8	ND	38	2.1	30	2.0	5	ND
40-44	183	4.5	100	5.0	73	4.4	15	6.7	83	4.1	66	3.9	9	ND
45-49	362	8.2	207	9.5	164	8.8	35	15.2	155	7.0	118	6.3	31	12.3
50-54	671	14.0	404	17.1	332	16.2	57	24.9	267	10.9	227	10.8	32	12.4
55-59	915	19.6	545	23.9	451	22.4	64	31.9	370	15.5	300	14.4	63	27.0
60-64	1,078	26.7	636	32.6	548	31.4	71	46.5	442	21.2	367	20.0	65	34.1
65-69	1,282	40.4	745	49.7	656	48.3	73	70.2	537	32.0	452	30.3	71	50.6
70-74	1,489	63.5	821	76.9	733	75.5	69	98.5	668	52.3	583	50.9	72	69.9
75-79	1,613	89.6	827	106.4	732	102.9	80	165.4	786	76.8	698	75.6	68	85.5
80-84	1,865	126.5	879	150.0	783	143.7	76	241.0	986	111.0	896	110.1	69	112.0
85+	3,303	202.3	1,224	231.6	1,153	232.6	54	206.7	2,079	188.3	1,923	187.3	125	188.5

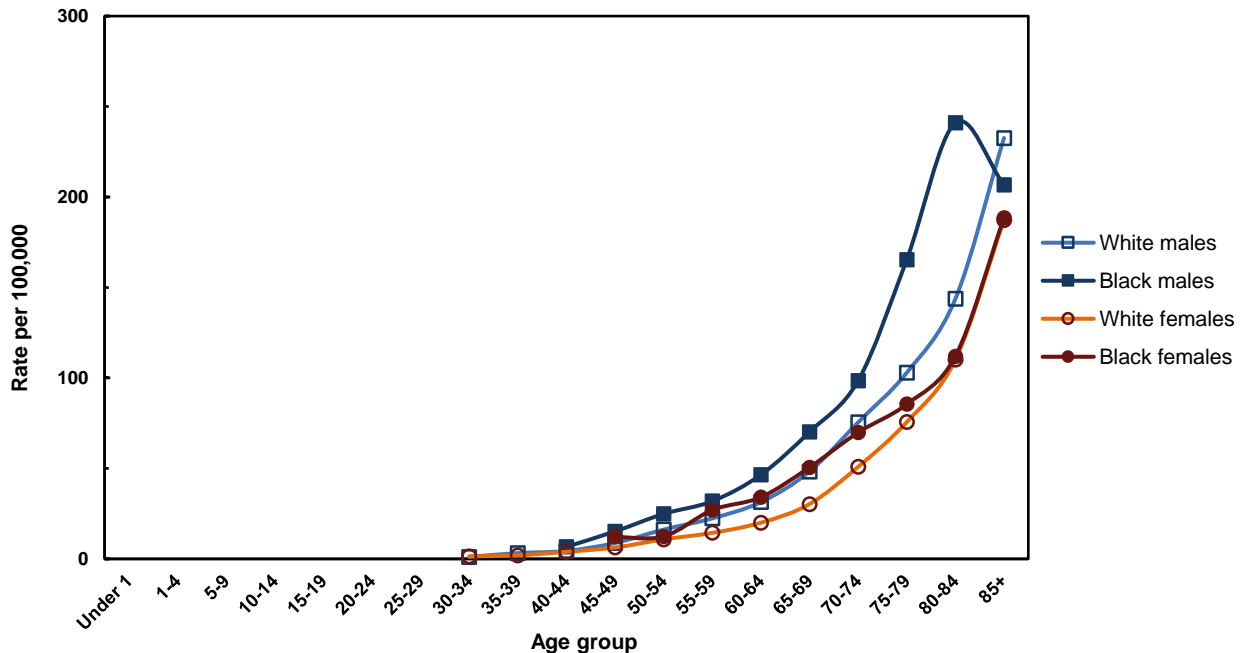
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
5-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Colon and Rectum: INCIDENCE (Invasive)

**TABLE
5-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	34,330	17,689	49.0	(48.3-49.7)	16,640	36.7	(36.1-37.3)								
Adams	266	127	40.8	(33.7-47.9)	139	38.4	(32.0-44.8)	Juniata	68	40	49.2	(34.0-64.4)	28	30.2	(19.0-41.4)
Allegheny	3,324	1,685	48.1	(45.8-50.4)	1,639	34.6	(32.9-36.3)	Lackawanna	600	306	47.9	(42.5-53.3)	294	35.8	(31.7-39.9)
Armstrong	234	125	53.6	(44.2-63.0)	109	40.4	(32.8-48.0)	Lancaster	1,203	653	43.9	(40.5-47.3)	550	31.0	(28.4-33.6)
Beaver	507	240	44.9	(39.2-50.6)	267	37.8	(33.3-42.3)	Lawrence	268	131	45.3	(37.5-53.1)	137	35.0	(29.1-40.9)
Bedford	174	94	55.0	(43.9-66.1)	80	40.1	(31.3-48.9)	Lebanon	347	167	39.7	(33.7-45.7)	180	35.8	(30.6-41.0)
Berks	1,007	515	44.9	(41.0-48.8)	492	35.7	(32.5-38.9)	Lehigh	895	437	45.5	(41.2-49.8)	458	36.6	(33.2-40.0)
Blair	408	208	54.5	(47.1-61.9)	200	39.6	(34.1-45.1)	Luzerne	1,088	579	60.5	(55.6-65.4)	509	39.2	(35.8-42.6)
Bradford	186	85	42.2	(33.2-51.2)	101	45.9	(36.9-54.9)	Lycoming	331	161	47.1	(39.8-54.4)	170	39.0	(33.1-44.9)
Bucks	1,597	859	47.0	(43.9-50.1)	738	33.0	(30.6-35.4)	McKean	120	65	49.2	(37.2-61.2)	55	34.1	(25.1-43.1)
Butler	542	291	54.1	(47.9-60.3)	251	38.6	(33.8-43.4)	Mercer	399	219	59.1	(51.3-66.9)	180	39.0	(33.3-44.7)
Cambria	511	269	57.3	(50.5-64.1)	242	41.6	(36.4-46.8)	Mifflin	136	75	49.3	(38.1-60.5)	61	34.0	(25.5-42.5)
Cameron	24	15	ND		9	ND		Monroe	409	222	45.5	(39.5-51.5)	187	35.9	(30.8-41.0)
Carbon	190	92	42.4	(33.7-51.1)	98	38.1	(30.6-45.6)	Montgomery	2,006	994	43.5	(40.8-46.2)	1,011	34.7	(32.6-36.8)
Centre	272	149	42.1	(35.3-48.9)	123	30.2	(24.9-35.5)	Montour	60	25	44.7	(27.2-62.2)	35	49.6	(33.2-66.0)
Chester	1,052	518	38.4	(35.1-41.7)	534	33.2	(30.4-36.0)	Northampton	776	424	48.4	(43.8-53.0)	352	32.2	(28.8-35.6)
Clarion	121	57	48.8	(36.1-61.5)	64	42.0	(31.7-52.3)	Northumberland	266	135	44.6	(37.1-52.1)	131	36.8	(30.5-43.1)
Clearfield	256	132	50.4	(41.8-59.0)	124	38.1	(31.4-44.8)	Perry	116	64	49.5	(37.4-61.6)	52	35.9	(26.1-45.7)
Clinton	131	62	56.0	(42.1-69.9)	69	49.7	(38.0-61.4)	Philadelphia	3,709	1,872	57.2	(54.6-59.8)	1,837	40.1	(38.3-41.9)
Columbia	200	112	59.1	(48.2-70.0)	88	37.9	(30.0-45.8)	Pike	155	76	38.0	(29.5-46.5)	79	40.3	(31.4-49.2)
Crawford	292	150	55.6	(46.7-64.5)	142	44.6	(37.3-51.9)	Potter	71	40	66.0	(45.5-86.5)	31	41.7	(27.0-56.4)
Cumberland	660	312	45.1	(40.1-50.1)	348	40.8	(36.5-45.1)	Schuylkill	547	272	57.0	(50.2-63.8)	275	45.5	(40.1-50.9)
Dauphin	668	328	45.4	(40.5-50.3)	340	37.4	(33.4-41.4)	Snyder	96	45	40.7	(28.8-52.6)	51	37.4	(27.1-47.7)
Delaware	1,518	785	54.2	(50.4-58.0)	733	37.9	(35.2-40.6)	Somerset	265	145	53.6	(44.9-62.3)	120	38.8	(31.9-45.7)
Elk	129	84	80.0	(62.9-97.1)	45	34.7	(24.6-44.8)	Sullivan	24	17	ND		7	ND	
Erie	614	325	43.1	(38.4-47.8)	289	31.0	(27.4-34.6)	Susquehanna	115	68	46.8	(35.7-57.9)	47	29.9	(21.4-38.4)
Fayette	462	265	60.5	(53.2-67.8)	197	36.1	(31.1-41.1)	Tioga	119	75	52.0	(40.2-63.8)	44	26.9	(19.0-34.8)
Forest	17	12	ND		5	ND		Union	105	50	39.2	(28.3-50.1)	55	40.1	(29.5-50.7)
Franklin	447	228	49.9	(43.4-56.4)	219	39.8	(34.5-45.1)	Venango	175	100	53.1	(42.7-63.5)	75	35.1	(27.2-43.0)
Fulton	42	15	ND		27	53.3	(33.2-73.4)	Warren	113	61	45.1	(33.8-56.4)	52	30.8	(22.4-39.2)
Greene	139	67	59.6	(45.3-73.9)	72	59.2	(45.5-72.9)	Washington	679	360	55.2	(49.5-60.9)	319	38.5	(34.3-42.7)
Huntingdon	112	58	39.3	(29.2-49.4)	54	33.7	(24.7-42.7)	Wayne	150	78	41.1	(32.0-50.2)	72	38.0	(29.2-46.8)
Indiana	237	139	55.4	(46.2-64.6)	98	30.9	(24.8-37.0)	Westmoreland	1,174	611	50.2	(46.2-54.2)	563	36.1	(33.1-39.1)
Jefferson	147	81	53.3	(41.7-64.9)	66	36.8	(27.9-45.7)	Wyoming	77	40	46.2	(31.9-60.5)	37	37.2	(25.2-49.2)
								York	1,182	598	47.9	(44.1-51.7)	584	40.5	(37.2-43.8)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

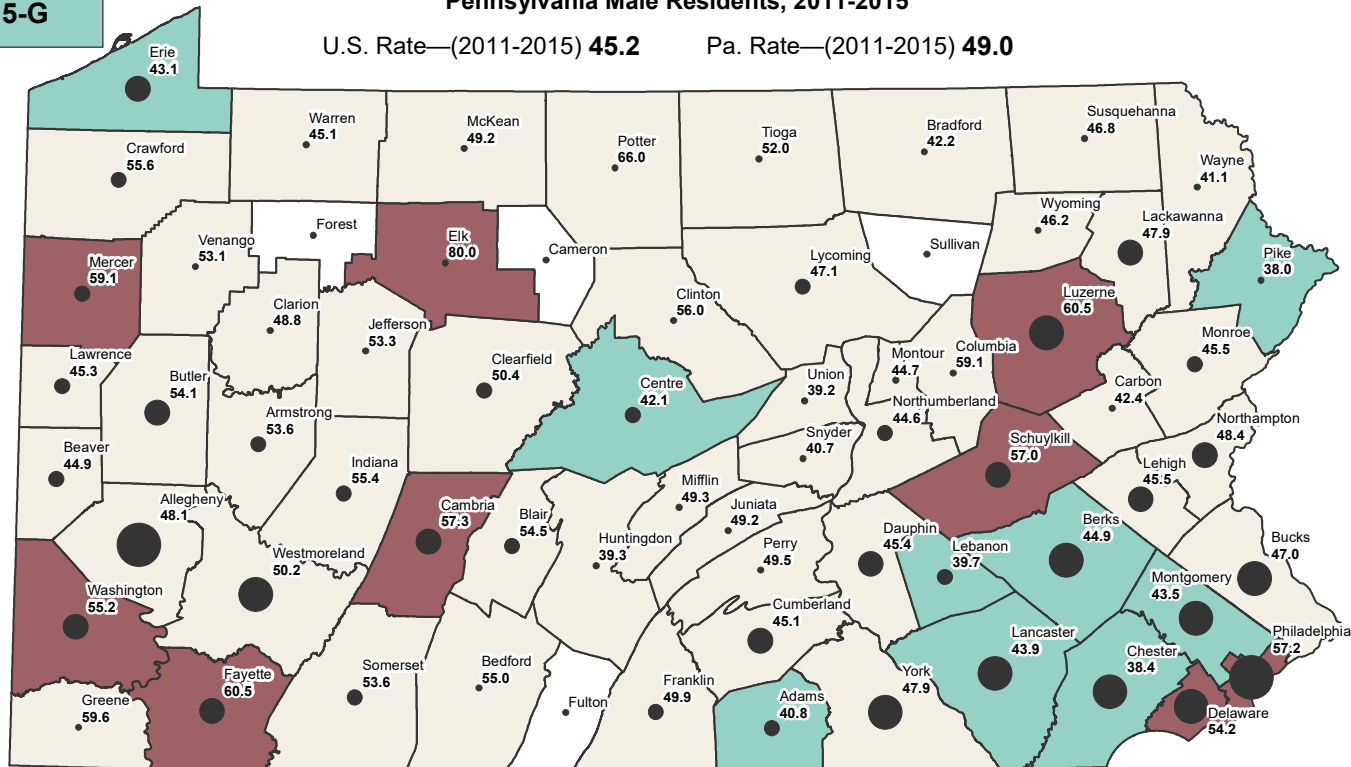
Cancer of the Colon and Rectum: INCIDENCE (Invasive)

**MAP
5-G**

**Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates
Pennsylvania Male Residents, 2011-2015**

U.S. Rate—(2011-2015) **45.2**

Pa. Rate—(2011-2015) **49.0**



Significantly higher

Significantly lower

Not significantly different

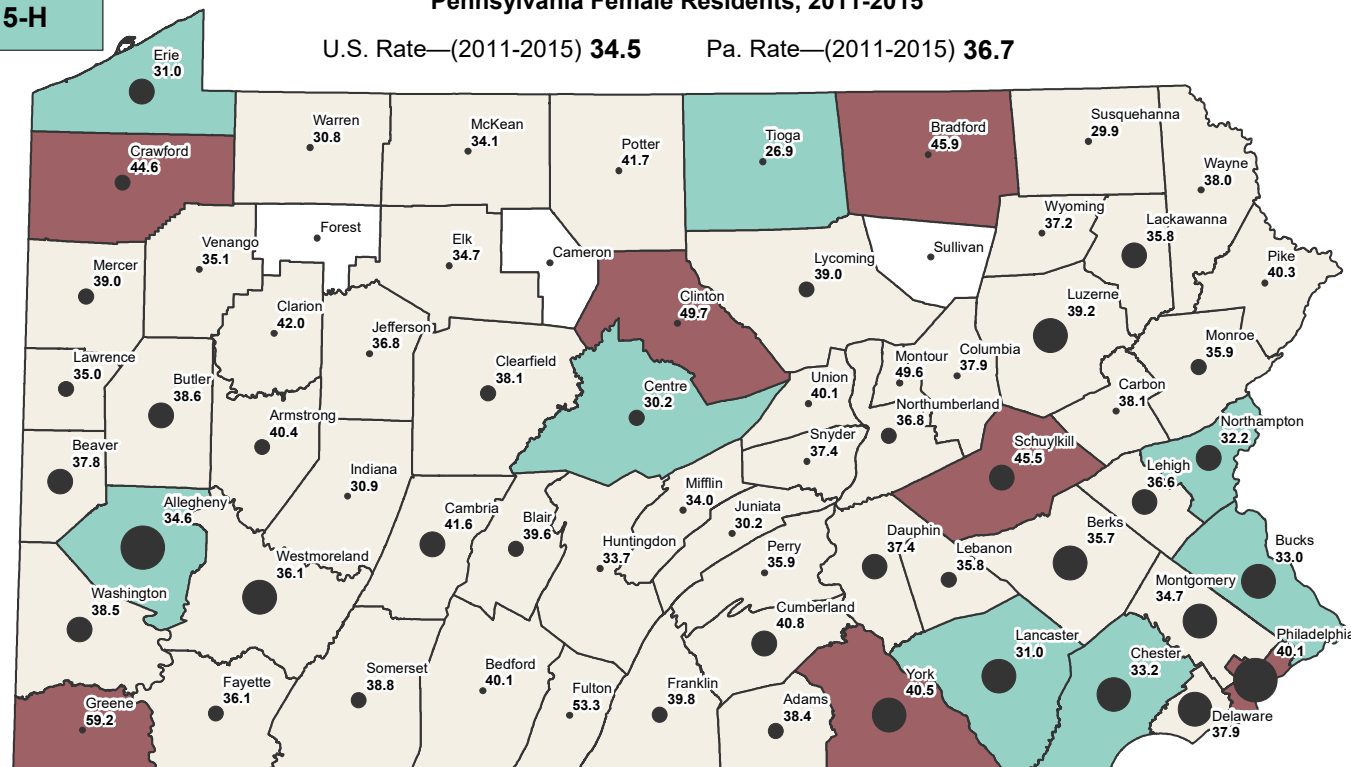
Significance not determined—less than 20 observed cases

**MAP
5-H**

**Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates
Pennsylvania Female Residents, 2011-2015**

U.S. Rate—(2011-2015) **34.5**

Pa. Rate—(2011-2015) **36.7**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Colon and Rectum: MORTALITY

**TABLE
5-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	12,930	6,486	18.3	(17.9-18.7)	6,444	13.1	(12.8-13.4)								
Adams	111	61	19.9	(14.9-24.9)	50	13.6	(9.8-17.4)	Juniata	27	11	ND		16	ND	
Allegheny	1,301	655	18.6	(17.2-20.0)	646	12.4	(11.4-13.4)	Lackawanna	224	108	17.3	(14.0-20.6)	116	12.6	(10.3-14.9)
Armstrong	84	40	18.2	(12.6-23.8)	44	15.5	(10.9-20.1)	Lancaster	476	259	17.4	(15.3-19.5)	217	11.4	(9.9-12.9)
Beaver	199	94	17.3	(13.8-20.8)	105	13.3	(10.8-15.8)	Lawrence	117	47	16.1	(11.5-20.7)	70	16.4	(12.6-20.2)
Bedford	52	28	15.9	(10.0-21.8)	24	11.6	(7.0-16.2)	Lebanon	123	62	15.4	(11.6-19.2)	61	10.1	(7.6-12.6)
Berks	390	214	18.5	(16.0-21.0)	176	11.6	(9.9-13.3)	Lehigh	333	153	15.7	(13.2-18.2)	180	12.9	(11.0-14.8)
Blair	151	79	20.4	(15.9-24.9)	72	12.7	(9.8-15.6)	Luzerne	444	218	23.0	(19.9-26.1)	226	15.9	(13.8-18.0)
Bradford	63	26	12.9	(7.9-17.9)	37	14.4	(9.8-19.0)	Lycoming	130	58	16.8	(12.5-21.1)	72	16.2	(12.5-19.9)
Bucks	560	272	15.4	(13.6-17.2)	288	11.8	(10.4-13.2)	McKean	49	30	22.8	(14.6-31.0)	19	ND	
Butler	187	105	20.0	(16.2-23.8)	82	11.3	(8.9-13.7)	Mercer	176	94	25.2	(20.1-30.3)	82	17.3	(13.6-21.0)
Cambria	167	93	19.8	(15.8-23.8)	74	11.1	(8.6-13.6)	Mifflin	66	33	22.3	(14.7-29.9)	33	17.2	(11.3-23.1)
Cameron	13	7	ND		6	ND		Monroe	125	62	14.6	(11.0-18.2)	63	12.3	(9.3-15.3)
Carbon	72	32	14.9	(9.7-20.1)	40	15.0	(10.4-19.6)	Montgomery	683	302	13.5	(12.0-15.0)	381	12.1	(10.9-13.3)
Centre	85	45	13.5	(9.6-17.4)	40	8.9	(6.1-11.7)	Montour	19	9	ND		10	ND	
Chester	373	186	14.4	(12.3-16.5)	187	11.2	(9.6-12.8)	Northampton	295	141	16.1	(13.4-18.8)	154	12.8	(10.8-14.8)
Clarion	39	21	18.6	(10.6-26.6)	18	ND		Northumberland	110	55	18.4	(13.5-23.3)	55	13.3	(9.8-16.8)
Clearfield	101	51	20.3	(14.7-25.9)	50	14.0	(10.1-17.9)	Perry	45	21	17.1	(9.8-24.4)	24	16.0	(9.6-22.4)
Clinton	55	25	22.9	(13.9-31.9)	30	18.9	(12.1-25.7)	Philadelphia	1,399	701	22.5	(20.8-24.2)	698	14.5	(13.4-15.6)
Columbia	60	27	15.7	(9.8-21.6)	33	13.0	(8.6-17.4)	Pike	59	34	19.0	(12.6-25.4)	25	11.9	(7.2-16.6)
Crawford	101	50	20.0	(14.5-25.5)	51	14.7	(10.7-18.7)	Potter	28	14	ND		14	ND	
Cumberland	233	115	16.9	(13.8-20.0)	118	13.1	(10.7-15.5)	Schuylkill	184	80	17.4	(13.6-21.2)	104	15.5	(12.5-18.5)
Dauphin	238	126	17.8	(14.7-20.9)	112	11.6	(9.5-13.7)	Snyder	46	24	21.3	(12.8-29.8)	22	16.3	(9.5-23.1)
Delaware	608	305	21.3	(18.9-23.7)	303	14.3	(12.7-15.9)	Somerset	102	60	23.0	(17.2-28.8)	42	11.5	(8.0-15.0)
Elk	44	25	23.2	(14.1-32.3)	19	ND		Sullivan	7	4	ND		3	ND	
Erie	273	138	18.3	(15.2-21.4)	135	13.1	(10.9-15.3)	Susquehanna	40	23	16.3	(9.6-23.0)	17	ND	
Fayette	187	109	26.3	(21.4-31.2)	78	12.5	(9.7-15.3)	Tioga	43	25	17.5	(10.6-24.4)	18	ND	
Forest	8	7	ND		1	ND		Union	33	16	ND		17	ND	
Franklin	153	78	17.2	(13.4-21.0)	75	12.4	(9.6-15.2)	Venango	82	38	20.0	(13.6-26.4)	44	21.0	(14.8-27.2)
Fulton	13	4	ND		9	ND		Warren	47	25	17.3	(10.5-24.1)	22	11.9	(6.9-16.9)
Greene	47	26	24.2	(14.9-33.5)	21	16.4	(9.4-23.4)	Washington	277	127	19.2	(15.9-22.5)	150	17.3	(14.5-20.1)
Huntingdon	52	30	20.1	(12.9-27.3)	22	13.1	(7.6-18.6)	Wayne	55	23	12.9	(7.6-18.2)	32	17.8	(11.6-24.0)
Indiana	96	53	21.6	(15.8-27.4)	43	12.1	(8.5-15.7)	Westmoreland	478	248	20.1	(17.6-22.6)	230	13.8	(12.0-15.6)
Jefferson	66	36	24.9	(16.8-33.0)	30	16.6	(10.7-22.5)	Wyoming	29	17	ND		12	ND	
								York	397	201	16.6	(14.3-18.9)	196	12.6	(10.8-14.4)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

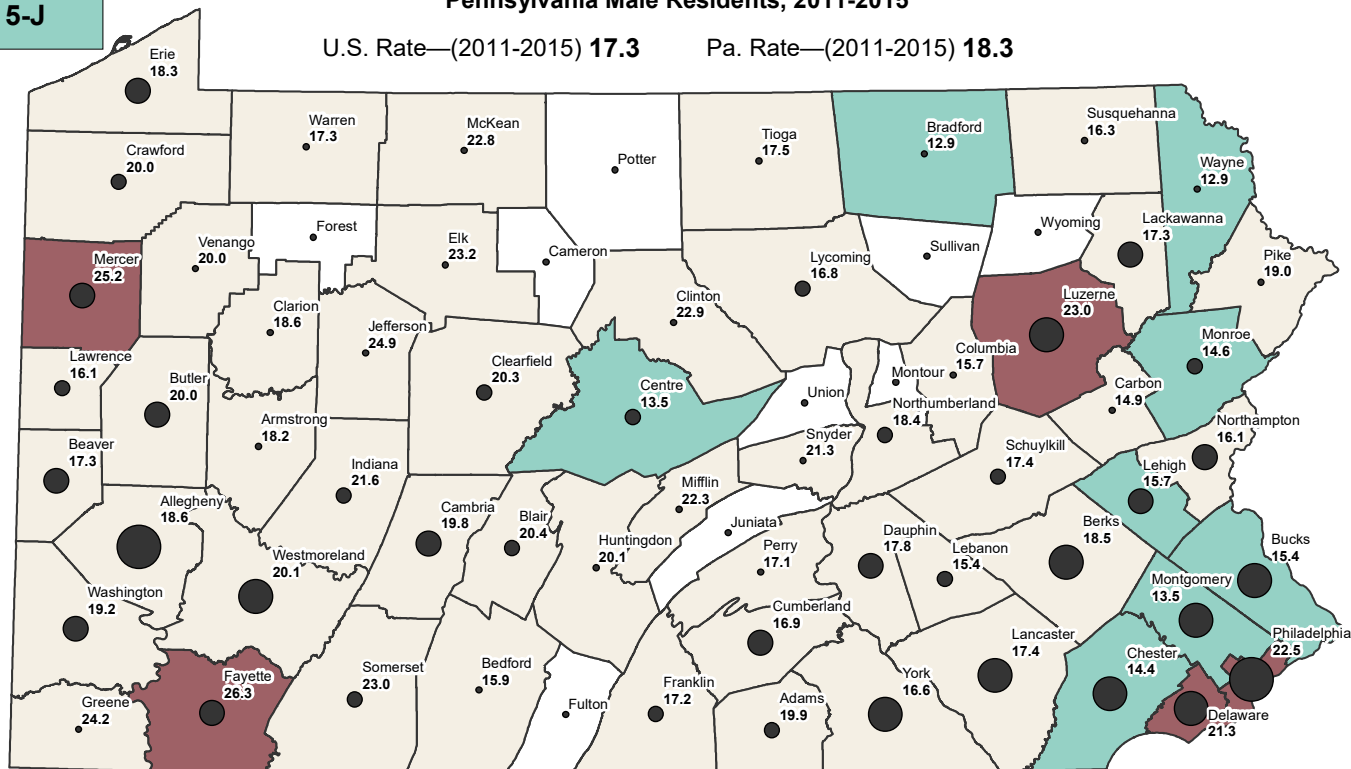
Cancer of the Colon and Rectum: MORTALITY

MAP
5-J

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) 17.3

Pa. Rate—(2011-2015) 18.3



Significantly higher

Significantly lower

Not significantly different

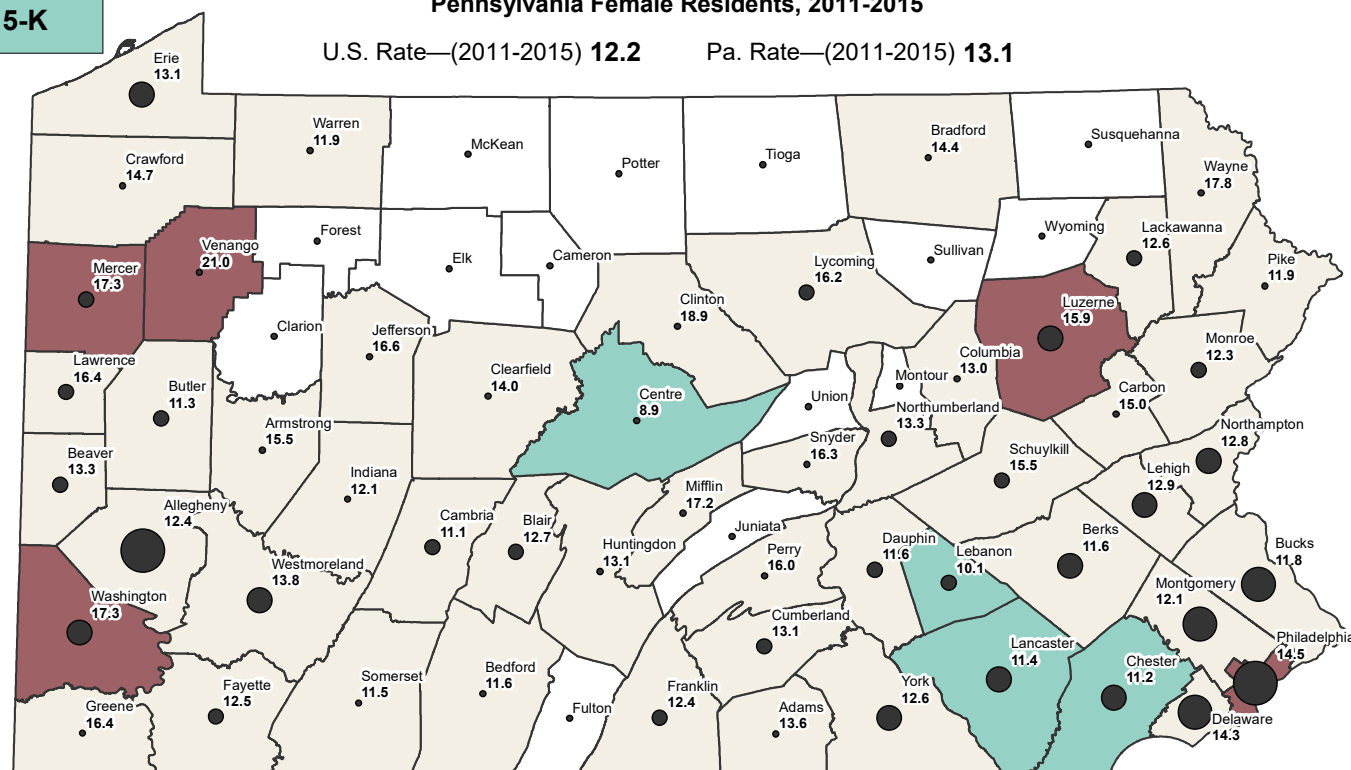
Significance not determined—less than 20 observed cases

MAP
5-K

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) 12.2

Pa. Rate—(2011-2015) 13.1



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Liver and Intrahepatic Bile Duct

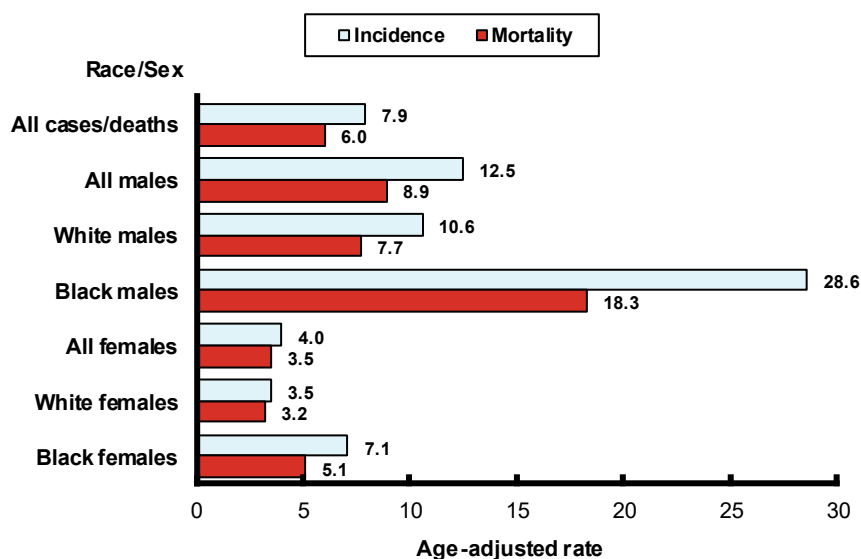
Data Highlights

The 2011-2015 average annual age-adjusted incidence rate for invasive cancers of the liver and intrahepatic bile duct was over three times higher in males than in females (12.5 compared to 4.0 per 100,000). The highest rate occurred among black males (28.6) and was over two times the rate among white males (10.6).

In 2015, there were 1,526 cases of invasive liver/intrahepatic bile duct cancers diagnosed among residents for an age-adjusted rate of 8.8 per 100,000. The annual age-adjusted incidence rates by sex and race for the last 10 years (2006-2015) showed increasing rates among males and females. The 2011-2015 average annual age-specific incidence rates among the four sex/race groups indicated that black males had the highest risk for liver cancer between the ages of 55 and 84. During the summary period of 2011-2015, 97 percent of the cases were diagnosed among residents 45 years of age or older. In 2015, 48 percent of the liver/intrahepatic bile duct cancers were diagnosed at the late stage (regional or distant) of the disease, and approximately 41 percent were diagnosed at the early stage (local).

As observed with incidence rates, the 2011-2015 average annual age-adjusted death rates for cancer of the liver and intrahepatic bile duct were much higher for black males (18.3 per 100,000) compared to white males (7.7). Black females (5.1) also had higher death rates compared to white females (3.2). Liver cancer death counts and rates were also very similar to the incidence figures for all sex/race groups. This is indicative of poor survival rates for this disease. During the period 2006-2015, the annual age-adjusted death rates had increasing trends among white males, black males and white females. Annual death rates among black females displayed no discernible long-term trends.

FIGURE 6
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, chronic infection with hepatitis B virus, hepatitis C virus, cirrhosis of the liver (usually from excessive use of alcohol), diseases of the bile duct, inherited metabolic diseases, obesity, type 2 diabetes, tyrosinemia, alpha 1-antitrypsin deficiency, porphyria cutanea tarda, glycogen storage diseases, Wilson disease, long-term exposure to aflatoxin, exposure to vinyl chloride or thorium dioxide (thorotrast), anabolic steroids, arsenic in drinking water, infection with the parasite that causes schistosomiasis, and use of tobacco are associated with liver cancers.

Early Detection

No screening tests have proven to be effective or are currently being evaluated.

Cancer of the Liver and Intrahepatic Bile Duct: INCIDENCE (Invasive)

**TABLE
6-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,526	8.8 (8.4-9.2)	1,112	13.6 (12.8-14.4)	858	11.9 (11.1-12.7)	200	29.9 (25.8-34.0)	413	4.5 (4.1-4.9)	332	4.1 (3.7-4.5)	64	7.7 (5.8-9.6)
2014	1,413	8.2 (7.8-8.6)	1,042	12.9 (12.1-13.7)	790	11.1 (10.3-11.9)	198	30.3 (26.1-34.5)	371	4.0 (3.6-4.4)	292	3.6 (3.2-4.0)	57	6.9 (5.1-8.7)
2013	1,351	7.9 (7.5-8.3)	975	12.3 (11.5-13.1)	748	10.6 (9.8-11.4)	179	27.8 (23.7-31.9)	376	4.2 (3.8-4.6)	289	3.7 (3.3-4.1)	66	8.2 (6.2-10.2)
2012	1,258	7.5 (7.1-7.9)	934	12.0 (11.2-12.8)	687	10.0 (9.3-10.7)	161	25.3 (21.4-29.2)	324	3.6 (3.2-4.0)	234	3.0 (2.6-3.4)	48	5.9 (4.2-7.6)
2011	1,191	7.2 (6.8-7.6)	862	11.3 (10.5-12.1)	628	9.3 (8.6-10.0)	184	29.2 (25.0-33.4)	329	3.6 (3.2-4.0)	256	3.1 (2.7-3.5)	55	6.8 (5.0-8.6)
2010	1,111	7.0 (6.6-7.4)	802	10.9 (10.1-11.7)	613	9.5 (8.7-10.3)	144	24.1 (20.2-28.0)	309	3.5 (3.1-3.9)	248	3.2 (2.8-3.6)	46	6.4 (4.6-8.2)
2009	1,110	7.2 (6.8-7.6)	794	11.3 (10.5-12.1)	612	9.7 (8.9-10.5)	140	27.3 (22.8-31.8)	316	3.7 (3.3-4.1)	246	3.2 (2.8-3.6)	54	7.8 (5.7-9.9)
2008	1,033	6.9 (6.5-7.3)	733	10.8 (10.0-11.6)	558	9.2 (8.4-10.0)	131	25.9 (21.5-30.3)	300	3.5 (3.1-3.9)	240	3.1 (2.7-3.5)	47	7.1 (5.1-9.1)
2007	970	6.5 (6.1-6.9)	721	10.9 (10.1-11.7)	552	9.3 (8.5-10.1)	123	24.4 (20.1-28.7)	249	2.9 (2.5-3.3)	207	2.6 (2.2-3.0)	30	4.4 (2.8-6.0)
2006	889	6.1 (5.7-6.5)	650	10.0 (9.2-10.8)	520	8.9 (8.1-9.7)	99	19.5 (15.7-23.3)	239	2.8 (2.4-3.2)	197	2.5 (2.2-2.8)	31	4.6 (3.0-6.2)

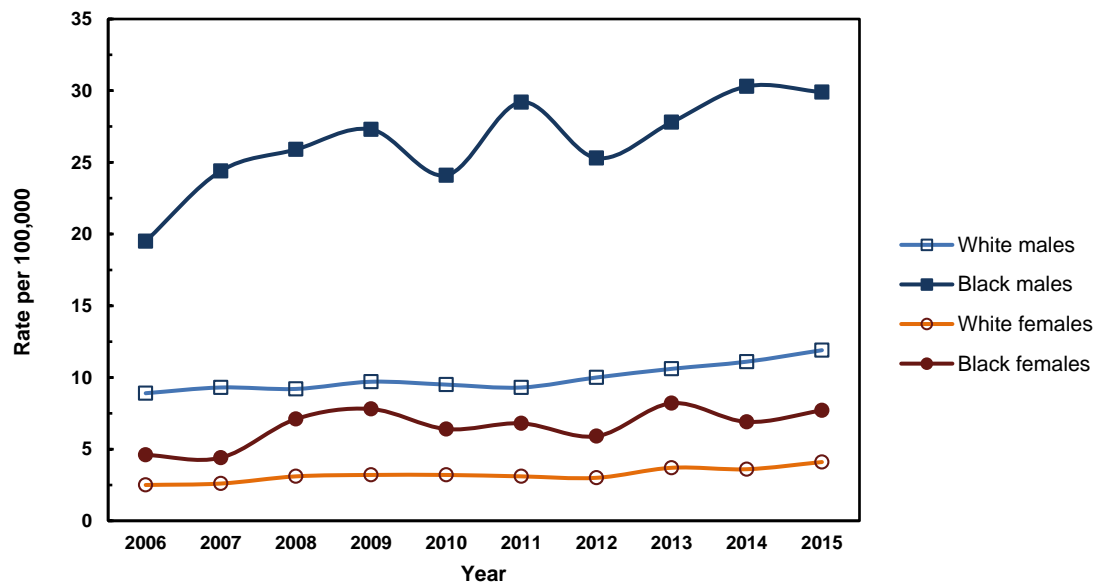
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
6-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Liver and Intrahepatic Bile Duct: INCIDENCE (Invasive)

**TABLE
6-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

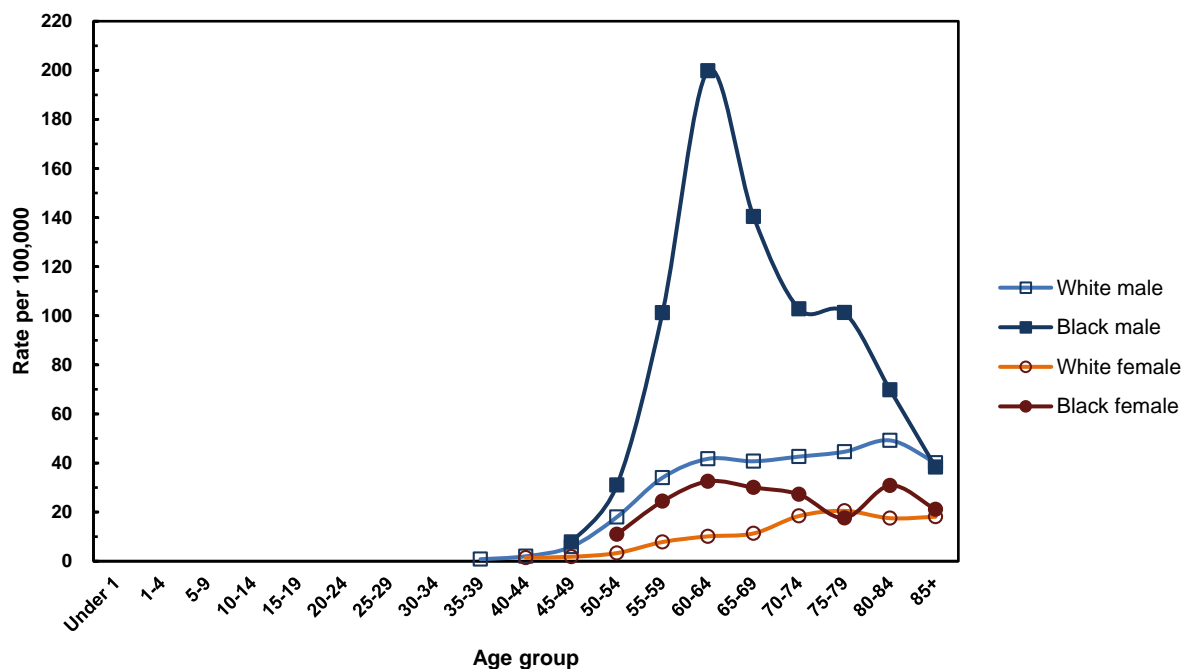
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	10.6	15.8	14.3	26.1	5.6	5.2	7.6
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	0.5	ND	ND	ND	0.7	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	0.3	ND	ND	ND	ND	ND	ND
25-29	0.4	ND	ND	ND	ND	ND	ND
30-34	0.4	ND	ND	ND	0.5	ND	ND
35-39	0.7	1.0	0.8	ND	ND	ND	ND
40-44	2.0	2.6	2.0	ND	1.5	1.4	ND
45-49	4.3	6.5	5.9	7.8	2.1	1.8	ND
50-54	12.2	20.2	18.0	31.0	4.5	3.3	10.9
55-59	25.1	41.5	34.0	101.2	9.4	7.8	24.4
60-64	33.5	56.0	41.7	199.8	12.5	10.1	32.5
65-69	30.4	49.0	40.7	140.4	13.8	11.3	30.0
70-74	32.5	47.8	42.6	102.8	19.8	18.4	27.2
75-79	33.6	49.5	44.6	101.3	21.4	20.5	17.6
80-84	33.2	52.9	49.2	69.8	20.1	17.5	30.8
85+	26.4	41.1	40.1	38.3	19.3	18.1	21.1

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
6-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Liver and Intrahepatic Bile Duct: INCIDENCE (Invasive)

**TABLE
6-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	6,739	4,925	3,711	922	1,813	1,403	290
Under 1	8	7	4	2	1	1	0
1-4	15	5	2	2	10	8	2
5-9	3	1	1	0	2	2	0
10-14	3	3	3	0	0	0	0
15-19	6	3	2	0	3	1	2
20-24	11	8	5	3	3	2	1
25-29	18	9	4	5	9	7	2
30-34	16	6	4	1	10	6	3
35-39	27	19	12	4	8	5	2
40-44	82	52	34	9	30	24	5
45-49	188	142	110	18	46	33	9
50-54	587	476	370	71	111	70	28
55-59	1,171	946	684	203	225	162	57
60-64	1,351	1,091	726	305	260	185	62
65-69	966	735	552	146	231	169	42
70-74	763	510	414	72	253	211	28
75-79	604	385	317	49	219	189	14
80-84	489	310	268	22	179	142	19
85+	431	217	199	10	213	186	14

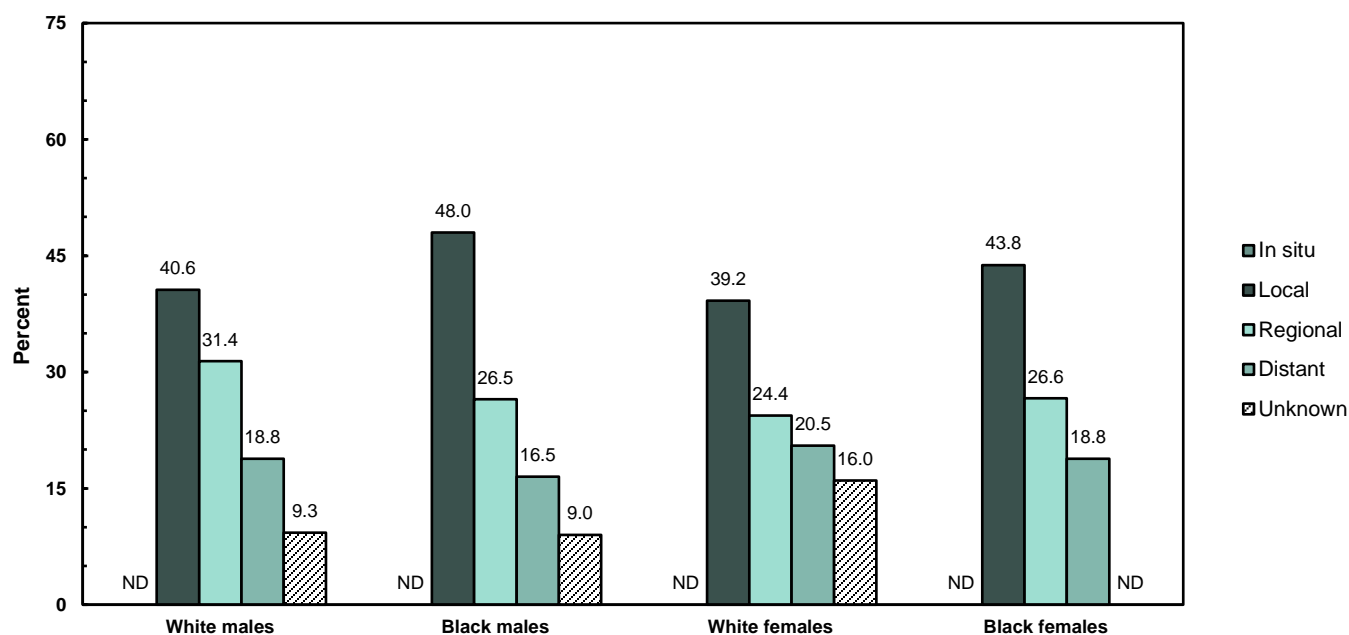
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
6-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 858 - 56.2%

Cancer of the Liver and Intrahepatic Bile Duct: MORTALITY

**TABLE
6-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,083	6.1 (5.7-6.5)	739	9.2 (8.5-9.9)	573	7.9 (7.3-8.5)	120	19.1 (15.7-22.5)	344	3.5 (3.1-3.9)	294	3.4 (3.0-3.8)	33	3.8 (2.5-5.1)
2014	1,095	6.4 (6.0-6.8)	741	9.5 (8.8-10.2)	573	8.2 (7.5-8.9)	123	20.2 (16.6-23.8)	354	3.8 (3.4-4.2)	284	3.3 (2.9-3.7)	47	6.2 (4.4-8.0)
2013	1,014	5.9 (5.5-6.3)	680	8.8 (8.1-9.5)	510	7.5 (6.8-8.2)	112	18.4 (15.0-21.8)	334	3.6 (3.2-4.0)	277	3.2 (2.8-3.6)	41	5.2 (3.6-6.8)
2012	1,021	6.1 (5.7-6.5)	687	9.1 (8.4-9.8)	538	8.0 (7.3-8.7)	109	17.9 (14.5-21.3)	334	3.6 (3.2-4.0)	266	3.2 (2.8-3.6)	45	5.7 (4.0-7.4)
2011	886	5.4 (5.0-5.8)	579	7.8 (7.2-8.4)	457	6.9 (6.3-7.5)	96	15.9 (12.7-19.1)	307	3.3 (2.9-3.7)	263	3.1 (2.7-3.5)	36	4.7 (3.2-6.2)
2010	881	5.4 (5.0-5.8)	583	8.1 (7.4-8.8)	479	7.5 (6.8-8.2)	92	15.8 (12.6-19.0)	298	3.2 (2.8-3.6)	254	3.1 (2.7-3.5)	37	5.3 (3.6-7.0)
2009	851	5.5 (5.1-5.9)	584	8.6 (7.9-9.3)	484	7.9 (7.2-8.6)	92	18.8 (15.0-22.6)	267	3.0 (2.6-3.4)	224	2.7 (2.3-3.1)	40	5.9 (4.1-7.7)
2008	805	5.3 (4.9-5.7)	549	8.3 (7.6-9.0)	444	7.5 (6.8-8.2)	86	17.6 (13.9-21.3)	256	2.8 (2.5-3.1)	229	2.8 (2.4-3.2)	21	3.3 (1.9-4.7)
2007	789	5.3 (4.9-5.7)	501	7.9 (7.2-8.6)	414	7.3 (6.6-8.0)	76	15.2 (11.8-18.6)	288	3.3 (2.9-3.7)	241	3.0 (2.6-3.4)	39	5.8 (4.0-7.6)
2006	710	4.7 (4.4-5.0)	445	7.0 (6.3-7.7)	377	6.6 (5.9-7.3)	58	11.5 (8.5-14.5)	265	3.0 (2.6-3.4)	231	2.8 (2.4-3.2)	30	4.6 (3.0-6.2)

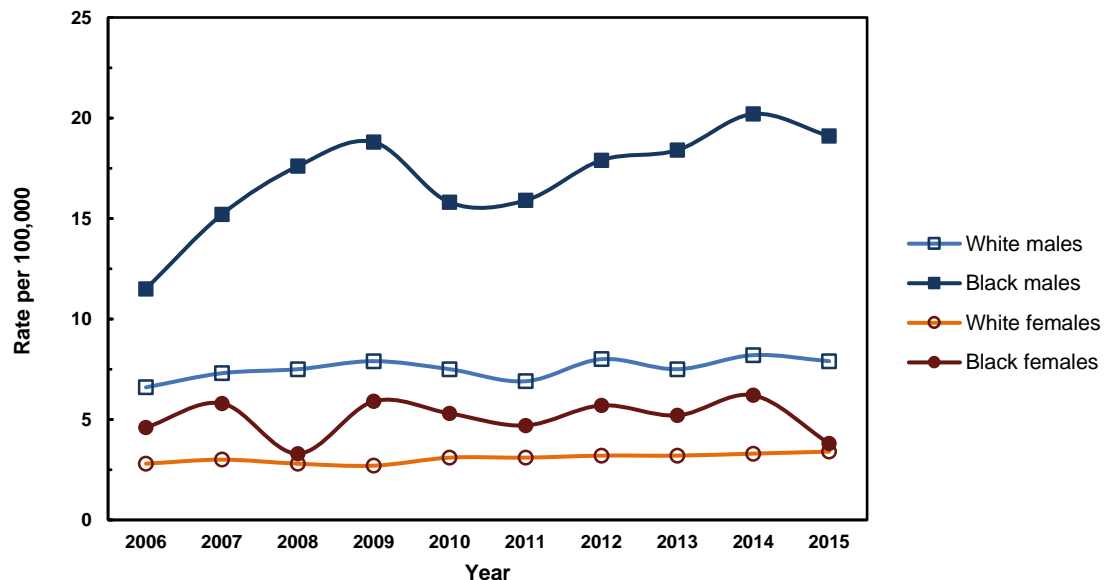
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
6-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Liver and Intrahepatic Bile Duct: MORTALITY

**TABLE
6-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	5,099	8.0	3,426	11.0	2,651	10.2	560	15.9	1,673	5.1	1,384	5.1	202	5.3
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	2	ND	1	ND	1	ND	0	ND	1	ND	1	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
15-19	1	ND	0	ND	0	ND	0	ND	1	ND	0	ND	1	ND
20-24	3	ND	1	ND	0	ND	1	ND	2	ND	1	ND	0	ND
25-29	9	ND	5	ND	3	ND	2	ND	4	ND	2	ND	2	ND
30-34	12	0.3	4	ND	2	ND	1	ND	8	ND	4	ND	2	ND
35-39	22	0.6	13	0.7	6	ND	1	ND	9	ND	6	ND	0	ND
40-44	47	1.2	25	1.2	19	1.1	3	ND	22	1.1	16	1.0	5	ND
45-49	99	2.2	70	3.2	50	2.7	9	ND	29	1.3	19	1.0	6	ND
50-54	344	7.2	272	11.5	209	10.2	34	14.9	72	2.9	49	2.3	17	6.6
55-59	668	14.3	544	23.8	387	19.2	116	57.8	124	5.2	92	4.4	26	11.1
60-64	868	21.5	681	34.9	465	26.7	177	116.0	187	9.0	141	7.7	39	20.5
65-69	679	21.4	488	32.5	372	27.4	94	90.4	191	11.4	156	10.5	23	16.4
70-74	569	24.3	345	32.3	283	29.1	41	58.6	224	17.5	184	16.1	26	25.2
75-79	568	31.6	340	43.8	282	39.6	40	82.7	228	22.3	197	21.3	16	20.1
80-84	558	37.9	336	57.4	296	54.3	24	76.1	222	25.0	198	24.3	16	26.0
85+	649	39.7	300	56.8	275	55.5	17	65.1	349	31.6	318	31.0	23	34.7

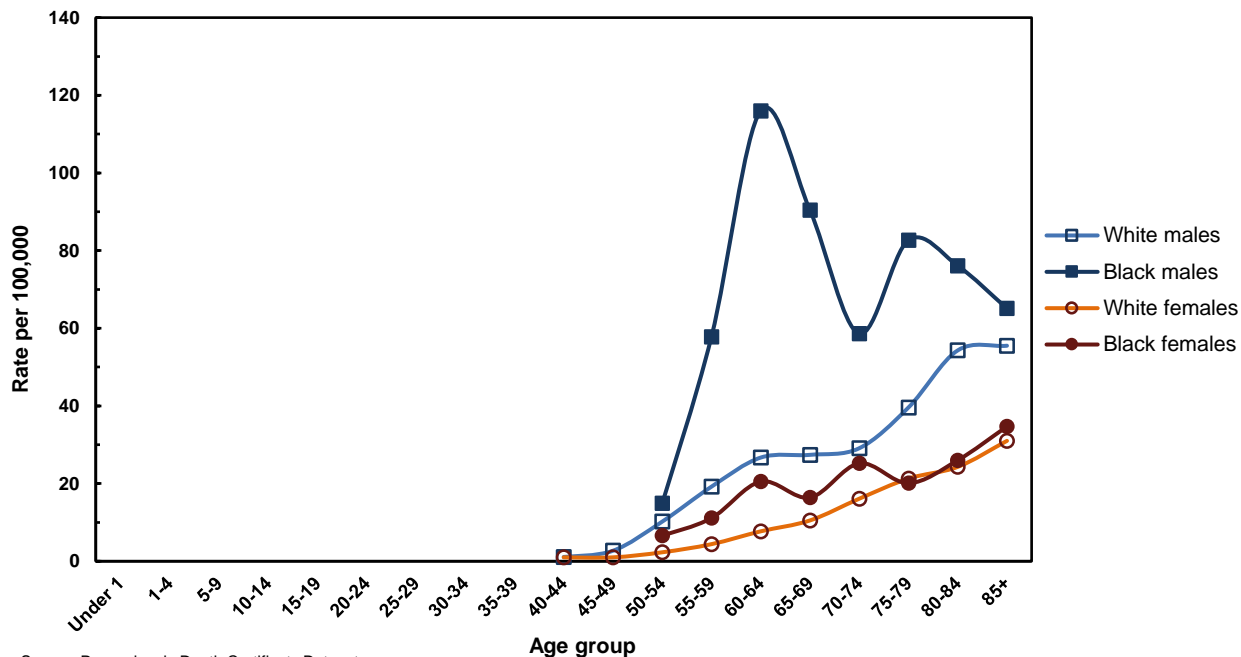
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
6-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Liver and Intrahepatic Bile Duct: INCIDENCE (Invasive)

**TABLE
6-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	6,739	4,925	12.5	(12.2-12.8)	1,813	4.0	(3.8-4.2)								
Adams	42	31	9.0	(5.8-12.2)	11	ND		Juniata	8	3	ND		5	ND	
Allegheny	729	526	13.7	(12.5-14.9)	203	4.4	(3.8-5.0)	Lackawanna	109	78	11.1	(8.6-13.6)	31	3.8	(2.5-5.1)
Armstrong	32	20	8.3	(4.7-11.9)	12	ND		Lancaster	227	166	10.4	(8.8-12.0)	61	3.5	(2.6-4.4)
Beaver	82	57	10.2	(7.6-12.8)	25	3.4	(2.1-4.7)	Lawrence	52	38	12.5	(8.5-16.5)	14	ND	
Bedford	26	15	ND		11	ND		Lebanon	51	40	9.4	(6.5-12.3)	11	ND	
Berks	192	134	10.7	(8.9-12.5)	58	4.4	(3.3-5.5)	Lehigh	194	137	13.2	(11.0-15.4)	57	4.7	(3.5-5.9)
Blair	62	45	10.8	(7.6-14.0)	17	ND		Luzerne	185	136	13.1	(10.9-15.3)	49	4.0	(2.9-5.1)
Bradford	28	24	11.3	(6.8-15.8)	4	ND		Lycoming	63	46	12.1	(8.6-15.6)	17	ND	
Bucks	296	217	11.0	(9.5-12.5)	79	3.5	(2.7-4.3)	McKean	19	14	ND		5	ND	
Butler	56	44	7.7	(5.4-10.0)	12	ND		Mercer	67	47	11.9	(8.5-15.3)	20	4.3	(2.4-6.2)
Cambria	70	51	10.2	(7.4-13.0)	19	ND		Mifflin	16	9	ND		7	ND	
Cameron	0	0	ND		0	ND		Monroe	84	64	11.7	(8.8-14.6)	20	3.6	(2.0-5.2)
Carbon	38	27	11.4	(7.1-15.7)	11	ND		Montgomery	396	287	11.9	(10.5-13.3)	109	3.7	(3.0-4.4)
Centre	38	28	7.3	(4.6-10.0)	10	ND		Montour	6	4	ND		2	ND	
Chester	194	146	9.8	(8.2-11.4)	48	2.9	(2.1-3.7)	Northampton	160	121	12.9	(10.6-15.2)	38	3.6	(2.5-4.7)
Clarion	10	9	ND		1	ND		Northumberland	54	36	10.2	(6.9-13.5)	18	ND	
Clearfield	41	32	11.4	(7.5-15.3)	9	ND		Perry	8	4	ND		4	ND	
Clinton	17	12	ND		5	ND		Philadelphia	1,362	1,041	27.9	(26.2-29.6)	321	6.9	(6.1-7.7)
Columbia	33	25	11.8	(7.2-16.4)	8	ND		Pike	30	21	9.4	(5.4-13.4)	9	ND	
Crawford	28	15	ND		13	ND		Potter	5	4	ND		1	ND	
Cumberland	81	54	7.5	(5.5-9.5)	27	3.2	(2.0-4.4)	Schuylkill	80	59	12.0	(8.9-15.1)	21	3.6	(2.1-5.1)
Dauphin	146	113	14.1	(11.5-16.7)	33	3.8	(2.5-5.1)	Snyder	18	13	ND		5	ND	
Delaware	311	225	13.8	(12.0-15.6)	86	4.4	(3.5-5.3)	Somerset	40	30	10.5	(6.7-14.3)	10	ND	
Elk	17	13	ND		4	ND		Sullivan	3	3	ND		0	ND	
Erie	103	73	8.8	(6.8-10.8)	30	3.2	(2.1-4.3)	Susquehanna	25	20	11.2	(6.3-16.1)	5	ND	
Fayette	83	55	10.6	(7.8-13.4)	28	5.4	(3.4-7.4)	Tioga	10	5	ND		5	ND	
Forest	3	2	ND		1	ND		Union	9	8	ND		1	ND	
Franklin	39	30	6.3	(4.0-8.6)	9	ND		Venango	33	23	12.3	(7.3-17.3)	10	ND	
Fulton	3	2	ND		1	ND		Warren	23	18	ND		5	ND	
Greene	13	11	ND		2	ND		Washington	117	76	10.7	(8.3-13.1)	41	5.1	(3.5-6.7)
Huntingdon	21	14	ND		7	ND		Wayne	30	24	10.8	(6.5-15.1)	6	ND	
Indiana	37	25	9.0	(5.5-12.5)	12	ND		Westmoreland	177	125	9.8	(8.1-11.5)	52	3.6	(2.6-4.6)
Jefferson	21	12	ND		9	ND		Wyoming	16	15	ND		1	ND	
								York	170	123	9.4	(7.7-11.1)	47	3.2	(2.3-4.1)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

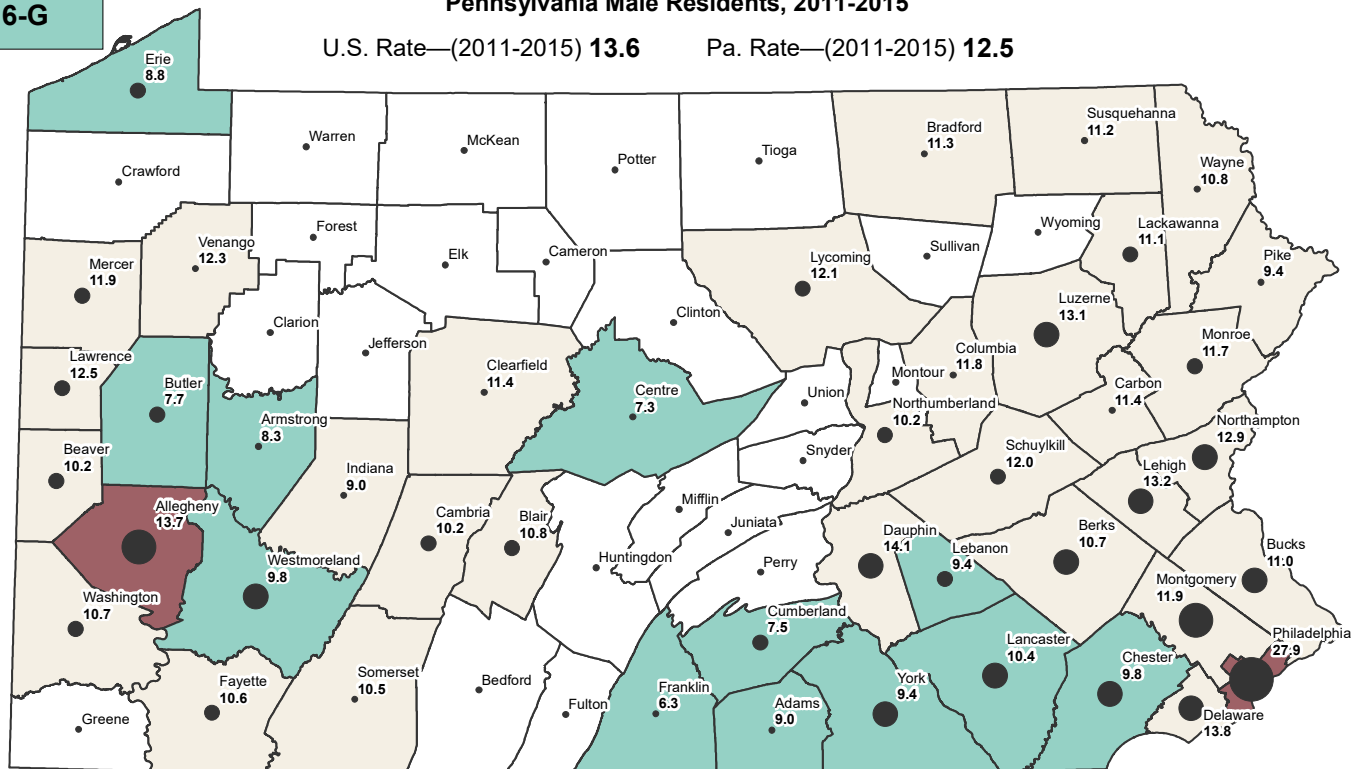
Cancer of the Liver and Intrahepatic Bile Duct: INCIDENCE (Invasive)

**MAP
6-G**

**Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates
Pennsylvania Male Residents, 2011-2015**

U.S. Rate—(2011-2015) **13.6**

Pa. Rate—(2011-2015) **12.5**



Significantly higher

Significantly lower

Not significantly
different

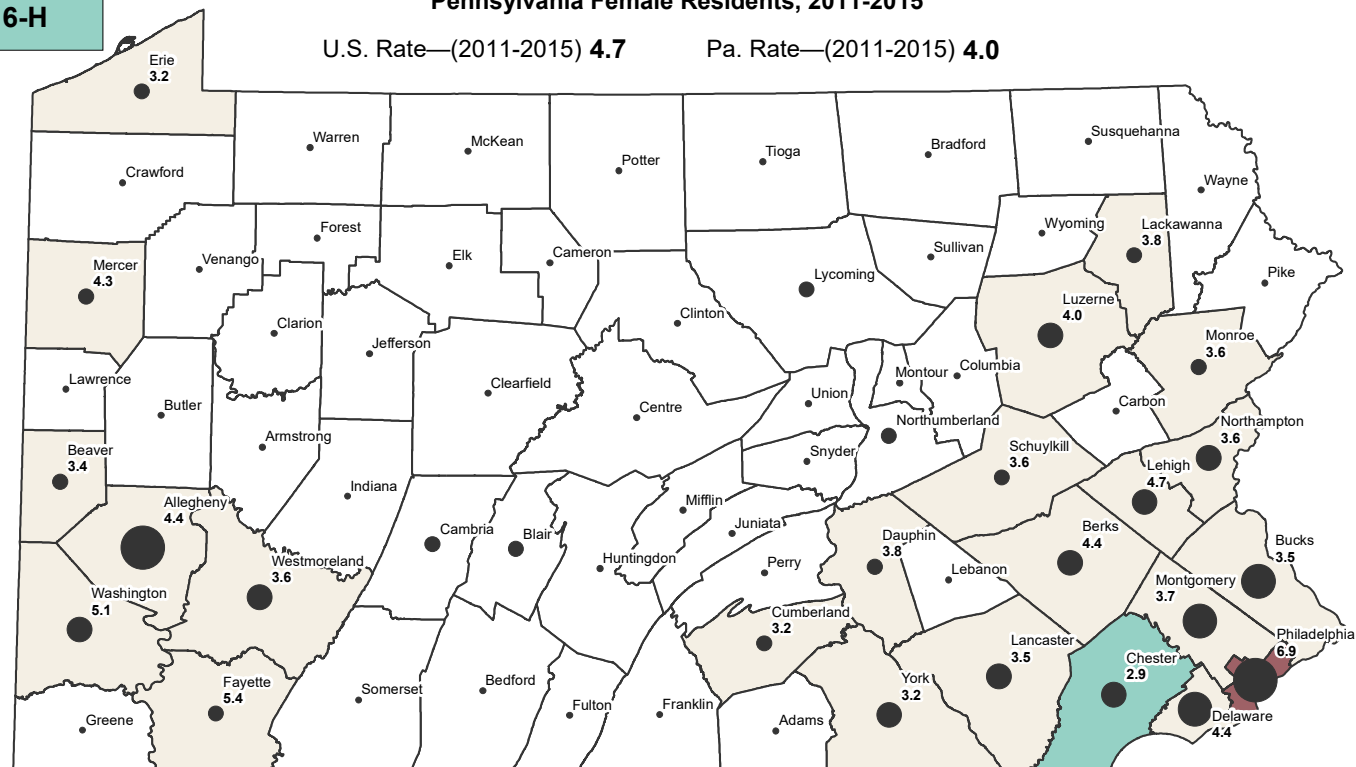
Significance not determined—
less than 20 observed cases

**MAP
6-H**

**Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates
Pennsylvania Female Residents, 2011-2015**

U.S. Rate—(2011-2015) **4.7**

Pa. Rate—(2011-2015) **4.0**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Liver and Intrahepatic Bile Duct: MORTALITY

**TABLE
6-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	5,099	3,426	8.9	(8.6-9.2)	1,673	3.5	(3.3-3.7)								
Adams	33	24	6.7	(4.0-9.4)	9	ND		Juniata	10	3	ND		7	ND	
Allegheny	556	378	9.9	(8.9-10.9)	178	3.6	(3.1-4.1)	Lackawanna	96	56	8.6	(6.3-10.9)	40	4.5	(3.1-5.9)
Armstrong	28	20	8.7	(4.9-12.5)	8	ND		Lancaster	188	132	8.4	(7.0-9.8)	56	3.1	(2.3-3.9)
Beaver	83	49	8.4	(6.0-10.8)	34	4.3	(2.9-5.7)	Lawrence	48	30	9.7	(6.2-13.2)	18	ND	
Bedford	16	8	ND		8	ND		Lebanon	55	35	8.2	(5.5-10.9)	20	3.8	(2.1-5.5)
Berks	164	106	8.7	(7.0-10.4)	58	4.0	(3.0-5.0)	Lehigh	144	98	9.4	(7.5-11.3)	46	3.8	(2.7-4.9)
Blair	55	33	8.0	(5.3-10.7)	22	4.3	(2.5-6.1)	Luzerne	107	73	7.1	(5.5-8.7)	34	2.6	(1.7-3.5)
Bradford	21	16	ND		5	ND		Lycoming	42	29	7.3	(4.6-10.0)	13	ND	
Bucks	212	142	7.3	(6.1-8.5)	70	3.1	(2.4-3.8)	McKean	12	9	ND		3	ND	
Butler	66	43	7.6	(5.3-9.9)	23	3.2	(1.9-4.5)	Mercer	49	32	8.2	(5.4-11.0)	17	ND	
Cambria	56	36	7.4	(5.0-9.8)	20	3.3	(1.9-4.7)	Mifflin	17	7	ND		10	ND	
Cameron	0	0	ND		0	ND		Monroe	70	46	8.6	(6.1-11.1)	24	4.5	(2.7-6.3)
Carbon	31	21	10.0	(5.7-14.3)	10	ND		Montgomery	286	192	8.2	(7.0-9.4)	94	3.1	(2.5-3.7)
Centre	28	20	5.3	(3.0-7.6)	8	ND		Montour	5	3	ND		2	ND	
Chester	158	115	8.2	(6.7-9.7)	43	2.5	(1.8-3.2)	Northampton	126	85	9.4	(7.4-11.4)	41	3.5	(2.4-4.6)
Clarion	15	10	ND		5	ND		Northumberland	39	23	7.1	(4.2-10.0)	16	ND	
Clearfield	31	18	ND		13	ND		Perry	14	9	ND		5	ND	
Clinton	13	10	ND		3	ND		Philadelphia	895	642	17.9	(16.5-19.3)	253	5.4	(4.7-6.1)
Columbia	28	17	ND		11	ND		Pike	25	16	ND		9	ND	
Crawford	30	14	ND		16	ND		Potter	6	4	ND		2	ND	
Cumberland	61	38	5.3	(3.6-7.0)	23	2.7	(1.6-3.8)	Schuylkill	70	47	10.0	(7.1-12.9)	23	3.4	(2.0-4.8)
Dauphin	98	68	8.6	(6.6-10.6)	30	3.6	(2.3-4.9)	Snyder	8	7	ND		1	ND	
Delaware	205	128	8.2	(6.8-9.6)	77	3.8	(3.0-4.6)	Somerset	25	18	ND		7	ND	
Elk	16	14	ND		2	ND		Sullivan	3	1	ND		2	ND	
Erie	97	63	7.9	(5.9-9.9)	34	3.3	(2.2-4.4)	Susquehanna	18	13	ND		5	ND	
Fayette	65	42	8.5	(5.9-11.1)	23	3.8	(2.2-5.4)	Tioga	11	4	ND		7	ND	
Forest	3	2	ND		1	ND		Union	8	6	ND		2	ND	
Franklin	33	24	5.2	(3.1-7.3)	9	ND		Venango	26	16	ND		10	ND	
Fulton	4	4	ND		0	ND		Warren	18	13	ND		5	ND	
Greene	11	10	ND		1	ND		Washington	80	52	7.7	(5.6-9.8)	28	3.3	(2.1-4.5)
Huntingdon	15	11	ND		4	ND		Wayne	25	20	9.2	(5.2-13.2)	5	ND	
Indiana	36	24	8.6	(5.2-12.0)	12	ND		Westmoreland	155	97	7.6	(6.1-9.1)	58	3.7	(2.7-4.7)
Jefferson	22	14	ND		8	ND		Wyoming	16	11	ND		5	ND	
								York	112	75	5.8	(4.5-7.1)	37	2.5	(1.7-3.3)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

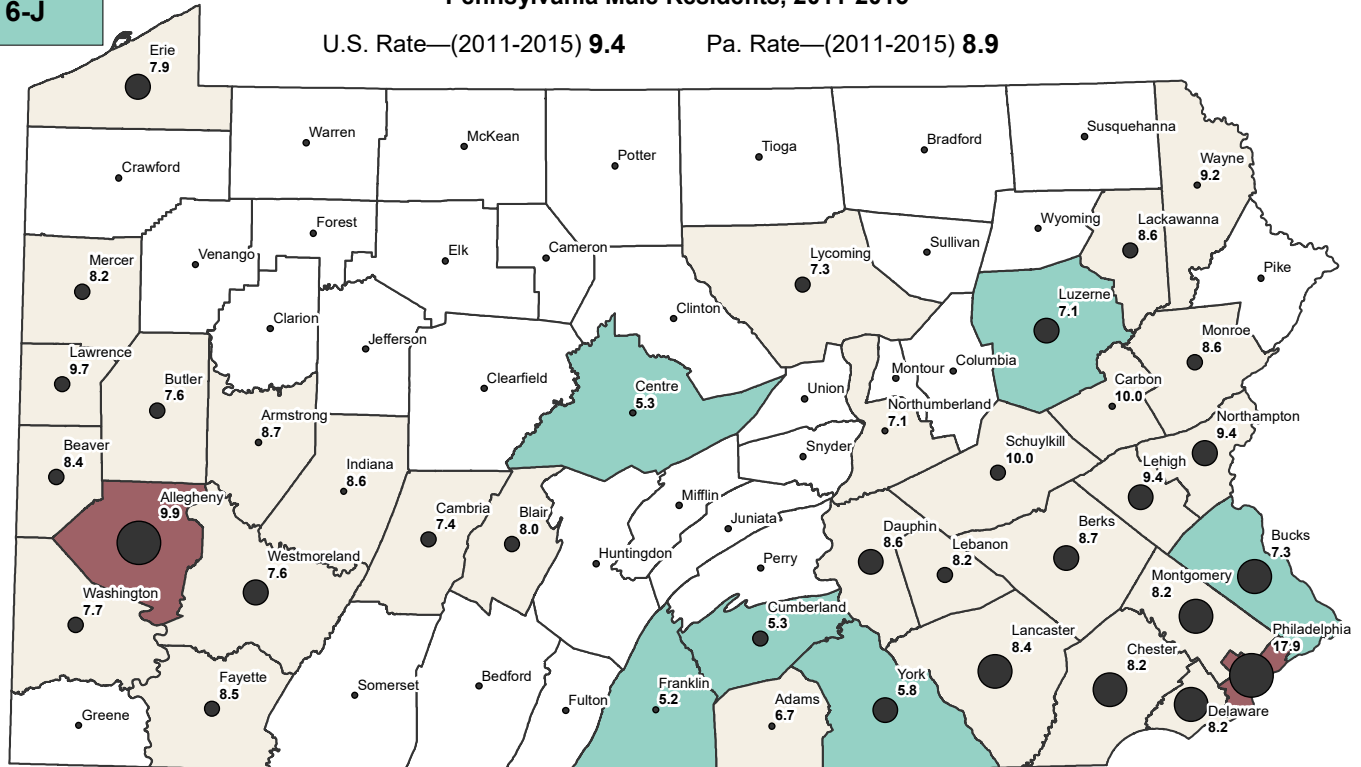
Cancer of the Liver and Intrahepatic Bile Duct: MORTALITY

**MAP
6-J**

**Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates
Pennsylvania Male Residents, 2011-2015**

U.S. Rate—(2011-2015) **9.4**

Pa. Rate—(2011-2015) **8.9**



Significantly higher

Significantly lower

Not significantly different

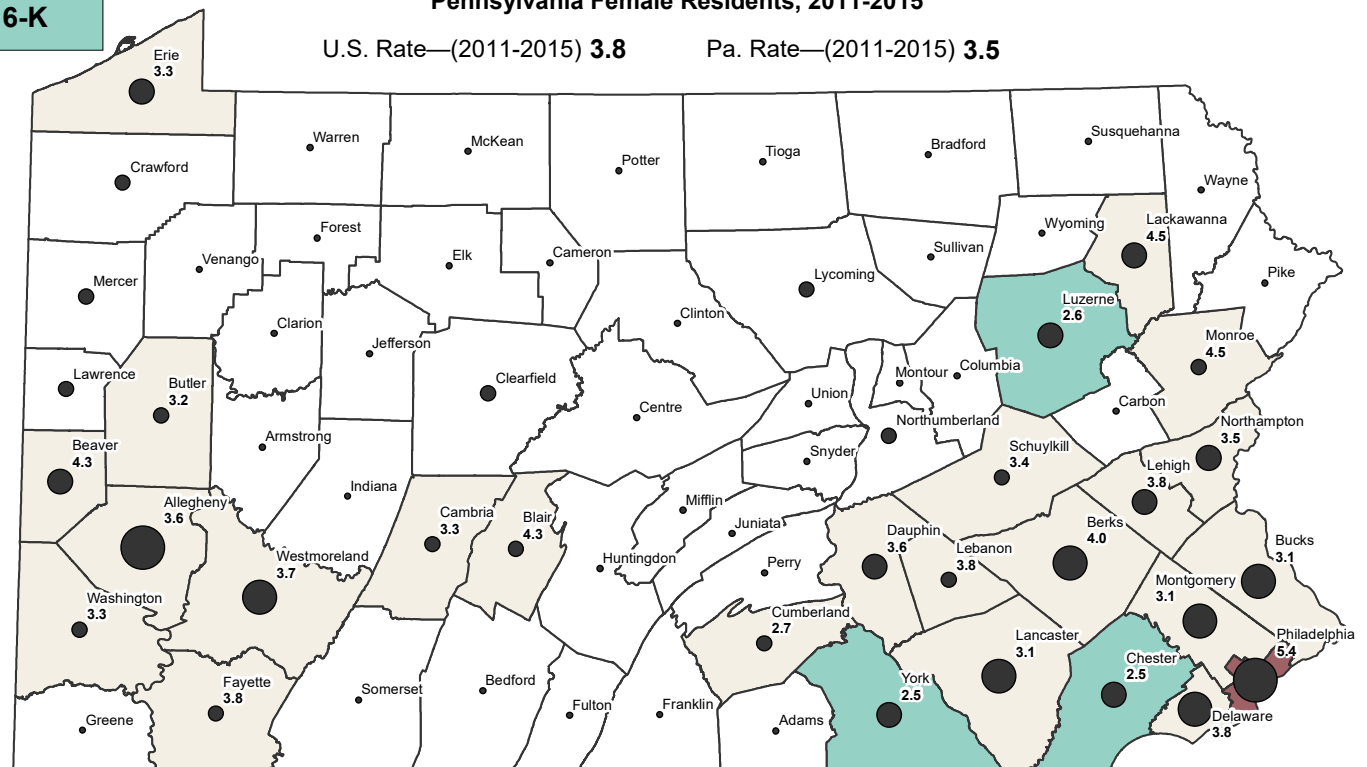
Significance not determined—less than 20 observed cases

**MAP
6-K**

**Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates
Pennsylvania Female Residents, 2011-2015**

U.S. Rate—(2011-2015) **3.8**

Pa. Rate—(2011-2015) **3.5**



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Pancreas

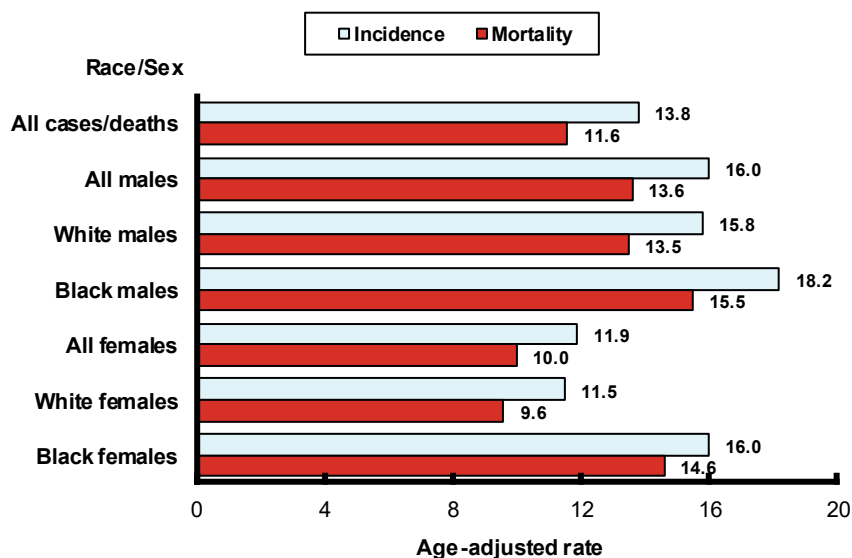
Data Highlights

The highest 2011-2015 average annual age-adjusted incidence rate among the four sex/race groups for invasive pancreatic cancer occurred in black males, with a rate of 18.2 per 100,000. Black females had the second highest rate (16.0). The rate of 15.8 for white males was about 13 percent lower than the rate for black males. The rate for white females (11.5) was about 28 percent lower than the rate for black females. A total of 2,530 cases of invasive pancreatic cancer were diagnosed among residents of Pennsylvania in 2015 — the highest annual number of cases recorded since statewide reporting began in 1985. Annual age-adjusted incidence rates by sex and race between 2006 and 2015 showed increasing trends among white males and white females but no discernible trends among black males and black females.

There is limited information about the etiology of this disease, although cigarette smoking is associated with increased risk. Epidemiological studies have consistently shown an excess risk for smokers relative to nonsmokers. This risk increases with the amount of tobacco use. According to the American Cancer Society, the risk of getting pancreatic cancer is two times as likely among smokers than those who never smoked. The five-year net survival rate of invasive pancreatic cancer in Pennsylvania is only 10.9 percent because most cases are diagnosed at advanced stages. In 2015, only 9.3 percent of pancreatic cancers were diagnosed in the early (in situ and localized) stages of the disease among Pennsylvania residents, while 8.1 percent of such cancers were unstaged and 82.7 percent were diagnosed in the late stage (regional and distant).

While pancreatic cancer represented 3.2 percent of all new invasive cancers in 2015, it accounted for about 7.3 percent of the cancer deaths that year. In fact, the 2011-2015 average annual age-adjusted death rate (11.6 per 100,000) for this cancer was almost as high as the average annual incidence rate (13.8). The 2015 annual number of deaths was similar to the number of cases diagnosed for each sex/race group. For both white males and white females, over the 10-year period of 2006 to 2015, the age-adjusted death rates were highest in 2006. The rate for white males was lowest in 2009 and 2013, and the rate for white females was lowest in 2013. The death rates among black males and black females showed inconclusive trends, as reflected in the annual deviations (Figure 7-D).

FIGURE 7
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, cigarette/cigar/pipe smoking, smokeless tobacco, obesity, exposure to certain chemicals used in the dry cleaning and metal working industries, type 2 diabetes, chronic pancreatitis, cirrhosis of the liver, and stomach infections (*Helicobacter pylori*) are suggestive of pancreatic cancer risk.

Early Detection

No screening tests have proven to be effective or are currently being evaluated.

Cancer of the Pancreas: INCIDENCE (Invasive)

**TABLE
7-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,530	14.8 (14.2-15.4)	1,340	17.6 (16.7-18.5)	1,214	17.7 (16.7-18.7)	104	18.9 (15.3-22.5)	1,189	12.5 (11.8-13.2)	1,021	12.1 (11.4-12.8)	143	17.5 (14.6-20.4)
2014	2,378	14.0 (13.4-14.6)	1,211	16.2 (15.3-17.1)	1,082	16.1 (15.1-17.1)	107	18.7 (15.2-22.2)	1,167	12.2 (11.5-12.9)	1,042	12.1 (11.4-12.8)	108	14.1 (11.4-16.8)
2013	2,223	13.4 (12.8-14.0)	1,151	15.7 (14.8-16.6)	1,027	15.5 (14.6-16.4)	105	19.9 (16.1-23.7)	1,072	11.4 (10.7-12.1)	925	11.0 (10.3-11.7)	128	17.0 (14.1-19.9)
2012	2,164	13.1 (12.5-13.7)	1,102	15.3 (14.4-16.2)	944	14.4 (13.5-15.3)	89	16.5 (13.1-19.9)	1,062	11.2 (10.5-11.9)	862	10.2 (9.5-10.9)	114	15.4 (12.6-18.2)
2011	2,195	13.5 (12.9-14.1)	1,075	15.2 (14.3-16.1)	977	15.3 (14.3-16.3)	88	16.9 (13.4-20.4)	1,120	12.1 (11.4-12.8)	988	11.8 (11.1-12.5)	118	15.8 (12.9-18.7)
2010	2,125	13.2 (12.6-13.8)	1,042	14.9 (14.0-15.8)	934	14.9 (13.9-15.9)	94	18.9 (15.1-22.7)	1,083	11.8 (11.1-12.5)	923	11.0 (10.3-11.7)	145	21.0 (17.6-24.4)
2009	1,948	12.5 (11.9-13.1)	949	14.3 (13.4-15.2)	846	13.9 (13.0-14.8)	86	19.0 (15.0-23.0)	999	11.1 (10.4-11.8)	885	10.8 (10.1-11.5)	100	14.6 (11.7-17.5)
2008	1,973	12.9 (12.3-13.5)	968	14.9 (14.0-15.8)	871	14.7 (13.7-15.7)	82	18.2 (14.3-22.1)	1,005	11.3 (10.6-12.0)	877	10.9 (10.2-11.6)	110	16.5 (13.4-19.6)
2007	1,916	12.8 (12.2-13.4)	918	14.5 (13.6-15.4)	838	14.5 (13.5-15.5)	68	15.4 (11.7-19.1)	998	11.3 (10.6-12.0)	879	10.9 (10.2-11.6)	111	17.0 (13.8-20.2)
2006	1,909	12.8 (12.2-13.4)	939	15.1 (14.1-16.1)	858	15.1 (14.1-16.1)	65	15.4 (11.7-19.1)	969	11.2 (10.5-11.9)	852	10.8 (10.1-11.5)	100	15.4 (12.4-18.4)

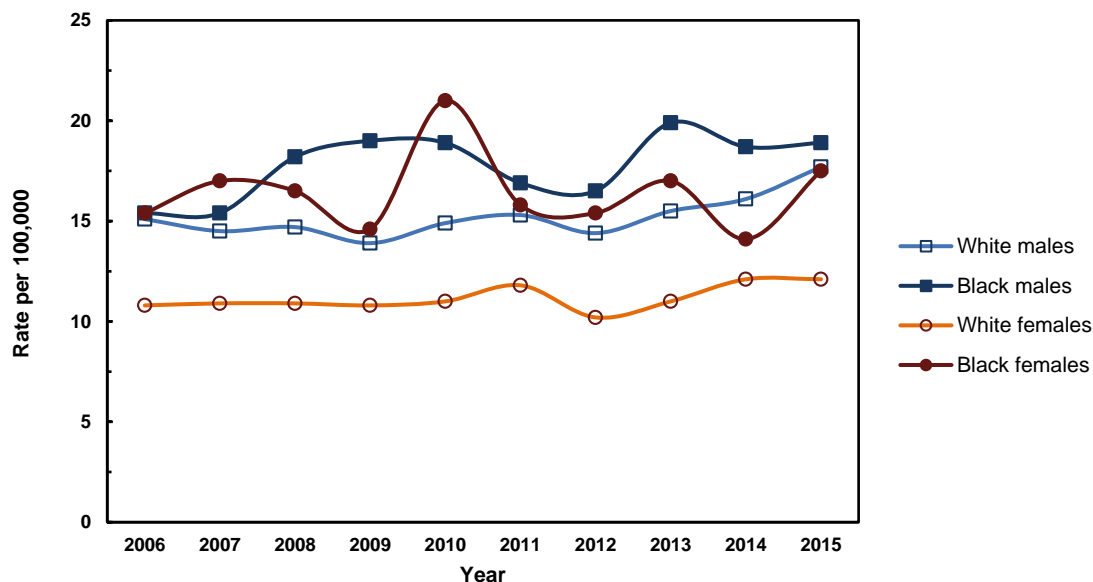
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
7-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Pancreas: INCIDENCE (Invasive)

**TABLE
7-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

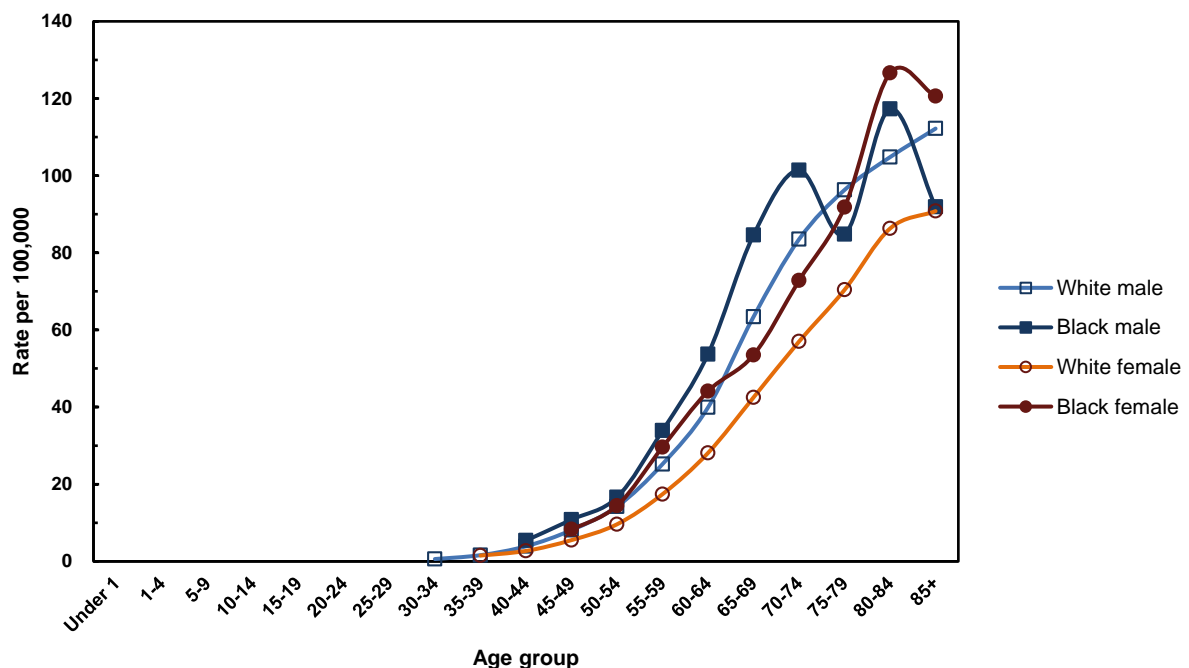
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	18.0	18.8	20.1	14.0	17.2	17.9	16.0
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	0.3	ND	ND	ND	ND	ND	ND
25-29	0.5	0.5	ND	ND	0.6	ND	ND
30-34	0.5	0.6	0.6	ND	ND	ND	ND
35-39	1.7	1.7	1.6	ND	1.6	1.5	ND
40-44	3.3	4.0	3.9	5.4	2.7	2.7	ND
45-49	6.9	8.1	8.1	10.8	5.7	5.5	8.3
50-54	12.1	14.3	14.2	16.6	10.1	9.6	14.4
55-59	22.1	26.0	25.2	33.9	18.3	17.4	29.6
60-64	34.9	40.7	39.9	53.7	29.4	28.1	44.1
65-69	53.3	64.6	63.4	84.6	43.1	42.5	53.5
70-74	70.0	84.3	83.5	101.4	58.1	57.0	72.8
75-79	82.7	96.4	96.3	84.8	72.2	70.4	91.8
80-84	96.7	105.7	104.8	117.3	90.8	86.3	126.6
85+	102.2	113.9	112.2	91.9	96.5	90.8	120.6

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
7-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Pancreas: INCIDENCE (Invasive)

**TABLE
7-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	11,490	5,879	5,244	493	5,610	4,838	611
Under 1	0	0	0	0	0	0	0
1-4	0	0	0	0	0	0	0
5-9	0	0	0	0	0	0	0
10-14	1	0	0	0	1	1	0
15-19	0	0	0	0	0	0	0
20-24	11	5	5	0	6	3	3
25-29	22	10	9	1	12	8	3
30-34	19	12	10	0	7	7	0
35-39	60	31	24	6	29	22	5
40-44	134	80	66	12	54	45	8
45-49	303	176	150	25	127	103	21
50-54	584	338	292	38	246	201	37
55-59	1,031	594	508	68	437	362	69
60-64	1,407	794	696	82	613	516	84
65-69	1,693	969	861	88	723	634	75
70-74	1,643	900	811	71	743	652	75
75-79	1,488	749	685	41	739	650	73
80-84	1,426	619	571	37	807	702	78
85+	1,668	602	556	24	1,066	932	80

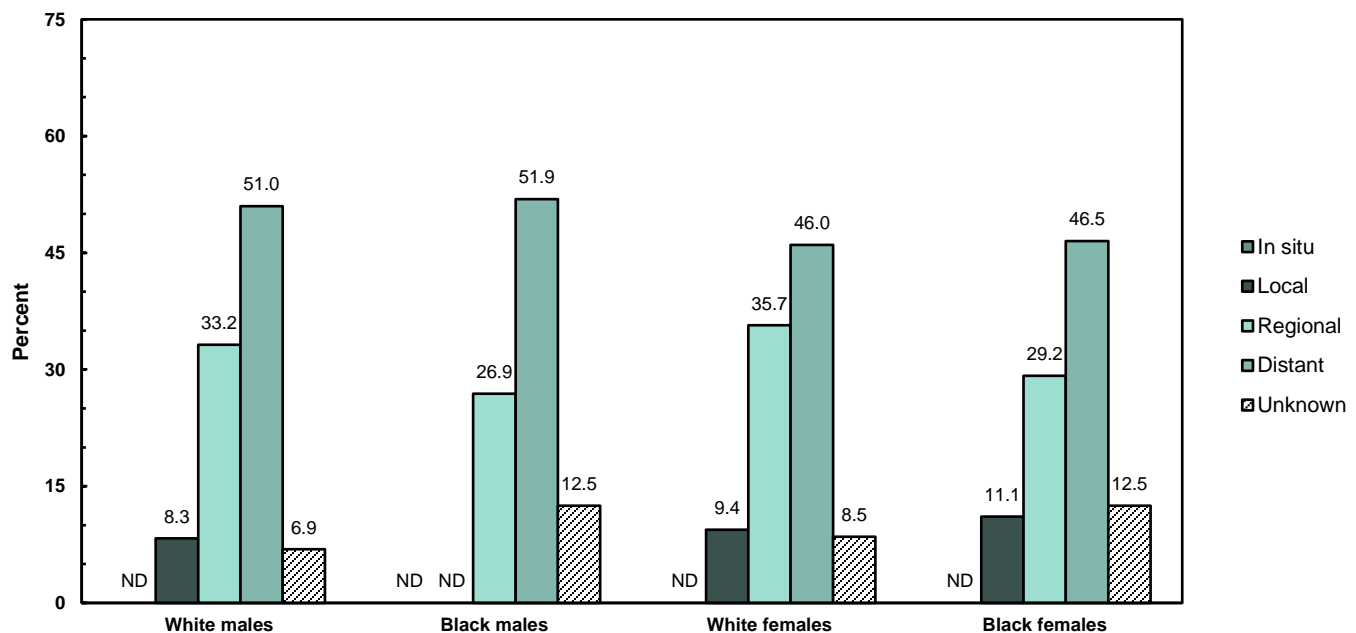
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
7-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 2,157 - 85.3%

Cancer of the Pancreas: MORTALITY

**TABLE
7-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,082	12.1 (11.6-12.6)	1,064	14.0 (13.2-14.8)	945	13.8 (12.9-14.7)	88	16.4 (13.0-19.8)	1,018	10.4 (9.8-11.0)	867	9.9 (9.2-10.6)	119	14.4 (11.8-17.0)
2014	2,036	11.9 (11.4-12.4)	1,058	14.3 (13.4-15.2)	939	14.1 (13.2-15.0)	96	17.3 (13.8-20.8)	978	9.9 (9.3-10.5)	851	9.6 (9.0-10.2)	103	13.5 (10.9-16.1)
2013	1,863	11.0 (10.5-11.5)	946	13.0 (12.2-13.8)	851	12.8 (11.9-13.7)	74	14.0 (10.8-17.2)	917	9.5 (8.9-10.1)	795	9.1 (8.5-9.7)	107	14.5 (11.8-17.2)
2012	1,917	11.5 (11.0-12.0)	949	13.3 (12.5-14.1)	850	13.1 (12.2-14.0)	80	15.4 (12.0-18.8)	968	10.0 (9.4-10.6)	841	9.5 (8.9-10.1)	107	14.4 (11.7-17.1)
2011	1,925	11.7 (11.2-12.2)	942	13.5 (12.6-14.4)	861	13.5 (12.6-14.4)	72	14.6 (11.2-18.0)	983	10.3 (9.7-10.9)	853	9.9 (9.2-10.6)	116	16.0 (13.1-18.9)
2010	1,882	11.6 (11.1-12.1)	927	13.5 (12.6-14.4)	839	13.5 (12.6-14.4)	79	16.3 (12.7-19.9)	955	10.0 (9.4-10.6)	859	9.9 (9.2-10.6)	83	12.0 (9.4-14.6)
2009	1,773	11.3 (10.8-11.8)	860	13.0 (12.1-13.9)	773	12.8 (11.9-13.7)	78	17.6 (13.7-21.5)	913	10.0 (9.4-10.6)	801	9.6 (8.9-10.3)	102	15.2 (12.3-18.1)
2008	1,768	11.5 (11.0-12.0)	862	13.4 (12.5-14.3)	788	13.4 (12.5-14.3)	67	15.3 (11.6-19.0)	906	9.9 (9.3-10.5)	816	9.8 (9.1-10.5)	87	12.9 (10.2-15.6)
2007	1,798	11.9 (11.3-12.5)	878	14.1 (13.2-15.0)	810	14.2 (13.2-15.2)	63	14.0 (10.5-17.5)	920	10.2 (9.5-10.9)	825	10.1 (9.4-10.8)	92	14.2 (11.3-17.1)
2006	1,822	12.2 (11.6-12.8)	910	14.7 (13.7-15.7)	826	14.7 (13.7-15.7)	76	17.4 (13.5-21.3)	912	10.3 (9.6-11.0)	826	10.2 (9.5-10.9)	81	12.5 (9.8-15.2)

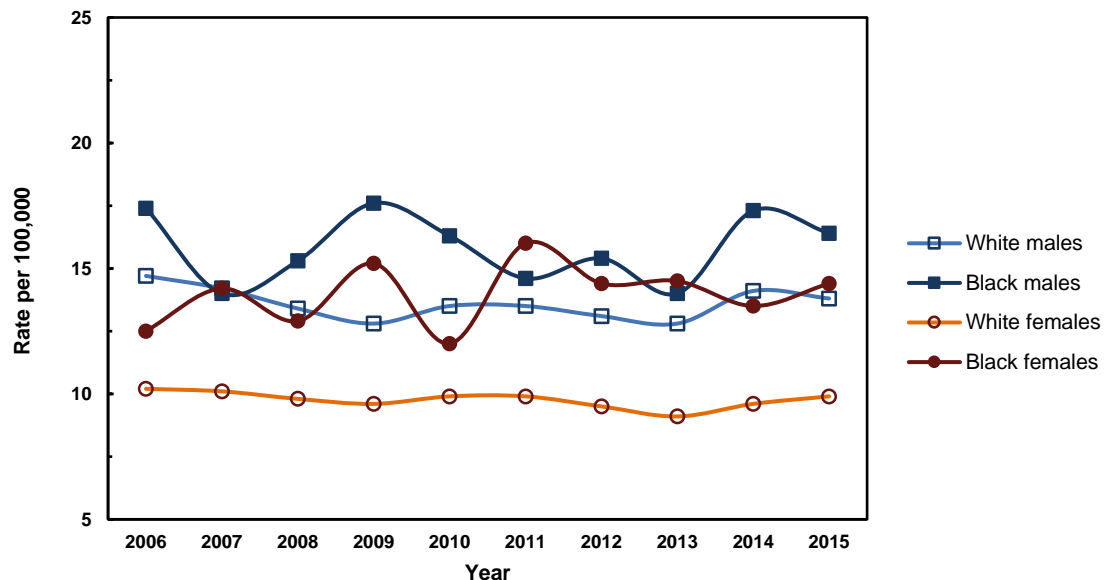
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
7-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Pancreas: MORTALITY

**TABLE
7-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	9,823	15.4	4,959	15.9	4,446	17.1	410	11.6	4,864	14.9	4,207	15.5	552	14.4
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	3	ND	3	ND	2	ND	1	ND	0	ND	0	ND	0	ND
25-29	6	ND	4	ND	3	ND	1	ND	2	ND	0	ND	1	ND
30-34	9	ND	6	ND	5	ND	0	ND	3	ND	2	ND	0	ND
35-39	23	0.6	12	0.7	10	0.7	1	ND	11	0.6	10	0.7	1	ND
40-44	70	1.7	48	2.4	36	2.1	10	4.5	22	1.1	18	1.1	2	ND
45-49	201	4.6	126	5.8	109	5.9	15	6.5	75	3.4	63	3.4	10	4.0
50-54	407	8.5	256	10.8	215	10.5	31	13.6	151	6.2	119	5.7	30	11.6
55-59	756	16.2	431	18.9	372	18.5	51	25.4	325	13.6	274	13.2	45	19.3
60-64	1,114	27.6	651	33.4	570	32.7	66	43.2	463	22.2	385	21.0	68	35.7
65-69	1,315	41.4	753	50.2	667	49.1	71	68.3	562	33.5	477	32.0	73	52.1
70-74	1,436	61.2	783	73.3	702	72.3	67	95.7	653	51.1	557	48.7	79	76.7
75-79	1,313	72.9	661	85.1	613	86.2	38	78.6	652	63.7	563	61.0	75	94.3
80-84	1,385	93.9	586	100.0	541	99.3	31	98.3	799	89.9	704	86.5	73	118.5
85+	1,785	109.3	639	120.9	601	121.2	27	103.3	1,146	103.8	1,035	100.8	95	143.3

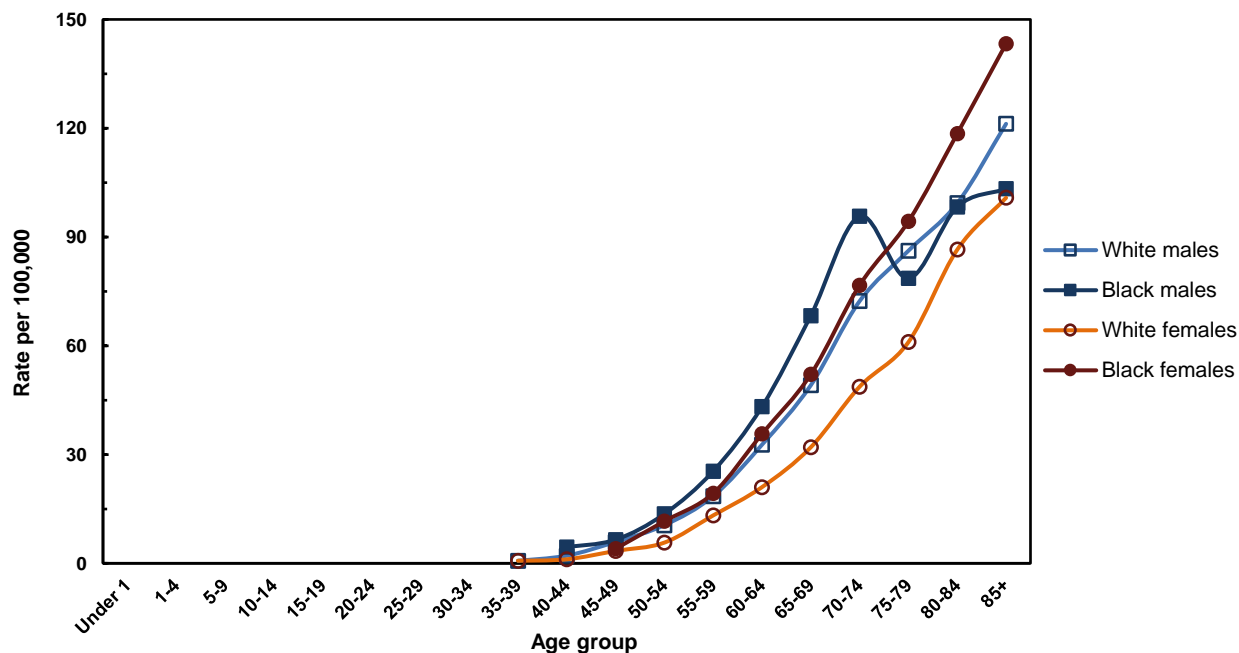
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
7-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Pancreas: INCIDENCE (Invasive)

**TABLE
7-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	11,490	5,879	16.0	(15.6-16.4)	5,610	11.9	(11.6-12.2)								
Adams	108	56	16.8	(12.4-21.2)	52	13.9	(10.1-17.7)	Juniata	26	13	ND		13	ND	
Allegheny	1,240	571	16.1	(14.8-17.4)	669	13.4	(12.4-14.4)	Lackawanna	196	99	15.1	(12.1-18.1)	97	10.8	(8.7-12.9)
Armstrong	56	23	9.8	(5.8-13.8)	33	10.8	(7.1-14.5)	Lancaster	433	223	14.4	(12.5-16.3)	210	11.2	(9.7-12.7)
Beaver	209	107	19.3	(15.6-23.0)	102	13.7	(11.0-16.4)	Lawrence	115	56	18.5	(13.7-23.3)	59	15.6	(11.6-19.6)
Bedford	59	35	20.7	(13.8-27.6)	24	12.2	(7.3-17.1)	Lebanon	122	61	14.5	(10.9-18.1)	61	10.9	(8.2-13.6)
Berks	319	166	14.3	(12.1-16.5)	153	10.9	(9.2-12.6)	Lehigh	293	148	14.9	(12.5-17.3)	145	11.8	(9.9-13.7)
Blair	116	65	16.2	(12.3-20.1)	51	9.5	(6.9-12.1)	Luzerne	327	170	17.0	(14.4-19.6)	157	11.8	(10.0-13.6)
Bradford	62	33	15.9	(10.5-21.3)	29	12.0	(7.6-16.4)	Lycoming	99	48	13.5	(9.7-17.3)	51	11.1	(8.1-14.1)
Bucks	577	292	15.7	(13.9-17.5)	285	12.1	(10.7-13.5)	McKean	34	19	ND		15	ND	
Butler	144	72	13.4	(10.3-16.5)	72	10.7	(8.2-13.2)	Mercer	106	52	13.2	(9.6-16.8)	54	11.6	(8.5-14.7)
Cambria	165	95	19.3	(15.4-23.2)	70	11.1	(8.5-13.7)	Mifflin	43	28	16.8	(10.6-23.0)	15	ND	
Cameron	3	1	ND		2	ND		Monroe	167	87	19.1	(15.1-23.1)	80	14.8	(11.6-18.0)
Carbon	70	34	15.6	(10.4-20.8)	36	14.3	(9.6-19.0)	Montgomery	745	379	16.6	(14.9-18.3)	366	12.3	(11.0-13.6)
Centre	92	51	14.3	(10.4-18.2)	41	9.3	(6.5-12.1)	Montour	17	9	ND		8	ND	
Chester	375	221	16.7	(14.5-18.9)	154	9.5	(8.0-11.0)	Northampton	271	142	15.9	(13.3-18.5)	129	11.4	(9.4-13.4)
Clarion	50	24	20.3	(12.2-28.4)	26	17.5	(10.8-24.2)	Northumberland	89	49	15.7	(11.3-20.1)	40	10.4	(7.2-13.6)
Clearfield	77	38	14.7	(10.0-19.4)	39	11.7	(8.0-15.4)	Perry	34	17	ND		17	ND	
Clinton	41	23	18.5	(10.9-26.1)	18	ND		Philadelphia	1,199	568	17.3	(15.9-18.7)	631	13.5	(12.4-14.6)
Columbia	67	38	20.7	(14.1-27.3)	29	11.6	(7.4-15.8)	Pike	41	24	11.0	(6.6-15.4)	17	ND	
Crawford	89	52	17.8	(13.0-22.6)	37	11.4	(7.7-15.1)	Potter	11	7	ND		4	ND	
Cumberland	208	110	15.6	(12.7-18.5)	98	10.8	(8.7-12.9)	Schuylkill	178	101	21.0	(16.9-25.1)	77	13.0	(10.1-15.9)
Dauphin	235	106	14.6	(11.8-17.4)	129	14.0	(11.6-16.4)	Snyder	19	9	ND		10	ND	
Delaware	491	240	16.3	(14.2-18.4)	250	12.2	(10.7-13.7)	Somerset	85	43	15.5	(10.9-20.1)	42	12.7	(8.9-16.5)
Elk	42	24	21.7	(13.0-30.4)	18	ND		Sullivan	8	4	ND		4	ND	
Erie	230	113	14.4	(11.7-17.1)	117	12.1	(9.9-14.3)	Susquehanna	45	27	18.7	(11.6-25.8)	18	ND	
Fayette	127	67	15.0	(11.4-18.6)	60	10.4	(7.8-13.0)	Tioga	51	28	18.8	(11.8-25.8)	23	14.1	(8.3-19.9)
Forest	9	7	ND		2	ND		Union	28	17	ND		11	ND	
Franklin	135	84	18.1	(14.2-22.0)	51	8.5	(6.2-10.8)	Venango	54	34	18.1	(12.0-24.2)	20	9.0	(5.1-12.9)
Fulton	24	8	ND		16	ND		Warren	30	16	ND		14	ND	
Greene	36	26	23.5	(14.5-32.5)	10	ND		Washington	179	97	14.8	(11.9-17.7)	82	10.2	(8.0-12.4)
Huntingdon	42	20	14.3	(8.0-20.6)	22	14.0	(8.1-19.9)	Wayne	52	24	12.9	(7.7-18.1)	28	14.0	(8.8-19.2)
Indiana	48	30	11.4	(7.3-15.5)	18	ND		Westmoreland	402	209	16.8	(14.5-19.1)	193	12.4	(10.7-14.1)
Jefferson	48	26	17.2	(10.6-23.8)	22	11.2	(6.5-15.9)	Wyoming	27	12	ND		15	ND	
								York	370	201	16.4	(14.1-18.7)	169	11.1	(9.4-12.8)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

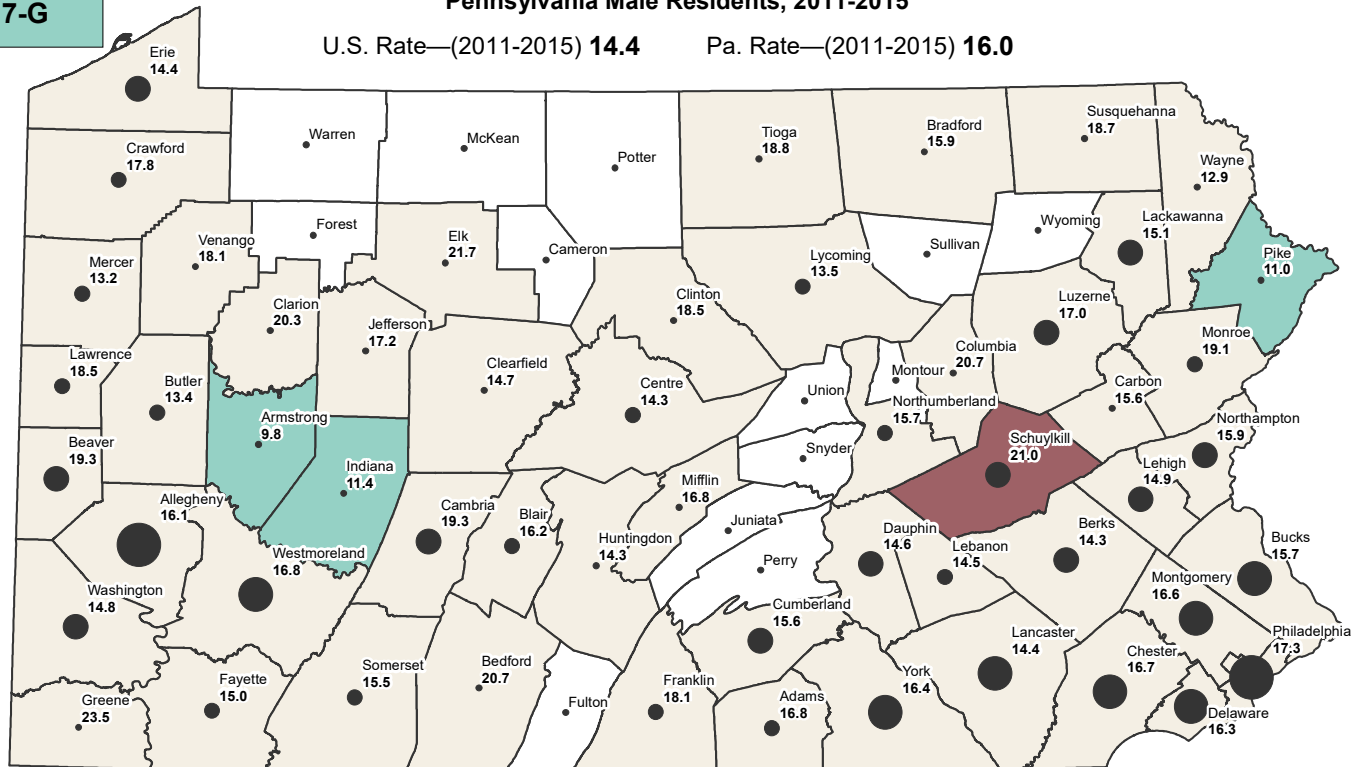
Cancer of the Pancreas: INCIDENCE (Invasive)

**MAP
7-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **14.4**

Pa. Rate—(2011-2015) **16.0**



Significantly higher

Significantly lower

Not significantly different

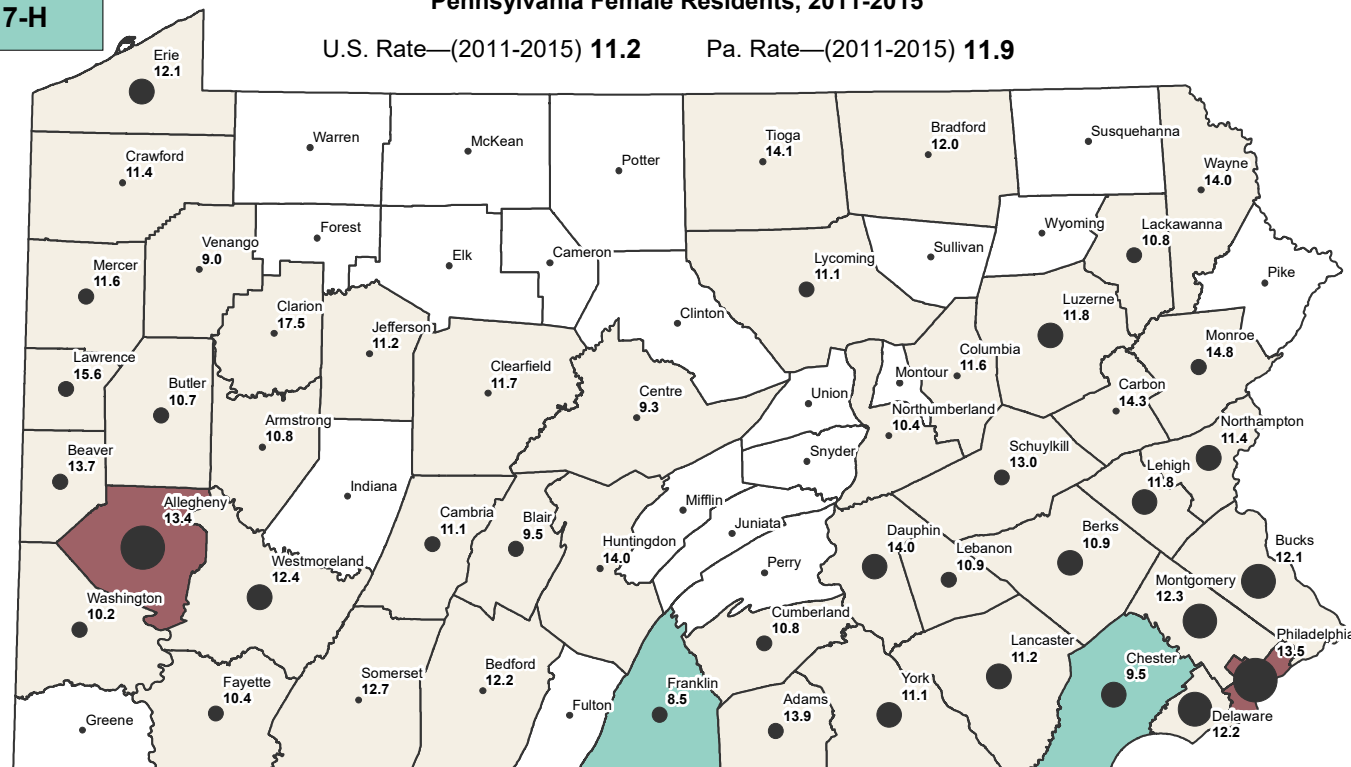
Significance not determined—less than 20 observed cases

**MAP
7-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **11.2**

Pa. Rate—(2011-2015) **11.9**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Pancreas: MORTALITY

**TABLE
7-1**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	9,823	4,959	13.6	(13.2-14.0)	4,864	10.0	(9.7-10.3)								
Adams	100	51	15.6	(11.3-19.9)	49	13.0	(9.4-16.6)	Juniata	20	8	ND		12	ND	
Allegheny	1,067	502	14.2	(13.0-15.4)	565	10.9	(10.0-11.8)	Lackawanna	168	80	12.0	(9.4-14.6)	88	9.2	(7.3-11.1)
Armstrong	47	22	9.6	(5.6-13.6)	25	8.1	(4.9-11.3)	Lancaster	355	169	11.1	(9.4-12.8)	186	9.7	(8.3-11.1)
Beaver	175	99	18.1	(14.5-21.7)	76	9.7	(7.5-11.9)	Lawrence	98	47	15.9	(11.4-20.4)	51	12.1	(8.8-15.4)
Bedford	40	23	13.7	(8.1-19.3)	17	ND		Lebanon	111	54	12.9	(9.5-16.3)	57	9.7	(7.2-12.2)
Berks	264	140	12.4	(10.3-14.5)	124	8.6	(7.1-10.1)	Lehigh	245	122	12.5	(10.3-14.7)	123	9.7	(8.0-11.4)
Blair	106	59	14.4	(10.7-18.1)	47	8.8	(6.3-11.3)	Luzerne	289	156	15.6	(13.2-18.0)	133	10.0	(8.3-11.7)
Bradford	57	28	13.1	(8.2-18.0)	29	11.7	(7.4-16.0)	Lycoming	90	45	12.3	(8.7-15.9)	45	9.7	(6.9-12.5)
Bucks	484	236	12.8	(11.2-14.4)	248	10.5	(9.2-11.8)	McKean	32	16	ND		16	ND	
Butler	109	50	9.4	(6.8-12.0)	59	8.3	(6.2-10.4)	Mercer	97	45	11.7	(8.3-15.1)	52	10.5	(7.6-13.4)
Cambria	138	75	14.9	(11.5-18.3)	63	9.8	(7.4-12.2)	Mifflin	33	20	12.4	(7.0-17.8)	13	ND	
Cameron	2	1	ND		1	ND		Monroe	130	66	14.3	(10.8-17.8)	64	11.8	(8.9-14.7)
Carbon	65	33	15.7	(10.3-21.1)	32	13.2	(8.6-17.8)	Montgomery	634	307	13.7	(12.2-15.2)	327	10.5	(9.4-11.6)
Centre	85	49	14.2	(10.2-18.2)	36	8.3	(5.6-11.0)	Montour	16	11	ND		5	ND	
Chester	335	179	13.8	(11.8-15.8)	156	9.3	(7.8-10.8)	Northampton	226	109	12.2	(9.9-14.5)	117	9.4	(7.7-11.1)
Clarion	43	20	16.5	(9.3-23.7)	23	15.6	(9.2-22.0)	Northumberland	70	42	13.2	(9.2-17.2)	28	6.6	(4.2-9.0)
Clearfield	61	35	13.9	(9.3-18.5)	26	7.8	(4.8-10.8)	Perry	26	14	ND		12	ND	
Clinton	37	17	ND		20	14.3	(8.0-20.6)	Philadelphia	1,041	482	14.9	(13.6-16.2)	559	11.7	(10.7-12.7)
Columbia	45	25	13.0	(7.9-18.1)	20	7.3	(4.1-10.5)	Pike	27	15	ND		12	ND	
Crawford	76	42	14.2	(9.9-18.5)	34	10.3	(6.8-13.8)	Potter	10	7	ND		3	ND	
Cumberland	182	96	14.0	(11.2-16.8)	86	9.1	(7.2-11.0)	Schuylkill	141	76	15.7	(12.2-19.2)	65	10.9	(8.3-13.5)
Dauphin	187	90	12.9	(10.2-15.6)	97	10.1	(8.1-12.1)	Snyder	21	12	ND		9	ND	
Delaware	435	213	14.5	(12.6-16.4)	222	10.7	(9.3-12.1)	Somerset	75	42	15.4	(10.7-20.1)	33	9.5	(6.3-12.7)
Elk	32	20	19.0	(10.7-27.3)	12	ND		Sullivan	8	4	ND		4	ND	
Erie	216	112	14.7	(12.0-17.4)	104	10.6	(8.6-12.6)	Susquehanna	42	22	15.6	(9.1-22.1)	20	11.7	(6.6-16.8)
Fayette	108	52	11.3	(8.2-14.4)	56	9.3	(6.9-11.7)	Tioga	43	27	18.0	(11.2-24.8)	16	ND	
Forest	8	6	ND		2	ND		Union	21	13	ND		8	ND	
Franklin	125	72	15.5	(11.9-19.1)	53	8.9	(6.5-11.3)	Venango	45	26	13.7	(8.4-19.0)	19	ND	
Fulton	21	7	ND		14	ND		Warren	28	12	ND		16	ND	
Greene	24	17	ND		7	ND		Washington	160	88	13.2	(10.4-16.0)	72	8.1	(6.2-10.0)
Huntingdon	36	18	ND		18	ND		Wayne	59	25	12.3	(7.5-17.1)	34	16.9	(11.2-22.6)
Indiana	47	26	10.2	(6.3-14.1)	21	7.0	(4.0-10.0)	Westmoreland	324	171	13.9	(11.8-16.0)	153	9.3	(7.8-10.8)
Jefferson	37	22	14.7	(8.6-20.8)	15	ND		Wyoming	23	12	ND		11	ND	
								York	321	177	14.5	(12.4-16.6)	144	9.4	(7.9-10.9)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

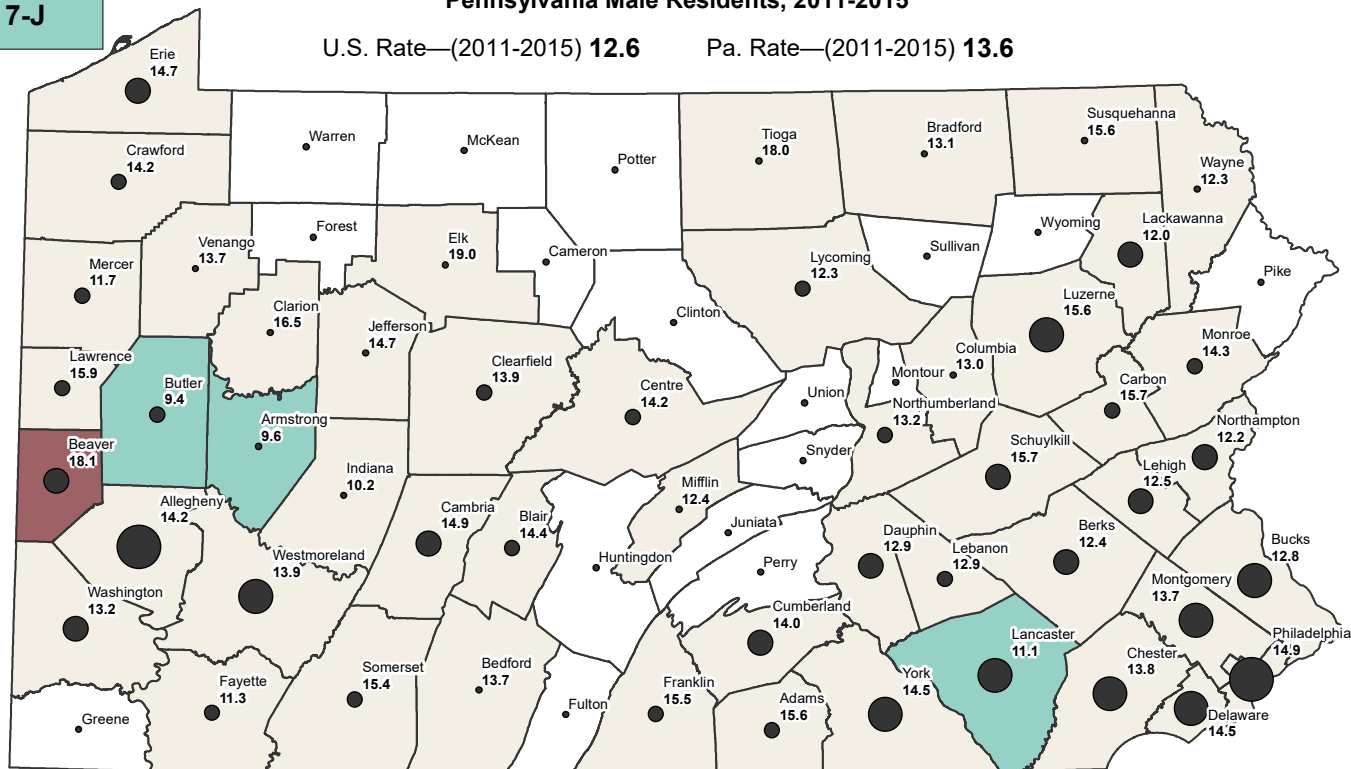
Cancer of the Pancreas: MORTALITY

**MAP
7-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **12.6**

Pa. Rate—(2011-2015) **13.6**



Significantly higher

Significantly lower

Not significantly different

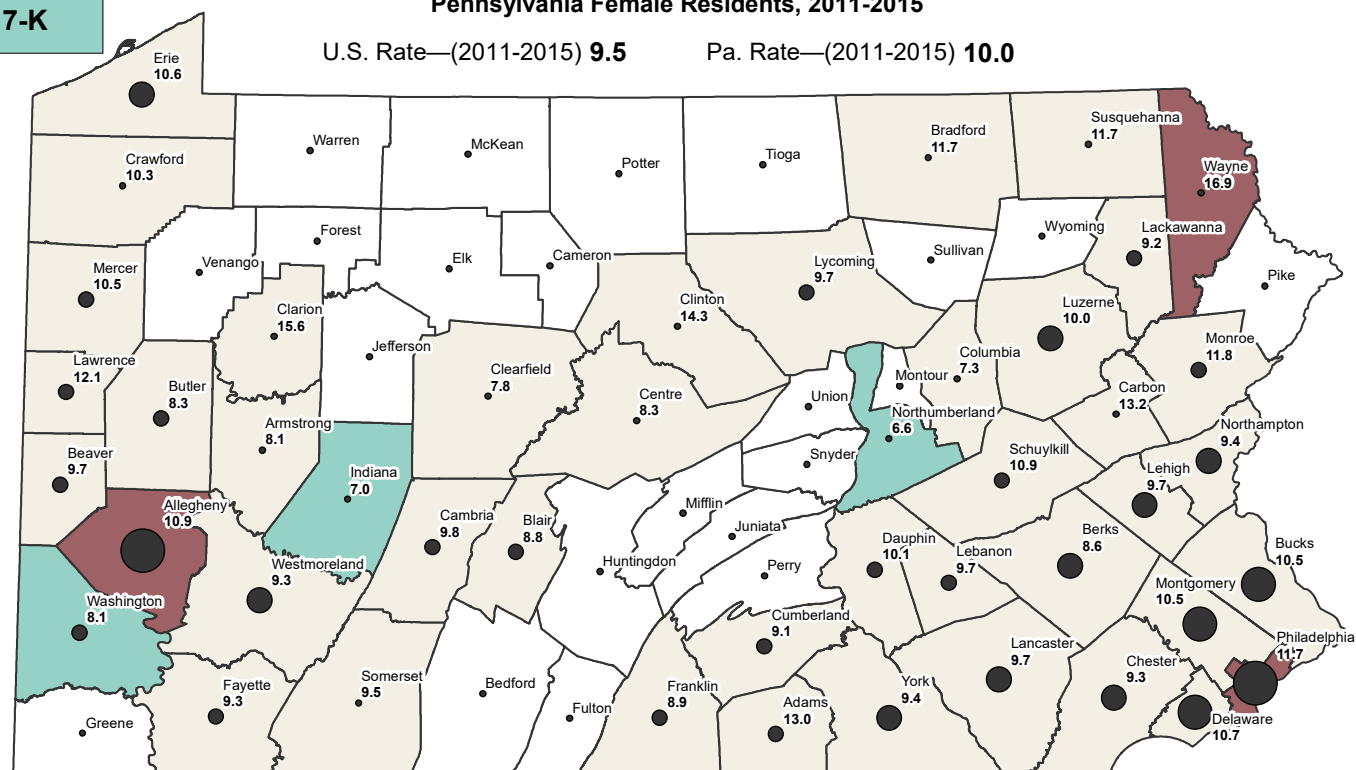
Significance not determined—less than 20 observed cases

**MAP
7-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **9.5**

Pa. Rate—(2011-2015) **10.0**



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Larynx

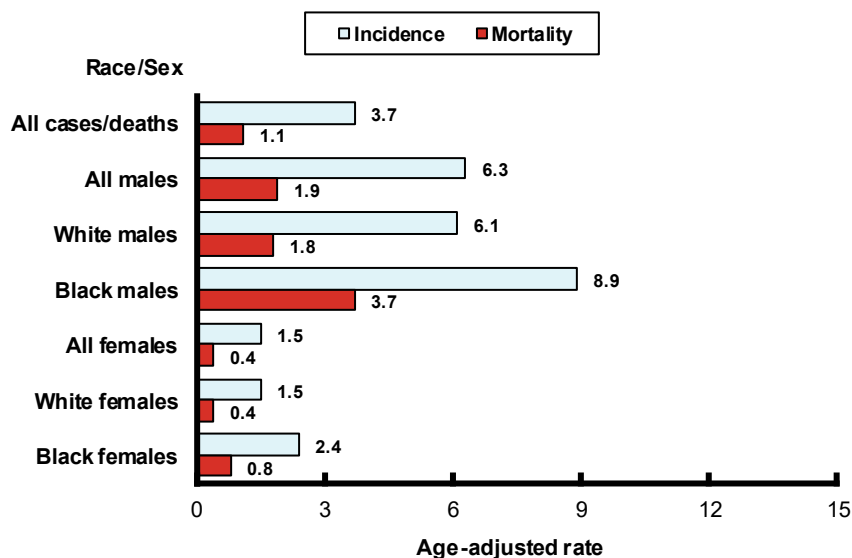
Data Highlights

Laryngeal cancer is predominately a male disease. The average annual (2011-2015) age-adjusted incidence rate for invasive cancer of the larynx was four times higher among males than for females (6.3 per 100,000 compared to 1.5, respectively). The average annual age-adjusted incidence rate for black males (8.9) was 46 percent higher than the rate for white males (6.1).

The main risk factors for laryngeal cancer are the use of tobacco and alcohol. According to the American Cancer Society, alcohol consumption combined with tobacco use increases the risk of larynx cancer far more than either drinking or smoking alone. In 2015, there were 597 cases of invasive laryngeal cancer diagnosed among residents of Pennsylvania for a rate of 3.5. Annual age-adjusted incidence rates for 2006 through 2015 displayed an overall decrease for black males and white males, but no discernible trends were observed for white females. Annual incidence rates for black females were insufficient for trend analysis due to the small number of cancers. Incidence rates rose steadily with age, with about 93 percent of the cases diagnosed among those 50 years of age and older during the five-year period of 2011-2015.

Fifty-four percent of laryngeal cancer cases were diagnosed at the in situ or localized stage in 2015. The five-year relative survival rate at these early stages is good. This is reflected in the age-adjusted death rates, which were much lower than incidence rates. For males and females, respectively, the average annual age-adjusted death rates for 2011-2015 were 1.9 and 0.4 per 100,000. The average annual age-adjusted death rates were disproportionately higher among black males (3.7) compared to white males (1.8). There were 183 resident deaths reported for this disease in 2015 – a near repeat of the previous year (2014) when there were 184 deaths. White males had a decreasing trend in the annual age-adjusted death rate between 2006 and 2015. The trend among white females between 2006 and 2015 remained stable. The annual death rate trend for black males and black females was statistically unreliable due to the small number of events.

FIGURE 8
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, tobacco smoking, excessive use of alcohol, poor nutrition, human papillomavirus, wood dust, paint fumes, gastroesophageal reflux disease (GERD), heavy exposure to asbestos or to certain chemicals used in the metalworking, petroleum, plastics and textiles industries are suggestive.

Early Detection

No screening tests have proven to be effective or are currently being evaluated.

Cancer of the Larynx: INCIDENCE (Invasive)

**TABLE
8-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	597	3.5 (3.2-3.8)	470	6.1 (5.5-6.7)	412	6.0 (5.4-6.6)	44	7.1 (5.0-9.2)	126	1.4 (1.2-1.6)	108	1.3 (1.1-1.5)	17	ND
2014	632	3.7 (3.4-4.0)	492	6.3 (5.7-6.9)	431	6.1 (5.5-6.7)	52	9.5 (6.9-12.1)	139	1.6 (1.3-1.9)	119	1.5 (1.2-1.8)	18	ND
2013	611	3.7 (3.4-4.0)	468	6.2 (5.6-6.8)	412	6.1 (5.5-6.7)	51	8.9 (6.5-11.3)	143	1.6 (1.3-1.9)	122	1.5 (1.2-1.8)	20	2.5 (1.4-3.6)
2012	600	3.7 (3.4-4.0)	484	6.5 (5.9-7.1)	411	6.2 (5.6-6.8)	57	10.2 (7.6-12.8)	116	1.3 (1.1-1.5)	98	1.3 (1.0-1.6)	15	ND
2011	627	3.9 (3.6-4.2)	481	6.6 (6.0-7.2)	425	6.4 (5.8-7.0)	44	8.7 (6.1-11.3)	146	1.7 (1.4-2.0)	122	1.6 (1.3-1.9)	24	3.4 (2.0-4.8)
2010	605	3.8 (3.5-4.1)	484	6.8 (6.2-7.4)	420	6.6 (6.0-7.2)	50	10.1 (7.3-12.9)	121	1.4 (1.2-1.6)	103	1.4 (1.1-1.7)	16	ND
2009	571	3.7 (3.4-4.0)	423	6.2 (5.6-6.8)	363	5.8 (5.2-6.4)	51	11.7 (8.5-14.9)	148	1.7 (1.4-2.0)	119	1.6 (1.3-1.9)	26	3.8 (2.3-5.3)
2008	635	4.3 (4.0-4.6)	524	7.9 (7.2-8.6)	459	7.6 (6.9-8.3)	54	12.0 (8.8-15.2)	111	1.4 (1.1-1.7)	93	1.3 (1.0-1.6)	16	ND
2007	619	4.1 (3.8-4.4)	504	7.7 (7.0-8.4)	440	7.4 (6.7-8.1)	48	10.6 (7.6-13.6)	115	1.4 (1.1-1.7)	104	1.5 (1.2-1.8)	10	ND
2006	593	4.0 (3.7-4.3)	467	7.1 (6.5-7.7)	412	6.9 (6.2-7.6)	47	10.8 (7.7-13.9)	126	1.6 (1.3-1.9)	104	1.4 (1.1-1.7)	19	ND

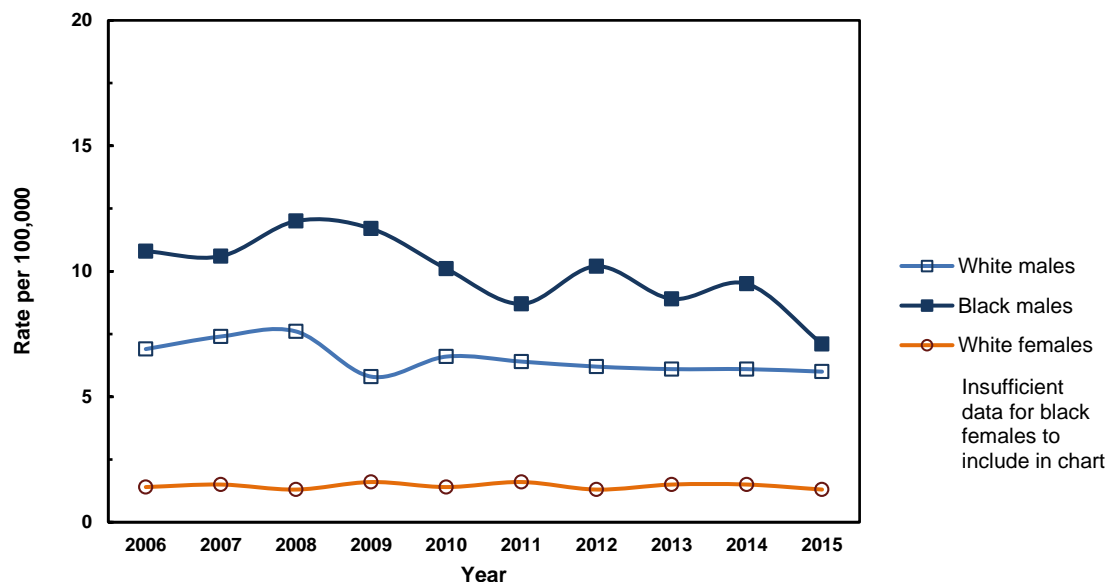
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
8-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Larynx: INCIDENCE (Invasive)

**TABLE
8-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

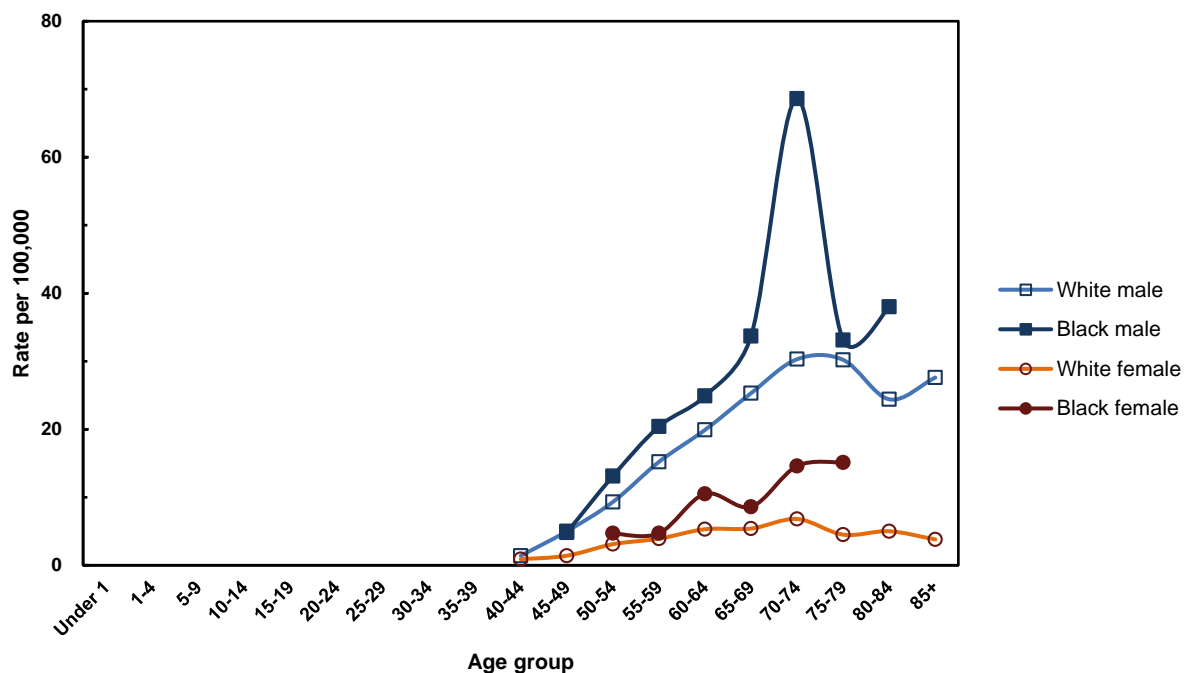
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	4.8	7.7	8.0	7.0	2.1	2.1	2.5
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	ND	ND	ND	ND	ND	ND	ND
25-29	ND	ND	ND	ND	ND	ND	ND
30-34	ND	ND	ND	ND	ND	ND	ND
35-39	0.4	0.7	ND	ND	ND	ND	ND
40-44	1.1	1.4	1.4	ND	0.8	0.9	ND
45-49	3.1	4.8	5.0	4.8	1.4	1.4	ND
50-54	6.4	9.7	9.3	13.1	3.3	3.1	4.7
55-59	9.5	15.3	15.2	20.4	3.9	3.9	4.7
60-64	12.8	20.3	19.9	24.9	5.7	5.3	10.5
65-69	15.1	25.8	25.3	33.7	5.5	5.4	8.6
70-74	19.0	32.9	30.3	68.6	7.3	6.8	14.6
75-79	15.9	29.9	30.2	33.1	5.4	4.5	15.1
80-84	13.2	25.6	24.4	38.0	5.0	5.0	ND
85+	11.8	28.6	27.6	ND	3.8	3.8	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
8-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Larynx: INCIDENCE (Invasive)

**TABLE
8-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	3,067	2,395	2,091	248	670	569	94
Under 1	0	0	0	0	0	0	0
1-4	0	0	0	0	0	0	0
5-9	0	0	0	0	0	0	0
10-14	0	0	0	0	0	0	0
15-19	0	0	0	0	0	0	0
20-24	1	1	1	0	0	0	0
25-29	2	1	1	0	1	1	0
30-34	3	2	2	0	1	1	0
35-39	13	12	8	3	1	1	0
40-44	45	29	23	5	16	15	1
45-49	136	105	92	11	31	26	5
50-54	309	229	190	30	80	66	12
55-59	444	350	306	41	94	82	11
60-64	515	395	346	38	119	97	20
65-69	480	387	343	35	93	80	12
70-74	445	351	294	48	93	78	15
75-79	287	232	215	16	55	42	12
80-84	194	150	133	12	44	41	3
85+	193	151	137	9	42	39	3

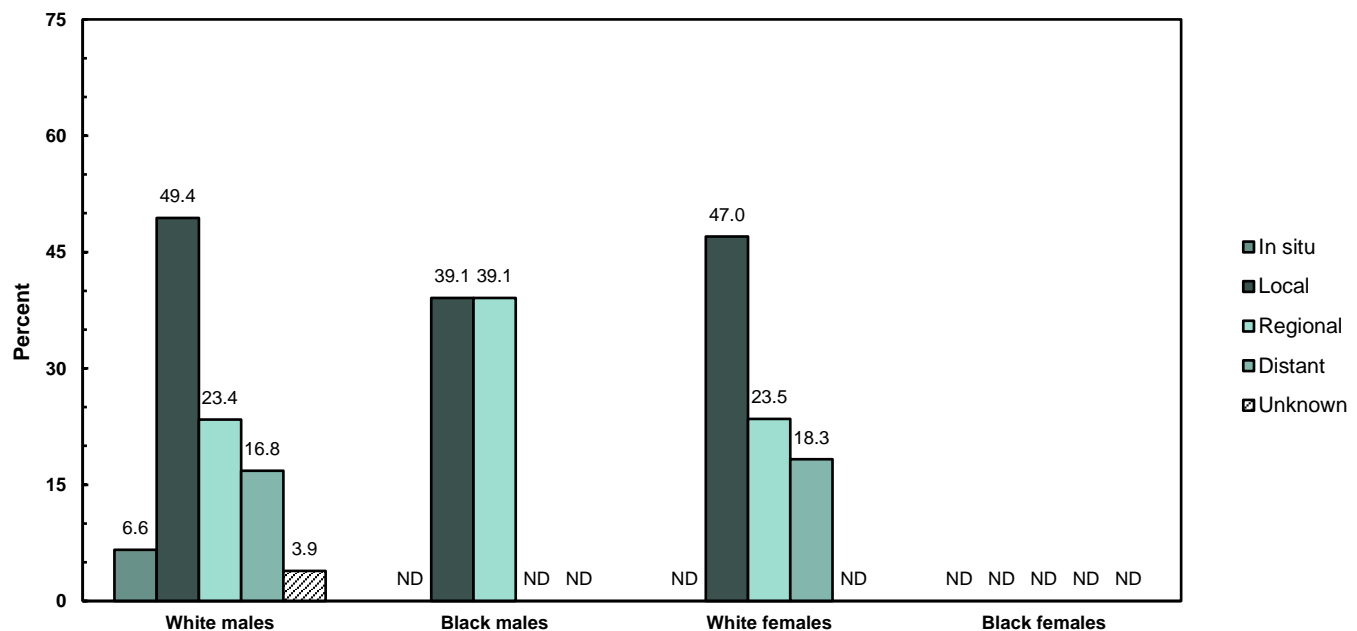
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
8-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 581 - 97.3%

Cancer of the Larynx: MORTALITY

**TABLE
8-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	183	1.0 (0.9-1.1)	148	1.9 (1.6-2.2)	129	1.8 (1.5-2.1)	14	ND	35	0.3 (0.2-0.4)	29	0.3 (0.2-0.4)	6	ND
2014	184	1.1 (0.9-1.3)	152	2.0 (1.7-2.3)	128	1.8 (1.5-2.1)	21	4.3 (2.5-6.1)	32	0.3 (0.2-0.4)	28	0.3 (0.2-0.4)	4	ND
2013	194	1.1 (0.9-1.3)	148	2.0 (1.7-2.3)	124	1.8 (1.5-2.1)	19	ND	46	0.5 (0.4-0.6)	39	0.5 (0.3-0.7)	7	ND
2012	180	1.1 (0.9-1.3)	138	1.9 (1.6-2.2)	121	1.9 (1.6-2.2)	11	ND	42	0.4 (0.3-0.5)	33	0.4 (0.3-0.5)	8	ND
2011	188	1.1 (0.9-1.3)	138	1.9 (1.6-2.2)	115	1.7 (1.4-2.0)	23	5.2 (3.1-7.3)	50	0.5 (0.4-0.6)	44	0.5 (0.4-0.6)	6	ND
2010	168	1.1 (0.9-1.3)	132	1.9 (1.6-2.2)	114	1.8 (1.5-2.1)	17	ND	36	0.4 (0.3-0.5)	33	0.4 (0.3-0.5)	2	ND
2009	184	1.2 (1.0-1.4)	146	2.2 (1.8-2.6)	124	2.0 (1.6-2.4)	20	4.6 (2.6-6.6)	38	0.4 (0.3-0.5)	31	0.4 (0.3-0.5)	7	ND
2008	204	1.3 (1.1-1.5)	166	2.5 (2.1-2.9)	139	2.3 (1.9-2.7)	27	6.2 (3.9-8.5)	38	0.4 (0.3-0.5)	34	0.4 (0.3-0.5)	4	ND
2007	206	1.4 (1.2-1.6)	167	2.7 (2.3-3.1)	140	2.4 (2.0-2.8)	24	5.4 (3.2-7.6)	39	0.4 (0.3-0.5)	32	0.4 (0.3-0.5)	7	ND
2006	185	1.2 (1.0-1.4)	136	2.2 (1.8-2.6)	116	2.0 (1.6-2.4)	20	4.6 (2.6-6.6)	49	0.6 (0.4-0.8)	35	0.4 (0.3-0.5)	13	ND

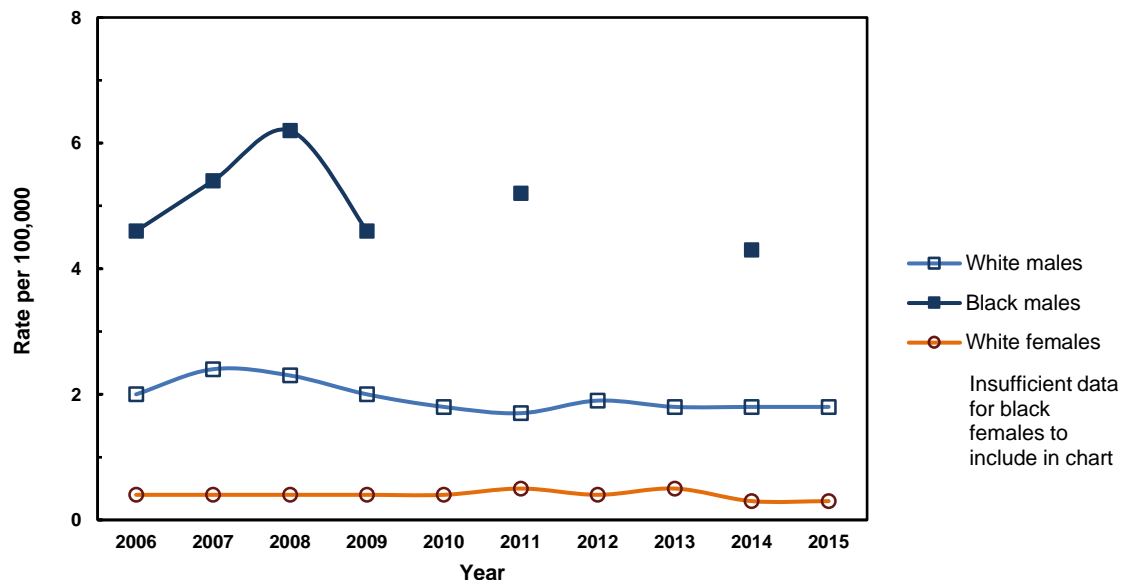
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
8-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Larynx: MORTALITY

**TABLE
8-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	929	1.5	724	2.3	617	2.4	88	2.5	205	0.6	173	0.6	31	0.8
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
25-29	2	ND	2	ND	1	ND	1	ND	0	ND	0	ND	0	ND
30-34	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
35-39	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
40-44	3	ND	3	ND	3	ND	0	ND	0	ND	0	ND	0	ND
45-49	22	0.5	15	0.7	14	0.8	1	ND	7	ND	6	ND	1	ND
50-54	47	1.0	37	1.6	28	1.4	6	ND	10	0.4	9	ND	1	ND
55-59	85	1.8	69	3.0	61	3.0	6	ND	16	0.7	13	0.6	3	ND
60-64	146	3.6	115	5.9	102	5.9	9	ND	31	1.5	19	1.0	12	6.3
65-69	155	4.9	121	8.1	100	7.4	21	20.2	34	2.0	31	2.1	3	ND
70-74	117	5.0	98	9.2	85	8.8	9	ND	19	1.5	16	1.4	3	ND
75-79	110	6.1	83	10.7	67	9.4	13	26.9	27	2.6	24	2.6	3	ND
80-84	116	7.9	88	15.0	74	13.6	11	34.9	28	3.2	25	3.1	2	ND
85+	125	7.7	92	17.4	81	16.3	11	42.1	33	3.0	30	2.9	3	ND

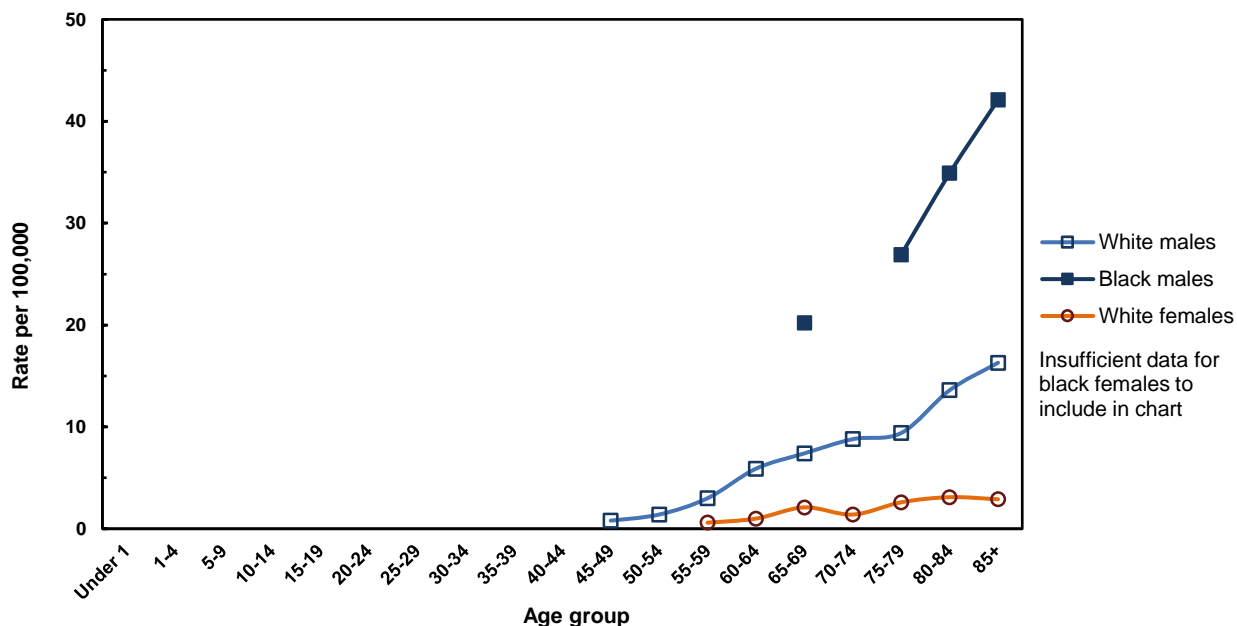
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
8-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Larynx: INCIDENCE (Invasive)

**TABLE
8-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	3,067	2,395	6.3	(6.0-6.6)	670	1.5	(1.4-1.6)								
Adams	18	16	ND		2	ND		Juniata	6	6	ND		0	ND	
Allegheny	356	279	7.5	(6.6-8.4)	77	1.7	(1.3-2.1)	Lackawanna	64	49	7.2	(5.2-9.2)	15	ND	
Armstrong	21	15	ND		6	ND		Lancaster	92	78	5.1	(4.0-6.2)	13	ND	
Beaver	39	30	5.7	(3.7-7.7)	9	ND		Lawrence	31	22	7.6	(4.4-10.8)	9	ND	
Bedford	20	16	ND		4	ND		Lebanon	35	25	5.5	(3.3-7.7)	10	ND	
Berks	91	74	6.5	(5.0-8.0)	17	ND		Lehigh	66	53	5.3	(3.9-6.7)	13	ND	
Blair	40	30	7.8	(5.0-10.6)	10	ND		Luzerne	92	69	6.6	(5.0-8.2)	23	1.9	(1.1-2.7)
Bradford	15	14	ND		1	ND		Lycoming	32	25	7.2	(4.4-10.0)	7	ND	
Bucks	139	118	5.9	(4.8-7.0)	21	1.0	(0.6-1.4)	McKean	12	8	ND		4	ND	
Butler	37	30	5.2	(3.3-7.1)	7	ND		Mercer	43	35	9.5	(6.4-12.6)	8	ND	
Cambria	37	27	6.5	(4.0-9.0)	10	ND		Mifflin	8	4	ND		4	ND	
Cameron	0	0	ND		0	ND		Monroe	43	32	5.6	(3.7-7.5)	11	ND	
Carbon	17	13	ND		4	ND		Montgomery	125	100	4.3	(3.5-5.1)	25	0.9	(0.5-1.3)
Centre	20	18	ND		2	ND		Montour	9	7	ND		2	ND	
Chester	83	66	4.6	(3.5-5.7)	16	ND		Northampton	67	49	5.4	(3.9-6.9)	18	ND	
Clarion	5	3	ND		2	ND		Northumberland	28	19	ND		9	ND	
Clearfield	30	19	ND		11	ND		Perry	15	12	ND		3	ND	
Clinton	7	5	ND		2	ND		Philadelphia	374	268	7.8	(6.9-8.7)	106	2.4	(1.9-2.9)
Columbia	12	12	ND		0	ND		Pike	16	10	ND		6	ND	
Crawford	23	15	ND		8	ND		Potter	6	5	ND		1	ND	
Cumberland	44	36	4.9	(3.3-6.5)	8	ND		Schuylkill	53	43	8.8	(6.2-11.4)	10	ND	
Dauphin	49	40	5.1	(3.5-6.7)	9	ND		Snyder	15	11	ND		4	ND	
Delaware	130	105	6.8	(5.5-8.1)	25	1.3	(0.8-1.8)	Somerset	24	20	7.3	(4.1-10.5)	4	ND	
Elk	9	8	ND		1	ND		Sullivan	4	4	ND		0	ND	
Erie	72	57	7.5	(5.6-9.4)	15	ND		Susquehanna	11	6	ND		5	ND	
Fayette	51	45	10.0	(7.1-12.9)	6	ND		Tioga	11	9	ND		2	ND	
Forest	2	2	ND		0	ND		Union	4	1	ND		3	ND	
Franklin	30	23	4.7	(2.8-6.6)	7	ND		Venango	16	14	ND		2	ND	
Fulton	6	5	ND		1	ND		Warren	18	15	ND		3	ND	
Greene	14	11	ND		3	ND		Washington	61	45	6.4	(4.5-8.3)	16	ND	
Huntingdon	13	11	ND		2	ND		Wayne	15	12	ND		3	ND	
Indiana	17	15	ND		2	ND		Westmoreland	106	82	6.5	(5.1-7.9)	24	1.7	(1.0-2.4)
Jefferson	12	8	ND		4	ND		Wyoming	7	6	ND		1	ND	
								York	99	85	6.3	(5.0-7.6)	14	ND	

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

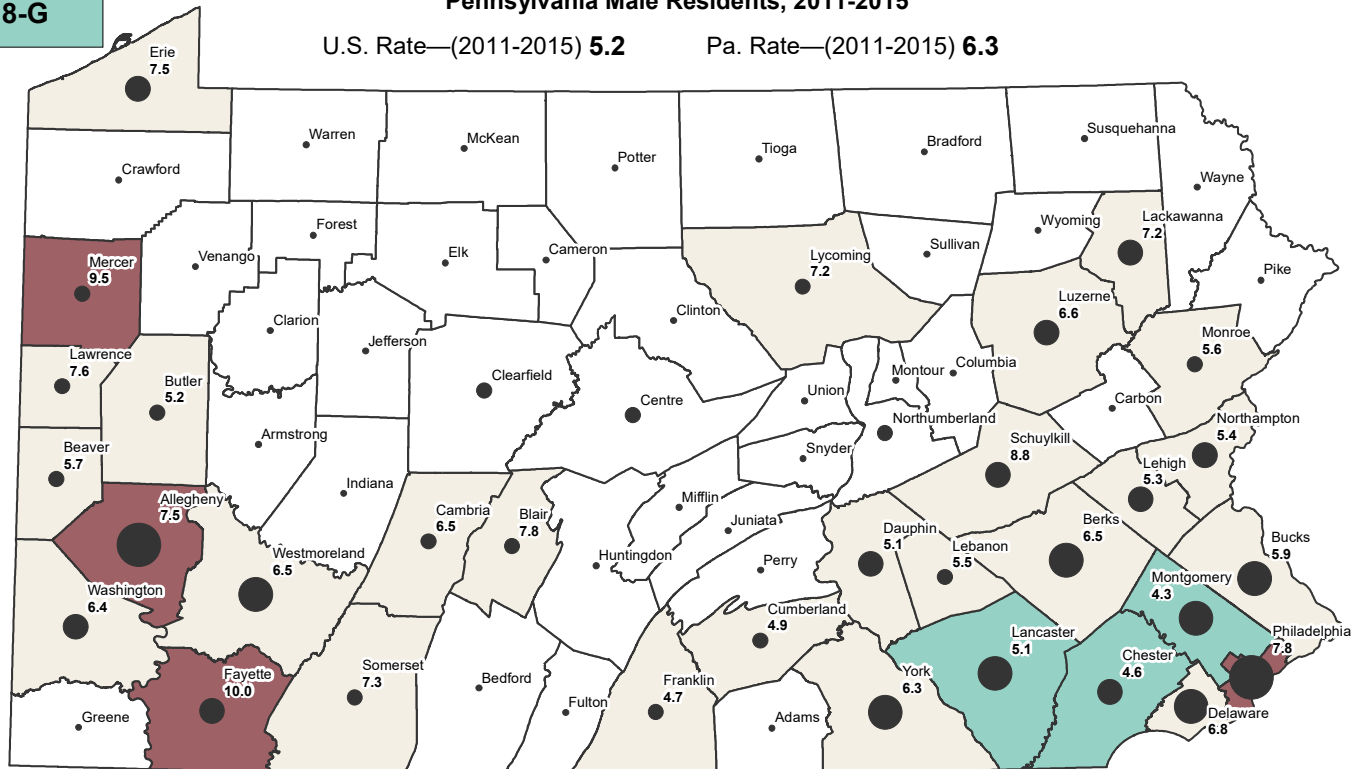
Cancer of the Larynx: INCIDENCE (Invasive)

**MAP
8-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **5.2**

Pa. Rate—(2011-2015) **6.3**



Significantly higher

Significantly lower

Not significantly different

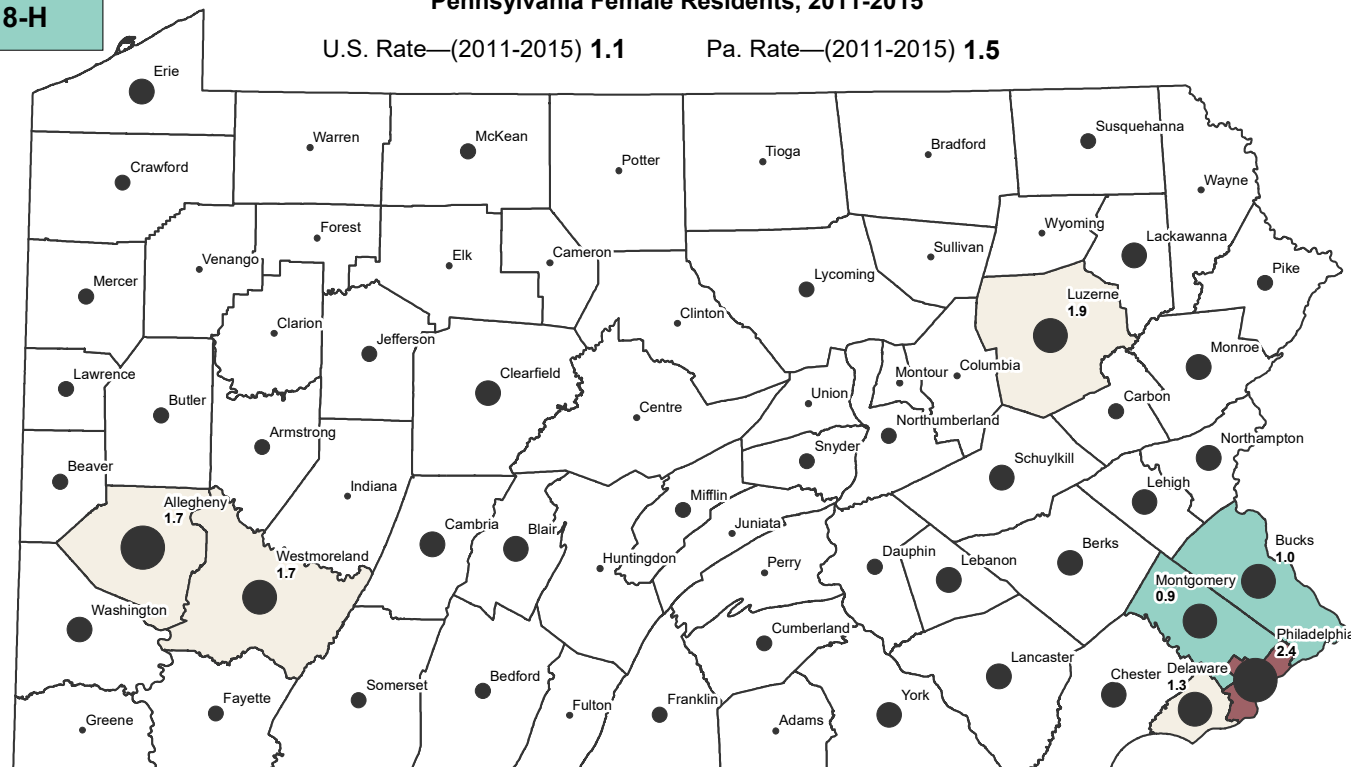
Significance not determined—less than 20 observed cases

**MAP
8-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **1.1**

Pa. Rate—(2011-2015) **1.5**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Larynx: MORTALITY

**TABLE
8-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	929	724	1.9	(1.8-2.0)	205	0.4	(0.3-0.5)								
Adams	7	7	ND		0	ND		Juniata	4	4	ND		0	ND	
Allegheny	104	81	2.2	(1.7-2.7)	23	0.4	(0.2-0.6)	Lackawanna	25	14	ND		11	ND	
Armstrong	4	3	ND		1	ND		Lancaster	26	26	1.7	(1.0-2.4)	0	ND	
Beaver	8	7	ND		1	ND		Lawrence	4	3	ND		1	ND	
Bedford	3	3	ND		0	ND		Lebanon	13	10	ND		3	ND	
Berks	35	29	2.6	(1.7-3.5)	6	ND		Lehigh	31	27	2.8	(1.7-3.9)	4	ND	
Blair	13	7	ND		6	ND		Luzerne	32	28	2.7	(1.7-3.7)	4	ND	
Bradford	4	4	ND		0	ND		Lycoming	7	4	ND		3	ND	
Bucks	30	21	1.1	(0.6-1.6)	9	ND		McKean	1	1	ND		0	ND	
Butler	11	8	ND		3	ND		Mercer	10	8	ND		2	ND	
Cambria	14	11	ND		3	ND		Mifflin	2	1	ND		1	ND	
Cameron	1	1	ND		0	ND		Monroe	11	10	ND		1	ND	
Carbon	8	7	ND		1	ND		Montgomery	49	40	1.7	(1.2-2.2)	9	ND	
Centre	7	5	ND		2	ND		Montour	3	2	ND		1	ND	
Chester	21	12	ND		9	ND		Northampton	29	25	2.6	(1.6-3.6)	4	ND	
Clarion	0	0	ND		0	ND		Northumberland	6	2	ND		4	ND	
Clearfield	6	3	ND		3	ND		Perry	3	3	ND		0	ND	
Clinton	1	0	ND		1	ND		Philadelphia	126	87	2.6	(2.1-3.1)	39	0.8	(0.5-1.1)
Columbia	5	5	ND		0	ND		Pike	5	4	ND		1	ND	
Crawford	2	1	ND		1	ND		Potter	1	0	ND		1	ND	
Cumberland	12	10	ND		2	ND		Schuylkill	13	10	ND		3	ND	
Dauphin	12	9	ND		3	ND		Snyder	2	2	ND		0	ND	
Delaware	42	32	2.2	(1.4-3.0)	10	ND		Somerset	4	4	ND		0	ND	
Elk	0	0	ND		0	ND		Sullivan	0	0	ND		0	ND	
Erie	14	12	ND		2	ND		Susquehanna	3	3	ND		0	ND	
Fayette	14	14	ND		0	ND		Tioga	6	5	ND		1	ND	
Forest	0	0	ND		0	ND		Union	3	1	ND		2	ND	
Franklin	14	13	ND		1	ND		Venango	4	4	ND		0	ND	
Fulton	0	0	ND		0	ND		Warren	4	4	ND		0	ND	
Greene	3	3	ND		0	ND		Washington	21	15	ND		6	ND	
Huntingdon	6	6	ND		0	ND		Wayne	5	3	ND		2	ND	
Indiana	8	6	ND		2	ND		Westmoreland	24	18	ND		6	ND	
Jefferson	3	2	ND		1	ND		Wyoming	3	1	ND		2	ND	
								York	37	33	2.6	(1.7-3.5)	4	ND	

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

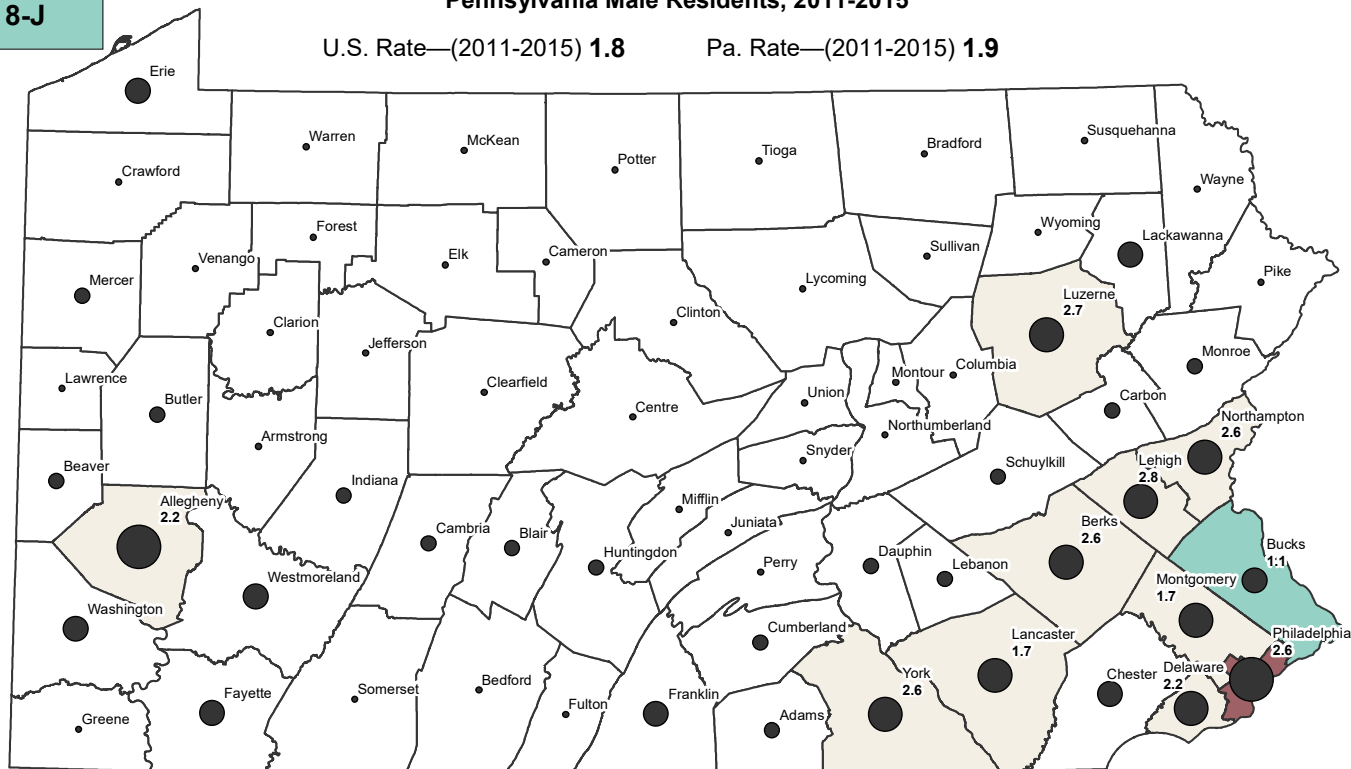
Cancer of the Larynx: MORTALITY

**MAP
8-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **1.8**

Pa. Rate—(2011-2015) **1.9**



Significantly higher

Significantly lower

Not significantly
different

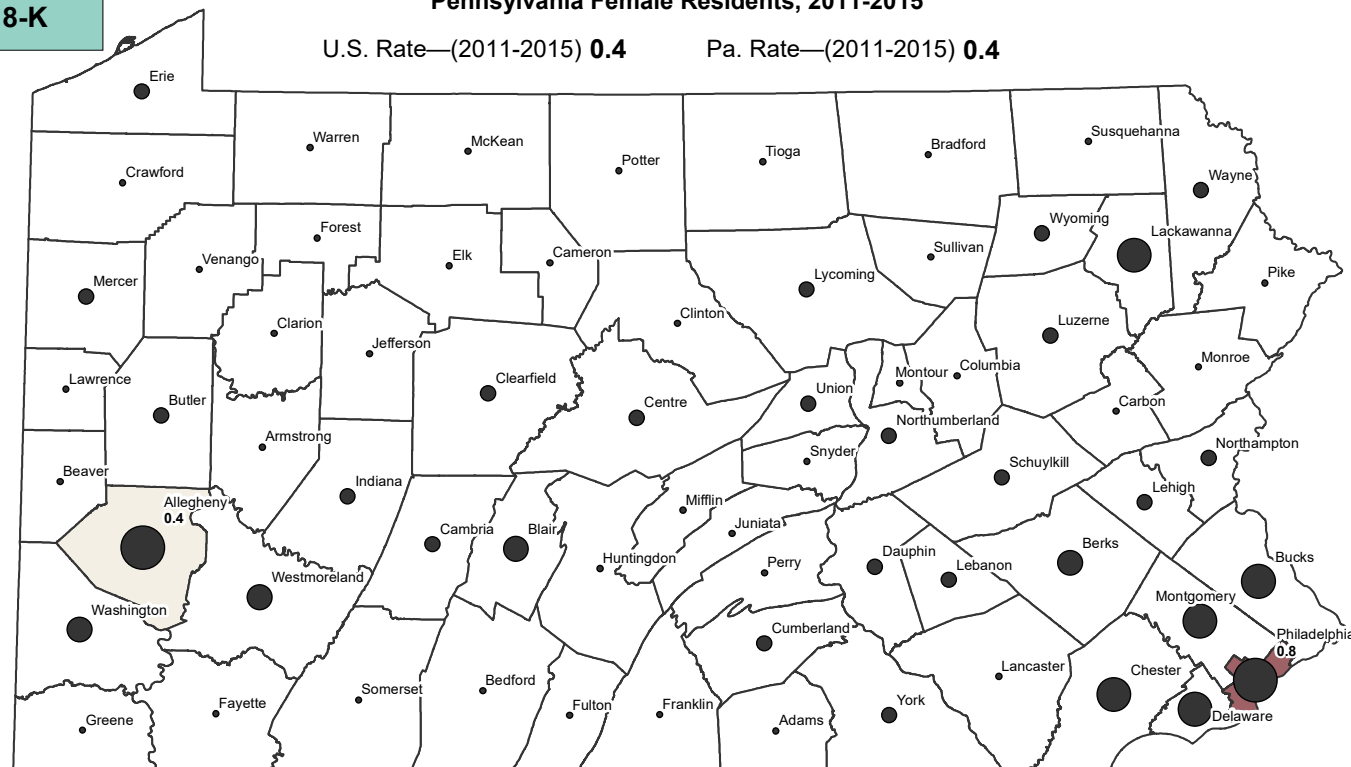
Significance not determined—
less than 20 observed cases

**MAP
8-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **0.4**

Pa. Rate—(2011-2015) **0.4**



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Lung and Bronchus

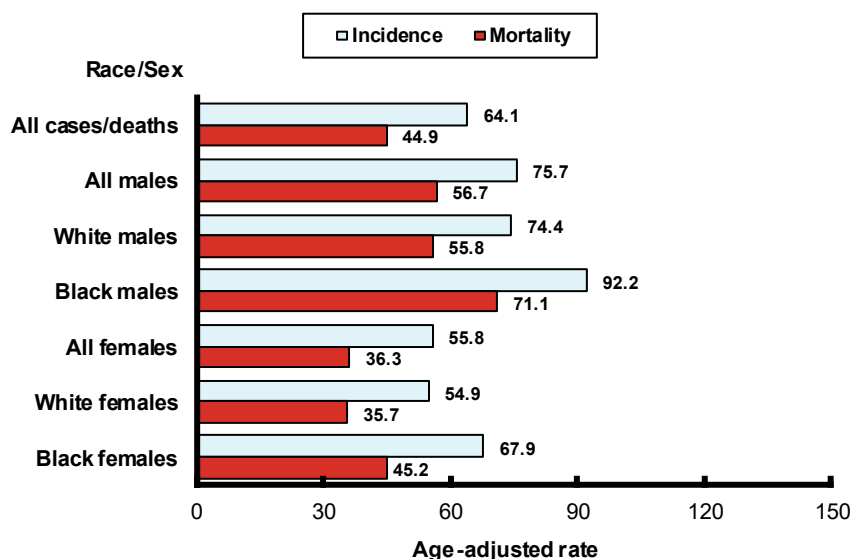
Data Highlights

In Pennsylvania, the average annual (2011-2015) age-adjusted incidence rate for invasive lung and bronchus cancer among males (75.7 per 100,000) was about 36 percent higher than the rate for females (55.8). Black males were disproportionately burdened. The 2011-2015 average annual rate for black males (92.2) was about 24 percent higher than the rate for white males (74.4).

There were 10,813 cases of invasive lung and bronchus cancers diagnosed among Pennsylvania residents in 2015 – the highest number of annual cases observed during the 10-year period 2006-2015. Lung and bronchus cancers accounted for approximately 14 percent of all invasive cancers in 2015. The annual age-adjusted incidence rates for white and black males have generally shown a decreasing trend during the period 2006-2015. Rates among white females and black females did not have any obvious trends. During the period of 2011-2015, about 99 percent of the invasive cases were diagnosed among residents 45 years of age or older. Starting with age group 55-59, males had higher average annual age-specific incidence rates than females during the 2011-2015 period.

In 2015, about 72 percent of lung and bronchus cancer cases were diagnosed at the late stage (regional or distant) of the disease, and 22 percent were diagnosed at the early stage (in situ or local). Because lung cancers are very difficult to detect early, survival is poor. According to Pennsylvania estimates, the five-year net survival rate was 19.9 percent for 2010 diagnoses. The 2011-2015 average annual age-adjusted death rate was highest among black males (71.1 per 100,000) and lowest for white females (35.7). In 2015, about 27 percent of all cancer deaths among males were from lung and bronchus cancers (4,006), while the proportion was about 25 percent (3,371) for females, making this site the leading cause of cancer mortality in 2015. According to the American Cancer Society's report, "Cancer Facts and Figures 2018," 80 percent of the estimated 154,050 lung cancer deaths that will occur in the U.S. in 2018 are caused by tobacco smoking. In Pennsylvania, the annual age-adjusted death rates from 2006 to 2015 showed declines among black females and males of both races but no discernible trend among white females.

FIGURE 9
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, tobacco smoking, secondhand smoke, radon, asbestos, uranium, arsenic, beryllium, cadmium, silica, vinyl chloride, nickel, chromium, coal products, mustard gas, chloromethyl ethers, diesel exhaust, air pollution, radiation therapy to the lungs, arsenic in drinking water, personal or family history of lung cancer, and beta carotene supplements are suggestive of lung cancer risk.

Early Detection

Recent studies have shown that screening for lung cancer using a low-dose CT scan helps lower the risk of dying from this disease. Although imaging (CT Scan) can detect early lung cancers, it finds a lot of non-cancerous abnormalities, which may result in excess testing, biopsies, and surgeries. The American Cancer Society recommends that individuals who are in fairly good health, between the ages of 55 and 74, have at least a 30-year smoking history, and are either current smokers or have quit smoking within the last 15 years talk to their doctor about starting to screen for lung cancer.

Cancer of the Lung and Bronchus: INCIDENCE (Invasive)

**TABLE
9-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	10,813	63.2 (62.0-64.4)	5,491	72.2 (70.3-74.1)	4,938	72.0 (70.0-74.0)	466	85.8 (78.0-93.6)	5,322	56.9 (55.4-58.4)	4,716	56.9 (55.3-58.5)	545	67.3 (61.6-73.0)
2014	10,662	63.2 (62.0-64.4)	5,516	73.7 (71.8-75.6)	4,952	73.4 (71.4-75.4)	479	87.8 (79.9-95.7)	5,146	55.6 (54.1-57.1)	4,555	55.2 (53.6-56.8)	509	65.3 (59.6-71.0)
2013	10,654	64.3 (63.1-65.5)	5,595	75.9 (73.9-77.9)	4,991	74.8 (72.7-76.9)	500	94.7 (86.4-103.0)	5,058	55.9 (54.4-57.4)	4,449	55.1 (53.5-56.7)	538	72.0 (65.9-78.1)
2012	10,419	63.9 (62.7-65.1)	5,509	76.9 (74.9-78.9)	4,772	73.3 (71.2-75.4)	435	86.3 (78.2-94.4)	4,910	54.6 (53.1-56.1)	4,182	52.4 (50.8-54.0)	479	64.0 (58.3-69.7)
2011	10,579	66.0 (64.7-67.3)	5,637	80.1 (78.0-82.2)	5,028	78.6 (76.4-80.8)	525	106.6 (97.5-115.7)	4,942	55.9 (54.3-57.5)	4,365	55.1 (53.5-56.7)	514	70.4 (64.3-76.5)
2010	10,402	65.9 (64.6-67.2)	5,506	79.8 (77.7-81.9)	4,942	79.1 (76.9-81.3)	494	105.8 (96.5-115.1)	4,896	55.9 (54.3-57.5)	4,311	55.2 (53.6-56.8)	529	75.5 (69.1-81.9)
2009	10,598	69.0 (67.7-70.3)	5,604	84.7 (82.5-86.9)	4,986	82.5 (80.2-84.8)	522	118.3 (108.2-128.4)	4,994	58.0 (56.4-59.6)	4,405	56.6 (54.9-58.3)	527	77.8 (71.2-84.4)
2008	10,581	69.8 (68.5-71.1)	5,595	86.6 (84.3-88.9)	5,074	85.8 (83.4-88.2)	460	107.2 (97.4-117.0)	4,985	58.3 (56.7-59.9)	4,428	57.2 (55.5-58.9)	504	76.0 (69.4-82.6)
2007	10,650	70.9 (69.6-72.2)	5,657	89.3 (87.0-91.6)	5,067	87.4 (85.0-89.8)	518	121.8 (111.3-132.3)	4,993	58.5 (56.9-60.1)	4,454	57.6 (55.9-59.3)	480	73.5 (66.9-80.1)
2006	10,432	69.9 (68.6-71.2)	5,656	90.2 (87.8-92.6)	5,126	89.3 (86.9-91.7)	474	111.5 (101.5-121.5)	4,776	56.5 (54.9-58.1)	4,248	55.3 (53.6-57.0)	481	73.6 (67.0-80.2)

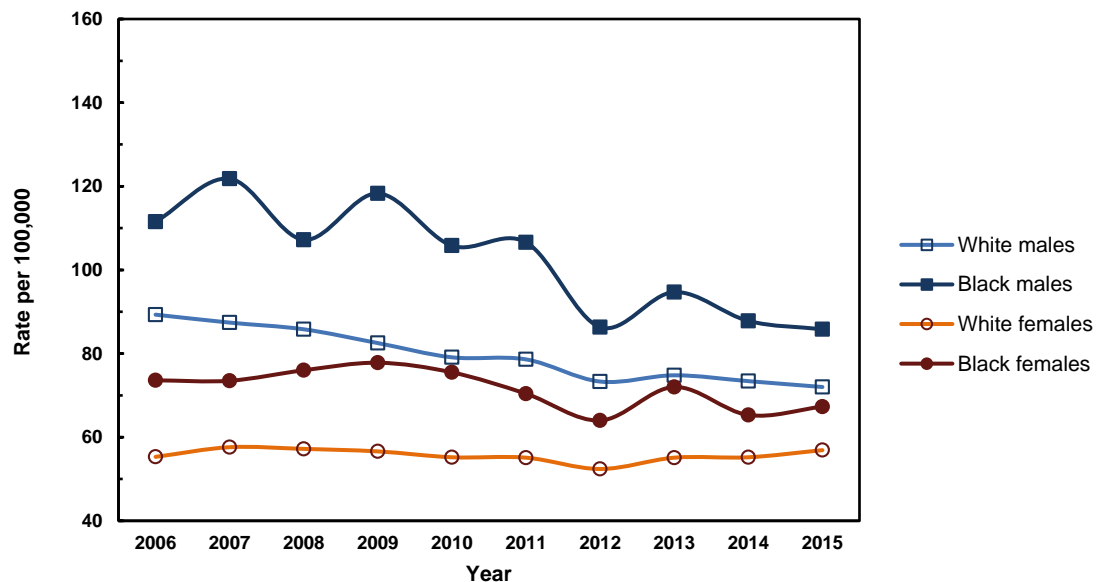
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
9-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Lung and Bronchus: INCIDENCE (Invasive)

**TABLE
9-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

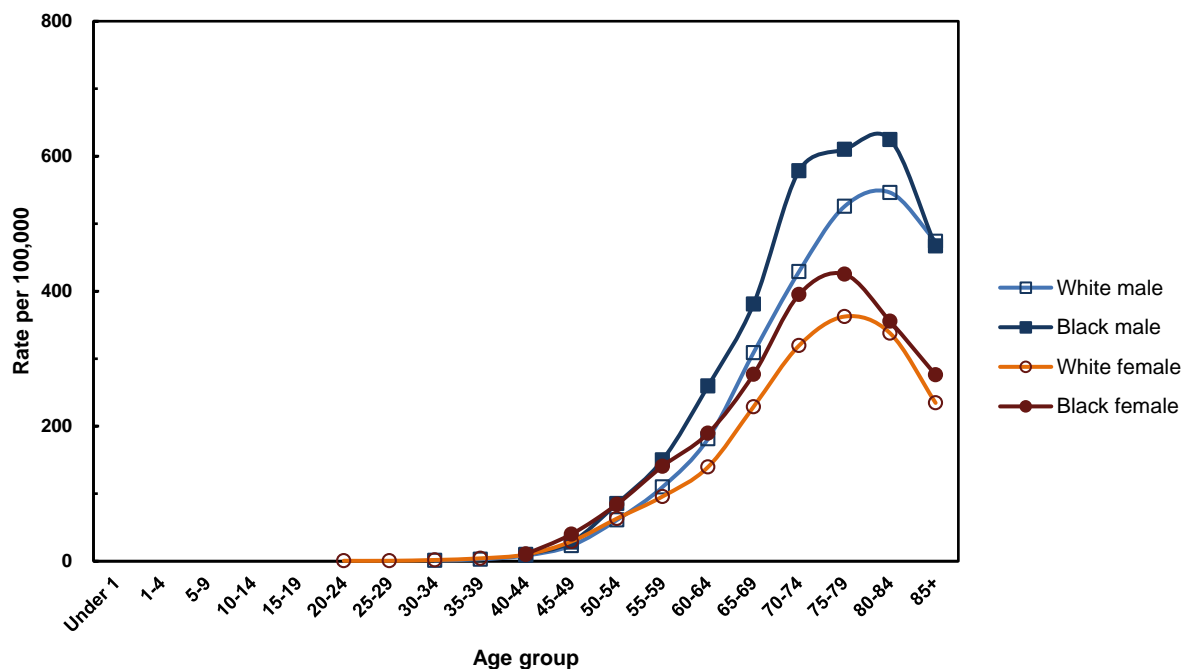
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	83.2	88.9	94.8	68.1	77.7	82.2	67.6
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	0.3	ND	ND	ND	0.5	0.6	ND
25-29	0.5	ND	ND	ND	0.7	0.6	ND
30-34	1.5	1.2	1.1	ND	1.9	1.8	ND
35-39	3.3	2.7	2.7	ND	3.9	4.2	ND
40-44	9.1	8.4	8.4	9.8	9.7	9.9	10.7
45-49	26.5	23.1	23.0	28.2	29.8	29.2	40.0
50-54	63.8	63.0	61.1	85.3	64.6	63.2	84.3
55-59	105.9	113.1	109.8	150.0	98.9	95.8	140.6
60-64	163.6	186.3	181.2	259.5	142.4	139.5	189.5
65-69	269.2	312.8	308.8	380.9	230.1	228.7	276.7
70-74	373.6	435.0	429.0	578.4	322.3	319.4	395.0
75-79	437.6	531.5	525.6	610.0	366.3	362.4	425.1
80-84	427.7	558.2	546.1	624.6	341.7	337.7	355.4
85+	321.7	482.7	473.9	466.9	244.7	234.5	276.0

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
9-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Lung and Bronchus: INCIDENCE (Invasive)

**TABLE
9-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	53,127	27,748	24,681	2,405	25,378	22,267	2,585
Under 1	1	0	0	0	1	0	1
1-4	2	0	0	0	2	2	0
5-9	0	0	0	0	0	0	0
10-14	2	2	1	0	0	0	0
15-19	4	2	1	1	2	2	0
20-24	13	3	3	0	10	10	0
25-29	22	8	8	0	14	10	2
30-34	60	23	17	4	37	28	5
35-39	120	49	40	6	71	61	9
40-44	366	168	140	22	198	165	26
45-49	1,166	502	426	65	664	548	101
50-54	3,070	1,488	1,255	195	1,582	1,328	217
55-59	4,944	2,582	2,212	301	2,361	1,990	328
60-64	6,604	3,632	3,157	396	2,972	2,557	361
65-69	8,550	4,692	4,191	396	3,858	3,410	388
70-74	8,766	4,646	4,166	405	4,120	3,656	407
75-79	7,878	4,130	3,740	295	3,748	3,346	338
80-84	6,306	3,270	2,975	197	3,036	2,747	219
85+	5,253	2,551	2,349	122	2,702	2,407	183

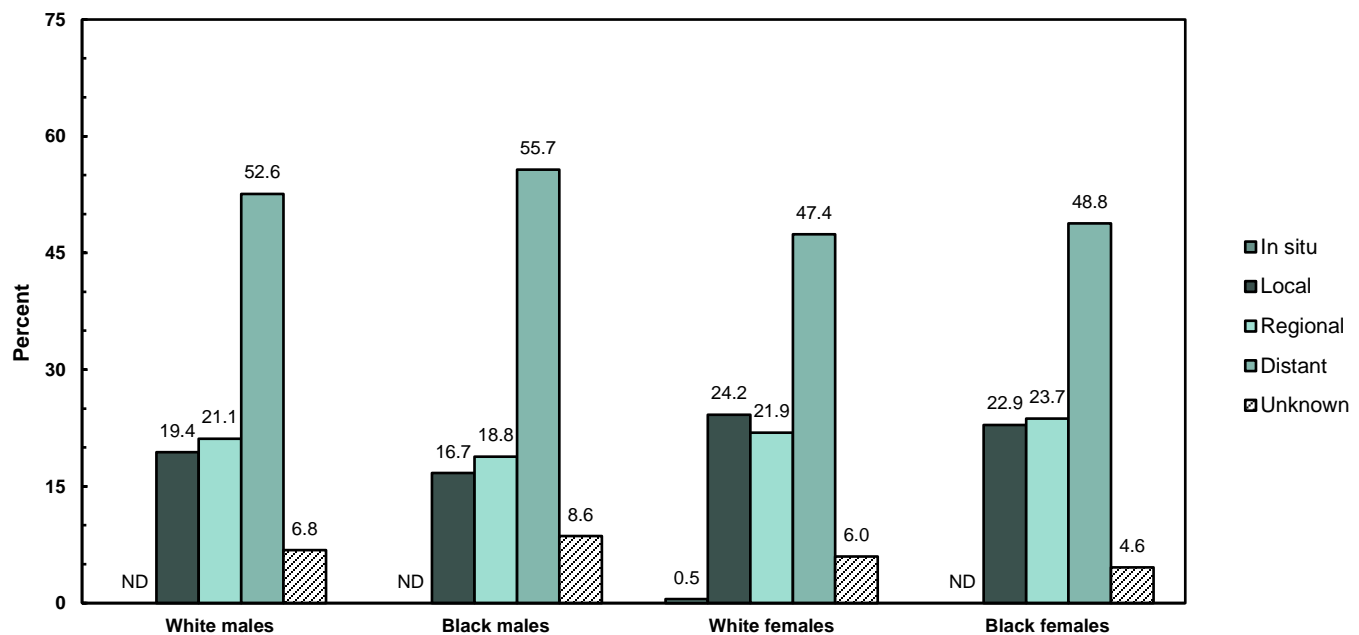
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
9-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 9,400 - 86.9%

Cancer of the Lung and Bronchus: MORTALITY

**TABLE
9-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	7,377	42.8 (41.8-43.8)	4,006	53.3 (51.6-55.0)	3,573	52.5 (50.8-54.2)	338	64.5 (57.6-71.4)	3,371	35.1 (33.9-36.3)	2,970	34.7 (33.5-35.9)	327	41.2 (36.7-45.7)
2014	7,394	43.6 (42.6-44.6)	4,055	54.8 (53.1-56.5)	3,606	53.9 (52.1-55.7)	361	68.3 (61.3-75.3)	3,339	35.2 (34.0-36.4)	2,967	35.0 (33.7-36.3)	315	40.6 (36.1-45.1)
2013	7,507	44.9 (43.9-45.9)	4,150	57.1 (55.4-58.8)	3,693	55.9 (54.1-57.7)	364	72.9 (65.4-80.4)	3,357	36.0 (34.8-37.2)	2,936	35.1 (33.8-36.4)	360	47.4 (42.5-52.3)
2012	7,639	46.4 (45.4-47.4)	4,230	59.4 (57.6-61.2)	3,784	58.4 (56.5-60.3)	365	74.2 (66.6-81.8)	3,409	36.8 (35.6-38.0)	2,992	35.9 (34.6-37.2)	362	49.0 (44.0-54.0)
2011	7,634	47.1 (46.0-48.2)	4,131	59.2 (57.4-61.0)	3,724	58.6 (56.7-60.5)	363	76.0 (68.2-83.8)	3,503	38.4 (37.1-39.7)	3,119	38.0 (36.7-39.3)	352	48.5 (43.4-53.6)
2010	7,729	48.6 (47.5-49.7)	4,306	63.1 (61.2-65.0)	3,866	62.4 (60.4-64.4)	404	87.1 (78.6-95.6)	3,423	38.1 (36.8-39.4)	3,077	38.2 (36.9-39.5)	328	46.5 (41.5-51.5)
2009	7,702	49.7 (48.6-50.8)	4,223	64.5 (62.6-66.4)	3,808	63.5 (61.5-65.5)	380	88.1 (79.2-97.0)	3,479	39.2 (37.9-40.5)	3,107	38.6 (37.2-40.0)	354	52.4 (46.9-57.9)
2008	7,868	51.4 (50.3-52.5)	4,352	67.9 (65.9-69.9)	3,980	67.7 (65.6-69.8)	348	83.5 (74.7-92.3)	3,516	40.1 (38.8-41.4)	3,164	39.6 (38.2-41.0)	337	50.6 (45.2-56.0)
2007	7,884	52.2 (51.0-53.4)	4,390	70.2 (68.1-72.3)	3,970	69.4 (67.2-71.6)	387	91.9 (82.7-101.1)	3,494	40.1 (38.8-41.4)	3,109	39.1 (37.7-40.5)	373	56.8 (51.0-62.6)
2006	7,892	52.8 (51.6-54.0)	4,438	71.9 (69.8-74.0)	4,026	71.2 (69.0-73.4)	393	95.2 (85.8-104.6)	3,454	40.0 (38.7-41.3)	3,089	39.3 (37.9-40.7)	350	53.9 (48.3-59.5)

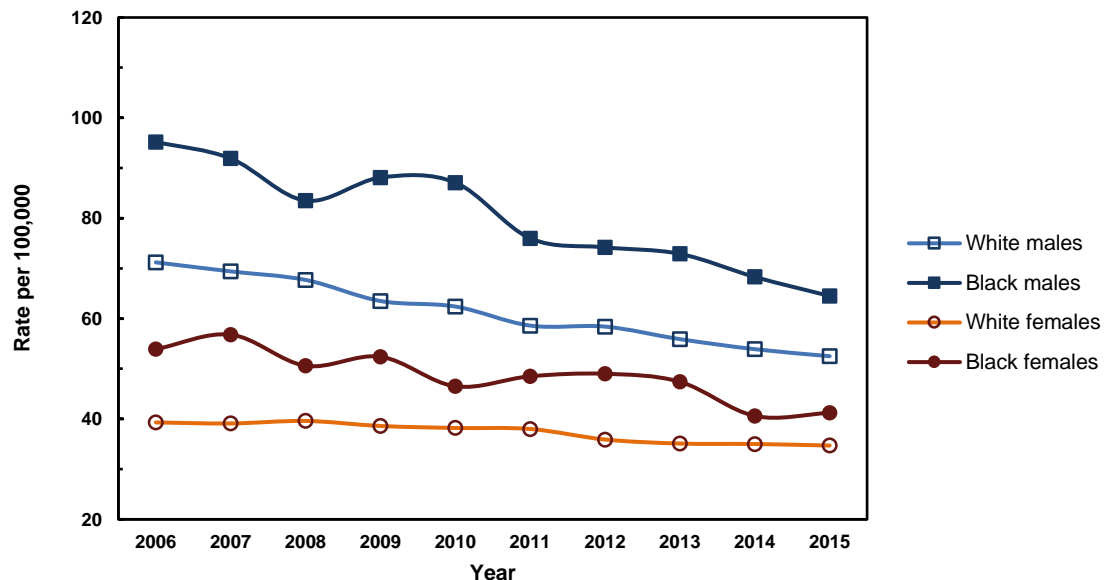
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
9-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Lung and Bronchus: MORTALITY

**TABLE
9-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	37,551	58.8	20,572	65.9	18,380	70.6	1,791	50.7	16,979	52.0	14,984	55.3	1,716	44.9
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
20-24	1	ND	0	ND	0	ND	0	ND	1	ND	1	ND	0	ND
25-29	5	ND	3	ND	3	ND	0	ND	2	ND	1	ND	1	ND
30-34	17	0.4	10	0.5	7	ND	3	ND	7	ND	6	ND	0	ND
35-39	61	1.7	33	1.8	24	1.6	7	ND	28	1.5	23	1.6	4	ND
40-44	207	5.1	95	4.7	77	4.6	14	6.2	112	5.5	96	5.7	13	5.3
45-49	652	14.8	329	15.1	281	15.2	42	18.2	323	14.5	252	13.4	61	24.2
50-54	1,720	35.8	929	39.3	774	37.7	132	57.7	791	32.3	664	31.6	111	43.1
55-59	3,109	66.6	1,740	76.2	1,504	74.7	194	96.7	1,369	57.3	1,145	55.1	202	86.6
60-64	4,197	104.0	2,461	126.2	2,134	122.5	269	176.3	1,736	83.2	1,489	81.2	217	113.9
65-69	5,458	171.8	3,163	210.9	2,796	206.0	306	294.3	2,295	136.9	2,014	135.1	237	169.0
70-74	5,858	249.7	3,282	307.3	2,946	303.4	276	394.2	2,576	201.5	2,281	199.3	260	252.3
75-79	5,642	313.4	3,082	396.6	2,773	389.7	246	508.7	2,560	250.2	2,283	247.3	234	294.3
80-84	5,276	357.9	2,834	483.8	2,601	477.4	180	570.7	2,442	274.9	2,217	272.5	186	301.8
85+	5,346	327.4	2,609	493.7	2,458	495.9	122	466.9	2,737	247.8	2,512	244.7	190	286.5

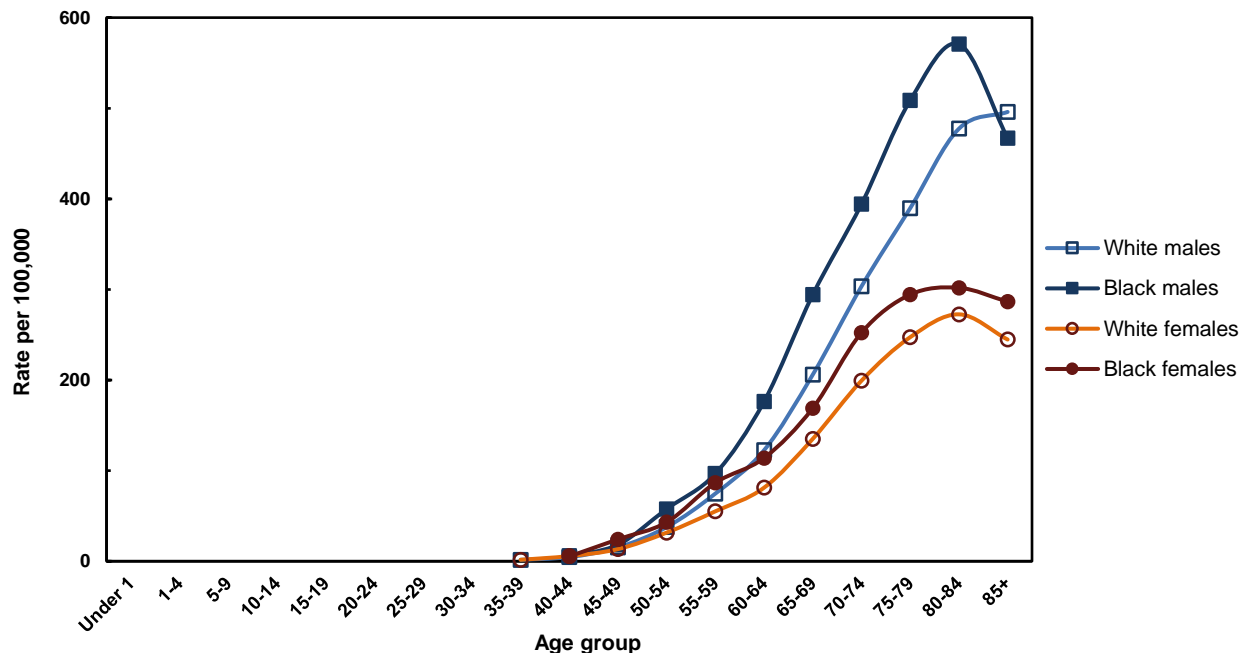
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
9-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Lung and Bronchus: INCIDENCE (Invasive)

**TABLE
9-F**

**Number of Cases, Average Annual Age-Adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	53,127	27,748	75.7	(74.8-76.6)	25,378	55.8	(55.1-56.5)								
Adams	445	230	71.1	(61.9-80.3)	215	57.5	(49.8-65.2)	Juniata	102	62	74.1	(55.7-92.5)	40	44.1	(30.4-57.8)
Allegheny	5,831	2,791	78.6	(75.7-81.5)	3,040	64.6	(62.3-66.9)	Lackawanna	995	543	82.6	(75.7-89.5)	452	56.0	(50.8-61.2)
Armstrong	323	175	74.5	(63.5-85.5)	148	53.9	(45.2-62.6)	Lancaster	1,688	906	60.0	(56.1-63.9)	782	42.7	(39.7-45.7)
Beaver	941	500	90.2	(82.3-98.1)	441	63.4	(57.5-69.3)	Lawrence	469	250	83.1	(72.8-93.4)	219	58.8	(51.0-66.6)
Bedford	200	121	68.5	(56.3-80.7)	79	38.6	(30.1-47.1)	Lebanon	607	343	80.7	(72.2-89.2)	264	50.8	(44.7-56.9)
Berks	1,653	895	77.6	(72.5-82.7)	757	55.1	(51.2-59.0)	Lehigh	1,367	718	73.8	(68.4-79.2)	649	52.8	(48.7-56.9)
Blair	582	315	77.3	(68.8-85.8)	267	53.9	(47.4-60.4)	Luzerne	1,539	828	83.4	(77.7-89.1)	711	56.4	(52.3-60.5)
Bradford	313	184	84.9	(72.6-97.2)	129	54.7	(45.3-64.1)	Lycoming	503	288	82.1	(72.6-91.6)	215	53.1	(46.0-60.2)
Bucks	2,503	1,283	70.7	(66.8-74.6)	1,220	54.4	(51.3-57.5)	McKean	211	106	78.9	(63.9-93.9)	105	66.7	(53.9-79.5)
Butler	726	400	72.0	(64.9-79.1)	326	49.7	(44.3-55.1)	Mercer	502	292	76.2	(67.5-84.9)	210	45.7	(39.5-51.9)
Cambria	619	335	72.5	(64.7-80.3)	284	49.9	(44.1-55.7)	Mifflin	245	148	91.3	(76.6-106.0)	97	53.0	(42.5-63.5)
Cameron	26	15	ND		11	ND		Monroe	720	397	84.5	(76.2-92.8)	323	60.6	(54.0-67.2)
Carbon	315	175	79.9	(68.1-91.7)	140	53.8	(44.9-62.7)	Montgomery	2,805	1,408	61.8	(58.6-65.0)	1,397	48.2	(45.7-50.7)
Centre	365	214	60.8	(52.7-68.9)	151	37.1	(31.2-43.0)	Montour	88	47	79.1	(56.5-101.7)	41	56.2	(39.0-73.4)
Chester	1,546	807	60.7	(56.5-64.9)	739	46.2	(42.9-49.5)	Northampton	1,270	690	79.1	(73.2-85.0)	580	52.1	(47.9-56.3)
Clarion	136	84	68.9	(54.2-83.6)	52	35.8	(26.1-45.5)	Northumberland	458	269	85.5	(75.3-95.7)	189	51.3	(44.0-58.6)
Clearfield	355	207	78.2	(67.5-88.9)	148	47.7	(40.0-55.4)	Perry	200	118	87.8	(72.0-103.6)	82	52.9	(41.5-64.3)
Clinton	157	91	77.5	(61.6-93.4)	66	47.4	(36.0-58.8)	Philadelphia	6,191	2,942	90.3	(87.0-93.6)	3,249	71.0	(68.6-73.4)
Columbia	243	146	73.0	(61.2-84.8)	97	42.2	(33.8-50.6)	Pike	258	137	66.2	(55.1-77.3)	121	55.7	(45.8-65.6)
Crawford	419	242	86.5	(75.6-97.4)	177	54.7	(46.6-62.8)	Potter	99	53	75.2	(55.0-95.4)	46	63.9	(45.4-82.4)
Cumberland	828	455	65.7	(59.7-71.7)	373	42.8	(38.5-47.1)	Schuylkill	737	423	87.2	(78.9-95.5)	314	55.4	(49.3-61.5)
Dauphin	1,079	548	75.8	(69.5-82.1)	531	58.5	(53.5-63.5)	Snyder	128	74	62.3	(48.1-76.5)	54	39.2	(28.7-49.7)
Delaware	2,298	1,111	76.4	(71.9-80.9)	1,187	61.5	(58.0-65.0)	Somerset	280	154	56.5	(47.6-65.4)	126	41.3	(34.1-48.5)
Elk	159	81	73.2	(57.3-89.1)	78	58.9	(45.8-72.0)	Sullivan	39	22	76.3	(44.4-108.2)	17	ND	
Erie	1,142	590	74.6	(68.6-80.6)	552	58.9	(54.0-63.8)	Susquehanna	187	116	73.4	(60.0-86.8)	71	39.9	(30.6-49.2)
Fayette	749	409	92.6	(83.6-101.6)	340	64.1	(57.3-70.9)	Tioga	205	117	78.1	(63.9-92.3)	88	54.1	(42.8-65.4)
Forest	39	21	67.5	(38.6-96.4)	18	ND		Union	129	72	57.5	(44.2-70.8)	57	40.6	(30.1-51.1)
Franklin	627	342	71.9	(64.3-79.5)	285	51.2	(45.3-57.1)	Venango	298	172	93.4	(79.4-107.4)	126	55.0	(45.4-64.6)
Fulton	66	38	71.2	(48.6-93.8)	28	49.4	(31.1-67.7)	Warren	174	94	61.7	(49.2-74.2)	80	47.6	(37.2-58.0)
Greene	182	103	86.5	(69.8-103.2)	79	58.3	(45.4-71.2)	Washington	1,029	534	78.2	(71.6-84.8)	495	60.8	(55.4-66.2)
Huntingdon	175	97	64.5	(51.7-77.3)	78	48.0	(37.3-58.7)	Wayne	274	147	73.4	(61.5-85.3)	127	61.5	(50.8-72.2)
Indiana	296	159	61.3	(51.8-70.8)	137	43.8	(36.5-51.1)	Westmoreland	1,850	960	75.8	(71.0-80.6)	890	58.9	(55.0-62.8)
Jefferson	209	126	82.8	(68.3-97.3)	83	48.5	(38.1-58.9)	Wyoming	142	75	82.7	(64.0-101.4)	67	65.3	(49.7-80.9)
								York	1,791	953	76.4	(71.5-81.3)	838	56.7	(52.9-60.5)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

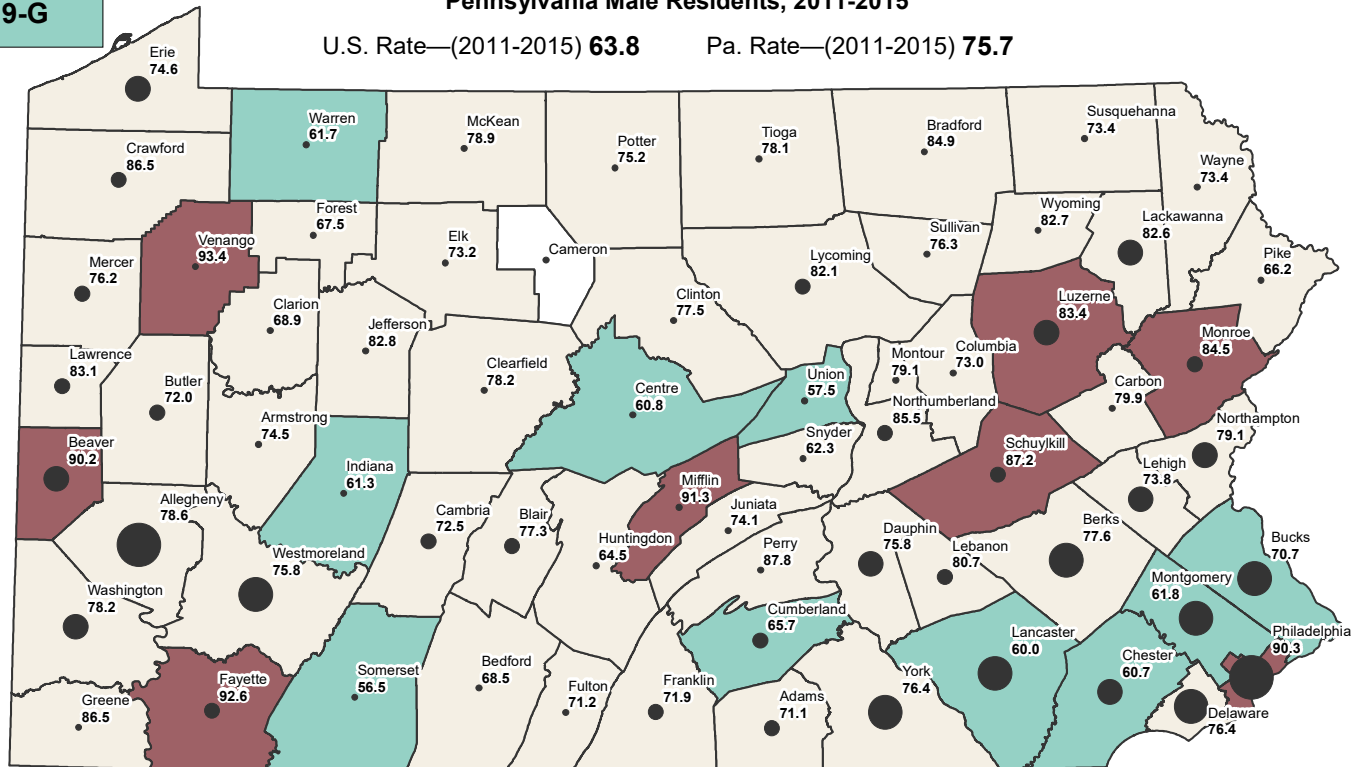
Cancer of the Lung and Bronchus: INCIDENCE (Invasive)

**MAP
9-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **63.8**

Pa. Rate—(2011-2015) **75.7**



Significantly higher

Significantly lower

Not significantly different

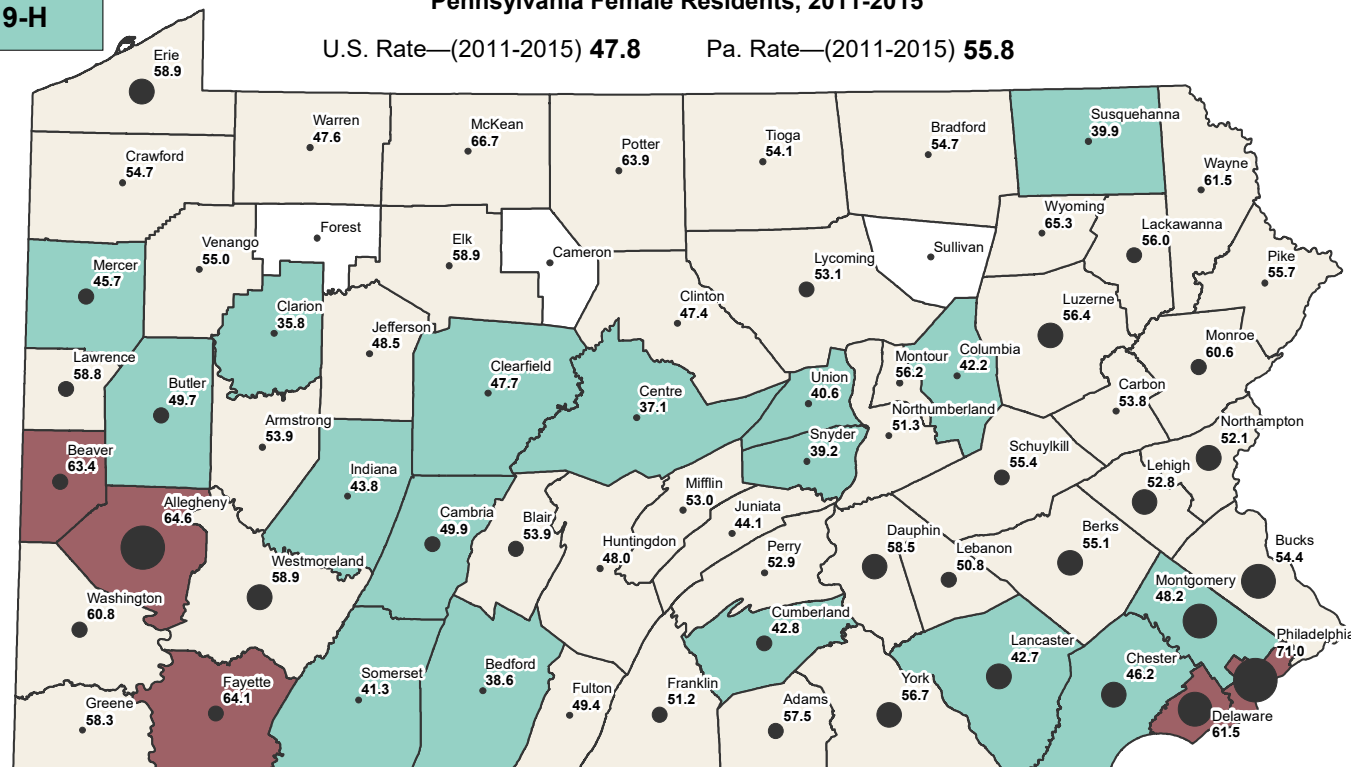
Significance not determined—less than 20 observed cases

**MAP
9-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **47.8**

Pa. Rate—(2011-2015) **55.8**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Lung and Bronchus: MORTALITY

**TABLE
9-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	37,551	20,572	56.7	(55.9-57.5)	16,979	36.3	(35.8-36.8)								
Adams	290	165	52.2	(44.2-60.2)	125	32.1	(26.5-37.7)	Juniata	76	47	57.2	(40.8-73.6)	29	29.3	(18.6-40.0)
Allegheny	4,109	2,098	58.8	(56.3-61.3)	2,011	41.0	(39.2-42.8)	Lackawanna	707	407	61.8	(55.8-67.8)	300	34.8	(30.9-38.7)
Armstrong	214	124	52.6	(43.3-61.9)	90	31.3	(24.8-37.8)	Lancaster	1,190	675	45.0	(41.6-48.4)	515	27.2	(24.9-29.5)
Beaver	656	371	65.9	(59.2-72.6)	285	38.7	(34.2-43.2)	Lawrence	316	190	62.6	(53.7-71.5)	126	32.6	(26.9-38.3)
Bedford	153	88	50.5	(39.9-61.1)	65	32.7	(24.8-40.6)	Lebanon	452	273	64.9	(57.2-72.6)	179	33.5	(28.6-38.4)
Berks	1,083	601	52.5	(48.3-56.7)	482	33.9	(30.9-36.9)	Lehigh	927	497	51.4	(46.9-55.9)	430	33.5	(30.3-36.7)
Blair	380	226	56.0	(48.7-63.3)	154	30.7	(25.9-35.5)	Luzerne	1,065	613	61.7	(56.8-66.6)	452	35.4	(32.1-38.7)
Bradford	230	136	64.3	(53.5-75.1)	94	39.4	(31.4-47.4)	Lycoming	388	222	63.8	(55.4-72.2)	166	39.0	(33.1-44.9)
Bucks	1,679	883	50.0	(46.7-53.3)	796	34.9	(32.5-37.3)	McKean	160	83	62.4	(49.0-75.8)	77	47.7	(37.0-58.4)
Butler	536	324	59.8	(53.3-66.3)	212	31.4	(27.2-35.6)	Mercer	382	236	61.3	(53.5-69.1)	146	30.4	(25.5-35.3)
Cambria	442	256	54.5	(47.8-61.2)	186	30.9	(26.5-35.3)	Mifflin	185	106	66.7	(54.0-79.4)	79	42.9	(33.4-52.4)
Cameron	16	8	ND		8	ND		Monroe	527	307	68.7	(61.0-76.4)	220	41.5	(36.0-47.0)
Carbon	250	142	67.2	(56.1-78.3)	108	41.1	(33.3-48.9)	Montgomery	1,946	1,029	45.3	(42.5-48.1)	917	30.9	(28.9-32.9)
Centre	277	162	46.4	(39.3-53.5)	115	27.6	(22.6-32.6)	Montour	58	33	56.9	(37.5-76.3)	25	35.1	(21.3-48.9)
Chester	1,070	543	41.3	(37.8-44.8)	527	32.7	(29.9-35.5)	Northampton	849	494	56.8	(51.8-61.8)	355	31.2	(28.0-34.4)
Clarion	108	75	61.2	(47.3-75.1)	33	21.5	(14.2-28.8)	Northumberland	357	211	68.4	(59.2-77.6)	146	38.2	(32.0-44.4)
Clearfield	258	155	58.8	(49.5-68.1)	103	31.9	(25.7-38.1)	Perry	146	94	67.5	(53.9-81.1)	52	32.9	(24.0-41.8)
Clinton	141	86	72.2	(56.9-87.5)	55	38.5	(28.3-48.7)	Philadelphia	4,355	2,193	68.6	(65.7-71.5)	2,162	46.5	(44.5-48.5)
Columbia	168	102	53.3	(43.0-63.6)	66	27.5	(20.9-34.1)	Pike	170	97	48.2	(38.6-57.8)	73	35.0	(27.0-43.0)
Crawford	325	185	65.7	(56.2-75.2)	140	42.5	(35.5-49.5)	Potter	78	40	61.2	(42.2-80.2)	38	49.1	(33.5-64.7)
Cumberland	628	351	50.7	(45.4-56.0)	277	30.6	(27.0-34.2)	Schuylkill	573	336	69.4	(62.0-76.8)	237	40.1	(35.0-45.2)
Dauphin	696	350	49.5	(44.3-54.7)	346	36.8	(32.9-40.7)	Snyder	82	57	49.8	(36.9-62.7)	25	18.6	(11.3-25.9)
Delaware	1,644	843	58.2	(54.3-62.1)	801	40.2	(37.4-43.0)	Somerset	220	128	47.6	(39.4-55.8)	92	28.7	(22.8-34.6)
Elk	107	54	48.7	(35.7-61.7)	53	39.3	(28.7-49.9)	Sullivan	30	22	80.9	(47.1-114.7)	8	ND	
Erie	827	432	55.9	(50.6-61.2)	395	41.0	(37.0-45.0)	Susquehanna	131	82	54.4	(42.6-66.2)	49	28.5	(20.5-36.5)
Fayette	547	323	73.8	(65.8-81.8)	224	40.5	(35.2-45.8)	Tioga	150	83	55.3	(43.4-67.2)	67	41.8	(31.8-51.8)
Forest	33	16	ND		17	ND		Union	98	50	40.6	(29.3-51.9)	48	32.0	(22.9-41.1)
Franklin	478	270	57.8	(50.9-64.7)	208	36.4	(31.5-41.3)	Venango	212	131	70.6	(58.5-82.7)	81	34.2	(26.8-41.6)
Fulton	42	22	42.1	(24.5-59.7)	20	34.3	(19.3-49.3)	Warren	147	72	47.2	(36.3-58.1)	75	42.8	(33.1-52.5)
Greene	137	74	66.1	(51.0-81.2)	63	45.7	(34.4-57.0)	Washington	766	438	66.2	(60.0-72.4)	328	38.4	(34.2-42.6)
Huntingdon	121	74	49.9	(38.5-61.3)	47	29.1	(20.8-37.4)	Wayne	199	116	59.0	(48.3-69.7)	83	40.3	(31.6-49.0)
Indiana	224	123	48.1	(39.6-56.6)	101	31.1	(25.0-37.2)	Westmoreland	1,309	722	58.0	(53.8-62.2)	587	37.0	(34.0-40.0)
Jefferson	139	79	52.8	(41.2-64.4)	60	33.9	(25.3-42.5)	Wyoming	101	61	69.6	(52.1-87.1)	40	38.7	(26.7-50.7)
								York	1,191	686	55.9	(51.7-60.1)	505	33.8	(30.9-36.7)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

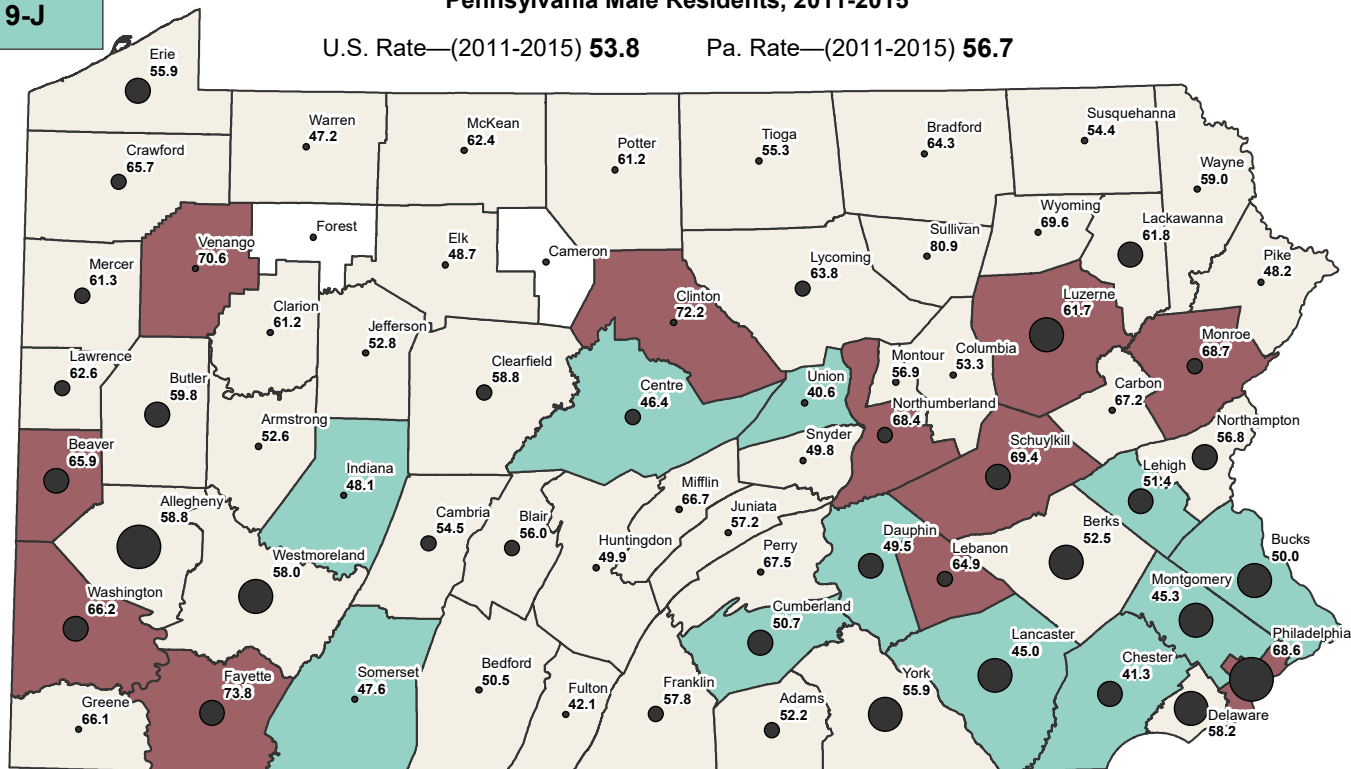
Cancer of the Lung and Bronchus: MORTALITY

**MAP
9-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **53.8**

Pa. Rate—(2011-2015) **56.7**



Significantly higher

Significantly lower

Not significantly different

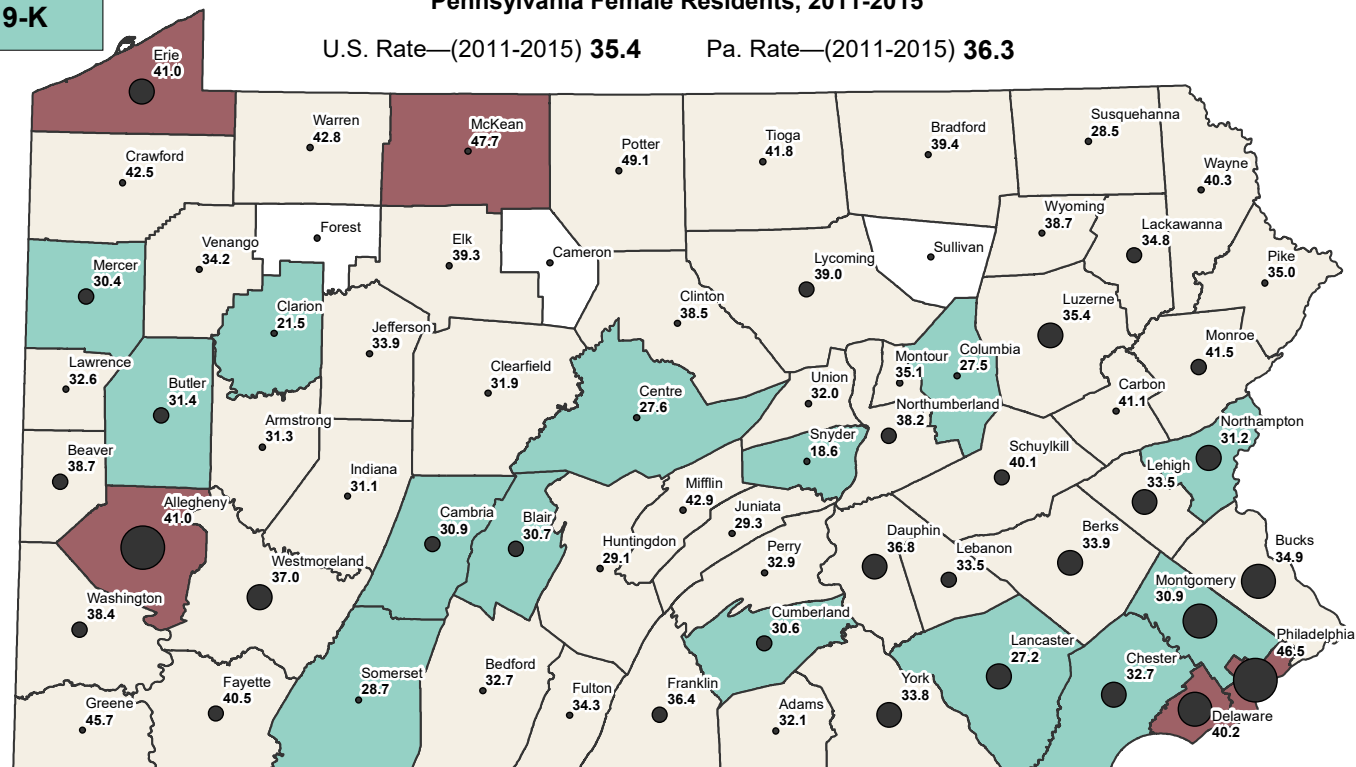
Significance not determined—less than 20 observed cases

**MAP
9-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **35.4**

Pa. Rate—(2011-2015) **36.3**



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Melanoma of the Skin

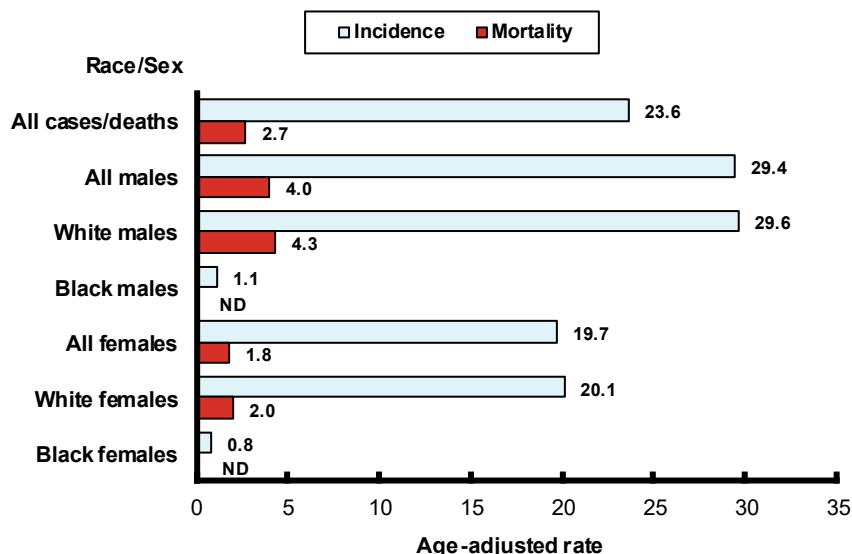
Data Highlights

Average annual (2011-2015) age-adjusted incidence rates for invasive melanoma of the skin were higher among white males (29.6 per 100,000) compared to white females (20.1). Among black males and black females, the rates were much lower, 1.1 and 0.8, respectively. Nationally, whites have a much greater risk compared to population groups with darker skin pigmentation, and white males have a greater risk than white females. There were 4,032 invasive cases of malignant melanoma of the skin diagnosed in 2015 among residents. This is the largest annual number of cases reported during the period of 2006-2015 and is 61 percent higher than the annual number of cases (2,501) reported in 2006. Annual age-adjusted incidence rates for white males and white females have been increasing consistently. Incidence rates for the United States, as published by the National Cancer Institute, also revealed increasing risks between 1975 and 2015. The Pennsylvania average annual age-specific incidence rates for 2011-2015 rose dramatically with age, especially for white males. Compared to white females, age-specific incidence rates were higher among white males aged 50 and older. However, white females aged 15-49 had higher age-specific incidence rates than comparable white males.

In 2015, 85 percent of the melanoma of the skin cancers reported to the Pennsylvania Cancer Registry were diagnosed during the early stage (in situ or local) of the disease, and just 7 percent of the cases were diagnosed at the late stage (regional or distant). Prevention of most melanoma deaths should be possible through primary prevention, such as decreased exposure to sunlight, and through screening. Earlier diagnoses can permit more effective treatment.

As observed with incidence, the average annual age-adjusted death rates for 2011-2015 were much higher for white males compared to white females. There were 410 deaths due to melanoma skin cancer among state residents in 2015, yielding an age-adjusted death rate of 2.5 per 100,000, a decrease from 2014 when there were 455 resident deaths and an age-adjusted death rate of 2.8. Nearly all the deaths due to melanoma occurred among whites. There were no discernible trends in the annual age-adjusted death rates for white males or white females during the 10-year period of 2006-2015.

FIGURE 10
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Note: Rates based on less than 20 events are statistically unreliable and are not displayed (ND).

Risk Factors

According to the American Cancer Society, excess exposure to the sun or other ultraviolet radiation sources (especially at an early age), tanning lamps and beds, lack of skin pigmentation, fair skin, freckling, light hair, immediate family history of skin cancer, personal history of melanoma, having a weakened immune system, dysplastic nevi (moles), and xeroderma pigmentosa are suggestive.

Early Detection

The American Cancer Society recommends routine examinations for changes in skin appearance.

Melanoma of the Skin: INCIDENCE (Invasive)

**TABLE
10-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	4,032	25.7 (24.9-26.5)	2,310	31.4 (30.1-32.7)	2,088	32.0 (30.6-33.4)	9	ND	1,722	21.8 (20.8-22.8)	1,536	22.7 (21.6-23.8)	8	ND
2014	4,017	25.8 (25.0-26.6)	2,303	31.9 (30.6-33.2)	2,053	31.9 (30.5-33.3)	5	ND	1,714	21.8 (20.8-22.8)	1,460	21.4 (20.3-22.5)	5	ND
2013	3,728	24.3 (23.5-25.1)	2,137	30.0 (28.7-31.3)	1,912	30.0 (28.7-31.3)	5	ND	1,591	20.4 (19.4-21.4)	1,406	21.1 (20.0-22.2)	6	ND
2012	3,220	21.2 (20.5-21.9)	1,912	27.2 (26.0-28.4)	1,738	27.6 (26.3-28.9)	7	ND	1,308	17.0 (16.1-17.9)	1,162	17.6 (16.6-18.6)	6	ND
2011	3,194	21.1 (20.4-21.8)	1,821	26.2 (25.0-27.4)	1,656	26.5 (25.2-27.8)	6	ND	1,373	17.6 (16.7-18.5)	1,202	17.7 (16.7-18.7)	6	ND
2010	3,069	20.5 (19.8-21.2)	1,712	24.9 (23.7-26.1)	1,532	25.1 (23.8-26.4)	5	ND	1,356	17.6 (16.7-18.5)	1,216	18.5 (17.5-19.5)	3	ND
2009	2,940	20.3 (19.6-21.0)	1,656	25.1 (23.9-26.3)	1,513	25.4 (24.1-26.7)	7	ND	1,284	17.0 (16.1-17.9)	1,170	17.7 (16.7-18.7)	5	ND
2008	2,585	18.2 (17.5-18.9)	1,460	22.8 (21.6-24.0)	1,384	23.9 (22.6-25.2)	9	ND	1,125	15.2 (14.3-16.1)	1,064	16.3 (15.3-17.3)	4	ND
2007	2,431	17.3 (16.6-18.0)	1,321	21.0 (19.9-22.1)	1,253	22.0 (20.8-23.2)	6	ND	1,110	15.3 (14.4-16.2)	1,039	16.4 (15.4-17.4)	6	ND
2006	2,501	18.0 (17.3-18.7)	1,360	21.7 (20.5-22.9)	1,274	22.5 (21.3-23.7)	5	ND	1,141	15.8 (14.9-16.7)	1,049	16.6 (15.6-17.6)	4	ND

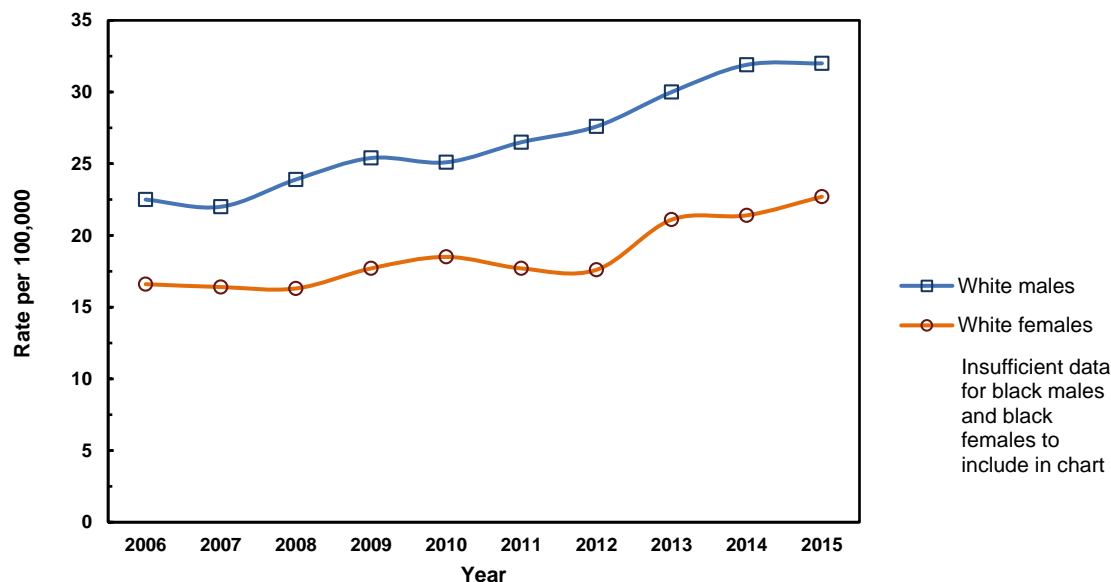
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
10-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Melanoma of the Skin: INCIDENCE (Invasive)

**TABLE
10-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

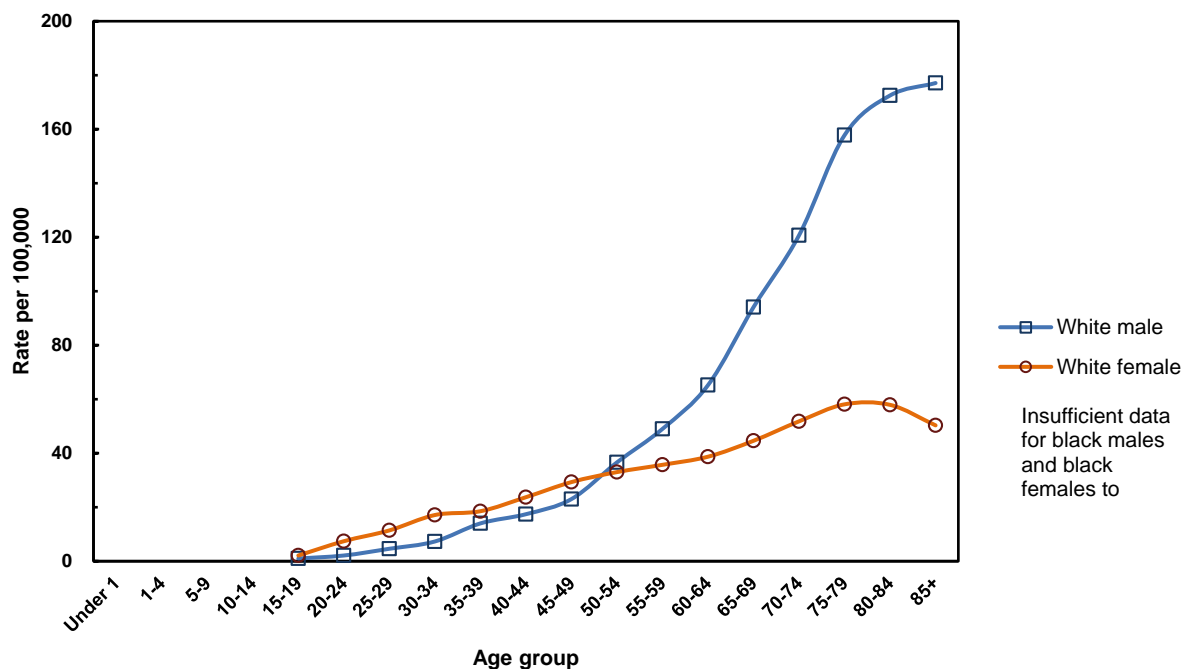
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	28.5	33.6	36.3	0.9	23.6	25.0	0.8
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	0.4	ND	ND	ND	ND	ND	ND
15-19	1.4	1.0	1.0	ND	1.9	2.1	ND
20-24	4.2	1.8	2.1	ND	6.6	7.4	ND
25-29	7.4	4.2	4.6	ND	10.6	11.4	ND
30-34	11.4	6.8	7.3	ND	16.0	17.1	ND
35-39	15.5	13.1	14.0	ND	17.8	18.5	ND
40-44	19.6	16.8	17.4	ND	22.3	23.7	ND
45-49	26.2	22.8	23.0	ND	29.5	29.3	ND
50-54	34.3	36.4	36.6	ND	32.3	33.0	ND
55-59	42.5	49.6	49.0	ND	35.7	35.7	ND
60-64	51.4	64.6	65.2	ND	39.1	38.7	ND
65-69	68.4	95.1	94.1	ND	44.4	44.6	ND
70-74	82.0	118.9	120.7	ND	51.2	51.8	ND
75-79	99.5	154.6	157.8	ND	57.8	58.1	ND
80-84	105.0	173.9	172.5	ND	59.5	57.9	ND
85+	92.8	179.2	177.1	ND	51.4	50.3	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
10-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Melanoma of the Skin: INCIDENCE (Invasive)

**TABLE
10-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	18,191	10,483	9,447	32	7,708	6,766	31
Under 1	7	5	5	0	2	2	0
1-4	5	1	0	1	4	4	0
5-9	5	1	0	1	4	4	0
10-14	14	7	5	0	7	7	0
15-19	60	21	18	0	39	34	0
20-24	184	41	36	0	143	124	0
25-29	305	89	77	0	216	184	1
30-34	442	132	116	2	310	265	0
35-39	561	237	208	0	324	271	1
40-44	790	337	292	2	453	396	2
45-49	1,155	497	426	1	658	550	5
50-54	1,652	861	751	4	791	693	1
55-59	1,984	1,131	987	3	853	741	4
60-64	2,075	1,259	1,136	2	816	710	5
65-69	2,172	1,427	1,277	8	745	665	2
70-74	1,925	1,270	1,172	3	655	593	2
75-79	1,792	1,201	1,123	1	591	536	3
80-84	1,548	1,019	940	1	529	471	4
85+	1,515	947	878	3	568	516	1

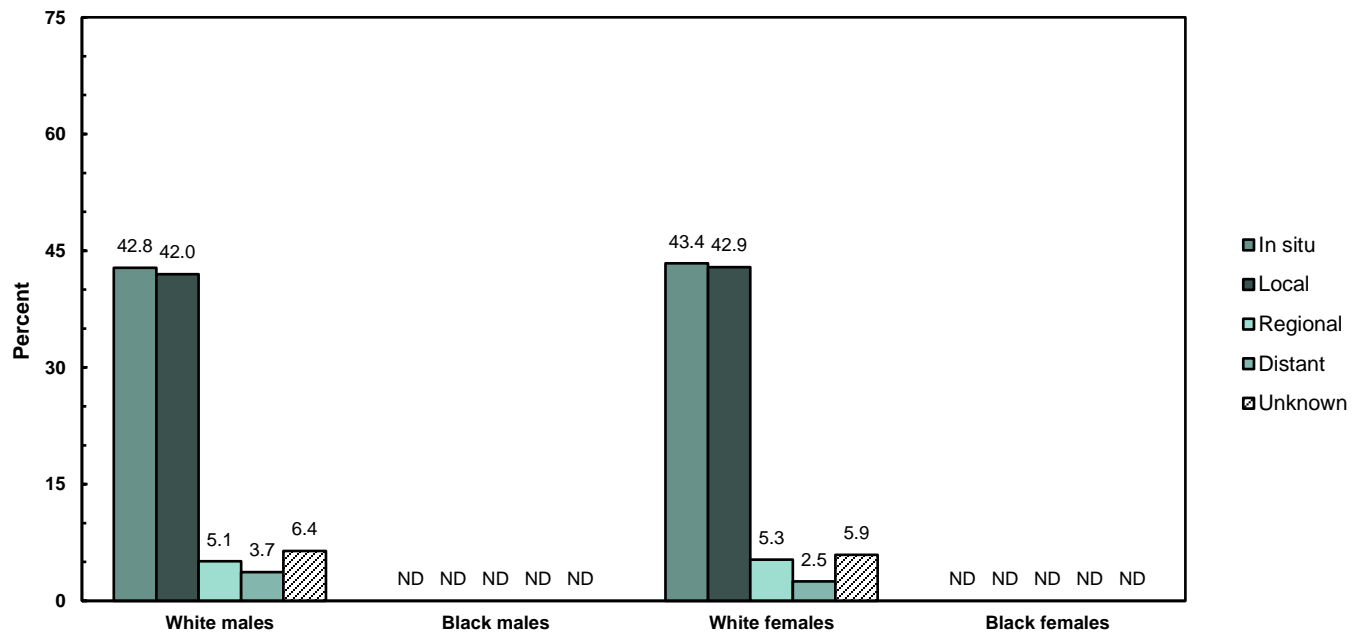
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
10-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 4,018 - 99.7%

Melanoma of the Skin: MORTALITY

**TABLE
10-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	410	2.5 (2.3-2.7)	261	3.6 (3.2-4.0)	255	4.0 (3.5-4.5)	3	ND	149	1.6 (1.3-1.9)	145	1.8 (1.5-2.1)	2	ND
2014	455	2.8 (2.5-3.1)	275	3.8 (3.4-4.2)	269	4.1 (3.6-4.6)	4	ND	180	2.0 (1.7-2.3)	172	2.1 (1.8-2.4)	5	ND
2013	446	2.7 (2.4-3.0)	282	4.0 (3.5-4.5)	277	4.4 (3.9-4.9)	3	ND	164	1.8 (1.5-2.1)	159	2.0 (1.7-2.3)	0	ND
2012	430	2.6 (2.4-2.8)	269	3.8 (3.3-4.3)	267	4.1 (3.6-4.6)	1	ND	161	1.7 (1.4-2.0)	158	1.9 (1.6-2.2)	1	ND
2011	482	3.1 (2.8-3.4)	315	4.6 (4.1-5.1)	313	5.1 (4.5-5.7)	2	ND	167	1.9 (1.6-2.2)	161	2.1 (1.8-2.4)	4	ND
2010	462	3.0 (2.7-3.3)	298	4.4 (3.9-4.9)	292	4.8 (4.2-5.4)	4	ND	164	1.9 (1.6-2.2)	161	2.1 (1.8-2.4)	2	ND
2009	470	3.1 (2.8-3.4)	299	4.5 (4.0-5.0)	297	4.9 (4.3-5.5)	2	ND	171	2.0 (1.7-2.3)	170	2.2 (1.9-2.5)	1	ND
2008	441	3.0 (2.7-3.3)	278	4.4 (3.9-4.9)	277	4.8 (4.2-5.4)	0	ND	163	1.9 (1.6-2.2)	159	2.1 (1.8-2.4)	4	ND
2007	406	2.7 (2.4-3.0)	259	4.2 (3.7-4.7)	255	4.5 (3.9-5.1)	3	ND	147	1.7 (1.4-2.0)	144	1.9 (1.6-2.2)	3	ND
2006	416	2.9 (2.6-3.2)	265	4.4 (3.9-4.9)	263	4.7 (4.1-5.3)	2	ND	151	1.8 (1.5-2.1)	147	2.0 (1.7-2.3)	2	ND

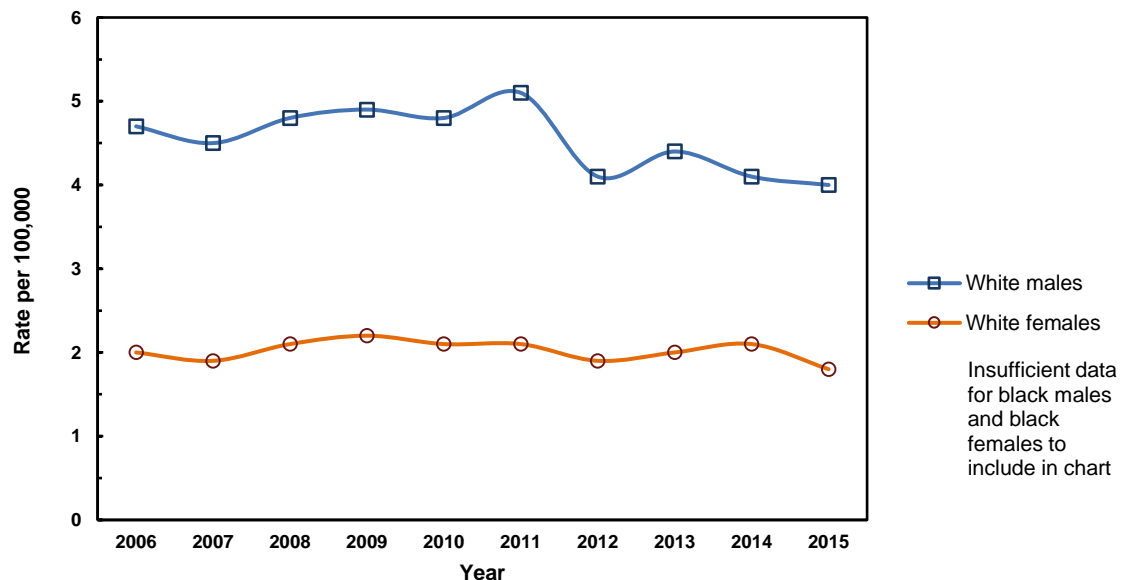
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (See Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
10-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Melanoma of the Skin: MORTALITY

**TABLE
10-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	2,223	3.5	1,402	4.5	1,381	5.3	13	0.4	821	2.5	795	2.9	12	0.3
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	5	ND	3	ND	3	ND	0	ND	2	ND	2	ND	0	ND
25-29	10	0.2	7	ND	7	ND	0	ND	3	ND	3	ND	0	ND
30-34	23	0.6	9	ND	8	ND	1	ND	14	0.7	14	0.9	0	ND
35-39	32	0.9	16	0.9	16	1.1	0	ND	16	0.9	13	0.9	3	ND
40-44	68	1.7	39	1.9	37	2.2	1	ND	29	1.4	26	1.6	0	ND
45-49	78	1.8	49	2.3	48	2.6	1	ND	29	1.3	28	1.5	1	ND
50-54	147	3.1	90	3.8	89	4.3	0	ND	57	2.3	54	2.6	2	ND
55-59	205	4.4	133	5.8	130	6.5	2	ND	72	3.0	69	3.3	0	ND
60-64	227	5.6	151	7.7	150	8.6	1	ND	76	3.6	74	4.0	2	ND
65-69	214	6.7	147	9.8	145	10.7	1	ND	67	4.0	61	4.1	2	ND
70-74	236	10.1	150	14.0	148	15.2	2	ND	86	6.7	86	7.5	0	ND
75-79	281	15.6	202	26.0	199	28.0	1	ND	79	7.7	77	8.3	1	ND
80-84	297	20.1	193	32.9	192	35.2	0	ND	104	11.7	103	12.7	1	ND
85+	399	24.4	212	40.1	208	42.0	3	ND	187	16.9	185	18.0	0	ND

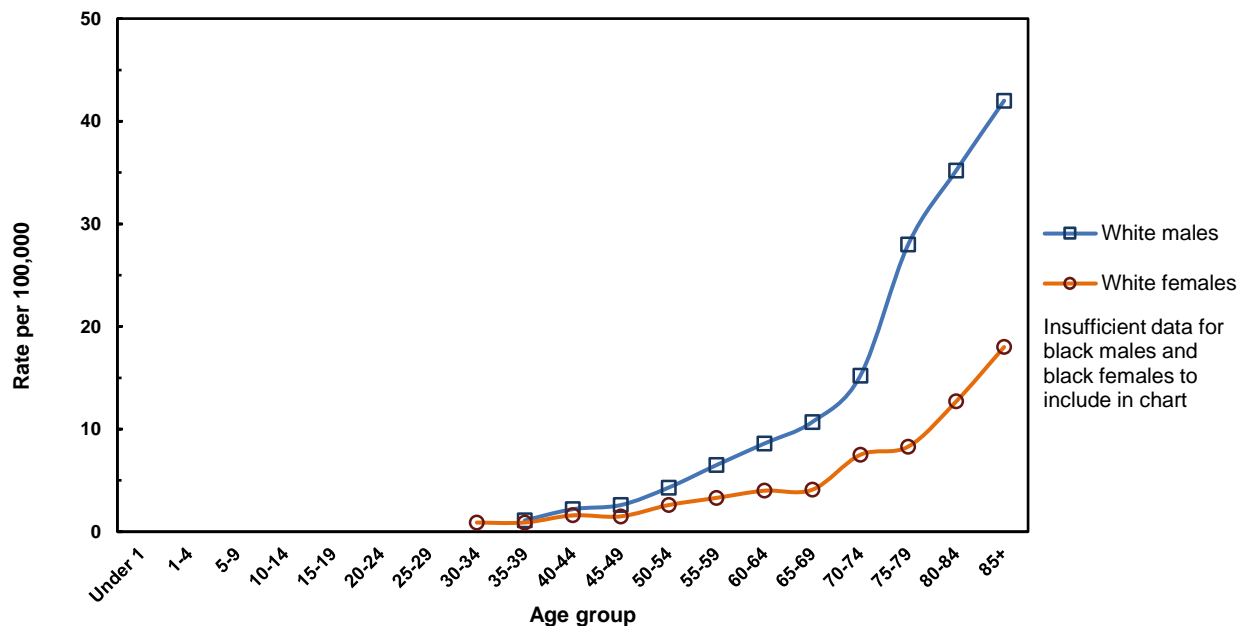
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
10-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Melanoma of the Skin: INCIDENCE (Invasive)

**TABLE
10-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	18,191	10,483	29.4	(28.8-30.0)	7,708	19.7	(19.3-20.1)								
Adams	184	105	32.6	(26.4-38.8)	79	25.1	(19.6-30.6)	Juniata	50	30	38.4	(24.7-52.1)	20	28.1	(15.8-40.4)
Allegheny	1,658	906	26.2	(24.5-27.9)	752	19.2	(17.8-20.6)	Lackawanna	242	137	22.1	(18.4-25.8)	105	14.9	(12.0-17.8)
Armstrong	109	57	25.2	(18.7-31.7)	52	24.3	(17.7-30.9)	Lancaster	816	501	34.2	(31.2-37.2)	315	20.0	(17.8-22.2)
Beaver	215	123	23.8	(19.6-28.0)	92	18.1	(14.4-21.8)	Lawrence	100	61	23.7	(17.8-29.6)	39	14.0	(9.6-18.4)
Bedford	82	53	33.3	(24.3-42.3)	29	17.1	(10.9-23.3)	Lebanon	198	107	26.2	(21.2-31.2)	91	20.9	(16.6-25.2)
Berks	547	301	26.6	(23.6-29.6)	246	20.1	(17.6-22.6)	Lehigh	567	334	34.8	(31.1-38.5)	233	21.4	(18.7-24.1)
Blair	203	124	31.9	(26.3-37.5)	79	20.2	(15.7-24.7)	Luzerne	418	248	25.6	(22.4-28.8)	170	16.3	(13.8-18.8)
Bradford	107	67	34.4	(26.2-42.6)	40	20.0	(13.8-26.2)	Lycoming	167	88	26.8	(21.2-32.4)	79	21.3	(16.6-26.0)
Bucks	1,216	709	38.0	(35.2-40.8)	507	25.5	(23.3-27.7)	McKean	50	26	19.1	(11.8-26.4)	24	20.6	(12.4-28.8)
Butler	336	190	34.8	(29.9-39.7)	146	26.8	(22.5-31.1)	Mercer	192	107	28.4	(23.0-33.8)	85	24.0	(18.9-29.1)
Cambria	204	121	26.9	(22.1-31.7)	83	20.3	(15.9-24.7)	Mifflin	76	43	28.9	(20.3-37.5)	33	23.4	(15.4-31.4)
Cameron	6	4	ND		2	ND		Monroe	174	100	21.7	(17.4-26.0)	74	15.5	(12.0-19.0)
Carbon	94	57	27.5	(20.4-34.6)	37	18.4	(12.5-24.3)	Montgomery	1,574	900	40.1	(37.5-42.7)	674	26.1	(24.1-28.1)
Centre	251	152	43.1	(36.2-50.0)	99	25.3	(20.3-30.3)	Montour	43	35	64.2	(42.9-85.5)	8	ND	
Chester	919	543	41.5	(38.0-45.0)	376	25.2	(22.7-27.7)	Northampton	490	295	34.2	(30.3-38.1)	195	21.0	(18.1-23.9)
Clarion	51	28	24.9	(15.7-34.1)	23	20.6	(12.2-29.0)	Northumberland	125	63	20.6	(15.5-25.7)	62	21.8	(16.4-27.2)
Clearfield	99	60	23.7	(17.7-29.7)	39	14.0	(9.6-18.4)	Perry	79	49	35.4	(25.5-45.3)	30	21.4	(13.7-29.1)
Clinton	42	26	23.0	(14.2-31.8)	16	ND		Philadelphia	903	537	16.3	(14.9-17.7)	366	8.2	(7.4-9.0)
Columbia	107	64	34.0	(25.7-42.3)	43	20.5	(14.4-26.6)	Pike	63	43	20.7	(14.5-26.9)	20	10.1	(5.7-14.5)
Crawford	120	67	24.7	(18.8-30.6)	53	18.5	(13.5-23.5)	Potter	35	23	34.4	(20.3-48.5)	12	ND	
Cumberland	408	230	32.7	(28.5-36.9)	178	24.0	(20.5-27.5)	Schuylkill	217	126	27.3	(22.5-32.1)	91	19.2	(15.3-23.1)
Dauphin	404	245	34.6	(30.3-38.9)	159	19.8	(16.7-22.9)	Snyder	74	40	36.4	(25.1-47.7)	34	27.6	(18.3-36.9)
Delaware	891	483	33.9	(30.9-36.9)	408	23.9	(21.6-26.2)	Somerset	125	75	30.1	(23.3-36.9)	50	20.3	(14.7-25.9)
Elk	43	24	23.0	(13.8-32.2)	19	ND		Sullivan	9	5	ND		4	ND	
Erie	265	146	19.3	(16.2-22.4)	119	15.0	(12.3-17.7)	Susquehanna	70	39	24.5	(16.8-32.2)	31	29.1	(18.9-39.3)
Fayette	128	78	20.0	(15.6-24.4)	50	12.7	(9.2-16.2)	Tioga	72	38	28.4	(19.4-37.4)	34	27.5	(18.3-36.7)
Forest	6	4	ND		2	ND		Union	64	35	26.5	(17.7-35.3)	29	25.1	(16.0-34.2)
Franklin	278	173	38.0	(32.3-43.7)	105	22.3	(18.0-26.6)	Venango	87	55	31.0	(22.8-39.2)	32	21.1	(13.8-28.4)
Fulton	36	27	55.1	(34.3-75.9)	9	ND		Warren	53	28	18.0	(11.3-24.7)	25	22.2	(13.5-30.9)
Greene	34	19	ND		15	ND		Washington	292	169	27.0	(22.9-31.1)	123	18.9	(15.6-22.2)
Huntingdon	53	33	22.4	(14.8-30.0)	20	16.4	(9.2-23.6)	Wayne	66	36	22.2	(14.9-29.5)	30	17.3	(11.1-23.5)
Indiana	114	63	26.6	(20.0-33.2)	51	21.1	(15.3-26.9)	Westmoreland	562	319	26.8	(23.9-29.7)	243	22.8	(19.9-25.7)
Jefferson	55	26	17.8	(11.0-24.6)	29	21.9	(13.9-29.9)	Wyoming	43	25	28.2	(17.1-39.3)	18	ND	
								York	830	458	37.7	(34.2-41.2)	372	28.4	(25.5-31.3)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

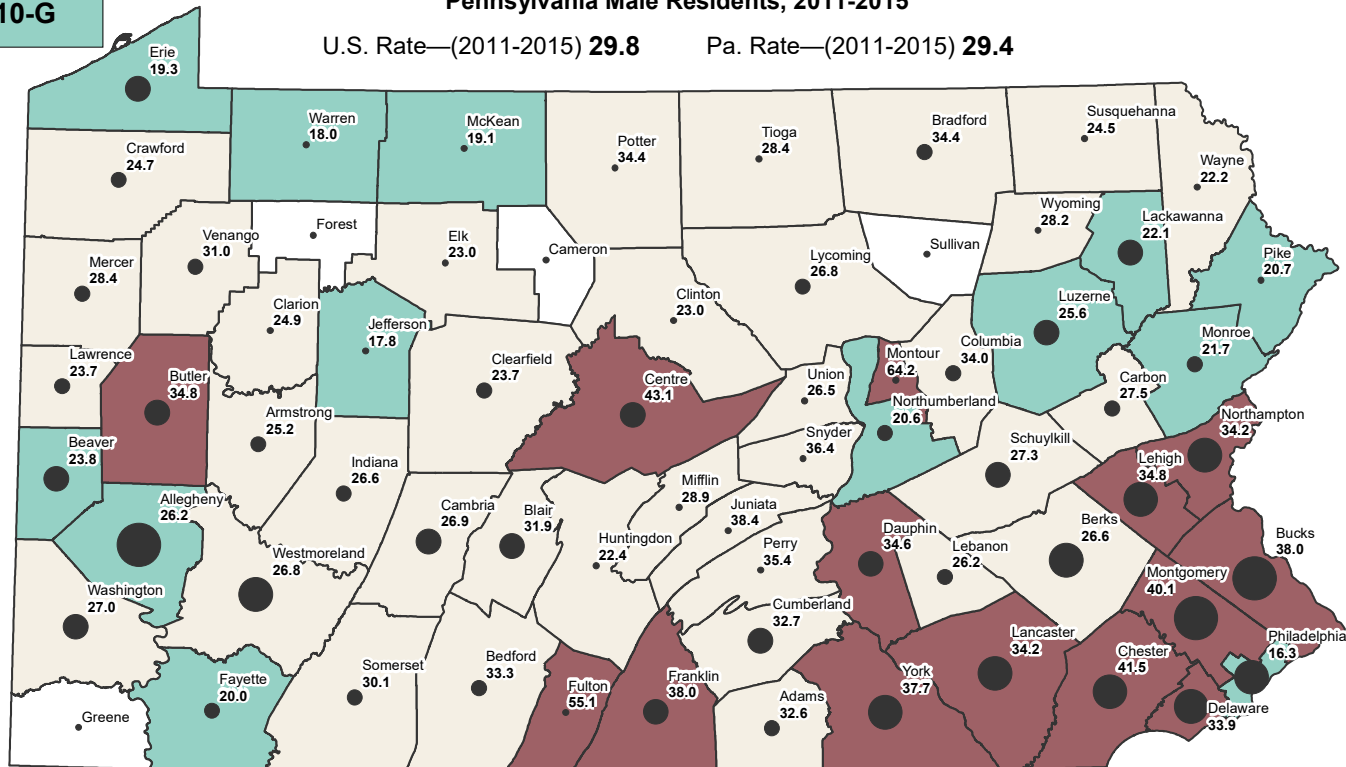
Melanoma of the Skin: INCIDENCE (Invasive)

**MAP
10-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **29.8**

Pa. Rate—(2011-2015) **29.4**



Significantly higher

Significantly lower

Not significantly different

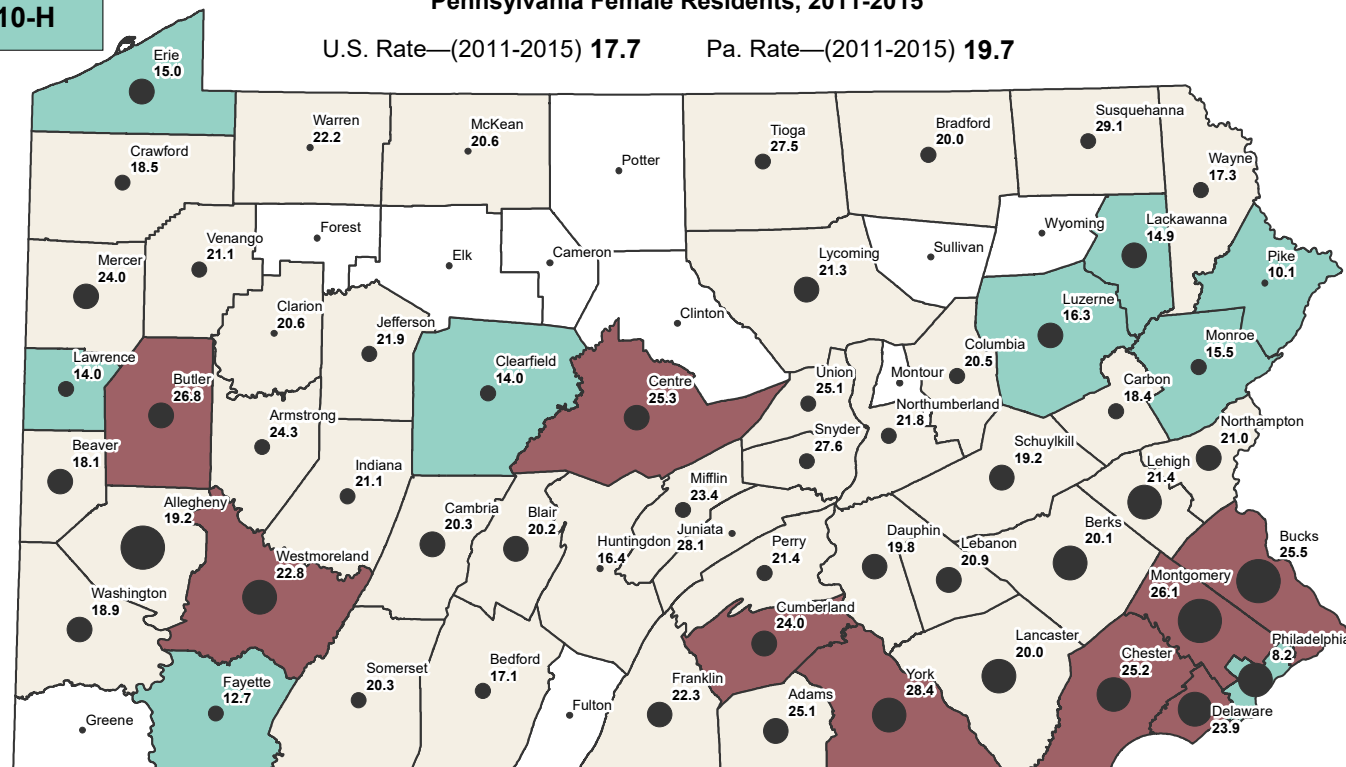
Significance not determined—less than 20 observed cases

**MAP
10-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **17.7**

Pa. Rate—(2011-2015) **19.7**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Melanoma of the Skin: MORTALITY

**TABLE
10-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	2,223	1,402	4.0	(3.8-4.2)	821	1.8	(1.7-1.9)								
Adams	16	13	ND		3	ND		Juniata	7	5	ND		2	ND	
Allegheny	179	108	3.0	(2.4-3.6)	71	1.5	(1.2-1.8)	Lackawanna	30	20	3.2	(1.8-4.6)	10	ND	
Armstrong	9	5	ND		4	ND		Lancaster	110	75	5.2	(4.0-6.4)	35	1.9	(1.3-2.5)
Beaver	24	18	ND		6	ND		Lawrence	17	10	ND		7	ND	
Bedford	13	10	ND		3	ND		Lebanon	31	14	ND		17	ND	
Berks	65	38	3.4	(2.3-4.5)	27	1.9	(1.2-2.6)	Lehigh	66	42	4.2	(2.9-5.5)	24	1.8	(1.1-2.5)
Blair	26	17	ND		9	ND		Luzerne	83	53	5.6	(4.1-7.1)	30	2.3	(1.5-3.1)
Bradford	13	8	ND		5	ND		Lycoming	32	18	ND		14	ND	
Bucks	103	70	4.0	(3.1-4.9)	33	1.4	(0.9-1.9)	McKean	5	4	ND		1	ND	
Butler	33	21	4.0	(2.3-5.7)	12	ND		Mercer	35	21	5.3	(3.0-7.6)	14	ND	
Cambria	25	16	ND		9	ND		Mifflin	8	6	ND		2	ND	
Cameron	2	1	ND		1	ND		Monroe	24	14	ND		10	ND	
Carbon	21	11	ND		10	ND		Montgomery	161	87	4.0	(3.2-4.8)	74	2.4	(1.9-2.9)
Centre	15	7	ND		8	ND		Montour	4	3	ND		1	ND	
Chester	93	62	5.0	(3.8-6.2)	31	1.7	(1.1-2.3)	Northampton	61	41	4.7	(3.3-6.1)	20	1.9	(1.1-2.7)
Clarion	14	10	ND		4	ND		Northumberland	16	11	ND		5	ND	
Clearfield	18	11	ND		7	ND		Perry	13	8	ND		5	ND	
Clinton	5	3	ND		2	ND		Philadelphia	138	85	2.8	(2.2-3.4)	53	1.2	(0.9-1.5)
Columbia	11	7	ND		4	ND		Pike	6	4	ND		2	ND	
Crawford	12	6	ND		6	ND		Potter	4	3	ND		1	ND	
Cumberland	42	29	4.6	(2.9-6.3)	13	ND		Schuylkill	35	24	4.9	(2.9-6.9)	11	ND	
Dauphin	37	28	4.1	(2.6-5.6)	9	ND		Snyder	10	5	ND		5	ND	
Delaware	114	73	5.1	(3.9-6.3)	41	2.0	(1.4-2.6)	Somerset	13	8	ND		5	ND	
Elk	3	2	ND		1	ND		Sullivan	4	3	ND		1	ND	
Erie	50	31	4.3	(2.8-5.8)	19	ND		Susquehanna	11	8	ND		3	ND	
Fayette	30	20	4.9	(2.8-7.0)	10	ND		Tioga	12	7	ND		5	ND	
Forest	2	2	ND		0	ND		Union	4	2	ND		2	ND	
Franklin	23	15	ND		8	ND		Venango	13	9	ND		4	ND	
Fulton	7	3	ND		4	ND		Warren	13	8	ND		5	ND	
Greene	5	3	ND		2	ND		Washington	35	23	3.4	(2.0-4.8)	12	ND	
Huntingdon	14	8	ND		6	ND		Wayne	13	6	ND		7	ND	
Indiana	17	13	ND		4	ND		Westmoreland	62	35	2.8	(1.9-3.7)	27	2.1	(1.3-2.9)
Jefferson	10	4	ND		6	ND		Wyoming	7	5	ND		2	ND	
								York	89	62	5.2	(3.9-6.5)	27	1.9	(1.2-2.6)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

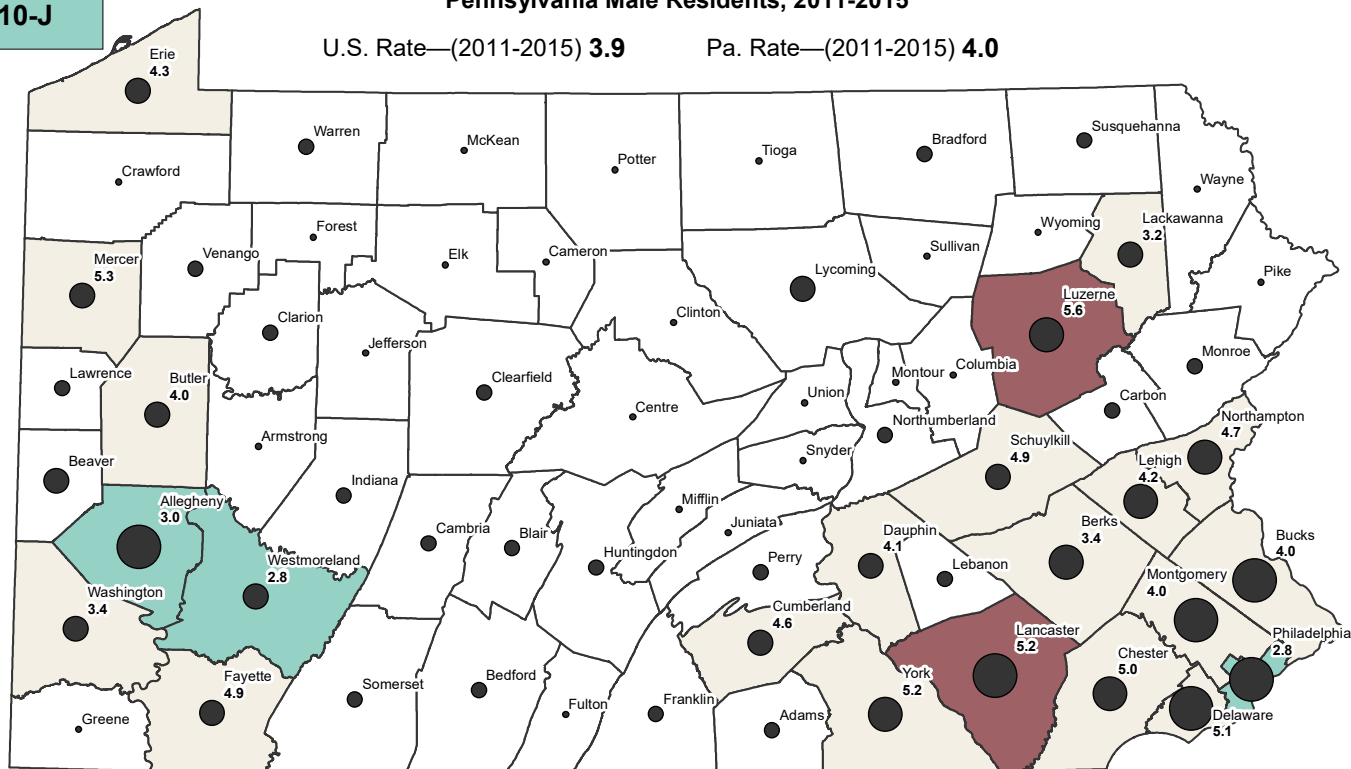
Melanoma of the Skin: MORTALITY

**MAP
10-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **3.9**

Pa. Rate—(2011-2015) **4.0**



Significantly higher

Significantly lower

Not significantly different

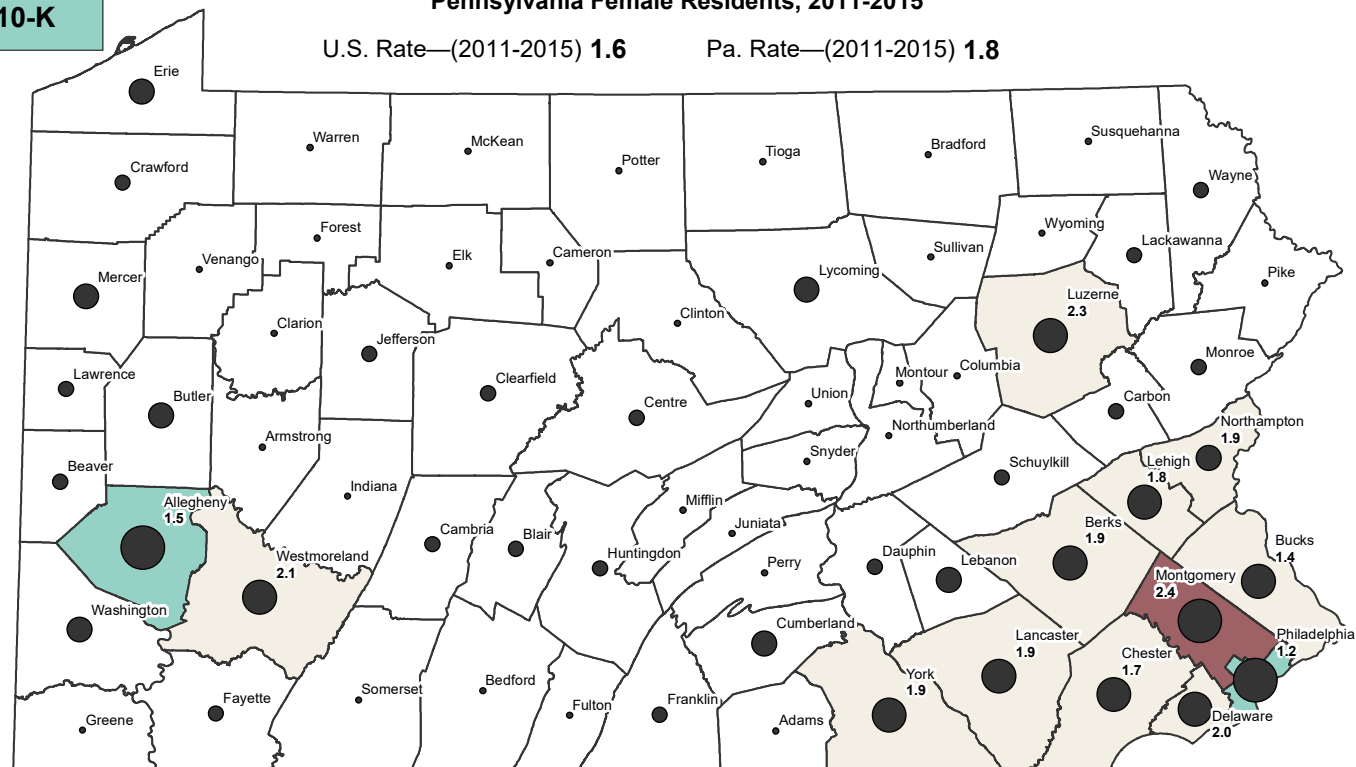
Significance not determined—less than 20 observed cases

**MAP
10-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **1.6**

Pa. Rate—(2011-2015) **1.8**



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Female Breast

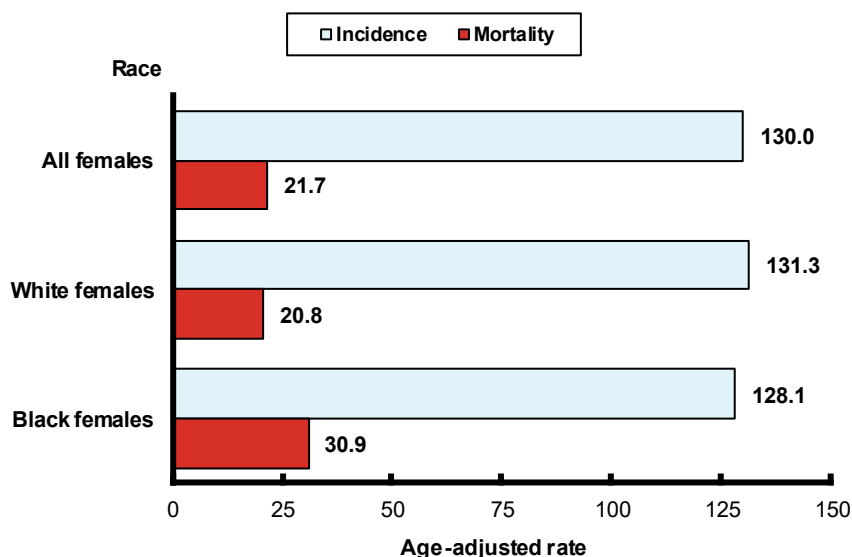
Data Highlights

As in previous years, breast cancer represented the leading cancer site for females. In Pennsylvania, there were 11,075 cases, accounting for approximately 28 percent of all invasive female cancer cases diagnosed in 2015. The 2011-2015 annual age-adjusted incidence rate for white females (131.3 per 100,000) was higher than the rate for black females (128.1). The annual age-adjusted rate among black females was higher than the rate for white females from 2006 to 2010; however, the rate for black females was less than the rate for white females from 2011 to 2014. In 2015, the rate for black females was again higher than the rate for white females. During the period 2006-2015, the rates among black women varied dramatically from a low of 120.6 in 2012 to high of 140.0 in 2008. Among white women, the annual rates were lowest for the years 2006 and 2007. The average annual age-specific incidence rates for 2011-2015 rose rapidly for females aged 30 and over. During the period of 2011-2015, approximately 96 percent of the female breast cancer cases were diagnosed among Pennsylvania residents aged 40 years or older.

In 2015, breast cancer was the second most frequent cause of cancer mortality among females, with 2,023 deaths – surpassed only by lung/bronchus cancers, which were responsible for 3,371 resident female deaths. Stage of disease is the single best predictor of survival. In 2015, about 26 percent of the female breast cancers were diagnosed at the late stage (regional or distant) of the disease, and 72 percent were diagnosed at the early (in situ or local) stage. Five-year survival rates in Pennsylvania were 83.6 percent for regionally staged cancers but dropped to 25.8 percent for distant staged cancers.

The 2011-2015 average annual age-adjusted death rate among black females (30.9 per 100,000) was about 49 percent higher than the rate for white females (20.8). The annual age-adjusted death rate for 2015 among all females was 21.6. This was an increase from 2014 when the death rate was 20.6. Annual age-adjusted death rates for white female and black female residents have declined over the 10-year period, 2006-2015. While there are no proven technologies to reduce breast cancer incidence, interventions aimed at early detection can significantly reduce death rates.

FIGURE 11
Average Annual Age-Adjusted Incidence and Death Rates*



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, genetic risk factors (gene defects/mutations), family history of breast cancer (mother, sister or daughter), personal history of breast cancer, dense breast tissue, benign proliferative lesions, lobular carcinoma in situ, early onset of menarche, late onset of menopause, chest radiation treatment (children/young adults), diethylstilbestrol exposure (DES), never being pregnant, first full-term pregnancy after age 30, use of birth control pills, long-term combined postmenopausal hormone therapy, long-term estrogen replacement therapy, not breast-feeding, heavy alcohol consumption, obesity and lack of physical activity are associated with female breast cancer.

Early Detection

Experts believe early detection tests for breast cancer save many thousands of lives each year. The American Cancer Society recommends that women between the ages of 45 and 54 at average risk for breast cancer get mammograms every year. Women 55 and older at average risk for breast cancer can continue having annual mammograms or switch to having them bi-annually. Women having a high risk of breast cancer should get an MRI screening and mammogram every year beginning at age 30.

Cancer of the Female Breast: INCIDENCE (Invasive)

**TABLE
11-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	11,075	131.2 (128.8-133.6)	9,774	132.4 (129.8-135.0)	1,050	133.8 (125.7-141.9)
2014	11,051	132.0 (129.5-134.5)	9,800	133.9 (131.2-136.6)	996	128.9 (120.9-136.9)
2013	10,973	130.8 (128.4-133.2)	9,763	132.6 (130.0-135.2)	984	129.0 (120.9-137.1)
2012	10,652	128.2 (125.8-130.6)	9,440	129.2 (126.6-131.8)	905	120.6 (112.7-128.5)
2011	10,561	128.1 (125.7-130.5)	9,375	128.6 (126.0-131.2)	938	127.6 (119.4-135.8)
2010	10,206	124.9 (122.5-127.3)	8,977	125.4 (122.8-128.0)	981	138.1 (129.5-146.7)
2009	10,421	131.0 (128.5-133.5)	9,292	130.7 (128.0-133.4)	920	136.5 (127.7-145.3)
2008	10,255	129.9 (127.4-132.4)	9,111	128.9 (126.3-131.5)	924	140.0 (131.0-149.0)
2007	9,708	123.5 (121.0-126.0)	8,654	122.6 (120.0-125.2)	848	128.9 (120.2-137.6)
2006	9,739	124.4 (121.9-126.9)	8,680	123.5 (120.9-126.1)	832	127.2 (118.6-135.8)

* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

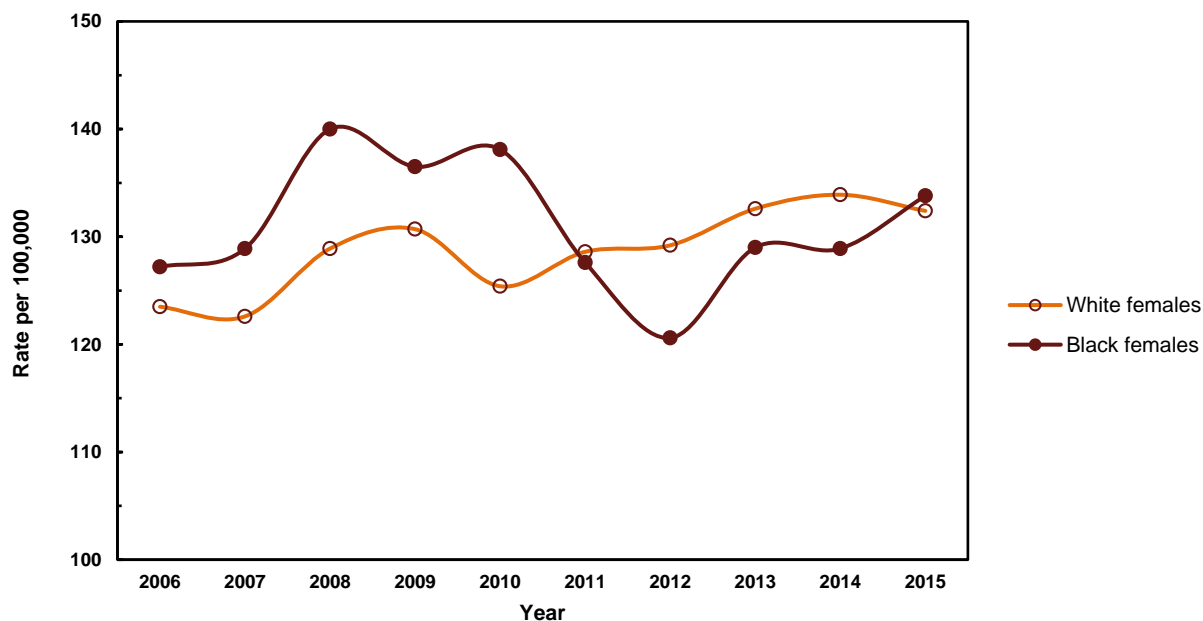
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below.

CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
11-A**

**Age-adjusted Incidence Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Female Breast: INCIDENCE (Invasive)

**TABLE
11-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**

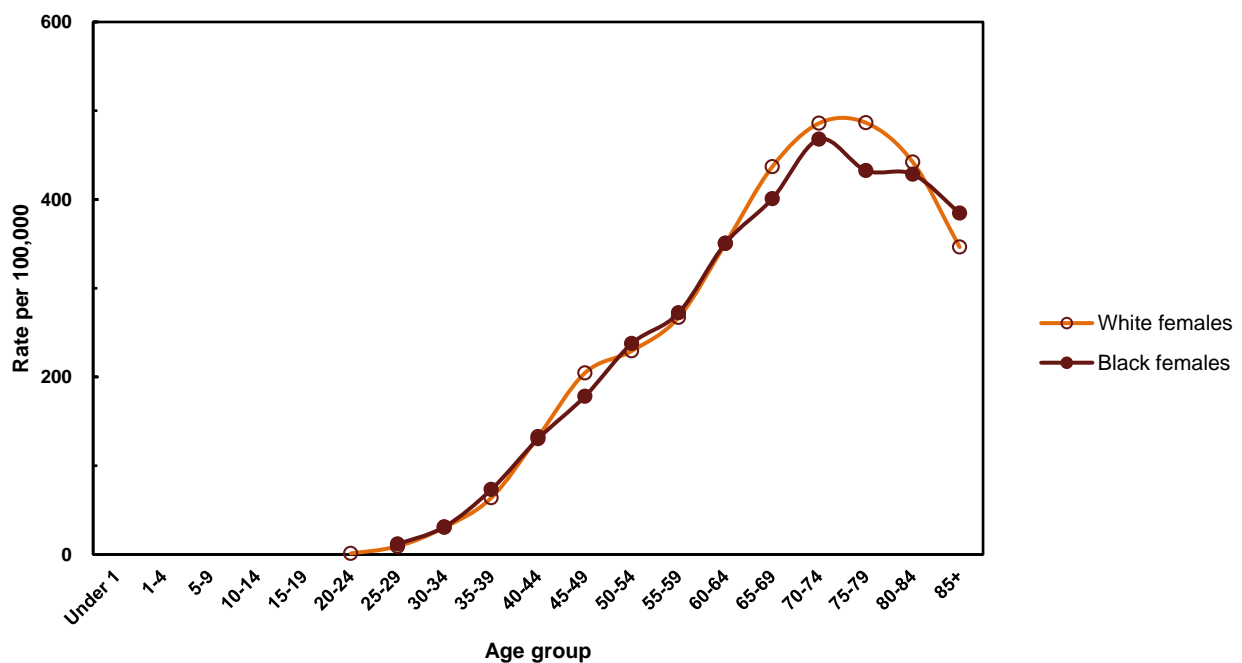
Age Group	All Females	White	Black
Total	166.3	177.7	127.5
Under 1	ND	ND	ND
1-4	ND	ND	ND
5-9	ND	ND	ND
10-14	ND	ND	ND
15-19	ND	ND	ND
20-24	1.2	1.2	ND
25-29	9.6	9.1	11.8
30-34	29.7	30.5	31.1
35-39	64.1	63.8	73.2
40-44	130.7	132.7	130.3
45-49	200.2	204.5	178.2
50-54	228.7	229.4	237.6
55-59	265.2	267.1	272.2
60-64	346.7	350.4	350.6
65-69	429.8	436.9	400.8
70-74	480.8	485.9	467.8
75-79	479.5	486.4	432.6
80-84	440.4	442.0	428.4
85+	352.7	346.3	384.6

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
11-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Female Breast: INCIDENCE (Invasive)

**TABLE
11-C**

**Total Number of Cancer Cases by Age and Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*	White	Black
Total	54,312	48,152	4,873
Under 1	0	0	0
1-4	0	0	0
5-9	0	0	0
10-14	1	1	0
15-19	3	2	0
20-24	25	21	4
25-29	197	148	33
30-34	575	471	78
35-39	1,167	934	169
40-44	2,654	2,220	317
45-49	4,463	3,839	450
50-54	5,597	4,823	612
55-59	6,331	5,549	635
60-64	7,234	6,425	668
65-69	7,205	6,515	562
70-74	6,146	5,562	482
75-79	4,906	4,491	344
80-84	3,913	3,596	264
85+	3,895	3,555	255

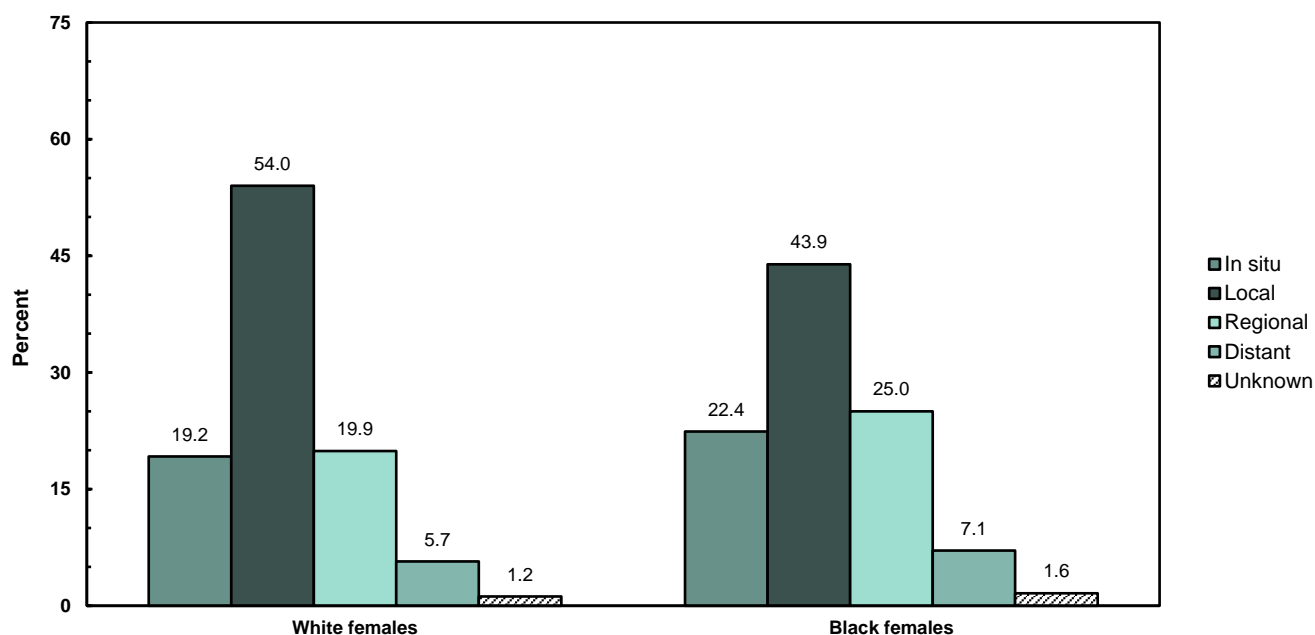
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
11-C**

**Stage of Disease at Diagnosis, Percent by Race
Pennsylvania Female Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 10,921 - 98.6%

Cancer of the Female Breast: MORTALITY

**TABLE
11-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,023	21.6 (20.7-22.5)	1,728	20.7 (19.7-21.7)	241	30.2 (26.4-34.0)
2014	1,920	20.6 (19.7-21.5)	1,616	19.2 (18.3-20.1)	238	31.0 (27.1-34.9)
2013	1,994	21.6 (20.7-22.5)	1,713	20.6 (19.6-21.6)	234	30.9 (26.9-34.9)
2012	2,012	22.2 (21.2-23.2)	1,733	21.2 (20.2-22.2)	236	30.7 (26.8-34.6)
2011	2,042	22.7 (21.7-23.7)	1,781	22.1 (21.1-23.1)	236	31.8 (27.7-35.9)
2010	2,071	23.1 (22.1-24.1)	1,824	22.8 (21.8-23.8)	237	33.4 (29.1-37.7)
2009	2,111	23.8 (22.8-24.8)	1,837	22.8 (21.8-23.8)	257	37.5 (32.9-42.1)
2008	2,083	24.0 (23.0-25.0)	1,852	23.5 (22.4-24.6)	226	33.4 (29.0-37.8)
2007	2,046	24.0 (23.0-25.0)	1,825	23.5 (22.4-24.6)	207	31.4 (27.1-35.7)
2006	2,096	24.9 (23.8-26.0)	1,882	24.6 (23.5-25.7)	203	30.9 (26.6-35.2)

* Includes any unknowns

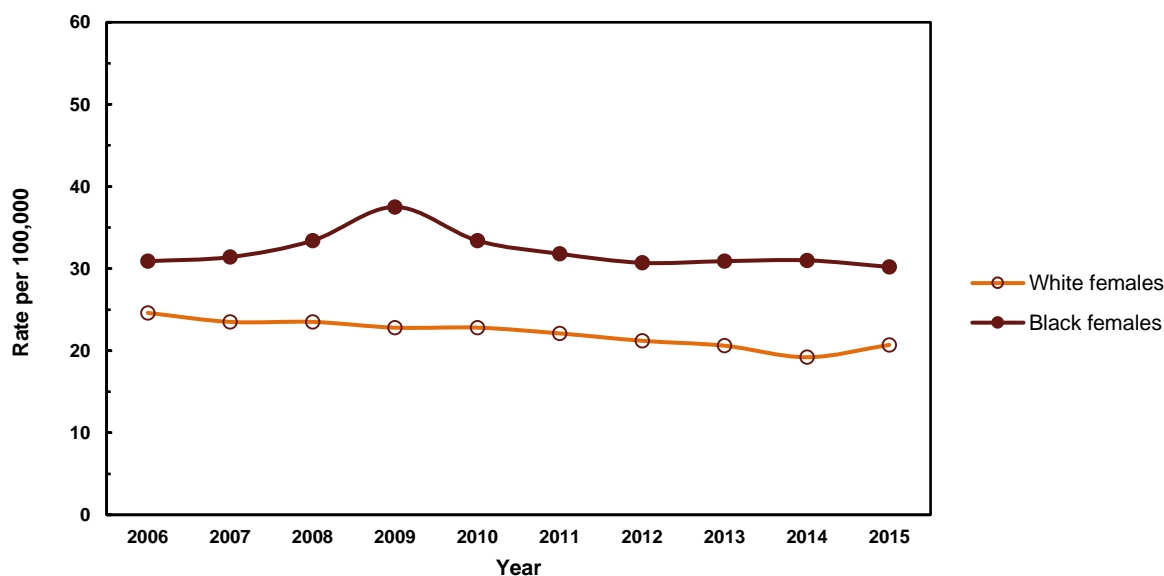
SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER Program.

**FIGURE
11-D**

**Age-adjusted Death Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Female Breast: MORTALITY

**TABLE
11-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*		White		Black	
	No.	Rate	No.	Rate	No.	Rate
Total*	9,991	30.6	8,571	31.6	1,185	31.0
Under 1	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND
20-24	2	ND	2	ND	0	ND
25-29	14	0.7	6	ND	7	ND
30-34	57	2.9	42	2.7	6	ND
35-39	133	7.3	100	6.8	27	11.7
40-44	252	12.4	189	11.3	39	16.0
45-49	443	19.9	336	17.9	85	33.7
50-54	700	28.6	553	26.3	116	45.0
55-59	933	39.1	757	36.4	147	63.0
60-64	1,059	50.7	877	47.8	158	82.9
65-69	1,092	65.1	954	64.0	113	80.6
70-74	1,032	80.7	896	78.3	120	116.5
75-79	1,014	99.1	894	96.8	107	134.6
80-84	1,178	132.6	1,056	129.8	112	181.7
85+	2,082	188.5	1,909	186.0	148	223.2

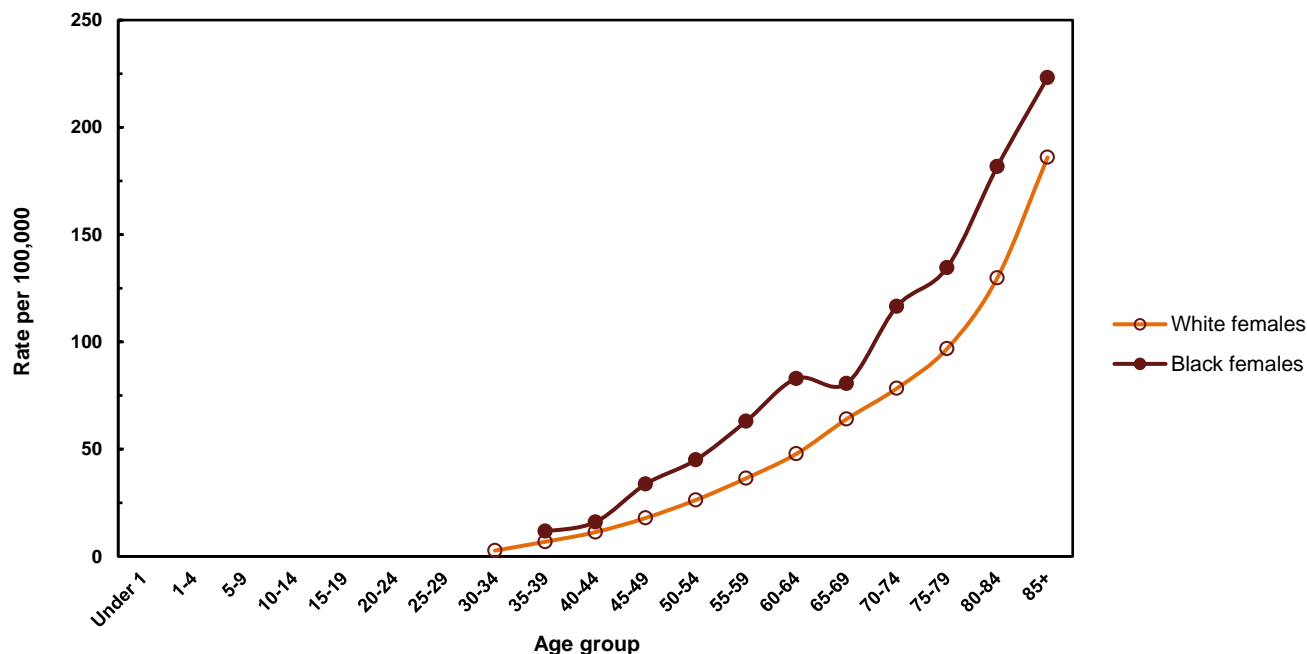
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
11-E**

**Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Female Breast: INCIDENCE (Invasive)

**TABLE
11-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	54,312	130.0	(128.9-131.1)				
Adams	420	121.3	(109.7-132.9)	Juniata	88	106.6	(84.3-128.9)
Allegheny	5,851	138.2	(134.7-141.7)	Lackawanna	883	120.1	(112.2-128.0)
Armstrong	346	136.7	(122.3-151.1)	Lancaster	2,066	125.0	(119.6-130.4)
Beaver	851	136.1	(127.0-145.2)	Lawrence	417	122.2	(110.5-133.9)
Bedford	219	127.7	(110.8-144.6)	Lebanon	615	133.7	(123.1-144.3)
Berks	1,629	125.8	(119.7-131.9)	Lehigh	1,392	124.5	(118.0-131.0)
Blair	546	117.8	(107.9-127.7)	Luzerne	1,372	122.3	(115.8-128.8)
Bradford	272	124.1	(109.4-138.8)	Lycoming	602	151.3	(139.2-163.4)
Bucks	2,896	138.3	(133.3-143.3)	McKean	175	123.8	(105.5-142.1)
Butler	831	136.7	(127.4-146.0)	Mercer	579	141.2	(129.7-152.7)
Cambria	613	122.4	(112.7-132.1)	Mifflin	206	123.0	(106.2-139.8)
Cameron	26	130.3	(80.2-180.4)	Monroe	668	125.9	(116.4-135.4)
Carbon	279	117.6	(103.8-131.4)	Montgomery	3,757	141.5	(137.0-146.0)
Centre	535	143.9	(131.7-156.1)	Montour	84	120.6	(94.8-146.4)
Chester	2,180	140.5	(134.6-146.4)	Northampton	1,314	130.6	(123.5-137.7)
Clarion	147	114.3	(95.8-132.8)	Northumberland	408	124.9	(112.8-137.0)
Clearfield	329	118.5	(105.7-131.3)	Perry	162	109.9	(93.0-126.8)
Clinton	143	118.2	(98.8-137.6)	Philadelphia	5,477	125.0	(121.7-128.3)
Columbia	293	128.6	(113.9-143.3)	Pike	206	102.9	(88.8-117.0)
Crawford	387	129.8	(116.9-142.7)	Potter	68	104.9	(80.0-129.8)
Cumberland	1,031	131.3	(123.3-139.3)	Schuylkill	583	113.2	(104.0-122.4)
Dauphin	1,096	126.0	(118.5-133.5)	Snyder	153	118.7	(99.9-137.5)
Delaware	2,468	138.8	(133.3-144.3)	Somerset	287	103.1	(91.2-115.0)
Elk	173	150.3	(127.9-172.7)	Sullivan	45	160.9	(113.9-207.9)
Erie	1,176	133.4	(125.8-141.0)	Susquehanna	175	117.2	(99.8-134.6)
Fayette	615	123.5	(113.7-133.3)	Tioga	194	133.4	(114.6-152.2)
Forest	27	117.0	(72.9-161.1)	Union	146	112.3	(94.1-130.5)
Franklin	533	105.8	(96.8-114.8)	Venango	231	120.1	(104.6-135.6)
Fulton	66	133.0	(100.9-165.1)	Warren	217	144.4	(125.2-163.6)
Greene	159	130.9	(110.6-151.2)	Washington	991	133.7	(125.4-142.0)
Huntingdon	170	112.8	(95.8-129.8)	Wayne	213	115.2	(99.7-130.7)
Indiana	307	112.6	(100.0-125.2)	Westmoreland	1,838	132.7	(126.6-138.8)
Jefferson	166	104.2	(88.3-120.1)	Wyoming	124	127.7	(105.2-150.2)
				York	1,796	129.2	(123.2-135.2)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). In situ cancer cases are excluded. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

Cancer of the Female Breast: MORTALITY

**TABLE
11-G**

**Number of Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	9,991	21.7	(21.3-22.1)				
Adams	81	21.5	(16.8-26.2)	Juniata	17	ND	
Allegheny	1,044	21.9	(20.6-23.2)	Lackawanna	197	22.6	(19.4-25.8)
Armstrong	56	19.0	(14.0-24.0)	Lancaster	383	21.3	(19.2-23.4)
Beaver	150	20.7	(17.4-24.0)	Lawrence	94	25.6	(20.4-30.8)
Bedford	32	16.1	(10.5-21.7)	Lebanon	101	19.3	(15.5-23.1)
Berks	280	19.9	(17.6-22.2)	Lehigh	286	23.5	(20.8-26.2)
Blair	92	18.8	(15.0-22.6)	Luzerne	282	21.7	(19.2-24.2)
Bradford	58	24.7	(18.3-31.1)	Lycoming	82	18.5	(14.5-22.5)
Bucks	513	22.4	(20.5-24.3)	McKean	27	17.3	(10.8-23.8)
Butler	144	21.2	(17.7-24.7)	Mercer	109	24.7	(20.1-29.3)
Cambria	123	20.5	(16.9-24.1)	Mifflin	32	18.2	(11.9-24.5)
Cameron	2	ND		Monroe	100	19.2	(15.4-23.0)
Carbon	62	24.6	(18.5-30.7)	Montgomery	631	21.3	(19.6-23.0)
Centre	61	15.6	(11.7-19.5)	Montour	17	ND	
Chester	378	22.7	(20.4-25.0)	Northampton	215	20.0	(17.3-22.7)
Clarion	30	22.2	(14.3-30.1)	Northumberland	71	18.0	(13.8-22.2)
Clearfield	63	19.4	(14.6-24.2)	Perry	33	21.4	(14.1-28.7)
Clinton	26	19.1	(11.8-26.4)	Philadelphia	1,239	26.6	(25.1-28.1)
Columbia	52	21.4	(15.6-27.2)	Pike	39	18.5	(12.7-24.3)
Crawford	56	18.8	(13.9-23.7)	Potter	11	ND	
Cumberland	170	20.0	(17.0-23.0)	Schuylkill	142	23.8	(19.9-27.7)
Dauphin	182	19.9	(17.0-22.8)	Snyder	21	13.3	(7.6-19.0)
Delaware	445	22.9	(20.8-25.0)	Somerset	51	16.0	(11.6-20.4)
Elk	33	24.6	(16.2-33.0)	Sullivan	7	ND	
Erie	231	24.4	(21.3-27.5)	Susquehanna	27	19.0	(11.8-26.2)
Fayette	133	24.0	(19.9-28.1)	Tioga	36	22.2	(14.9-29.5)
Forest	5	ND		Union	31	19.5	(12.6-26.4)
Franklin	92	16.6	(13.2-20.0)	Venango	40	17.6	(12.1-23.1)
Fulton	15	ND		Warren	44	26.5	(18.7-34.3)
Greene	25	18.8	(11.4-26.2)	Washington	180	22.0	(18.8-25.2)
Huntingdon	28	17.9	(11.3-24.5)	Wayne	43	21.3	(14.9-27.7)
Indiana	64	20.1	(15.2-25.0)	Westmoreland	338	21.7	(19.4-24.0)
Jefferson	39	22.4	(15.4-29.4)	Wyoming	21	20.0	(11.4-28.6)
				York	279	18.7	(16.5-20.9)

SOURCE: Pennsylvania Death Certificate Dataset

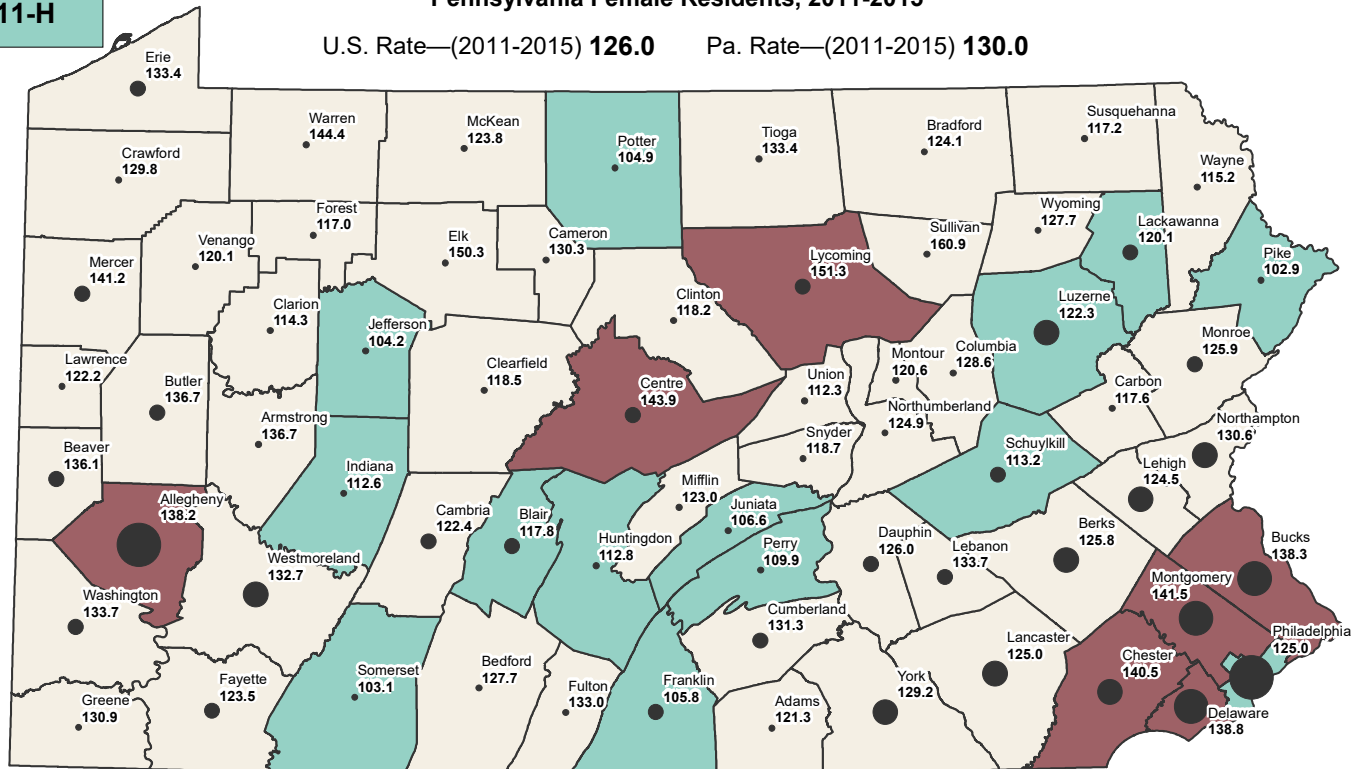
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

Cancer of the Female Breast: INCIDENCE (Invasive) and MORTALITY

**MAP
11-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **126.0** Pa. Rate—(2011-2015) **130.0**



Significantly higher

Significantly lower

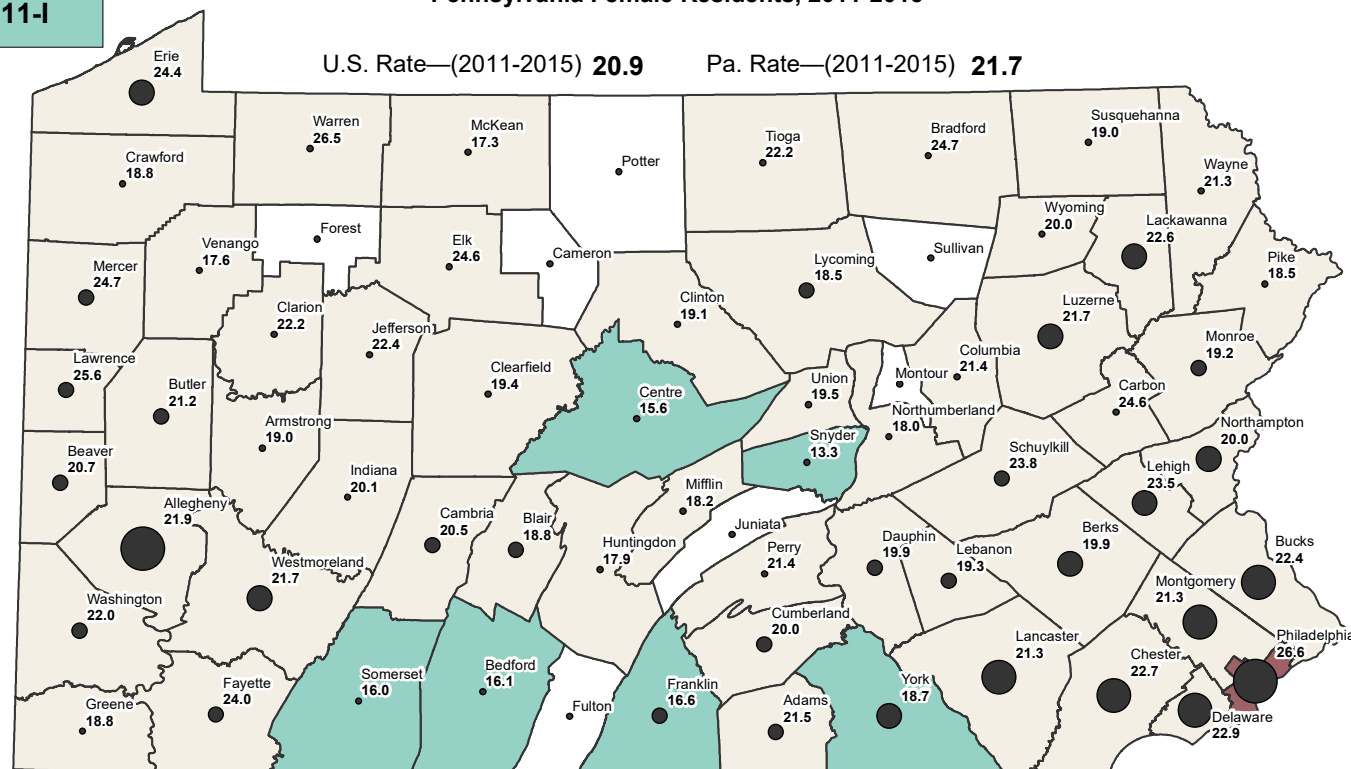
Not significantly
different

Significance not determined—
less than 20 observed cases

**MAP
11-I**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **20.9** Pa. Rate—(2011-2015) **21.7**



The symbol, ●, represents the number of invasive cancers or deaths. A larger circle indicates a larger amount of cases for the incidence map and a larger number of deaths for the mortality map.

SOURCES: Pennsylvania Cancer Registry; Pennsylvania Death Certificate Dataset; SEER 18 areas; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Cervix Uteri

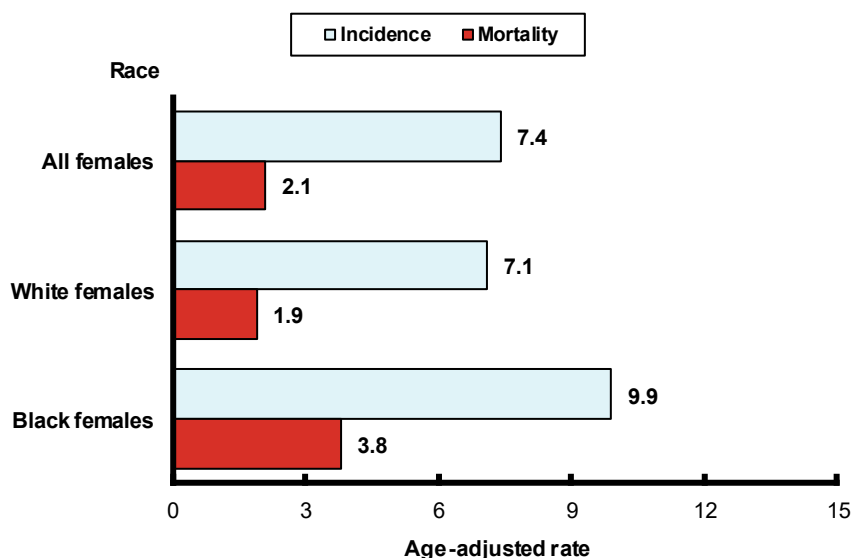
Data Highlights

During 2011-2015, the average annual age-adjusted incidence rate for invasive cancer of the cervix uteri was noticeably higher for black females compared to white females (9.9 versus 7.1 per 100,000). A total of 519 invasive cervical cancer cases were diagnosed among Pennsylvania females in 2015 – an increase from the 469 cases observed in the prior year, 2014. The 2015 annual age-adjusted incidence rate (7.4) was about 9 percent higher than the 2014 annual rate (6.8). The trends for annual age-adjusted incidence rates during the 10-year period 2006-2015 were inconclusive for both white and black females. Specifically, the incidence rates among black females displayed annual fluctuations, while rates among white females did not change very much (Figure 12-A).

Average annual (2011-2015) age-specific incidence rates among white females rose to 15.5 per 100,000 for ages 40-44 and remained below that level for all older age groups. Among black females, age-specific rates were higher than rates for white females aged 45 and over. About 21 percent of the cases were diagnosed among residents under 40 years of age during the five-year period of 2011-2015. Diagnoses of invasive cervical cancer cases represent missed opportunities at screening and early diagnosis. In 2015, 40 percent of the invasive cervix uteri cancer cases were diagnosed at the early (local) stage of the disease, and about 55 percent were diagnosed at the late (regional or distant) stage, when treatment is not as effective.

All cervical cancer deaths should be considered preventable. The average annual (2011-2015) age-adjusted death rate for black females (3.8 per 100,000) was noticeably higher than the rate for whites (1.9). In 2015, there were 168 cervical cancer deaths among residents of the state: a decrease of 4 percent from 2014, when there were 175 resident deaths. Overall, the annual age-adjusted death rates showed a decreasing trend among white females. Black females did not show any discernible trends during the 10-year period of 2006-2015.

FIGURE 12
Average Annual Age-Adjusted Incidence and Death Rates*
by Race, Pennsylvania Female Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, human papillomavirus (HPV), tobacco smoking, immunosuppression (HIV, AIDS), chlamydia infection, diets low in fruits and vegetables, long-term use of oral contraceptives, never having used an intrauterine device (IUD), having multiple full-term pregnancies, young age at first full-term pregnancy, poverty, diethylstilbestrol exposure (DES), and a family history of cervical cancer are associated with cervical cancer. Overweight women have higher risk of adenocarcinoma of the cervix.

Early Detection

Pap test screening can effectively reduce the cancer death rate. The American Cancer Society recommends regular Pap tests for women between the ages of 21 and 65. Less frequent screening is permitted at or after age 30 if the Pap test screening and HPV testing are combined. Women over 65, who have had regular screening for the previous 10 years, should stop being screened for cervical cancer if no serious pre-cancers were found in the last 20 years.

Cancer of the Cervix Uteri: INCIDENCE (Invasive)

**TABLE
12-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	519	7.4 (6.8-8.0)	434	7.4 (6.7-8.1)	65	8.2 (6.2-10.2)
2014	469	6.8 (6.2-7.4)	385	6.7 (6.0-7.4)	60	8.0 (6.0-10.0)
2013	507	7.1 (6.5-7.7)	390	6.4 (5.8-7.0)	83	11.3 (8.9-13.7)
2012	521	7.7 (7.0-8.4)	410	7.2 (6.5-7.9)	73	9.9 (7.6-12.2)
2011	552	8.1 (7.4-8.8)	442	7.7 (7.0-8.4)	88	12.2 (9.7-14.7)
2010	497	7.1 (6.5-7.7)	391	6.7 (6.0-7.4)	75	10.7 (8.3-13.1)
2009	559	8.2 (7.5-8.9)	459	7.9 (7.2-8.6)	75	11.4 (8.8-14.0)
2008	535	7.8 (7.1-8.5)	421	7.1 (6.4-7.8)	83	12.6 (9.9-15.3)
2007	560	8.4 (7.7-9.1)	464	8.0 (7.3-8.7)	71	10.9 (8.4-13.4)
2006	534	7.8 (7.1-8.5)	451	7.6 (6.9-8.3)	53	8.2 (6.0-10.4)

* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

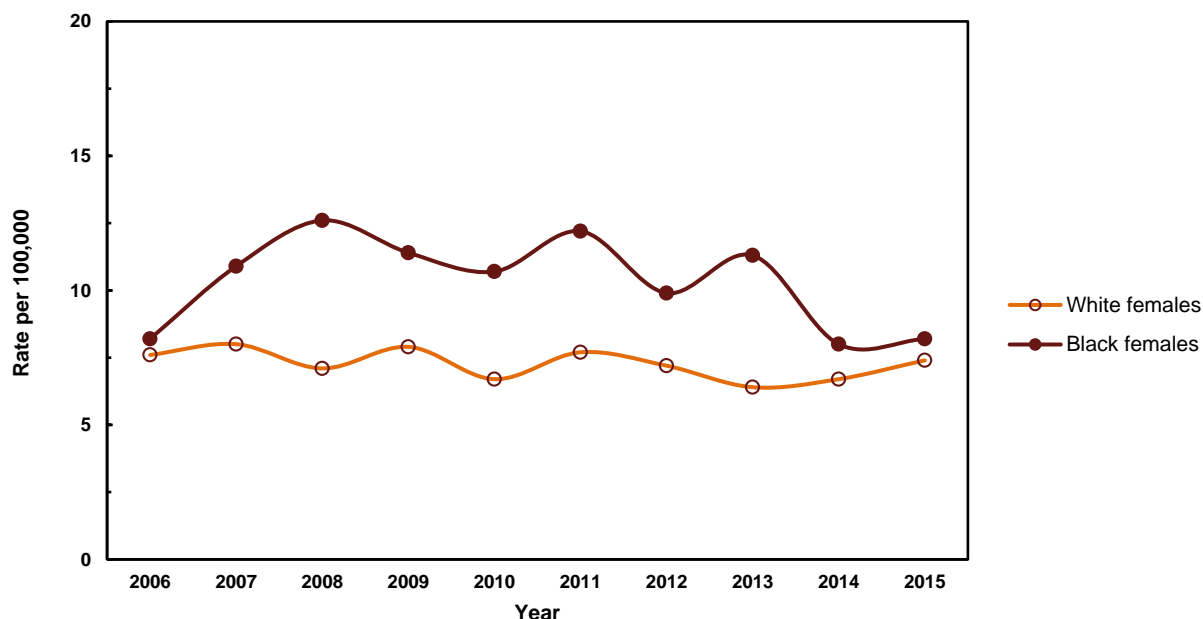
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below.

CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
12-A**

**Age-adjusted Incidence Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Cervix Uteri: INCIDENCE (Invasive)

**TABLE
12-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**

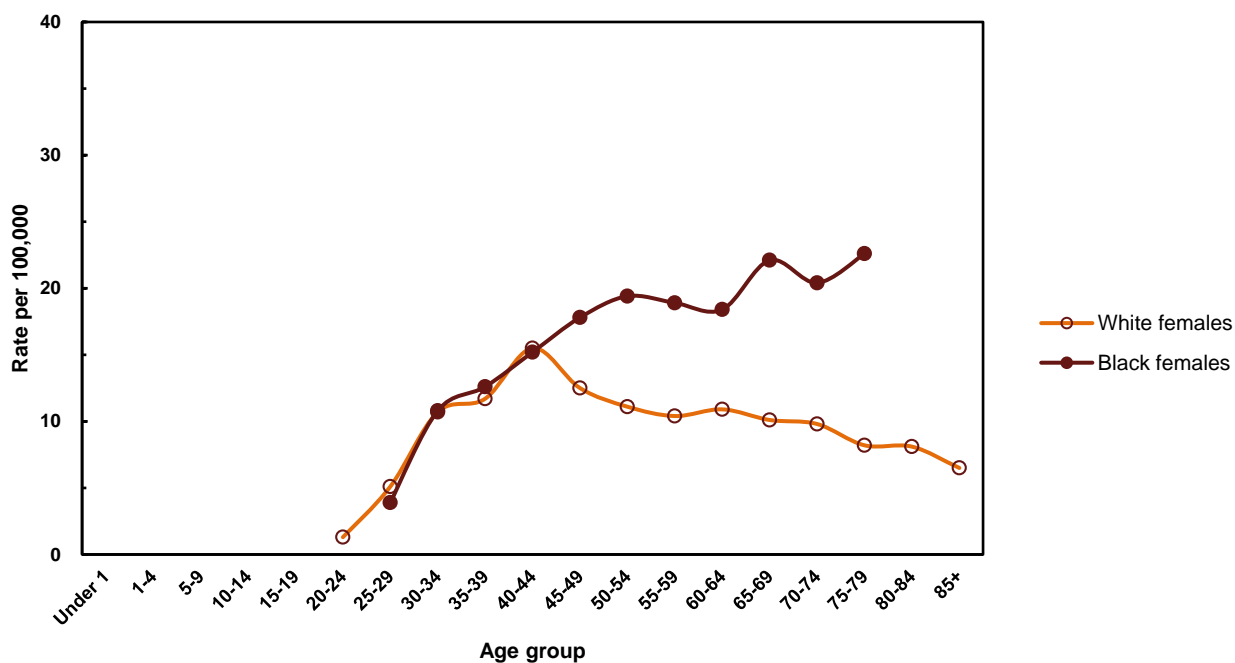
Age Group	All Females	White	Black
Total	7.9	7.6	9.7
Under 1	ND	ND	ND
1-4	ND	ND	ND
5-9	ND	ND	ND
10-14	ND	ND	ND
15-19	ND	ND	ND
20-24	1.3	1.3	ND
25-29	4.7	5.1	3.9
30-34	10.4	10.7	10.8
35-39	11.9	11.7	12.6
40-44	15.6	15.5	15.2
45-49	13.4	12.5	17.8
50-54	12.4	11.1	19.4
55-59	11.5	10.4	18.9
60-64	11.9	10.9	18.4
65-69	11.2	10.1	22.1
70-74	11.0	9.8	20.4
75-79	9.4	8.2	22.6
80-84	8.4	8.1	ND
85+	7.3	6.5	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
12-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Cervix Uteri: INCIDENCE (Invasive)

**TABLE
12-C**

**Total Number of Cancer Cases by Age and Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*	White	Black
Total	2,568	2,061	369
Under 1	0	0	0
1-4	0	0	0
5-9	0	0	0
10-14	1	1	0
15-19	2	2	0
20-24	28	22	6
25-29	97	83	11
30-34	202	165	27
35-39	217	171	29
40-44	316	260	37
45-49	298	235	45
50-54	304	234	50
55-59	275	217	44
60-64	248	200	35
65-69	188	150	31
70-74	140	112	21
75-79	96	76	18
80-84	75	66	7
85+	81	67	8

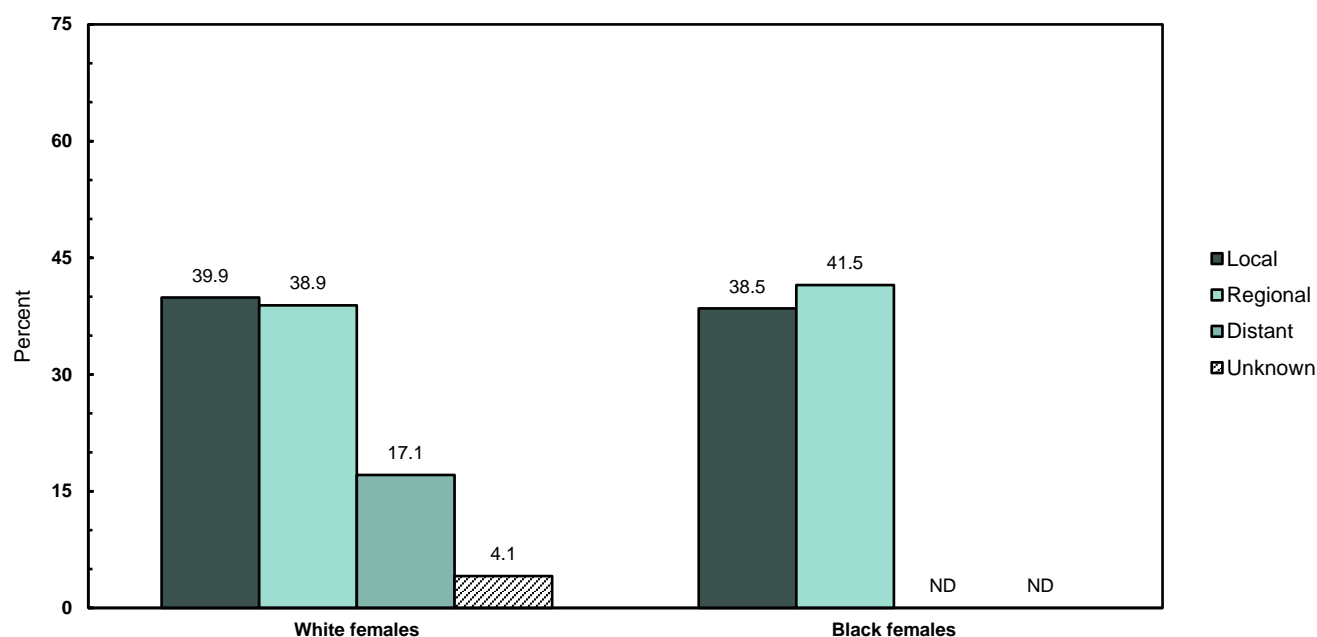
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
12-C**

**Stage of Disease at Diagnosis, Percent by Race
Pennsylvania Female Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Cases of cervix uteri cancer diagnosed at the in situ stage are not reportable to the Pennsylvania Cancer Registry.

Number and Percent of Invasive Cases Microscopically Confirmed: 513 - 98.8%

Cancer of the Cervix Uteri: MORTALITY

**TABLE
12-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	168	2.1 (1.8-2.4)	133	1.9 (1.6-2.2)	22	2.7 (1.6-3.8)
2014	175	2.2 (1.9-2.5)	132	1.9 (1.6-2.2)	34	4.4 (2.9-5.9)
2013	170	2.2 (1.9-2.5)	125	1.9 (1.6-2.2)	29	4.0 (2.5-5.5)
2012	152	1.9 (1.6-2.2)	107	1.6 (1.3-1.9)	34	4.5 (3.0-6.0)
2011	179	2.2 (1.9-2.5)	151	2.1 (1.8-2.4)	24	3.4 (2.0-4.8)
2010	149	1.9 (1.6-2.2)	119	1.8 (1.5-2.1)	28	3.9 (2.5-5.3)
2009	176	2.3 (2.0-2.6)	142	2.1 (1.8-2.4)	32	4.9 (3.2-6.6)
2008	166	2.3 (2.0-2.6)	142	2.2 (1.8-2.6)	23	3.5 (2.1-4.9)
2007	156	2.1 (1.8-2.4)	132	2.0 (1.7-2.3)	19	ND
2006	196	2.6 (2.2-3.0)	165	2.5 (2.1-2.9)	30	4.5 (2.9-6.1)

* Includes any unknowns

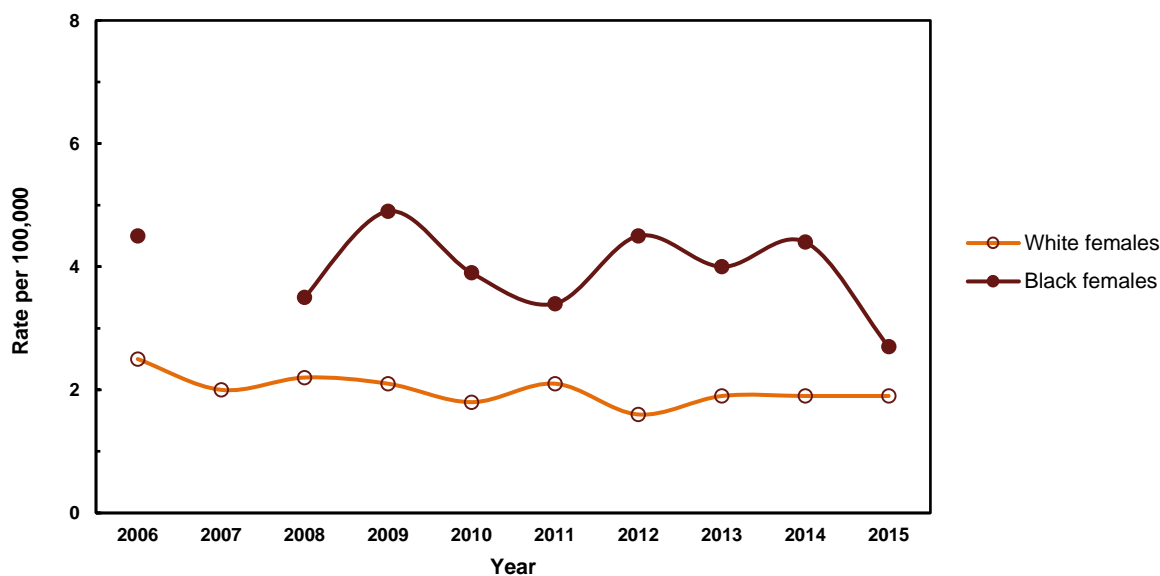
SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER Program.

**FIGURE
12-D**

**Age-adjusted Death Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Cervix Uteri: MORTALITY

**TABLE
12-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*		White		Black	
	No.	Rate	No.	Rate	No.	Rate
Total*	844	2.6	648	2.4	143	3.7
Under 1	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND
20-24	3	ND	3	ND	0	ND
25-29	14	0.7	10	0.6	3	ND
30-34	25	1.3	18	1.2	5	ND
35-39	29	1.6	18	1.2	7	ND
40-44	54	2.7	40	2.4	9	ND
45-49	97	4.4	77	4.1	14	5.5
50-54	101	4.1	77	3.7	20	7.8
55-59	123	5.2	95	4.6	17	7.3
60-64	97	4.6	76	4.1	15	7.9
65-69	84	5.0	64	4.3	15	10.7
70-74	69	5.4	55	4.8	12	11.6
75-79	52	5.1	39	4.2	12	15.1
80-84	40	4.5	32	3.9	6	ND
85+	56	5.1	44	4.3	8	ND

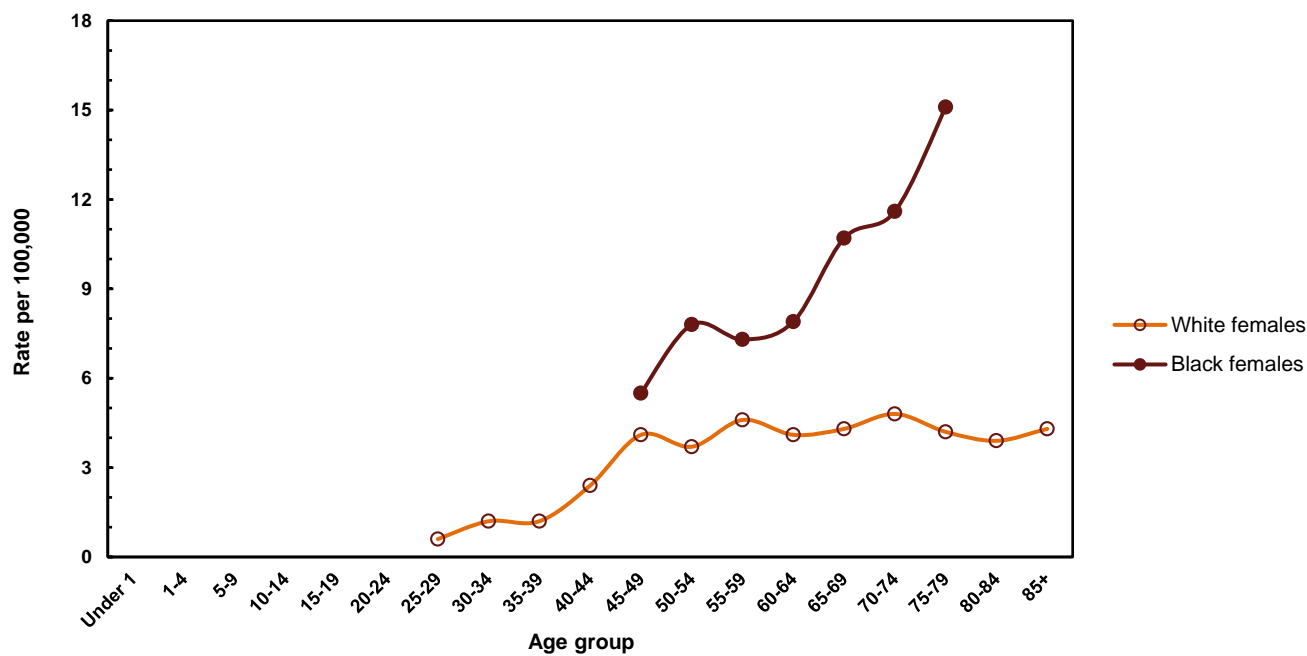
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
12-E**

**Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Cervix Uteri: INCIDENCE (Invasive)

**TABLE
12-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	2,568	7.4	(7.1-7.7)				
Adams	30	11.2	(7.2-15.2)	Juniata	6	ND	
Allegheny	228	6.6	(5.7-7.5)	Lackawanna	49	8.8	(6.3-11.3)
Armstrong	16	ND		Lancaster	99	7.1	(5.7-8.5)
Beaver	37	6.8	(4.6-9.0)	Lawrence	19	ND	
Bedford	6	ND		Lebanon	25	7.1	(4.3-9.9)
Berks	60	5.9	(4.4-7.4)	Lehigh	81	8.6	(6.7-10.5)
Blair	18	ND		Luzerne	97	11.5	(9.2-13.8)
Bradford	18	ND		Lycoming	14	ND	
Bucks	94	5.0	(4.0-6.0)	McKean	10	ND	
Butler	21	4.2	(2.4-6.0)	Mercer	29	9.7	(6.2-13.2)
Cambria	32	8.0	(5.2-10.8)	Mifflin	8	ND	
Cameron	2	ND		Monroe	37	8.0	(5.4-10.6)
Carbon	13	ND		Montgomery	133	5.6	(4.6-6.6)
Centre	14	ND		Montour	0	ND	
Chester	71	5.0	(3.8-6.2)	Northampton	67	7.8	(5.9-9.7)
Clarion	3	ND		Northumberland	26	10.4	(6.4-14.4)
Clearfield	18	ND		Perry	11	ND	
Clinton	4	ND		Philadelphia	448	11.0	(10.0-12.0)
Columbia	19	ND		Pike	10	ND	
Crawford	25	11.1	(6.7-15.5)	Potter	0	ND	
Cumberland	30	4.5	(2.9-6.1)	Schuylkill	33	9.4	(6.2-12.6)
Dauphin	53	7.3	(5.3-9.3)	Snyder	1	ND	
Delaware	125	7.8	(6.4-9.2)	Somerset	16	ND	
Elk	8	ND		Sullivan	0	ND	
Erie	50	6.8	(4.9-8.7)	Susquehanna	12	ND	
Fayette	36	9.4	(6.3-12.5)	Tioga	10	ND	
Forest	1	ND		Union	6	ND	
Franklin	16	ND		Venango	4	ND	
Fulton	1	ND		Warren	11	ND	
Greene	11	ND		Washington	51	9.2	(6.7-11.7)
Huntingdon	11	ND		Wayne	10	ND	
Indiana	19	ND		Westmoreland	83	7.9	(6.2-9.6)
Jefferson	6	ND		Wyoming	4	ND	
				York	62	5.3	(4.0-6.6)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). In situ cancer cases are excluded. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

Cancer of the Cervix Uteri: MORTALITY

**TABLE
12-G**

**Number of Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	844	2.1	(2.0-2.2)				
Adams	11	ND		Juniata	1	ND	
Allegheny	73	1.9	(1.5-2.3)	Lackawanna	13	ND	
Armstrong	6	ND		Lancaster	33	2.1	(1.4-2.8)
Beaver	14	ND		Lawrence	1	ND	
Bedford	4	ND		Lebanon	15	ND	
Berks	15	ND		Lehigh	21	1.8	(1.0-2.6)
Blair	8	ND		Luzerne	26	2.7	(1.7-3.7)
Bradford	4	ND		Lycoming	8	ND	
Bucks	26	1.3	(0.8-1.8)	McKean	3	ND	
Butler	9	ND		Mercer	5	ND	
Cambria	10	ND		Mifflin	5	ND	
Cameron	0	ND		Monroe	13	ND	
Carbon	4	ND		Montgomery	45	1.6	(1.1-2.1)
Centre	3	ND		Montour	0	ND	
Chester	18	ND		Northampton	13	ND	
Clarion	2	ND		Northumberland	6	ND	
Clearfield	5	ND		Perry	2	ND	
Clinton	0	ND		Philadelphia	157	3.6	(3.0-4.2)
Columbia	4	ND		Pike	3	ND	
Crawford	6	ND		Potter	1	ND	
Cumberland	11	ND		Schuylkill	16	ND	
Dauphin	22	2.9	(1.7-4.1)	Snyder	3	ND	
Delaware	42	2.2	(1.5-2.9)	Somerset	6	ND	
Elk	3	ND		Sullivan	1	ND	
Erie	15	ND		Susquehanna	1	ND	
Fayette	9	ND		Tioga	3	ND	
Forest	0	ND		Union	2	ND	
Franklin	14	ND		Venango	3	ND	
Fulton	0	ND		Warren	5	ND	
Greene	4	ND		Washington	17	ND	
Huntingdon	6	ND		Wayne	3	ND	
Indiana	5	ND		Westmoreland	29	2.3	(1.5-3.1)
Jefferson	0	ND		Wyoming	2	ND	
				York	29	2.3	(1.5-3.1)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

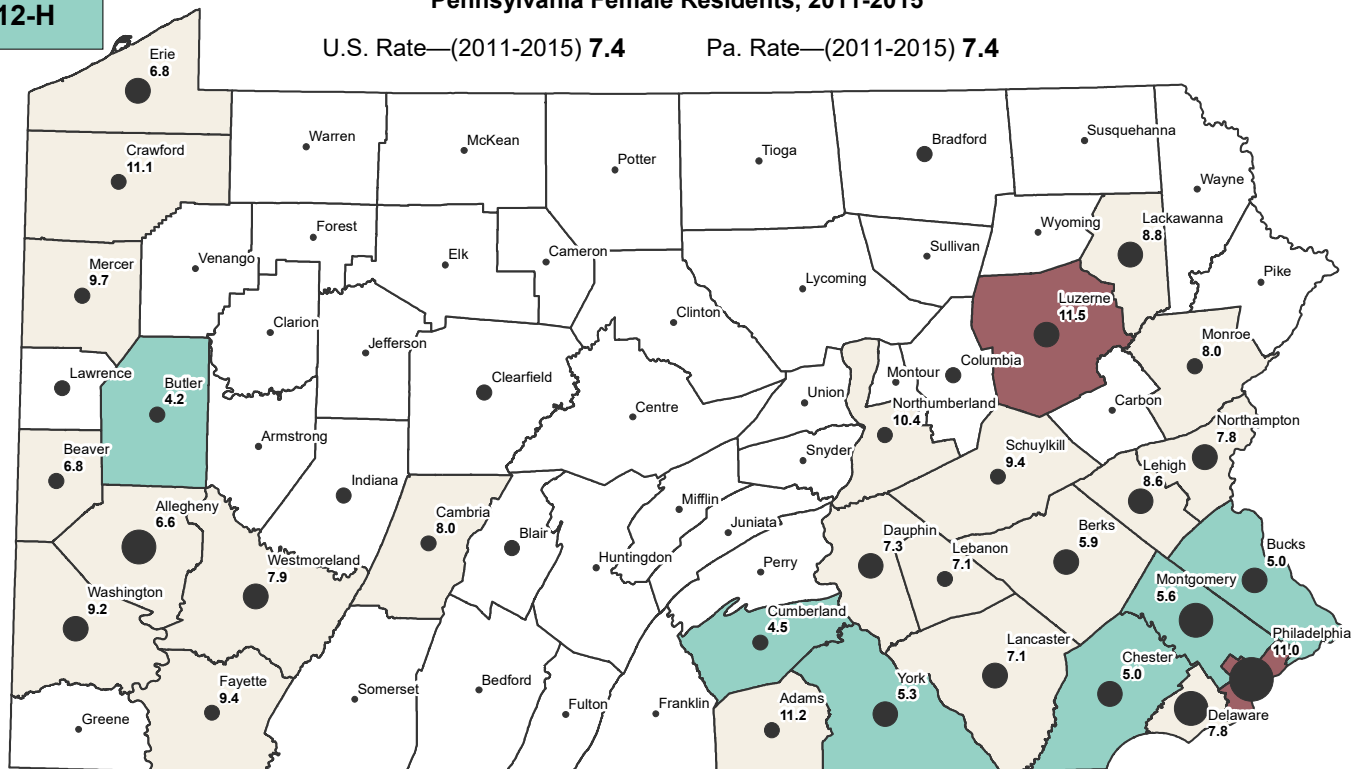
Cancer of the Cervix Uteri: INCIDENCE (Invasive) and MORTALITY

**MAP
12-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **7.4**

Pa. Rate—(2011-2015) **7.4**



Significantly higher

Significantly lower

Not significantly
different

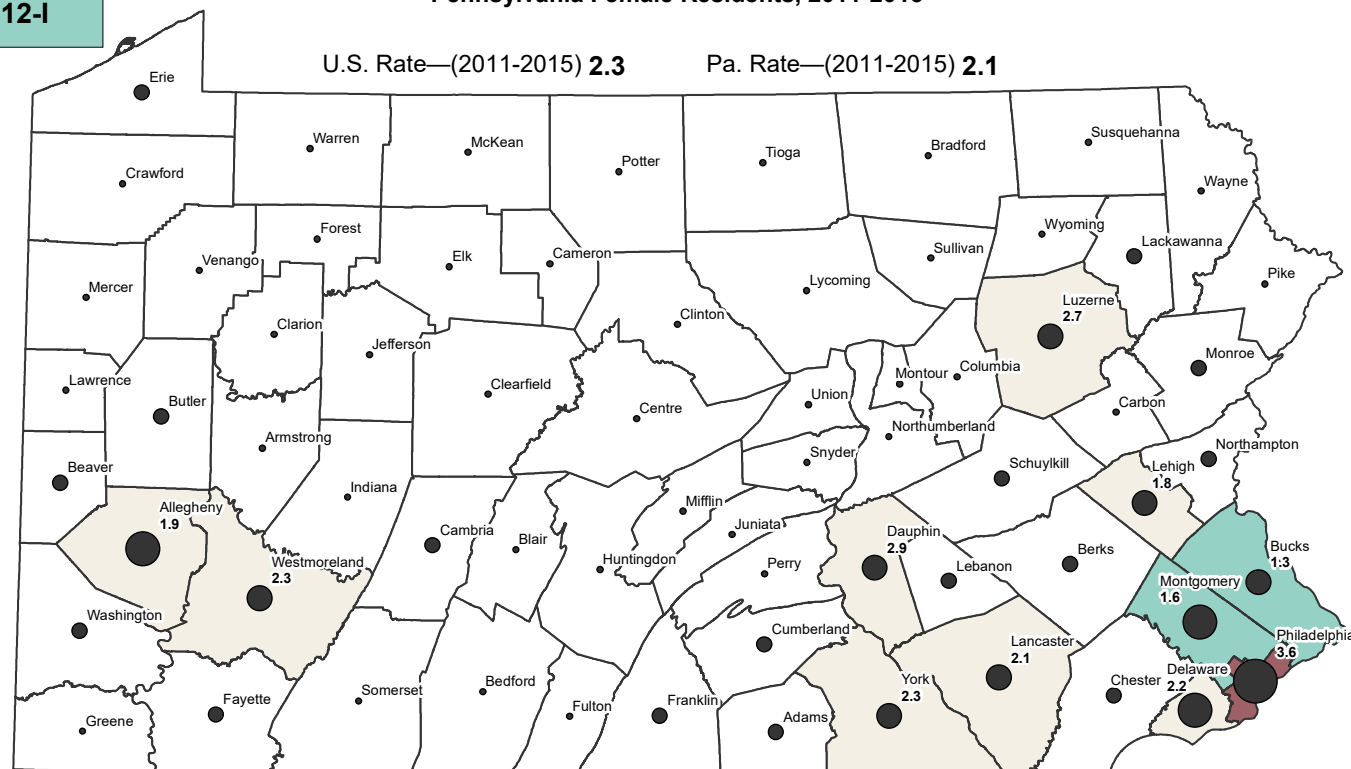
Significance not determined—
less than 20 observed cases

**MAP
12-I**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **2.3**

Pa. Rate—(2011-2015) **2.1**



The symbol, •, represents the number of invasive cancers or deaths. A larger circle indicates a larger amount of cases for the incidence map and a larger number of deaths for the mortality map.

SOURCES: Pennsylvania Cancer Registry; Pennsylvania Death Certificate Dataset; SEER 18 areas; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Corpus and Uterus, Not Otherwise Specified (NOS)

Data Highlights

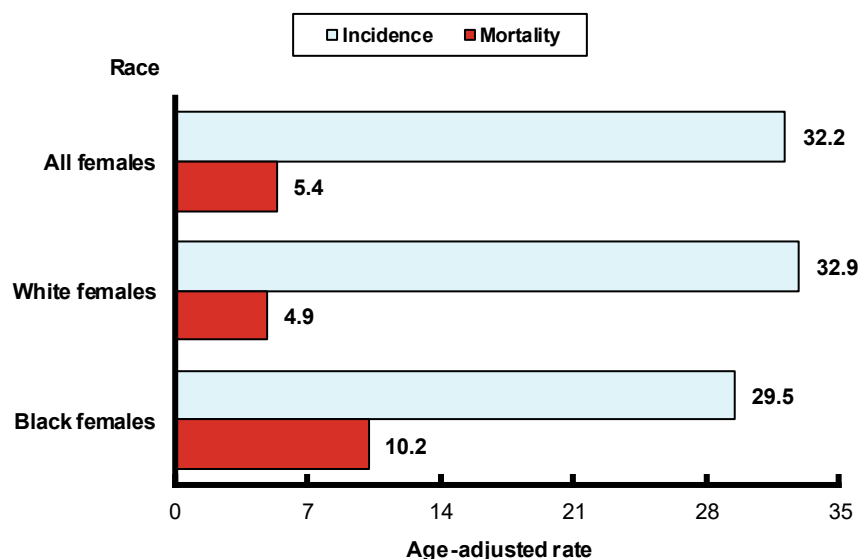
The average annual (2011-2015) age-adjusted incidence rate for invasive cancer of the corpus and uterus, NOS, among white females (32.9 per 100,000) was 12 percent higher than the rate for black females (29.5). In 2015, there were 2,919 cases of invasive corpus and uterus cancer diagnosed among female residents of Pennsylvania – an increase from the 2,849 cases observed in 2014.

Annual age-adjusted incidence rates for the years 2006 through 2015 showed that corpus and uterus cancers for whites and blacks have generally trended upward during the period 2006-2015. Over the 2011-2015 timeframe, the average age-specific incidence rate of this cancer rose dramatically with age, starting at about age 40, and began to decrease with the 70-74 age group. In 2015, about 68 percent of corpus and uterus cases were diagnosed at the early stage (in situ or local) of the disease, and approximately 28 percent of cases were diagnosed at the late stage (regional or distant). Approximately 37 percent of the cases diagnosed among blacks were at the regional or distant stages, compared to 27 percent for whites.

In contrast to the lower incidence rates among blacks, the average annual age-adjusted death rate was higher among black females (10.2 per 100,000) than for white females (4.9) during the five-year period of 2011-2015. Because survival is highly dependent on the stage at which the cancer is diagnosed, the disparity in death rates is at least partially attributed to the differences in staging distribution between these two groups. Because of the small number of deaths among black residents, there are several fluctuations in the age-adjusted rate from 2006 to 2015; however, there is an increasing trend overall. For white residents, the annual age-adjusted death rates showed no discernible trends during the 10-year period of 2006 through 2015.

NOTE: The abbreviation “NOS” means “Not Otherwise Specified.”

FIGURE 13
Average Annual Age-Adjusted Incidence and Death Rates*
by Race, Pennsylvania Female Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, changes in hormone levels, estrogen replacement therapy, early onset of menarche combined with late onset of menopause (total number of menstrual cycles), never pregnant (nulliparity), infertility, obesity, tamoxifen, ovarian tumor (granulosa-theca cell tumor), polycystic ovarian syndrome, never having used an intrauterine device (IUD), diets high in fat, diabetes, family history, personal history of ovarian or breast cancer, endometrial hyperplasia, and prior pelvic radiation therapy are associated with increased risk.

Early Detection

The American Cancer Society recommends that women experiencing menopause discuss risks and symptoms of uterine cancer and report any unexpected bleeding or spotting to their physicians. Women who have (or may have) hereditary non-polyposis colon cancer should be offered yearly testing beginning at age 35.

Cancer of the Corpus and Uterus, NOS: INCIDENCE (Invasive)

**TABLE
13-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,919	32.8 (31.6-34.0)	2,603	33.7 (32.4-35.0)	253	29.6 (26.0-33.2)
2014	2,849	31.9 (30.7-33.1)	2,557	32.7 (31.4-34.0)	244	30.6 (26.8-34.4)
2013	2,873	32.7 (31.5-33.9)	2,573	33.3 (32.0-34.6)	235	29.7 (25.9-33.5)
2012	2,748	31.3 (30.1-32.5)	2,448	31.7 (30.4-33.0)	217	27.7 (24.0-31.4)
2011	2,786	32.4 (31.2-33.6)	2,498	33.0 (31.7-34.3)	225	29.7 (25.8-33.6)
2010	2,706	32.0 (30.8-33.2)	2,431	32.9 (31.6-34.2)	206	28.4 (24.5-32.3)
2009	2,595	31.6 (30.4-32.8)	2,351	32.0 (30.7-33.3)	183	27.3 (23.3-31.3)
2008	2,570	31.6 (30.4-32.8)	2,352	32.4 (31.1-33.7)	157	23.3 (19.7-26.9)
2007	2,509	31.1 (29.9-32.3)	2,324	32.2 (30.9-33.5)	132	19.8 (16.4-23.2)
2006	2,339	29.3 (28.1-30.5)	2,142	30.1 (28.8-31.4)	155	23.5 (19.8-27.2)

* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

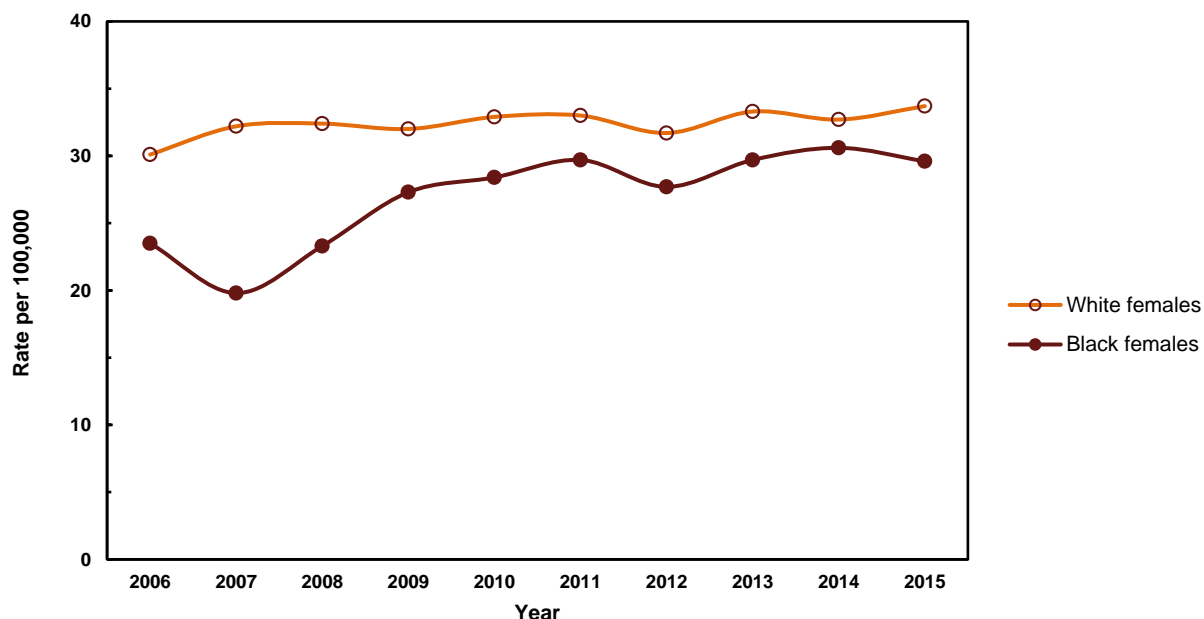
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below.

CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
13-A**

**Age-adjusted Incidence Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Corpus and Uterus, NOS: INCIDENCE (Invasive)

**TABLE
13-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**

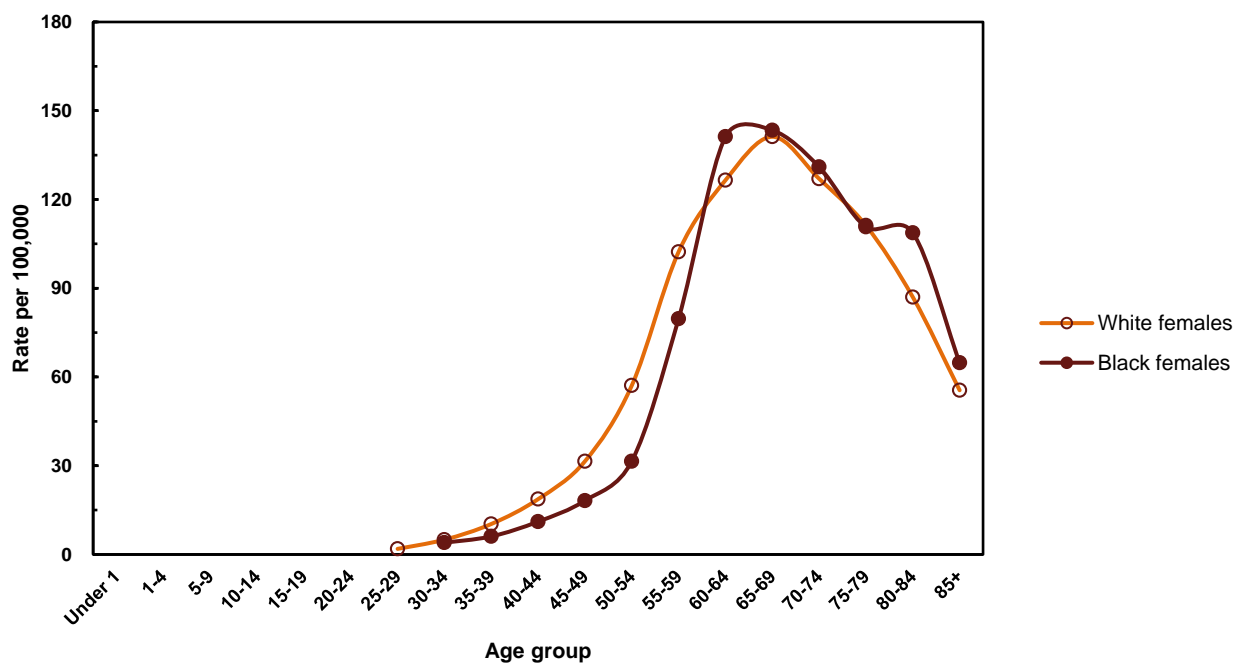
Age Group	All Females	White	Black
Total	43.4	46.8	30.7
Under 1	ND	ND	ND
1-4	ND	ND	ND
5-9	ND	ND	ND
10-14	ND	ND	ND
15-19	ND	ND	ND
20-24	ND	ND	ND
25-29	1.8	1.9	ND
30-34	4.7	5.0	4.0
35-39	9.2	10.3	6.1
40-44	17.7	18.7	11.1
45-49	29.6	31.5	18.2
50-54	54.5	57.1	31.5
55-59	99.0	102.3	79.7
60-64	126.8	126.5	141.2
65-69	139.6	141.2	143.4
70-74	126.4	127.0	131.0
75-79	110.8	111.2	110.7
80-84	88.0	87.0	108.7
85+	57.3	55.5	64.8

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
13-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Corpus and Uterus, NOS: INCIDENCE (Invasive)

**TABLE
13-C**

**Total Number of Cancer Cases by Age and Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*	White	Black
Total	14,175	12,679	1,174
Under 1	0	0	0
1-4	0	0	0
5-9	0	0	0
10-14	1	1	0
15-19	0	0	0
20-24	9	5	3
25-29	37	31	4
30-34	92	77	10
35-39	168	151	14
40-44	359	312	27
45-49	659	591	46
50-54	1,335	1,200	81
55-59	2,364	2,126	186
60-64	2,646	2,320	269
65-69	2,340	2,106	201
70-74	1,616	1,454	135
75-79	1,134	1,027	88
80-84	782	708	67
85+	633	570	43

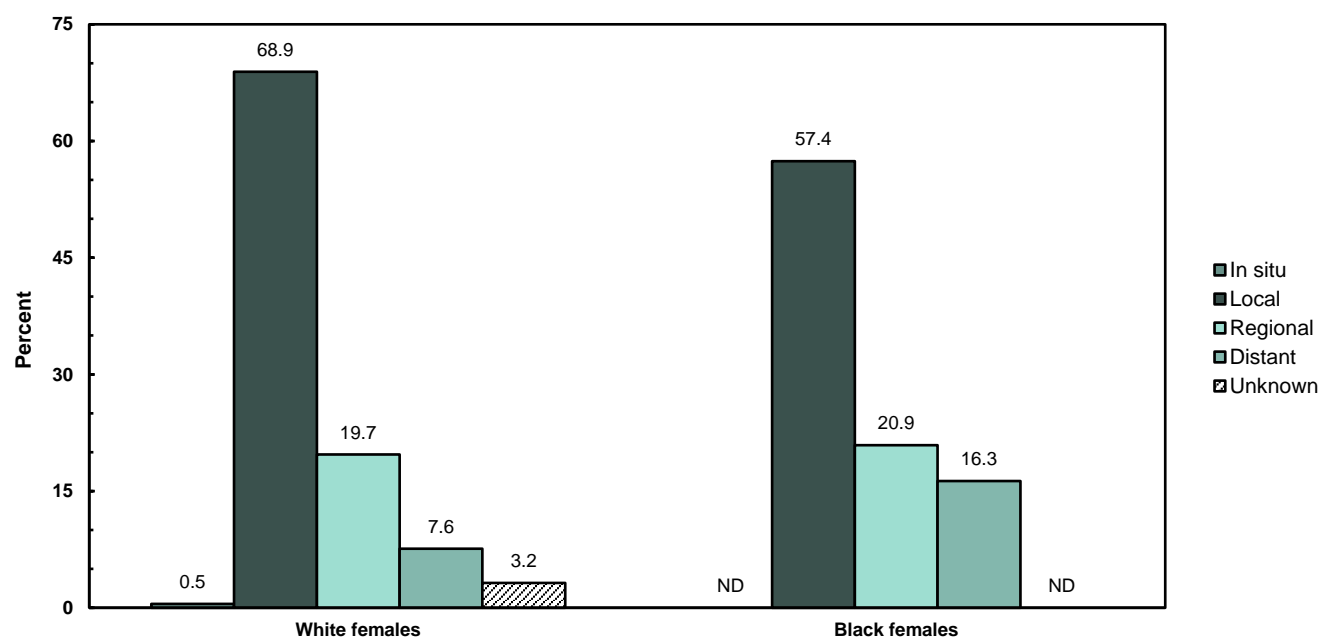
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
13-C**

**Stage of Disease at Diagnosis, Percent by Race
Pennsylvania Female Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 2,886 - 98.9%

Cancer of the Corpus and Uterus, NOS: MORTALITY

**TABLE
13-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	548	5.7 (5.2-6.2)	452	5.3 (4.8-5.8)	81	9.9 (7.7-12.1)
2014	552	5.9 (5.4-6.4)	445	5.3 (4.8-5.8)	94	11.9 (9.5-14.3)
2013	508	5.3 (4.8-5.8)	420	4.9 (4.4-5.4)	74	9.7 (7.5-11.9)
2012	475	5.1 (4.6-5.6)	382	4.5 (4.0-5.0)	81	11.2 (8.8-13.6)
2011	463	5.0 (4.5-5.5)	396	4.8 (4.3-5.3)	62	8.1 (6.1-10.1)
2010	479	5.2 (4.7-5.7)	405	4.9 (4.4-5.4)	69	9.8 (7.5-12.1)
2009	462	5.2 (4.7-5.7)	412	5.1 (4.6-5.6)	46	7.0 (5.0-9.0)
2008	387	4.3 (3.9-4.7)	348	4.2 (3.8-4.6)	36	5.2 (3.5-6.9)
2007	450	5.2 (4.7-5.7)	395	5.0 (4.5-5.5)	52	7.9 (5.8-10.0)
2006	430	4.9 (4.4-5.4)	385	4.8 (4.3-5.3)	42	6.5 (4.5-8.5)

* Includes any unknowns

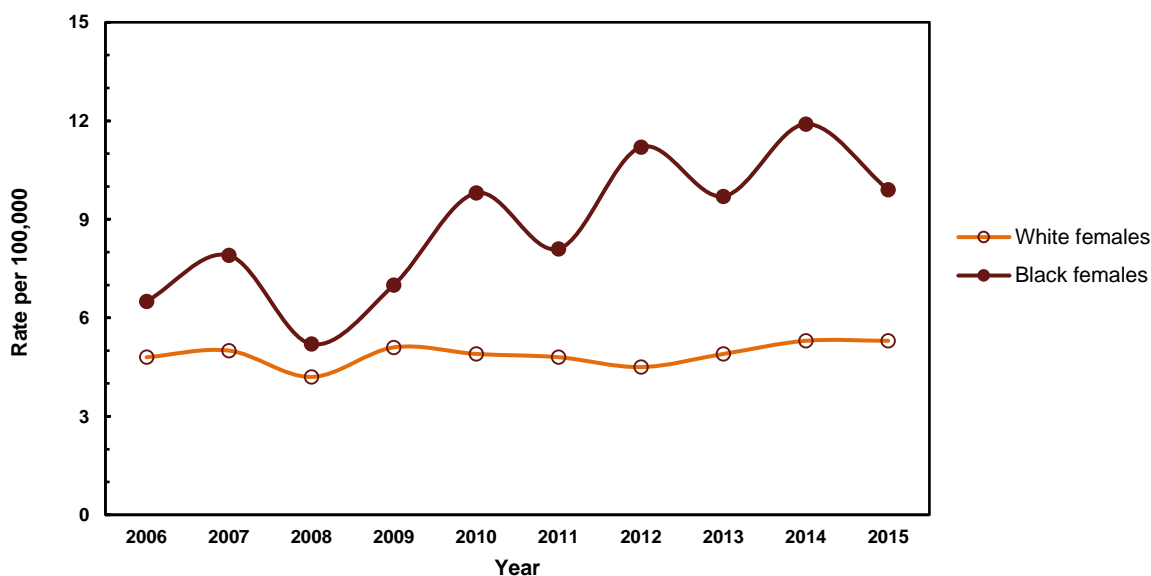
SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER Program.

**FIGURE
13-D**

**Age-adjusted Death Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Corpus and Uterus, NOS: MORTALITY

**TABLE
13-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*		White		Black	
	No.	Rate	No.	Rate	No.	Rate
Total*	2,546	7.8	2,095	7.7	392	10.3
Under 1	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND
20-24	0	ND	0	ND	0	ND
25-29	3	ND	1	ND	0	ND
30-34	3	ND	3	ND	0	ND
35-39	5	ND	4	ND	1	ND
40-44	15	0.7	12	0.7	1	ND
45-49	59	2.6	43	2.3	12	4.8
50-54	112	4.6	77	3.7	23	8.9
55-59	232	9.7	176	8.5	49	21.0
60-64	324	15.5	256	14.0	59	31.0
65-69	373	22.2	293	19.6	73	52.1
70-74	364	28.5	306	26.7	52	50.5
75-79	339	33.1	290	31.4	45	56.6
80-84	301	33.9	253	31.1	44	71.4
85+	416	37.7	381	37.1	33	49.8

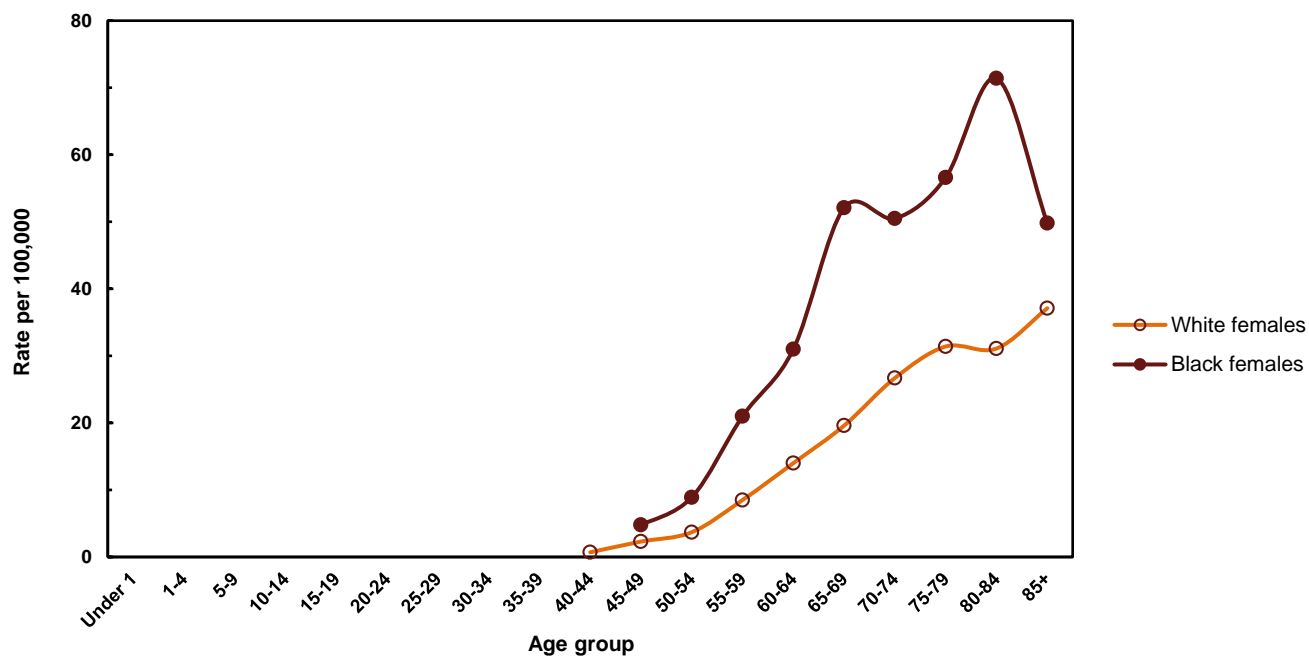
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
13-E**

**Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Corpus and Uterus, NOS: INCIDENCE (Invasive)

**TABLE
13-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	14,175	32.2	(31.7-32.7)				
Adams	106	29.2	(23.6-34.8)	Juniata	41	47.3	(32.8-61.8)
Allegheny	1,347	29.9	(28.3-31.5)	Lackawanna	263	33.9	(29.8-38.0)
Armstrong	78	29.3	(22.8-35.8)	Lancaster	582	33.9	(31.1-36.7)
Beaver	199	29.3	(25.2-33.4)	Lawrence	104	30.4	(24.6-36.2)
Bedford	47	25.0	(17.9-32.1)	Lebanon	167	34.9	(29.6-40.2)
Berks	401	29.5	(26.6-32.4)	Lehigh	426	35.8	(32.4-39.2)
Blair	140	30.8	(25.7-35.9)	Luzerne	447	38.5	(34.9-42.1)
Bradford	87	39.0	(30.8-47.2)	Lycoming	128	31.2	(25.8-36.6)
Bucks	723	32.5	(30.1-34.9)	McKean	44	31.6	(22.3-40.9)
Butler	168	26.4	(22.4-30.4)	Mercer	140	33.7	(28.1-39.3)
Cambria	162	30.7	(26.0-35.4)	Mifflin	48	26.2	(18.8-33.6)
Cameron	7	ND		Monroe	171	29.7	(25.2-34.2)
Carbon	92	37.7	(30.0-45.4)	Montgomery	929	32.9	(30.8-35.0)
Centre	140	35.0	(29.2-40.8)	Montour	28	37.9	(23.9-51.9)
Chester	467	28.3	(25.7-30.9)	Northampton	389	37.6	(33.9-41.3)
Clarion	51	38.9	(28.2-49.6)	Northumberland	128	37.6	(31.1-44.1)
Clearfield	89	30.1	(23.8-36.4)	Perry	73	48.1	(37.1-59.1)
Clinton	56	46.5	(34.3-58.7)	Philadelphia	1,517	32.8	(31.1-34.5)
Columbia	92	42.2	(33.6-50.8)	Pike	60	26.5	(19.8-33.2)
Crawford	106	32.1	(26.0-38.2)	Potter	21	32.7	(18.7-46.7)
Cumberland	287	34.2	(30.2-38.2)	Schuylkill	171	33.1	(28.1-38.1)
Dauphin	293	31.9	(28.2-35.6)	Snyder	50	39.1	(28.3-49.9)
Delaware	602	32.0	(29.4-34.6)	Somerset	83	31.2	(24.5-37.9)
Elk	38	31.6	(21.6-41.6)	Sullivan	14	ND	
Erie	266	28.9	(25.4-32.4)	Susquehanna	59	41.3	(30.8-51.8)
Fayette	162	31.3	(26.5-36.1)	Tioga	51	35.5	(25.8-45.2)
Forest	7	ND		Union	36	27.0	(18.2-35.8)
Franklin	139	26.8	(22.3-31.3)	Venango	51	27.0	(19.6-34.4)
Fulton	16	ND		Warren	45	27.5	(19.5-35.5)
Greene	53	43.4	(31.7-55.1)	Washington	265	34.1	(30.0-38.2)
Huntingdon	48	31.2	(22.4-40.0)	Wayne	61	31.4	(23.5-39.3)
Indiana	83	26.6	(20.9-32.3)	Westmoreland	452	31.0	(28.1-33.9)
Jefferson	57	34.7	(25.7-43.7)	Wyoming	45	44.3	(31.4-57.2)
				York	477	32.6	(29.7-35.5)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). In situ cancer cases are excluded. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

Cancer of the Corpus and Uterus, NOS: MORTALITY

**TABLE
13-G**

**Number of Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	2,546	5.4	(5.2-5.6)				
Adams	14	ND		Juniata	7	ND	
Allegheny	251	5.2	(4.6-5.8)	Lackawanna	43	4.8	(3.4-6.2)
Armstrong	12	ND		Lancaster	90	4.7	(3.7-5.7)
Beaver	25	3.2	(1.9-4.5)	Lawrence	13	ND	
Bedford	13	ND		Lebanon	31	6.1	(4.0-8.2)
Berks	65	4.8	(3.6-6.0)	Lehigh	77	6.1	(4.7-7.5)
Blair	21	3.9	(2.2-5.6)	Luzerne	71	5.2	(4.0-6.4)
Bradford	16	ND		Lycoming	20	4.4	(2.5-6.3)
Bucks	102	4.4	(3.5-5.3)	McKean	10	ND	
Butler	26	3.8	(2.3-5.3)	Mercer	18	ND	
Cambria	34	6.1	(4.0-8.2)	Mifflin	10	ND	
Cameron	0	ND		Monroe	26	4.7	(2.9-6.5)
Carbon	18	ND		Montgomery	181	6.1	(5.2-7.0)
Centre	11	ND		Montour	5	ND	
Chester	83	5.1	(4.0-6.2)	Northampton	80	7.2	(5.6-8.8)
Clarion	6	ND		Northumberland	15	ND	
Clearfield	16	ND		Perry	5	ND	
Clinton	4	ND		Philadelphia	386	8.2	(7.4-9.0)
Columbia	16	ND		Pike	10	ND	
Crawford	20	5.6	(3.1-8.1)	Potter	5	ND	
Cumberland	27	3.1	(1.9-4.3)	Schuylkill	34	5.7	(3.8-7.6)
Dauphin	55	6.0	(4.4-7.6)	Snyder	7	ND	
Delaware	124	6.1	(5.0-7.2)	Somerset	13	ND	
Elk	8	ND		Sullivan	2	ND	
Erie	48	4.8	(3.4-6.2)	Susquehanna	10	ND	
Fayette	38	7.0	(4.8-9.2)	Tioga	5	ND	
Forest	2	ND		Union	9	ND	
Franklin	26	4.4	(2.7-6.1)	Venango	13	ND	
Fulton	2	ND		Warren	10	ND	
Greene	3	ND		Washington	54	6.0	(4.4-7.6)
Huntingdon	6	ND		Wayne	12	ND	
Indiana	10	ND		Westmoreland	83	5.0	(3.9-6.1)
Jefferson	7	ND		Wyoming	8	ND	
				York	74	4.9	(3.8-6.0)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

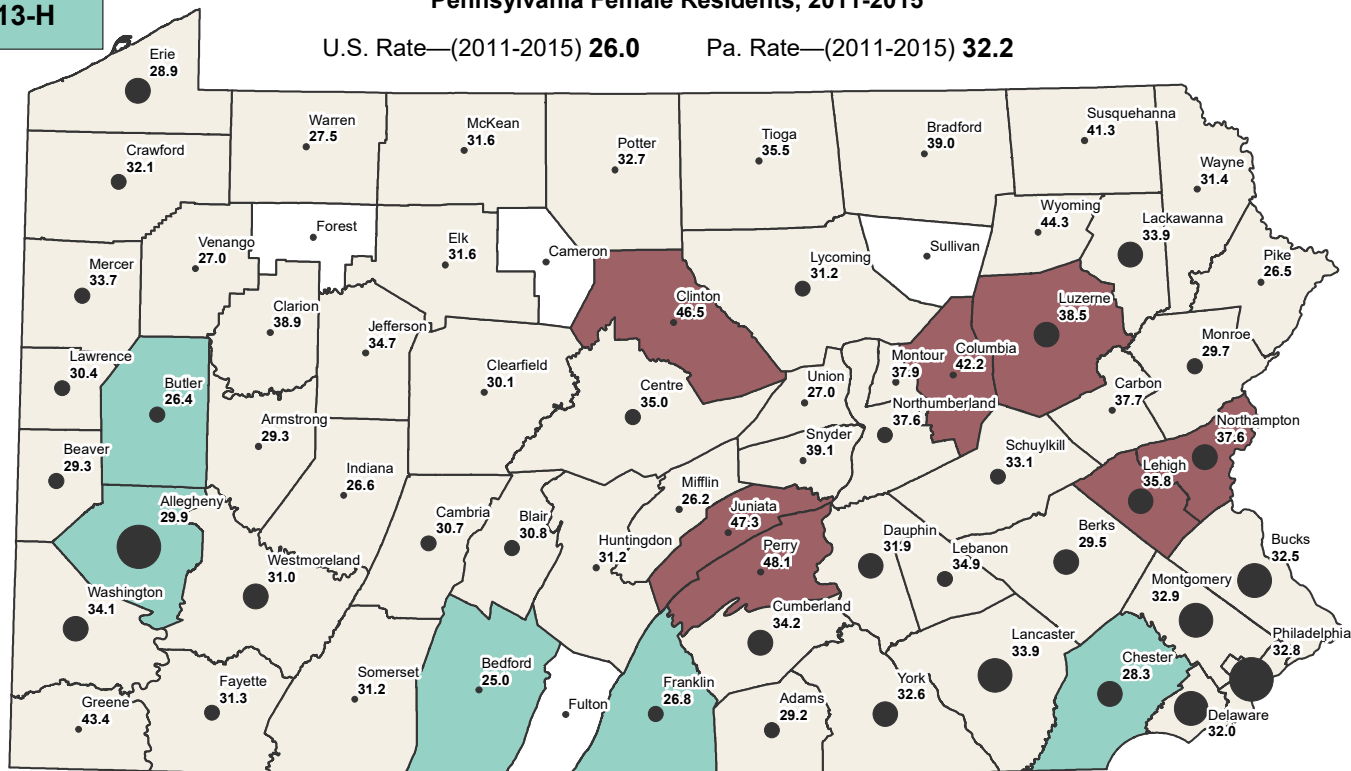
Cancer of the Corpus and Uterus, NOS: INCIDENCE (Invasive) and MORTALITY

**MAP
13-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **26.0**

Pa. Rate—(2011-2015) **32.2**



Significantly higher

Significantly lower

Not significantly different

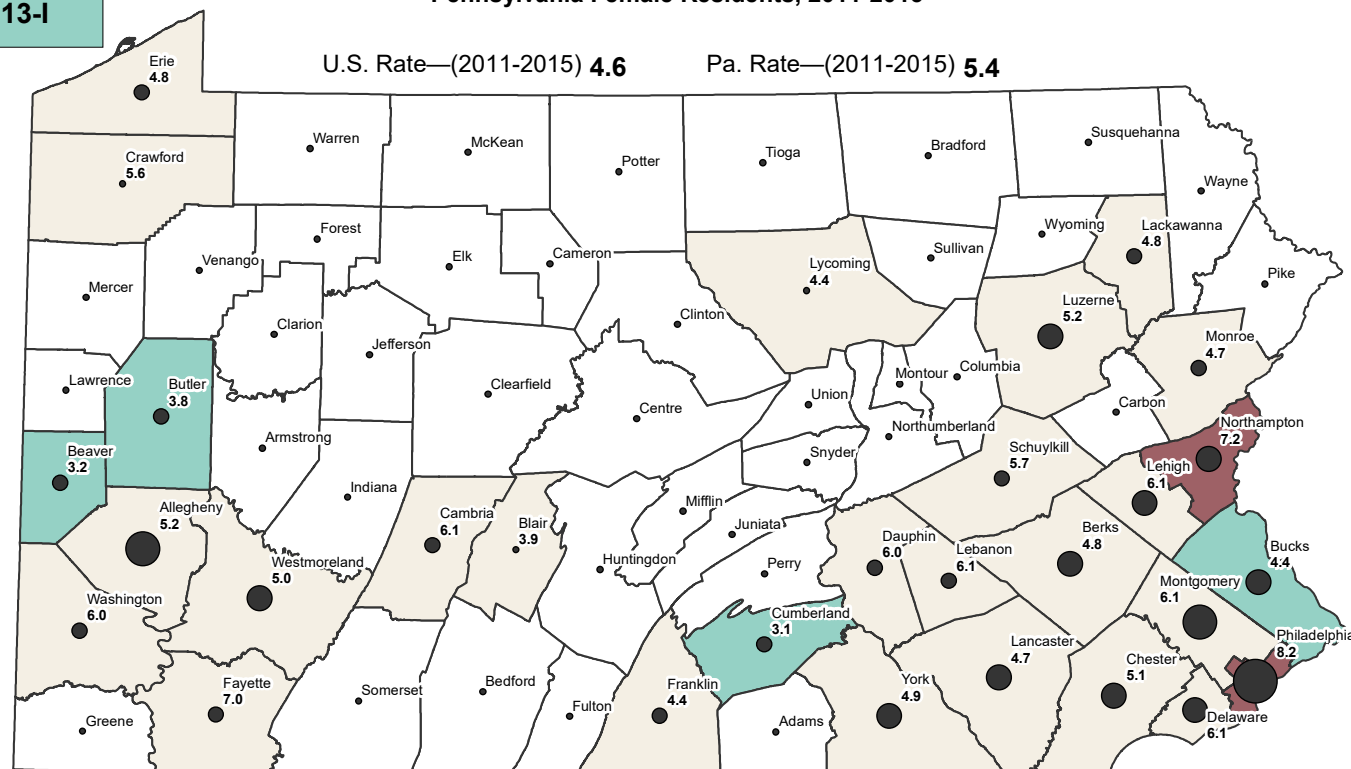
Significance not determined—less than 20 observed cases

**MAP
13-I**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **4.6**

Pa. Rate—(2011-2015) **5.4**



The symbol, •, represents the number of invasive cancers or deaths. A larger circle indicates a larger amount of cases for the incidence map and a larger number of deaths for the mortality map.

SOURCES: Pennsylvania Cancer Registry; Pennsylvania Death Certificate Dataset; SEER 18 areas; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Ovary

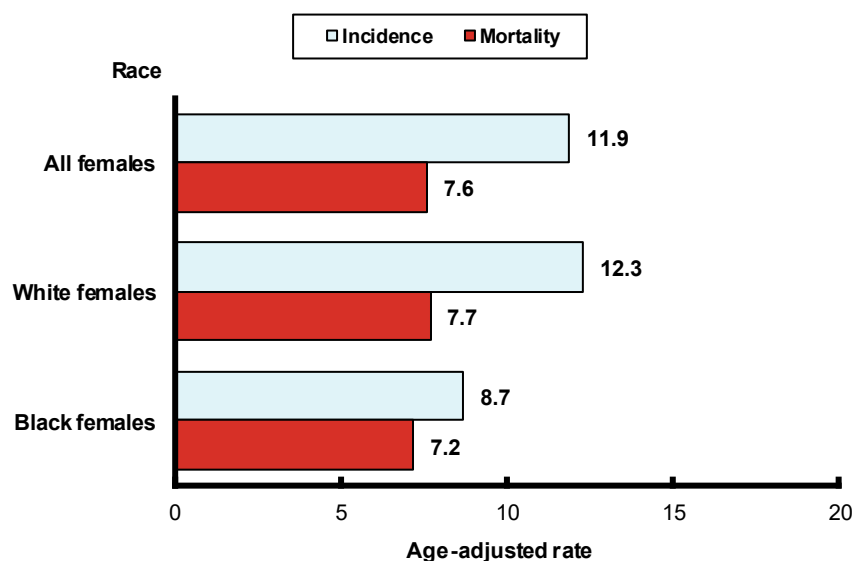
Data Highlights

The 2011-2015 average annual age-adjusted incidence rate for invasive ovarian cancer among white females (12.3 per 100,000) was about 41 percent higher than the rate for black females (8.7). In 2015, there were 990 cases of invasive ovarian cancer diagnosed and reported to the Pennsylvania Cancer Registry – the smallest number reported over the 10-year period of 2006-2015. The 2015 age-adjusted incidence rate for females was 11.6, compared to 12.6 for females diagnosed in 2006. Annual age-adjusted incidence rates for the 10-year period of 2006-2015 showed decreasing trends among white and black females.

Average annual (2011-2015) age-specific incidence rates for this site began rising dramatically at about age 40 among white females and age 50 among black females. During 2011-2015, about 94 percent of the invasive ovarian cancers were diagnosed in women aged 40 and older. In 2015, about 77 percent of the ovarian cancer cases were diagnosed at the late stage (regional or distant) of the disease, and about 16 percent were diagnosed at the early stage (in situ or local).

The 2011-2015 average annual age-adjusted death rate for white females (7.7 per 100,000) was about 7 percent higher than the rate for black females (7.2). In 2015, ovarian cancer claimed the lives of 665 female residents of Pennsylvania, resulting in an age-adjusted death rate of 7.0. As observed with incidence rates, the age-adjusted death rates by race were consistently higher for whites compared to blacks for the period 2006-2009; however, from 2010 to 2012, the age-adjusted death rate for blacks was higher than the rate for whites. In 2013, the rate for white females once again surpassed the rate for black females. The rate among white females and black females was equal (7.8) in 2014. In 2015, the age-adjusted death rate among white females was 59 percent higher than the rate among black females. Among white females, annual age-adjusted death rates from 2006 through 2015 showed a decreasing trend, while the trend among black females had no discernable trend. For most age groups, the 2011-2015 age-specific death rates were higher among whites compared to blacks.

FIGURE 14
Average Annual Age-Adjusted Incidence and Death Rates*
by Race, Pennsylvania Female Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, nulliparity or having a small number of live births; fertility drugs; obesity; personal history of breast cancer; family history of breast, ovarian or colorectal cancers; use of androgens (male hormones) and estrogen/hormone replacement therapy are suggestive of ovarian cancer risk.

Early Detection

Survival rates are very good for ovarian cancers found at an early stage. However, no screening tests have proven effective or are currently being evaluated.

Cancer of the Ovary: INCIDENCE (Invasive)

**TABLE
14-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	990	11.6 (10.9-12.3)	906	12.1 (11.3-12.9)	61	7.6 (5.7-9.5)
2014	1,029	12.0 (11.3-12.7)	939	12.4 (11.6-13.2)	65	8.3 (6.3-10.3)
2013	998	11.7 (11.0-12.4)	905	12.0 (11.2-12.8)	64	8.5 (6.4-10.6)
2012	1,013	11.9 (11.2-12.6)	893	12.1 (11.3-12.9)	65	8.6 (6.5-10.7)
2011	1,033	12.4 (11.6-13.2)	934	12.7 (11.9-13.5)	78	10.8 (8.4-13.2)
2010	1,066	12.9 (12.1-13.7)	970	13.5 (12.7-14.3)	76	10.9 (8.4-13.4)
2009	1,076	13.3 (12.5-14.1)	993	13.7 (12.8-14.6)	62	9.0 (6.8-11.2)
2008	1,100	13.5 (12.7-14.3)	994	13.6 (12.8-14.4)	86	12.5 (9.9-15.1)
2007	1,106	13.8 (13.0-14.6)	1,014	14.1 (13.2-15.0)	67	10.1 (7.7-12.5)
2006	1,013	12.6 (11.8-13.4)	936	12.9 (12.1-13.7)	64	9.7 (7.3-12.1)

* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

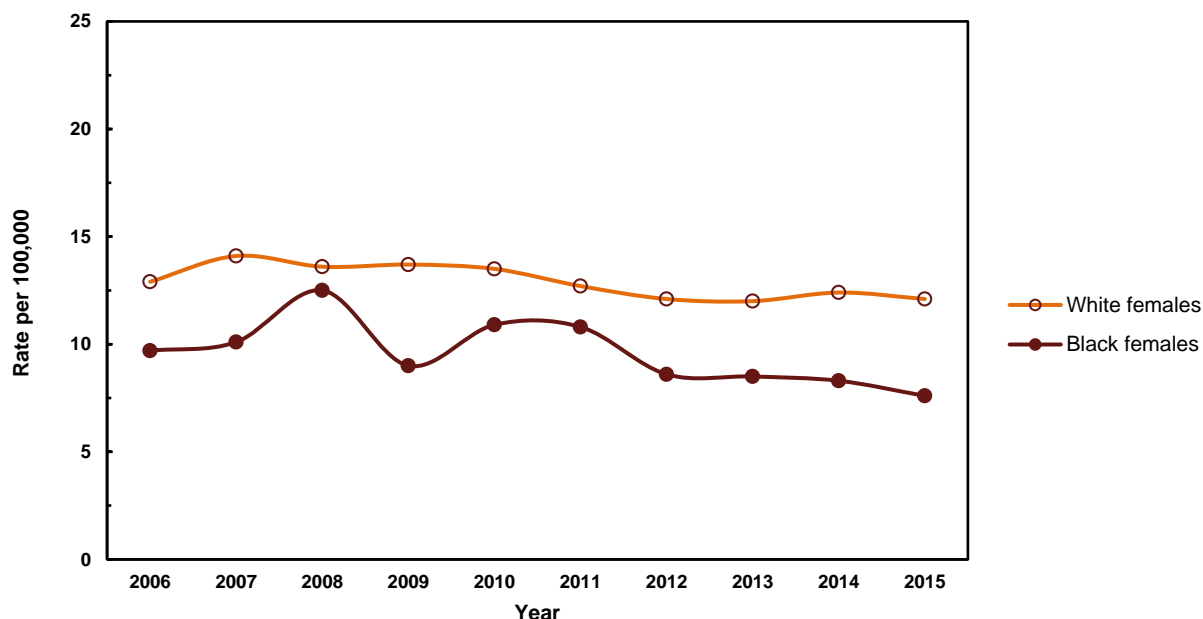
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below.

CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
14-A**

**Age-adjusted Incidence Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Ovary: INCIDENCE (Invasive)

**TABLE
14-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**

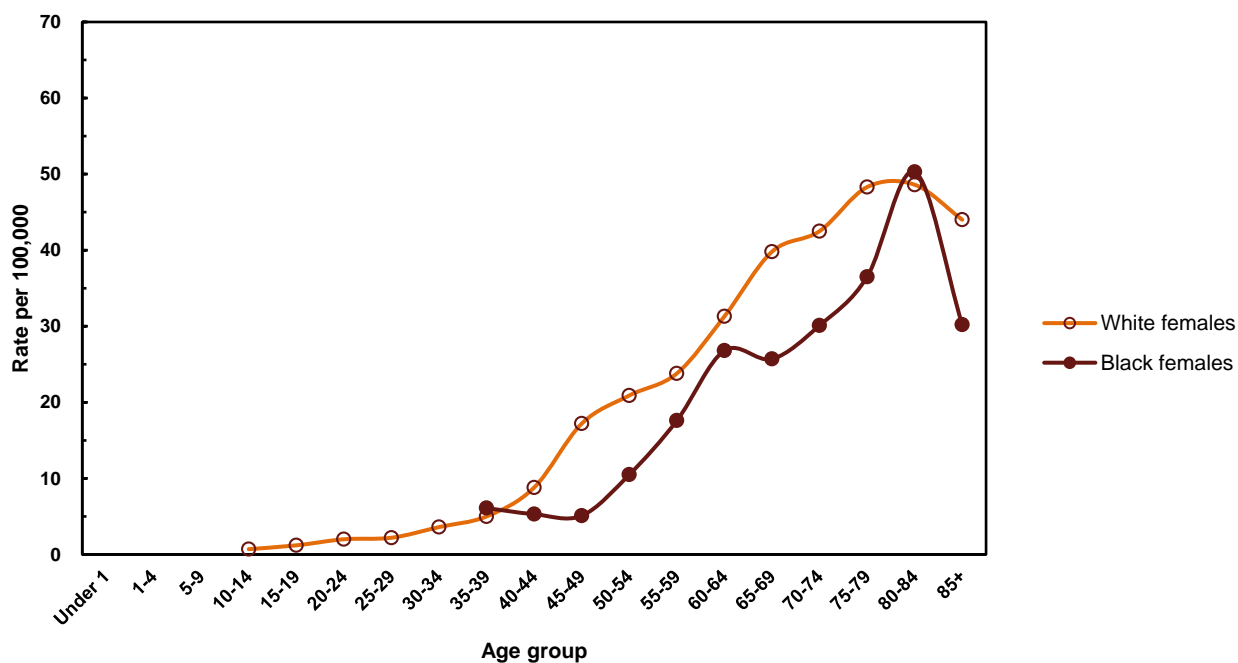
Age Group	All Females	White	Black
Total	15.5	16.9	8.7
Under 1	ND	ND	ND
1-4	ND	ND	ND
5-9	ND	ND	ND
10-14	0.7	0.7	ND
15-19	1.2	1.2	ND
20-24	2.0	2.0	ND
25-29	2.0	2.2	ND
30-34	3.5	3.6	ND
35-39	5.3	5.0	6.1
40-44	8.5	8.8	5.3
45-49	15.7	17.2	5.1
50-54	19.7	20.9	10.5
55-59	23.5	23.8	17.6
60-64	30.6	31.3	26.8
65-69	38.1	39.8	25.7
70-74	41.1	42.5	30.1
75-79	47.2	48.3	36.5
80-84	48.7	48.6	50.3
85+	44.6	44.0	30.2

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
14-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Ovary: INCIDENCE (Invasive)

**TABLE
14-C**

**Total Number of Cancer Cases by Age and Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*	White	Black
Total	5,063	4,577	333
Under 1	0	0	0
1-4	0	0	0
5-9	2	0	2
10-14	14	10	3
15-19	25	19	5
20-24	43	34	5
25-29	40	35	3
30-34	67	56	9
35-39	97	73	14
40-44	172	148	13
45-49	349	323	13
50-54	482	439	27
55-59	561	495	41
60-64	639	573	51
65-69	638	593	36
70-74	525	486	31
75-79	483	446	29
80-84	433	395	31
85+	493	452	20

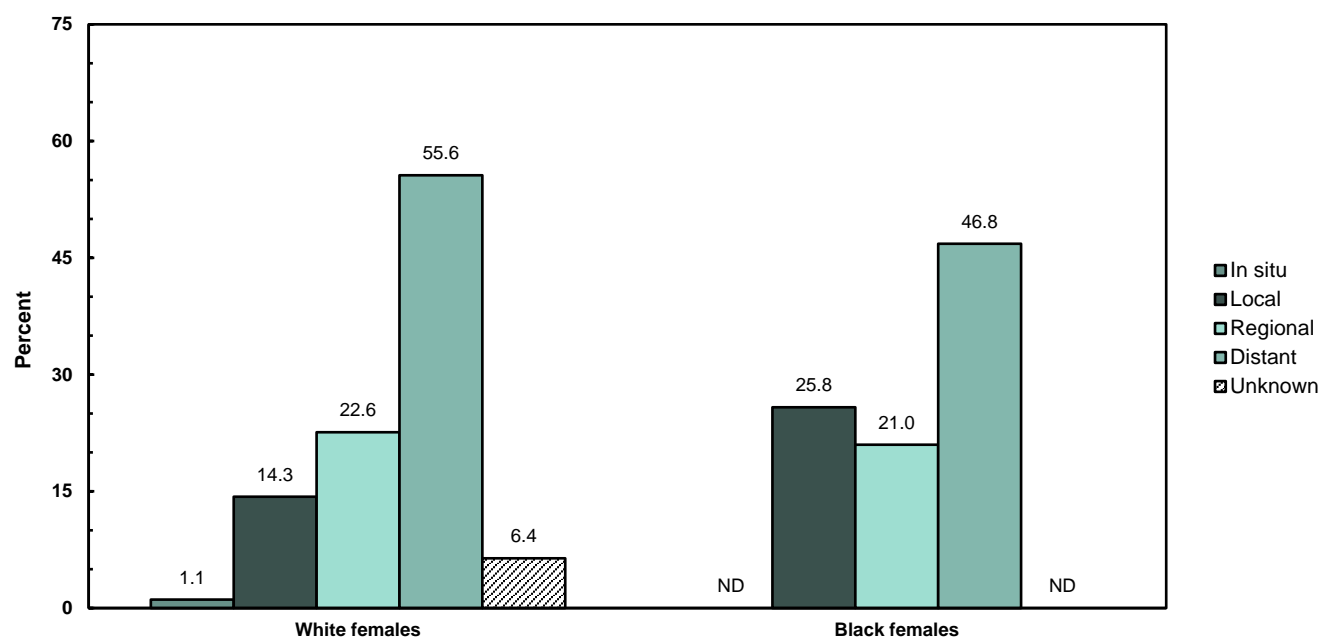
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
14-C**

**Stage of Disease at Diagnosis, Percent by Race
Pennsylvania Female Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 913 - 92.2%

Cancer of the Ovary: MORTALITY

**TABLE
14-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Female Residents, 2006-2015**

Year	All Females*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	665	7.0 (6.5-7.5)	609	7.3 (6.7-7.9)	38	4.6 (3.1-6.1)
2014	733	7.9 (7.3-8.5)	649	7.8 (7.2-8.4)	61	7.8 (5.8-9.8)
2013	713	7.7 (7.1-8.3)	642	7.7 (7.1-8.3)	54	7.1 (5.2-9.0)
2012	721	7.8 (7.2-8.4)	644	7.8 (7.2-8.4)	61	8.1 (6.1-10.1)
2011	682	7.6 (7.0-8.2)	620	7.7 (7.1-8.3)	61	8.4 (6.3-10.5)
2010	724	8.1 (7.5-8.7)	653	8.2 (7.6-8.8)	62	9.2 (6.9-11.5)
2009	782	8.9 (8.3-9.5)	736	9.2 (8.5-9.9)	43	6.4 (4.5-8.3)
2008	754	8.6 (8.0-9.2)	699	8.9 (8.2-9.6)	51	7.5 (5.4-9.6)
2007	793	9.1 (8.5-9.7)	747	9.5 (8.8-10.2)	39	5.8 (4.0-7.6)
2006	807	9.4 (8.8-10.0)	760	9.7 (9.0-10.4)	43	6.5 (4.6-8.4)

* Includes any unknowns

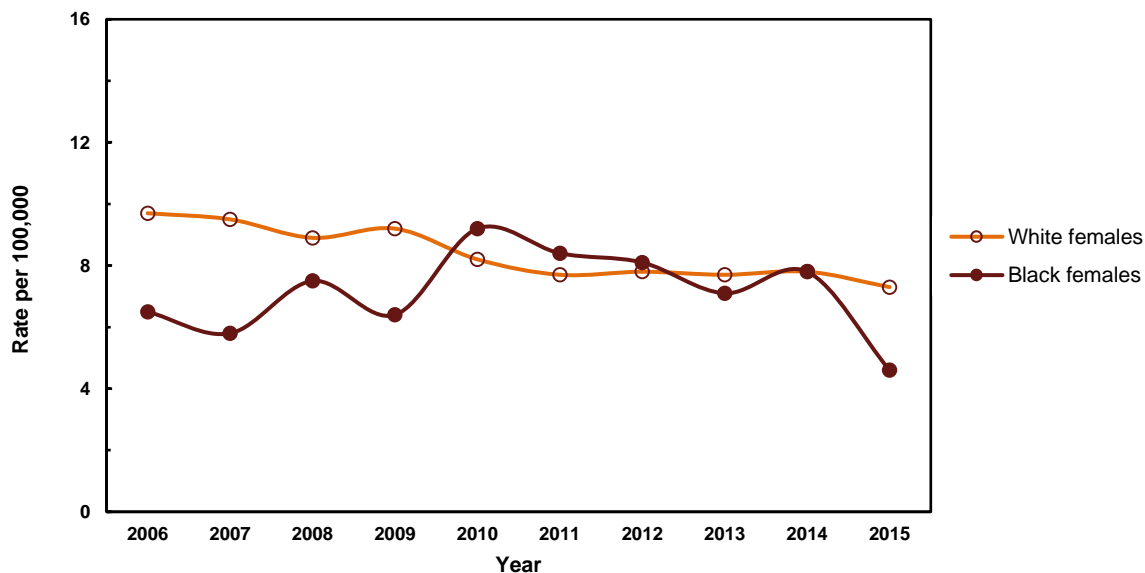
SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER Program.

**FIGURE
14-D**

**Age-adjusted Death Rates by Race
Pennsylvania Female Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Ovary: MORTALITY

**TABLE
14-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**

Age Group	All Females*		White		Black	
	No.	Rate	No.	Rate	No.	Rate
Total*	3,514	10.8	3,164	11.7	275	7.2
Under 1	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND
15-19	5	ND	3	ND	1	ND
20-24	4	ND	4	ND	0	ND
25-29	9	ND	8	ND	1	ND
30-34	12	0.6	11	0.7	1	ND
35-39	22	1.2	20	1.4	2	ND
40-44	52	2.6	43	2.6	6	ND
45-49	115	5.2	99	5.3	12	4.8
50-54	186	7.6	162	7.7	18	7.0
55-59	295	12.4	260	12.5	26	11.1
60-64	417	20.0	368	20.1	36	18.9
65-69	457	27.3	405	27.2	47	33.5
70-74	441	34.5	396	34.6	31	30.1
75-79	442	43.2	406	44.0	27	34.0
80-84	457	51.4	419	51.5	32	51.9
85+	600	54.3	560	54.6	35	52.8

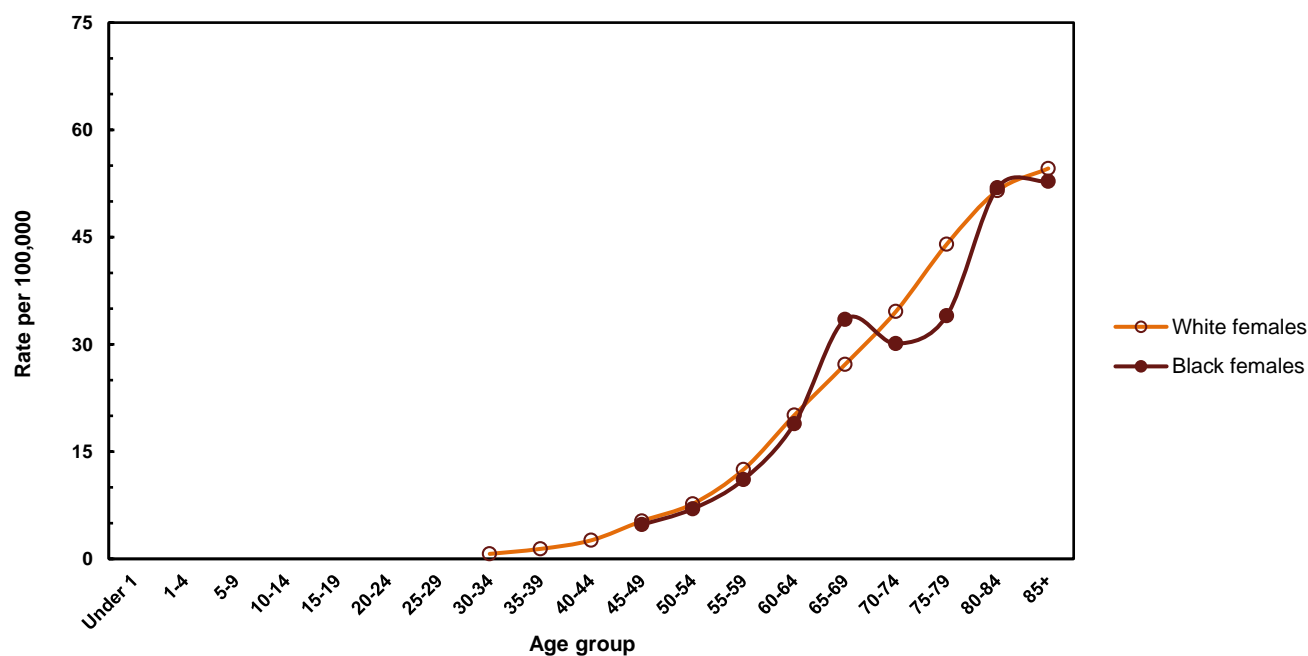
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
14-E**

**Average Annual Age-specific Death Rates by Race
Pennsylvania Female Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Ovary: INCIDENCE (Invasive)

**TABLE
14-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	5,063	11.9	(11.6-12.2)				
Adams	37	10.3	(7.0-13.6)	Juniata	12	ND	
Allegheny	496	11.2	(10.2-12.2)	Lackawanna	101	13.4	(10.8-16.0)
Armstrong	19	ND		Lancaster	212	12.3	(10.6-14.0)
Beaver	78	12.1	(9.4-14.8)	Lawrence	42	13.1	(9.1-17.1)
Bedford	18	ND		Lebanon	55	12.5	(9.2-15.8)
Berks	128	9.5	(7.9-11.1)	Lehigh	127	11.1	(9.2-13.0)
Blair	44	9.9	(7.0-12.8)	Luzerne	141	12.7	(10.6-14.8)
Bradford	32	14.1	(9.2-19.0)	Lycoming	44	11.9	(8.4-15.4)
Bucks	280	13.5	(11.9-15.1)	McKean	20	14.3	(8.0-20.6)
Butler	80	12.5	(9.8-15.2)	Mercer	47	12.6	(9.0-16.2)
Cambria	55	10.6	(7.8-13.4)	Mifflin	20	12.2	(6.9-17.5)
Cameron	2	ND		Monroe	68	12.8	(9.8-15.8)
Carbon	26	11.5	(7.1-15.9)	Montgomery	381	14.2	(12.8-15.6)
Centre	48	11.6	(8.3-14.9)	Montour	8	ND	
Chester	223	14.2	(12.3-16.1)	Northampton	147	14.8	(12.4-17.2)
Clarion	25	19.2	(11.7-26.7)	Northumberland	32	9.1	(5.9-12.3)
Clearfield	47	15.8	(11.3-20.3)	Perry	16	ND	
Clinton	13	ND		Philadelphia	477	10.6	(9.6-11.6)
Columbia	23	10.4	(6.1-14.7)	Pike	18	ND	
Crawford	31	10.3	(6.7-13.9)	Potter	8	ND	
Cumberland	94	11.4	(9.1-13.7)	Schuylkill	42	8.1	(5.7-10.5)
Dauphin	95	11.3	(9.0-13.6)	Snyder	10	ND	
Delaware	225	12.6	(11.0-14.2)	Somerset	47	16.2	(11.6-20.8)
Elk	9	ND		Sullivan	4	ND	
Erie	119	13.4	(11.0-15.8)	Susquehanna	26	18.0	(11.1-24.9)
Fayette	68	13.4	(10.2-16.6)	Tioga	22	15.4	(9.0-21.8)
Forest	2	ND		Union	14	ND	
Franklin	55	11.0	(8.1-13.9)	Venango	19	ND	
Fulton	3	ND		Warren	18	ND	
Greene	12	ND		Washington	79	10.3	(8.0-12.6)
Huntingdon	16	ND		Wayne	20	10.3	(5.8-14.8)
Indiana	25	9.0	(5.5-12.5)	Westmoreland	173	11.9	(10.1-13.7)
Jefferson	17	ND		Wyoming	10	ND	
				York	158	11.0	(9.3-12.7)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). In situ cancer cases are excluded. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

Cancer of the Ovary: MORTALITY

**TABLE
14-G**

**Number of Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County, Pennsylvania Female Residents, 2011-2015**

County	Females			County	Females		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	3,514	7.6	(7.3-7.9)				
Adams	33	8.6	(5.7-11.5)	Juniata	6	ND	
Allegheny	369	7.5	(6.7-8.3)	Lackawanna	81	9.5	(7.4-11.6)
Armstrong	24	9.3	(5.6-13.0)	Lancaster	140	7.5	(6.3-8.7)
Beaver	55	7.6	(5.6-9.6)	Lawrence	24	6.9	(4.1-9.7)
Bedford	14	ND		Lebanon	40	7.1	(4.9-9.3)
Berks	92	6.6	(5.3-7.9)	Lehigh	77	6.0	(4.7-7.3)
Blair	32	6.1	(4.0-8.2)	Luzerne	89	7.4	(5.9-8.9)
Bradford	19	ND		Lycoming	35	7.7	(5.1-10.3)
Bucks	166	7.6	(6.4-8.8)	McKean	13	ND	
Butler	40	5.7	(3.9-7.5)	Mercer	39	8.1	(5.6-10.6)
Cambria	63	11.1	(8.4-13.8)	Mifflin	8	ND	
Cameron	1	ND		Monroe	46	8.7	(6.2-11.2)
Carbon	14	ND		Montgomery	251	8.4	(7.4-9.4)
Centre	41	10.1	(7.0-13.2)	Montour	7	ND	
Chester	147	8.7	(7.3-10.1)	Northampton	74	6.8	(5.3-8.3)
Clarion	13	ND		Northumberland	24	6.0	(3.6-8.4)
Clearfield	27	8.3	(5.2-11.4)	Perry	7	ND	
Clinton	5	ND		Philadelphia	330	7.1	(6.3-7.9)
Columbia	14	ND		Pike	17	ND	
Crawford	27	8.3	(5.2-11.4)	Potter	4	ND	
Cumberland	62	7.0	(5.3-8.7)	Schuylkill	38	6.5	(4.4-8.6)
Dauphin	62	6.9	(5.2-8.6)	Snyder	8	ND	
Delaware	168	8.5	(7.2-9.8)	Somerset	26	7.6	(4.7-10.5)
Elk	10	ND		Sullivan	4	ND	
Erie	93	10.2	(8.1-12.3)	Susquehanna	11	ND	
Fayette	51	9.9	(7.2-12.6)	Tioga	13	ND	
Forest	1	ND		Union	9	ND	
Franklin	35	6.5	(4.3-8.7)	Venango	20	9.8	(5.5-14.1)
Fulton	3	ND		Warren	13	ND	
Greene	8	ND		Washington	76	8.8	(6.8-10.8)
Huntingdon	13	ND		Wayne	14	ND	
Indiana	19	ND		Westmoreland	130	8.3	(6.9-9.7)
Jefferson	15	ND		Wyoming	10	ND	
				York	94	6.3	(5.0-7.6)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

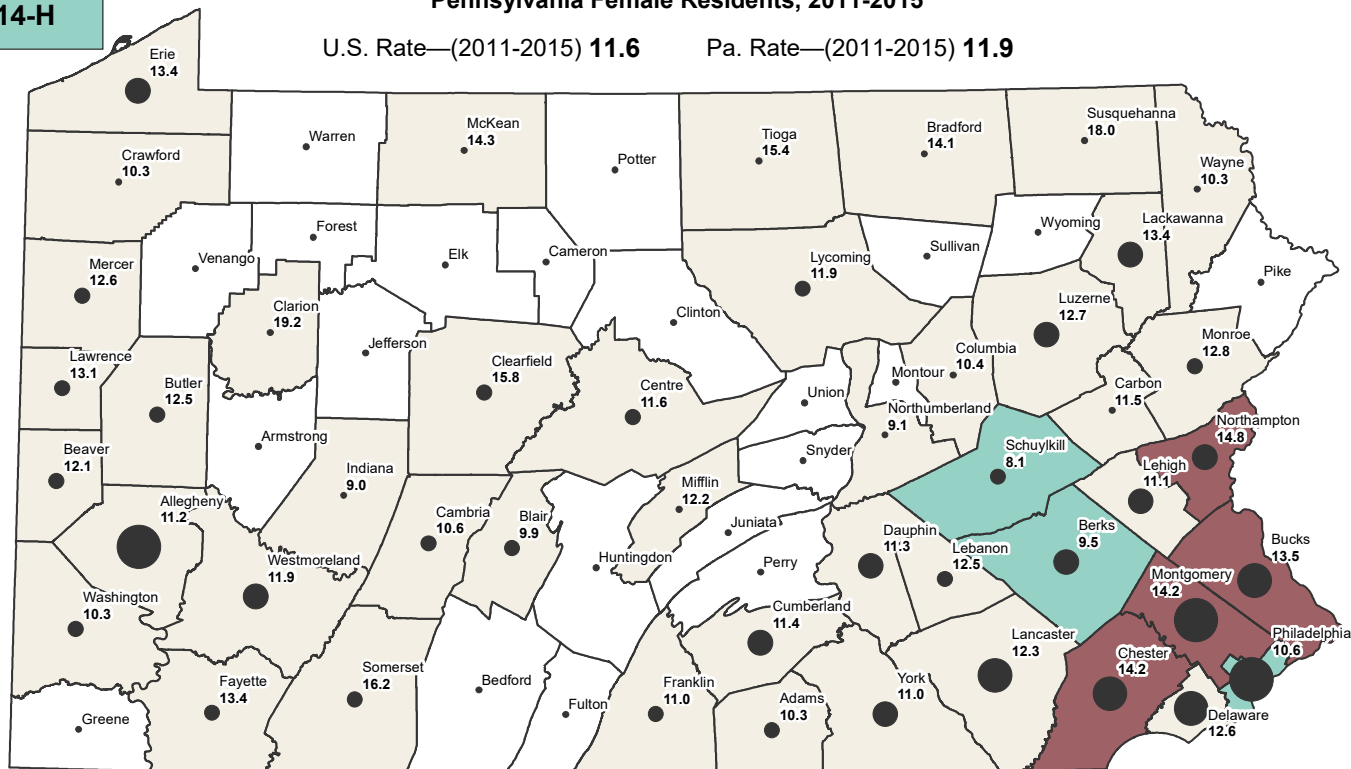
Cancer of the Ovary: INCIDENCE (Invasive) and MORTALITY

**MAP
14-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **11.6**

Pa. Rate—(2011-2015) **11.9**



Significantly higher

Significantly lower

Not significantly
different

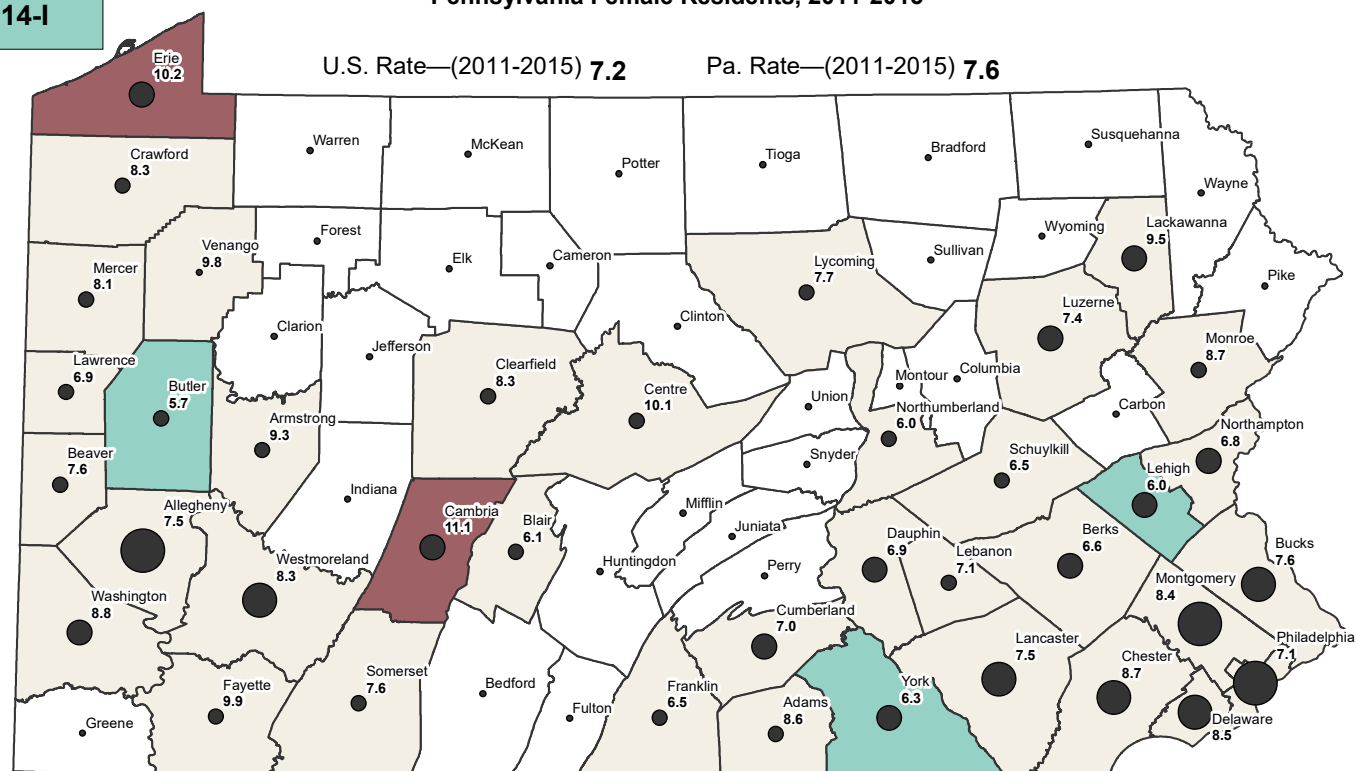
Significance not determined—
less than 20 observed cases

**MAP
14-I**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **7.2**

Pa. Rate—(2011-2015) **7.6**



The symbol, •, represents the number of invasive cancers or deaths. A larger circle indicates a larger amount of cases for the incidence map and a larger number of deaths for the mortality map.
SOURCES: Pennsylvania Cancer Registry; Pennsylvania Death Certificate Dataset; SEER 18 areas; US Mortality Files
NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Prostate

Data Highlights

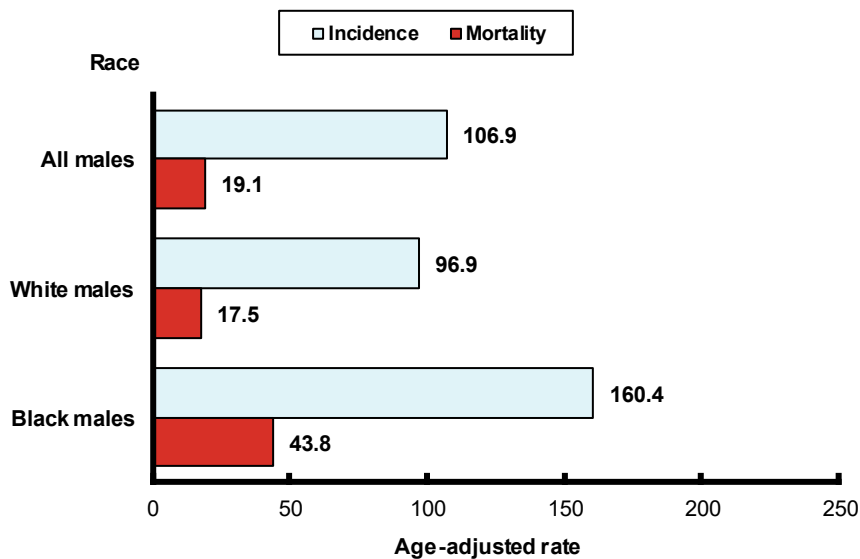
Cancer of the prostate accounted for the largest number (8,583) and percentage (22.1) of all invasive cancer cases diagnosed among male residents in 2015. The average annual (2011-2015) age-adjusted incidence rate for prostate cancer among black males was 160.4 per 100,000, approximately 66 percent higher than the rate of 96.9 for whites. According to the American Cancer Society, black males in the United States have been reported to have among the highest incidence of prostate cancer of any group in the world.

During the late 1980s and early 1990s, new screening procedures became available, thereby affecting the number of cases detected and reported. The effects of increased screening procedures stabilized during the mid-1990s. In 2012, the U.S. Preventive Services Task Force recommended against prostate-specific antigen-based screening for prostate cancer. As a result, the annual age-adjusted incidence rate declined dramatically, by 24 percent from 2011 to 2015. The age-adjusted rate among white males had a 25 percent decrease from 122.5 in 2011 to 92.2 in 2012. The rate decreased to a low of 83.6 in 2014 before increasing in 2015 to 93.8. Annual incidence rates among black males had a very similar trend compared to whites, except the rates for blacks were significantly higher than whites.

Prostate cancer is a disease more prevalent among older males. Approximately 76 percent of the invasive cases diagnosed from 2011 to 2015 were among males aged 60 and older. Average annual age-specific incidence rates among black males for this site began rising dramatically at about age 50 and then declining by age 75. The average annual age-specific incidence rates among white males had a similar trend to black males but rose at a slower rate. In 2015, about 74 percent of the prostate cancer cases reported among Pennsylvania residents were diagnosed at an early stage (in situ and local) of the disease. Approximately 20 percent of prostate cancers in 2015 were diagnosed at a late stage (regional or distant).

There were 1,307 resident deaths in 2015 due to prostate cancer, an increase from 2014, when there were 1,260 resident deaths. The average annual (2011-2015) age-adjusted death rate among black males (43.8 per 100,000) was over twice the rate for white males (17.5). As expected, the average annual (2011-2015) age-specific death rates for prostate cancer also showed black males with higher rates than white males for the age groups over 49. Overall, the annual age-adjusted death rates for blacks and whites have declined during the period 2006-2015.

FIGURE 15
Average Annual Age-Adjusted Incidence and Death Rates*
by Race, Pennsylvania Male Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, etiological factors are not known, although risk is higher among blacks and is associated with family history, diets high in red meats and high-fat dairy products, and a lack of fruits and vegetables.

Early Detection

The effectiveness of the digital rectal exam and the PSA tests as screening to reduce death rates is being evaluated.

Cancer of the Prostate: INCIDENCE (Invasive)

**TABLE
15-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Male Residents, 2006-2015**

Year	All Males*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	8,583	104.4 (102.2-106.6)	6,906	93.8 (91.6-96.0)	971	149.4 (140.0-158.8)
2014	7,407	92.0 (89.9-94.1)	6,041	83.6 (81.5-85.7)	970	158.3 (148.3-168.3)
2013	7,973	101.2 (99.0-103.4)	6,625	93.4 (91.2-95.6)	927	156.5 (146.4-166.6)
2012	7,841	101.7 (99.4-104.0)	6,431	92.2 (89.9-94.5)	861	145.7 (136.0-155.4)
2011	10,235	136.5 (133.9-139.1)	8,308	122.5 (119.9-125.1)	1,081	194.0 (182.4-205.6)
2010	9,690	132.8 (130.2-135.4)	7,617	116.0 (113.4-118.6)	976	182.6 (171.1-194.1)
2009	9,742	139.6 (136.8-142.4)	7,979	125.4 (122.6-128.2)	1,042	216.8 (203.6-230.0)
2008	10,098	148.7 (145.8-151.6)	8,525	137.5 (134.6-140.4)	1,040	224.8 (211.1-238.5)
2007	11,150	167.7 (164.6-170.8)	9,177	150.9 (147.8-154.0)	1,075	237.3 (223.1-251.5)
2006	10,770	164.4 (161.3-167.5)	8,994	149.7 (146.6-152.8)	1,013	225.2 (211.3-239.1)

* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

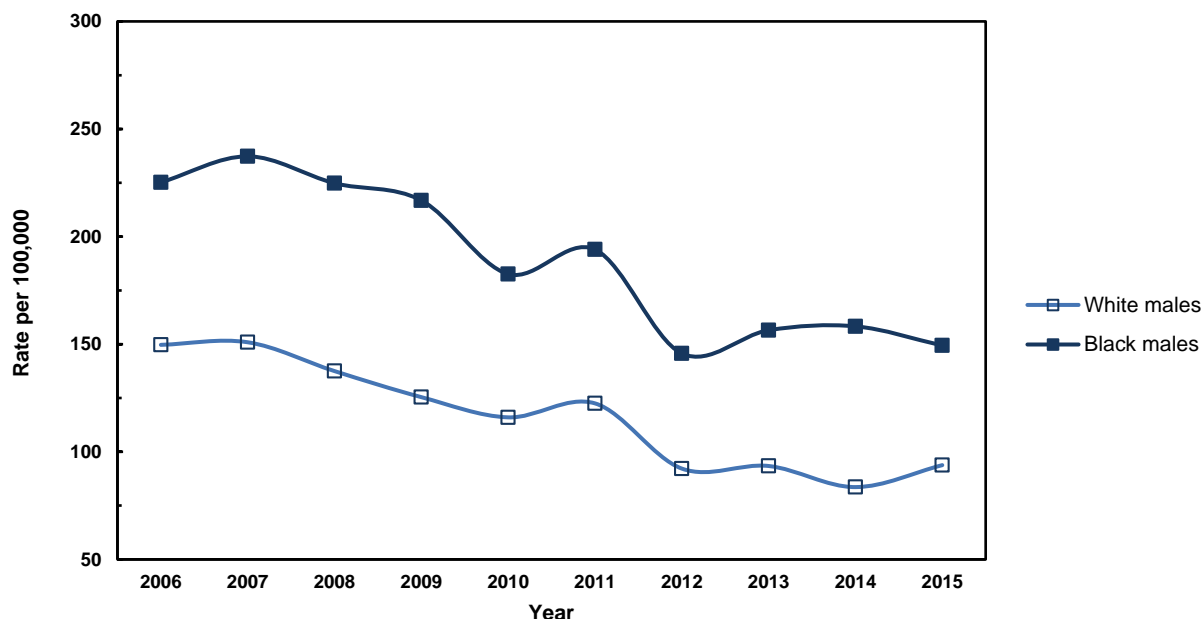
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below.

CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
15-A**

**Age-adjusted Incidence Rates by Race
Pennsylvania Male Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Prostate: INCIDENCE (Invasive)

**TABLE
15-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Male Residents, 2011-2015**

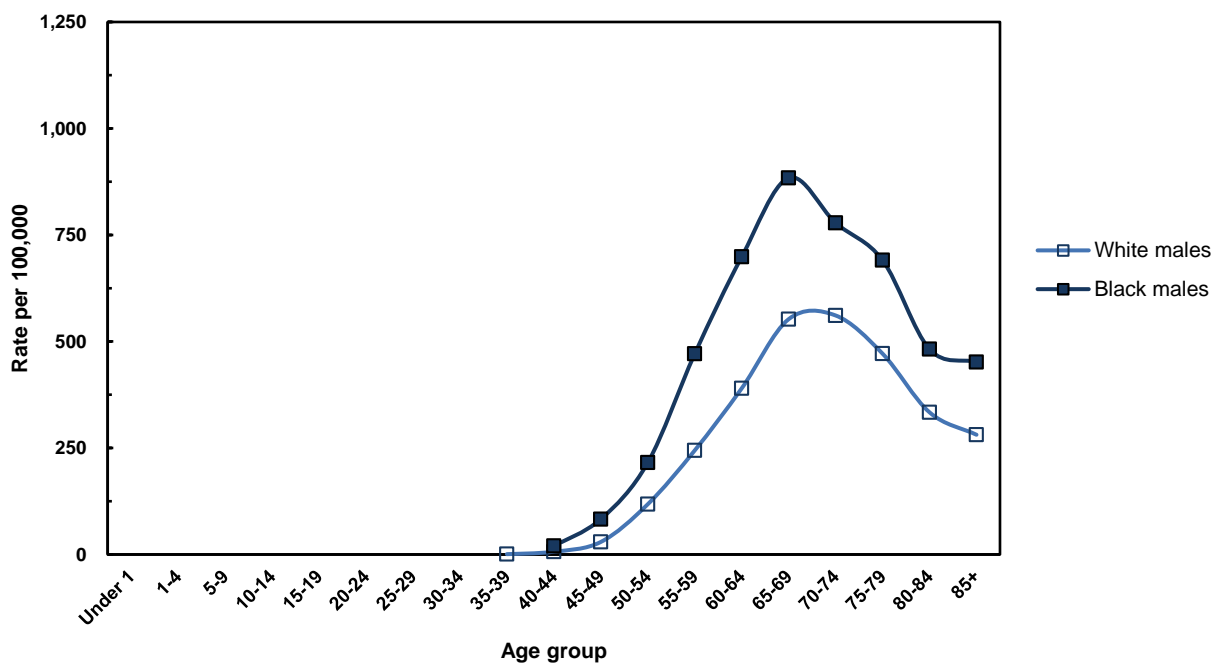
Age Group	All Males	White	Black
Total	134.7	131.8	136.2
Under 1	ND	ND	ND
1-4	ND	ND	ND
5-9	ND	ND	ND
10-14	ND	ND	ND
15-19	ND	ND	ND
20-24	ND	ND	ND
25-29	ND	ND	ND
30-34	ND	ND	ND
35-39	0.8	0.8	ND
40-44	8.1	6.4	20.1
45-49	35.8	29.4	82.8
50-54	130.3	117.9	215.5
55-59	271.9	244.2	470.9
60-64	430.7	389.9	698.5
65-69	601.6	552.3	884.0
70-74	610.4	561.0	778.4
75-79	522.5	471.4	690.7
80-84	367.7	333.7	481.9
85+	311.3	281.0	451.6

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
15-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Male Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Prostate: INCIDENCE (Invasive)

**TABLE
15-C**

**Total Number of Cancer Cases by Age and Race
Pennsylvania Male Residents, 2011-2015**

Age Group	All Males*	White	Black
Total	42,039	34,311	4,810
Under 1	0	0	0
1-4	0	0	0
5-9	0	0	0
10-14	0	0	0
15-19	0	0	0
20-24	0	0	0
25-29	0	0	0
30-34	2	1	0
35-39	14	12	2
40-44	163	108	45
45-49	779	546	191
50-54	3,077	2,421	493
55-59	6,206	4,919	945
60-64	8,396	6,795	1,066
65-69	9,024	7,497	919
70-74	6,519	5,447	545
75-79	4,060	3,354	334
80-84	2,154	1,818	152
85+	1,645	1,393	118

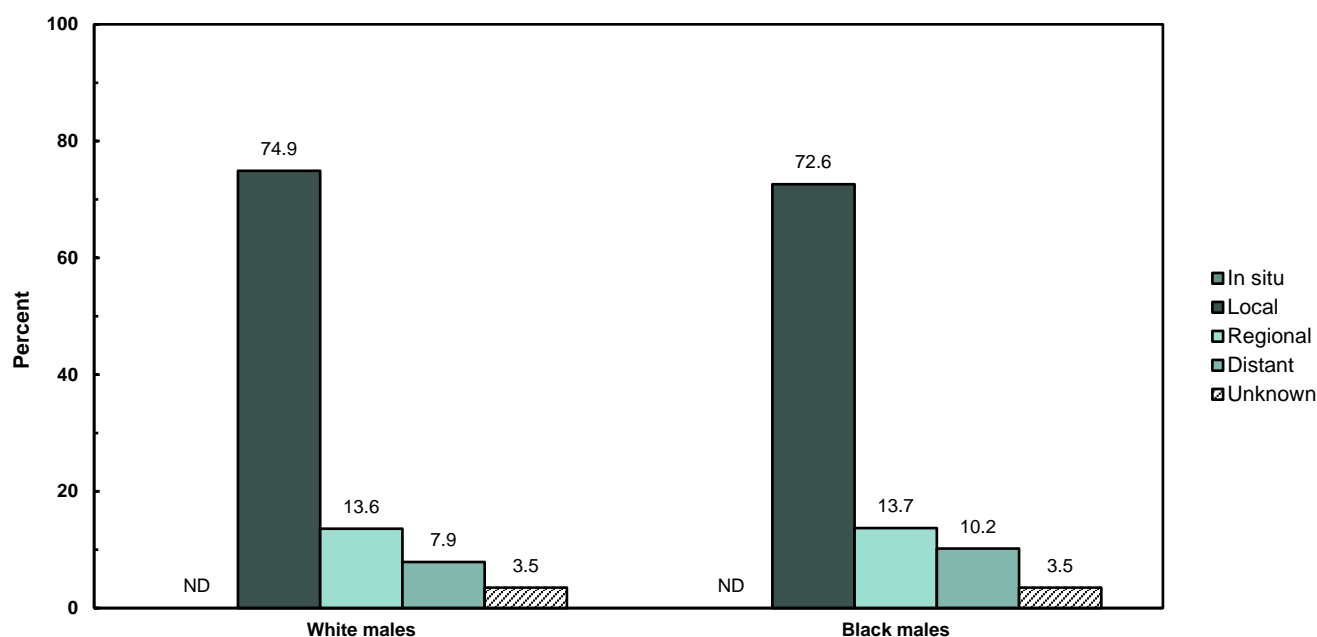
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
15-C**

**Stage of Disease at Diagnosis, Percent by Race
Pennsylvania Male Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 8,343 - 97.2%

Cancer of the Prostate: MORTALITY

**TABLE
15-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Male Residents, 2006-2015**

Year	All Males*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,307	18.3 (17.3-19.3)	1,100	16.9 (15.9-17.9)	165	36.6 (31.0-42.2)
2014	1,260	17.9 (16.9-18.9)	1,062	16.5 (15.5-17.5)	166	37.9 (32.1-43.7)
2013	1,359	19.6 (18.6-20.6)	1,147	18.1 (17.1-19.1)	192	44.1 (37.9-50.3)
2012	1,282	19.0 (18.0-20.0)	1,073	17.2 (16.2-18.2)	194	49.0 (42.1-55.9)
2011	1,364	20.6 (19.5-21.7)	1,147	18.7 (17.6-19.8)	205	52.7 (45.5-59.9)
2010	1,363	21.1 (20.0-22.2)	1,143	19.2 (18.1-20.3)	212	56.6 (49.0-64.2)
2009	1,338	21.0 (19.9-22.1)	1,145	19.5 (18.4-20.6)	185	46.9 (40.1-53.7)
2008	1,451	24.1 (22.9-25.3)	1,266	22.8 (21.5-24.1)	179	48.3 (41.2-55.4)
2007	1,450	26.7 (25.3-28.1)	1,259	25.1 (23.7-26.5)	188	55.0 (47.1-62.9)
2006	1,453	27.1 (25.7-28.5)	1,233	25.0 (23.6-26.4)	212	62.1 (53.7-70.5)

* Includes any unknowns

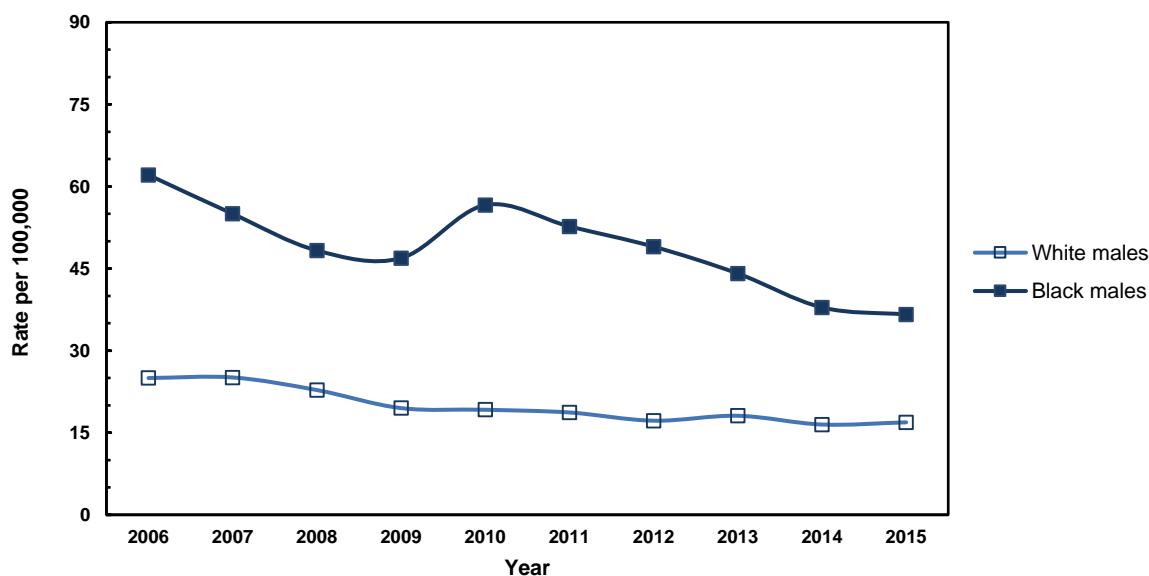
SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER Program.

**FIGURE
15-D**

**Age-adjusted Death Rates by Race
Pennsylvania Male Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Prostate: MORTALITY

**TABLE
15-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Race
Pennsylvania Male Residents, 2011-2015**

Age Group	All Males*		White		Black	
	No.	Rate	No.	Rate	No.	Rate
Total*	6,572	21.1	5,529	21.2	922	26.1
Under 1	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND
20-24	0	ND	0	ND	0	ND
25-29	0	ND	0	ND	0	ND
30-34	1	ND	1	ND	0	ND
35-39	2	ND	2	ND	0	ND
40-44	5	ND	3	ND	2	ND
45-49	13	0.6	11	0.6	2	ND
50-54	76	3.2	56	2.7	20	8.7
55-59	201	8.8	145	7.2	47	23.4
60-64	360	18.5	272	15.6	84	55.0
65-69	571	38.1	440	32.4	111	106.8
70-74	728	68.2	575	59.2	134	191.4
75-79	962	123.8	810	113.8	132	273.0
80-84	1,246	212.7	1,067	195.9	150	475.6
85+	2,407	455.4	2,147	433.1	240	918.6

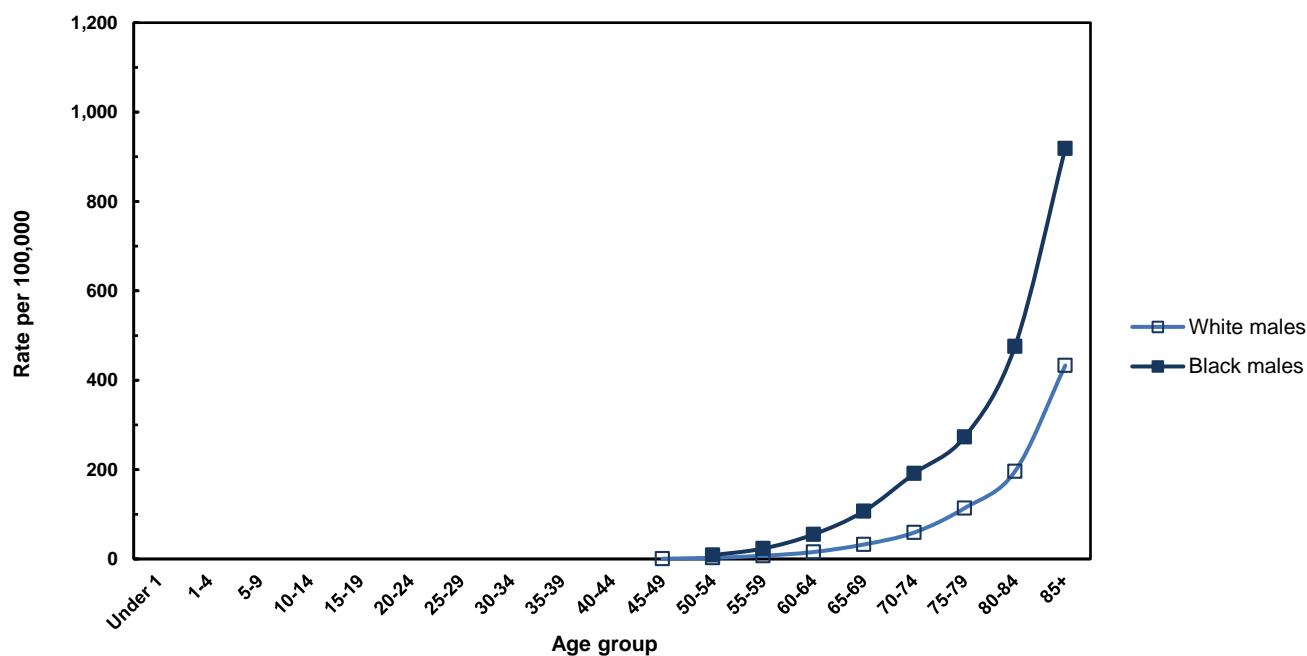
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
15-E**

**Average Annual Age-specific Death Rates by Race
Pennsylvania Male Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Prostate: INCIDENCE (Invasive)

**TABLE
15-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County, Pennsylvania Male Residents, 2011-2015**

County	Males			County	Males		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	42,039	106.9	(105.9-107.9)				
Adams	327	96.6	(86.1-107.1)	Juniata	44	50.5	(35.6-65.4)
Allegheny	3,874	102.5	(99.3-105.7)	Lackawanna	636	89.8	(82.8-96.8)
Armstrong	261	105.4	(92.6-118.2)	Lancaster	1,427	90.5	(85.8-95.2)
Beaver	511	85.4	(78.0-92.8)	Lawrence	320	101.9	(90.7-113.1)
Bedford	178	96.7	(82.5-110.9)	Lebanon	398	90.9	(82.0-99.8)
Berks	1,328	109.1	(103.2-115.0)	Lehigh	1,162	111.9	(105.5-118.3)
Blair	360	84.0	(75.3-92.7)	Luzerne	1,070	100.9	(94.9-106.9)
Bradford	208	90.5	(78.2-102.8)	Lycoming	365	97.5	(87.5-107.5)
Bucks	2,274	111.2	(106.6-115.8)	McKean	129	87.8	(72.6-103.0)
Butler	727	121.2	(112.4-130.0)	Mercer	536	134.6	(123.2-146.0)
Cambria	551	110.6	(101.4-119.8)	Mifflin	139	86.1	(71.8-100.4)
Cameron	35	161.2	(107.8-214.6)	Monroe	541	104.6	(95.8-113.4)
Carbon	241	101.0	(88.2-113.8)	Montgomery	2,877	117.8	(113.5-122.1)
Centre	415	107.0	(96.7-117.3)	Montour	81	132.2	(103.4-161.0)
Chester	1,698	112.8	(107.4-118.2)	Northampton	1,186	128.3	(121.0-135.6)
Clarion	133	103.3	(85.7-120.9)	Northumberland	336	99.9	(89.2-110.6)
Clearfield	327	115.4	(102.9-127.9)	Perry	105	64.6	(52.2-77.0)
Clinton	93	74.4	(59.3-89.5)	Philadelphia	5,002	140.8	(136.9-144.7)
Columbia	217	103.9	(90.1-117.7)	Pike	169	77.0	(65.4-88.6)
Crawford	354	115.2	(103.2-127.2)	Potter	78	113.2	(88.1-138.3)
Cumberland	545	72.1	(66.0-78.2)	Schuylkill	472	91.5	(83.2-99.8)
Dauphin	787	98.9	(92.0-105.8)	Snyder	125	98.1	(80.9-115.3)
Delaware	2,027	128.9	(123.3-134.5)	Somerset	293	99.9	(88.5-111.3)
Elk	182	151.2	(129.2-173.2)	Sullivan	41	138.2	(95.9-180.5)
Erie	921	109.2	(102.1-116.3)	Susquehanna	164	95.3	(80.7-109.9)
Fayette	375	77.3	(69.5-85.1)	Tioga	157	99.7	(84.1-115.3)
Forest	21	63.7	(36.5-90.9)	Union	125	91.7	(75.6-107.8)
Franklin	414	83.7	(75.6-91.8)	Venango	228	114.9	(100.0-129.8)
Fulton	43	79.0	(55.4-102.6)	Warren	171	107.0	(91.0-123.0)
Greene	72	58.0	(44.6-71.4)	Washington	739	102.1	(94.7-109.5)
Huntingdon	137	85.5	(71.2-99.8)	Wayne	167	79.4	(67.4-91.4)
Indiana	257	91.1	(80.0-102.2)	Westmoreland	1,274	95.1	(89.9-100.3)
Jefferson	224	140.3	(121.9-158.7)	Wyoming	115	111.0	(90.7-131.3)
				York	1,250	93.7	(88.5-98.9)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). In situ cancer cases are excluded. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

Cancer of the Prostate: MORTALITY

**TABLE
15-G**

**Number of Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County, Pennsylvania Male Residents, 2011-2015**

County	Males			County	Males		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	6,572	19.1	(18.6-19.6)				
Adams	52	17.5	(12.7-22.3)	Juniata	11	ND	
Allegheny	674	18.9	(17.5-20.3)	Lackawanna	97	15.2	(12.2-18.2)
Armstrong	35	15.2	(10.2-20.2)	Lancaster	240	16.1	(14.1-18.1)
Beaver	137	24.6	(20.5-28.7)	Lawrence	35	12.0	(8.0-16.0)
Bedford	17	ND		Lebanon	64	15.9	(12.0-19.8)
Berks	189	16.9	(14.5-19.3)	Lehigh	139	14.8	(12.3-17.3)
Blair	72	18.6	(14.3-22.9)	Luzerne	177	19.1	(16.3-21.9)
Bradford	39	20.6	(14.1-27.1)	Lycoming	60	17.9	(13.4-22.4)
Bucks	317	19.2	(17.1-21.3)	McKean	23	17.4	(10.3-24.5)
Butler	93	17.8	(14.2-21.4)	Mercer	67	17.1	(13.0-21.2)
Cambria	98	21.5	(17.2-25.8)	Mifflin	31	21.2	(13.7-28.7)
Cameron	3	ND		Monroe	78	20.4	(15.9-24.9)
Carbon	33	17.2	(11.3-23.1)	Montgomery	406	18.1	(16.3-19.9)
Centre	40	13.0	(9.0-17.0)	Montour	11	ND	
Chester	222	19.1	(16.6-21.6)	Northampton	162	18.9	(16.0-21.8)
Clarion	14	ND		Northumberland	48	15.5	(11.1-19.9)
Clearfield	52	21.6	(15.7-27.5)	Perry	18	ND	
Clinton	24	21.5	(12.9-30.1)	Philadelphia	882	30.3	(28.3-32.3)
Columbia	32	17.5	(11.4-23.6)	Pike	38	20.6	(14.1-27.1)
Crawford	62	24.8	(18.6-31.0)	Potter	11	ND	
Cumberland	98	14.8	(11.9-17.7)	Schuylkill	92	20.3	(16.2-24.4)
Dauphin	112	17.2	(14.0-20.4)	Snyder	19	ND	
Delaware	286	19.9	(17.6-22.2)	Somerset	44	16.6	(11.7-21.5)
Elk	24	22.7	(13.6-31.8)	Sullivan	7	ND	
Erie	146	20.3	(17.0-23.6)	Susquehanna	26	19.7	(12.1-27.3)
Fayette	73	17.1	(13.2-21.0)	Tioga	16	ND	
Forest	4	ND		Union	18	ND	
Franklin	73	16.4	(12.6-20.2)	Venango	37	21.8	(14.8-28.8)
Fulton	8	ND		Warren	20	14.3	(8.0-20.6)
Greene	16	ND		Washington	130	20.3	(16.8-23.8)
Huntingdon	23	17.8	(10.5-25.1)	Wayne	30	18.0	(11.6-24.4)
Indiana	45	19.1	(13.5-24.7)	Westmoreland	219	18.1	(15.7-20.5)
Jefferson	18	ND		Wyoming	21	27.5	(15.7-39.3)
				York	164	14.9	(12.6-17.2)

SOURCE: Pennsylvania Death Certificate Dataset

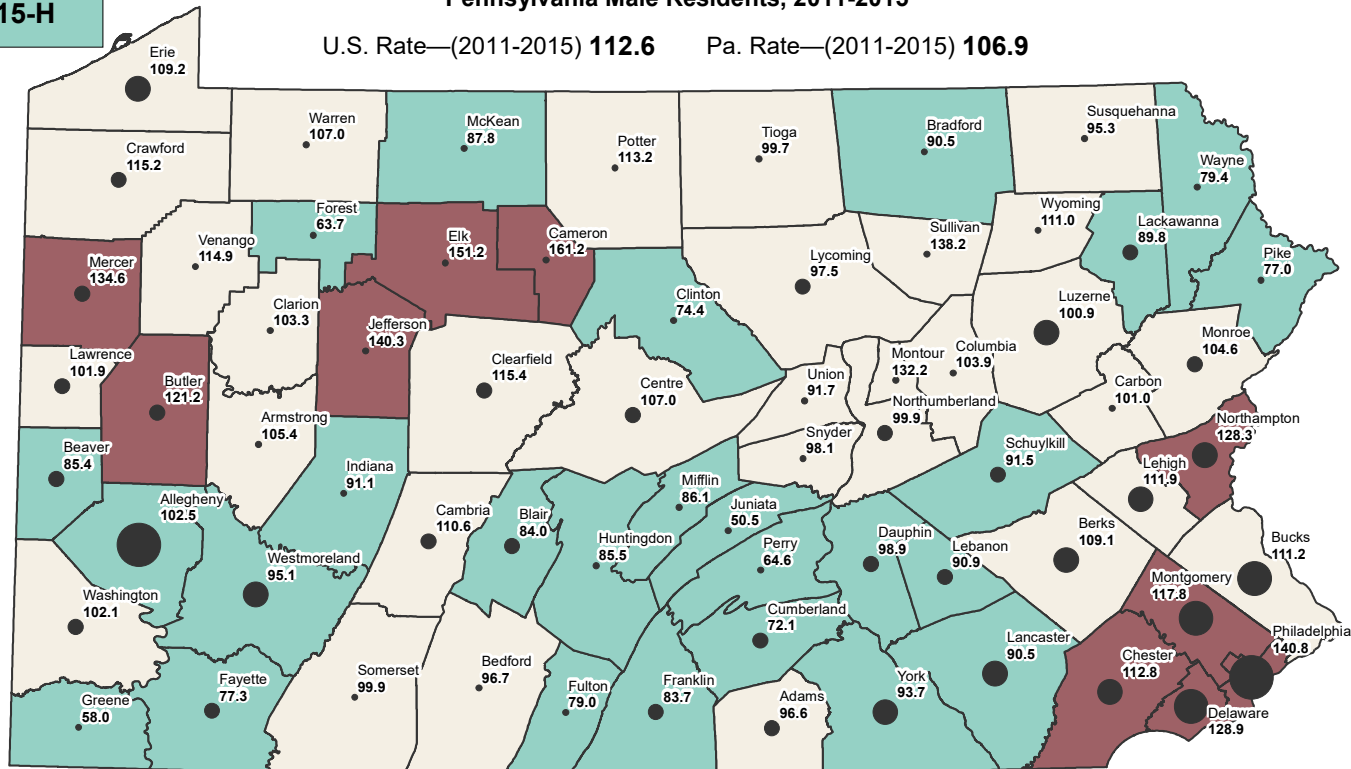
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

Cancer of the Prostate: INCIDENCE (Invasive) and MORTALITY

**MAP
15-H**

**Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates
Pennsylvania Male Residents, 2011-2015**

U.S. Rate—(2011-2015) **112.6** Pa. Rate—(2011-2015) **106.9**



Significantly higher

Significantly lower

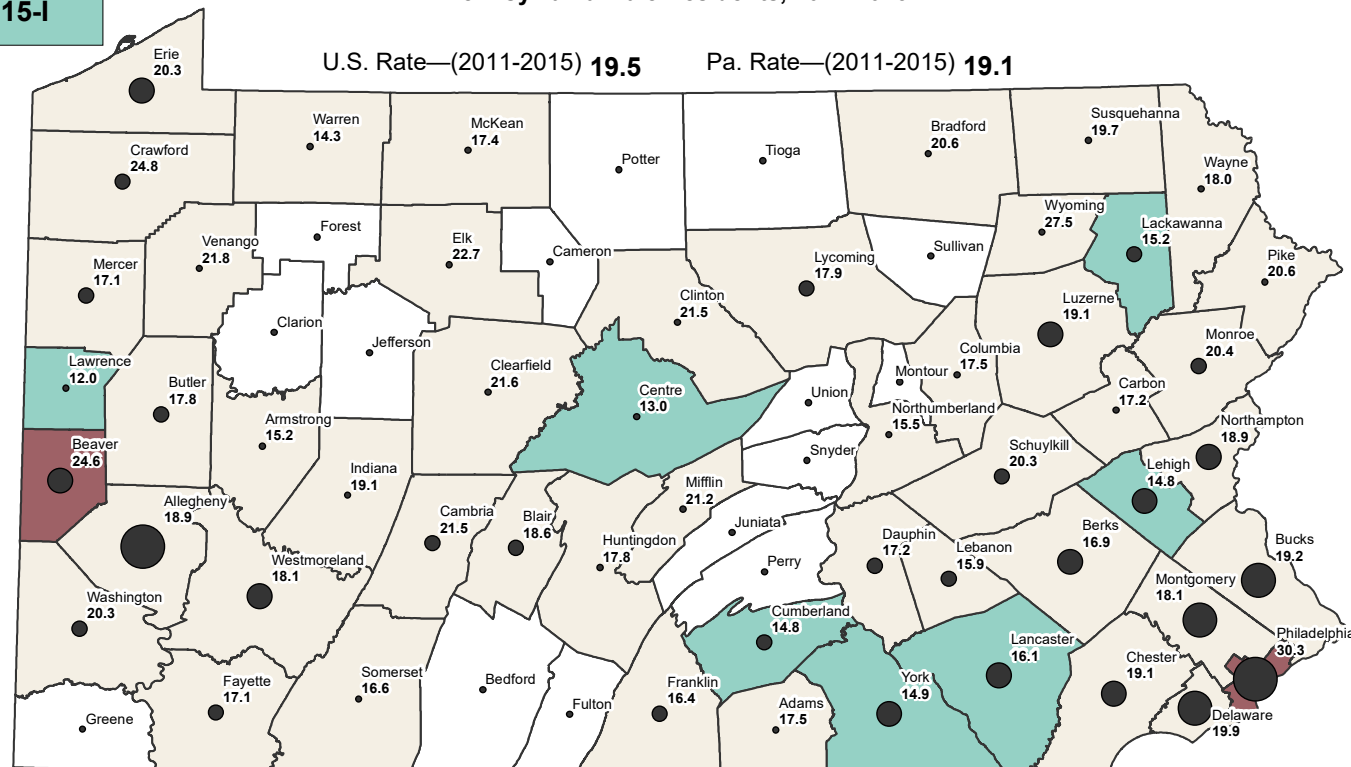
Not significantly
different

Significance not determined—
less than 20 observed cases

**MAP
15-I**

**Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates
Pennsylvania Male Residents, 2011-2015**

U.S. Rate—(2011-2015) **19.5** Pa. Rate—(2011-2015) **19.1**



The symbol, ●, represents the number of invasive cancers or deaths. A larger circle indicates a larger amount of cases for the incidence map and a larger number of deaths for the mortality map.

SOURCES: Pennsylvania Cancer Registry; Pennsylvania Death Certificate Dataset; SEER 18 areas; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Testis

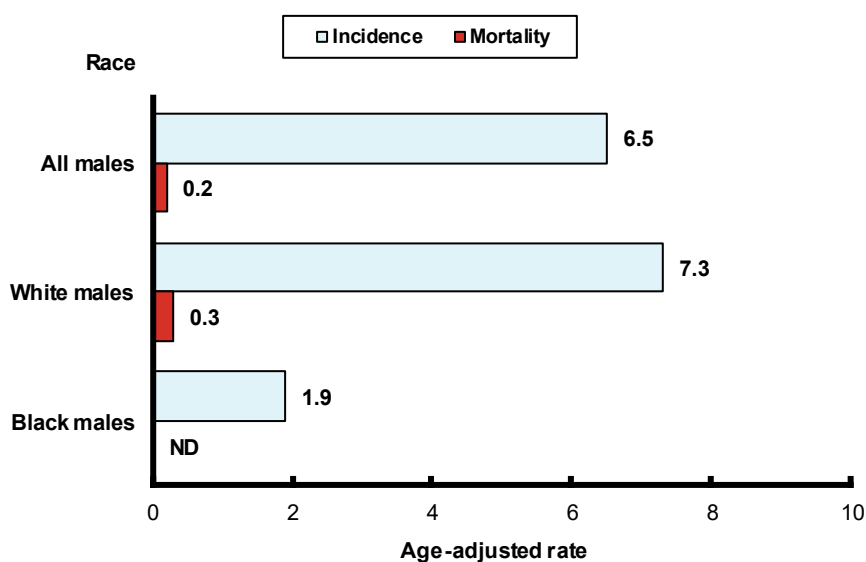
Data Highlights

The 2011-2015 average annual age-adjusted incidence rate for invasive testicular cancer was 7.3 per 100,000 for white males – more than three times higher than the rate for black males (1.9). In 2015, there were 396 invasive cases of testicular cancer diagnosed among male residents of Pennsylvania, resulting in an age-adjusted annual rate of 6.6, about 6 percent higher than the 2014 rate of 6.2. During the 10-year period of 2006-2015, the annual age-adjusted incidence rates for white males varied from a low of 6.6 in 2007 to a high of 8.5 in 2010. Overall, there was no discernible long-term trend. Due to the small numbers of events, the annual age-adjusted incidence rates for black males were considered statistically unreliable and, therefore, not calculated.

White males accounted for 362 cases or 91 percent of all testicular cases in 2015. While cancers of the testis represented only about 1 percent of all the cancers diagnosed among males, it was the most common type of malignancy among males under 45 years of age in 2015. The average annual age-specific incidence rates for testicular cancer among white males during the five-year period of 2011-2015 began to increase by age 15 and were highest between the ages of 30 and 34. During the five-year period of 2011-2015, approximately 90 percent of testicular cancers were diagnosed among males between the ages of 15 and 54. In 2015, the majority of testicular cases (69 percent) were diagnosed at an early stage (in situ or local) of the disease.

There were 21 deaths due to cancer of the testis among Pennsylvania men in 2015. Twenty of these cancer deaths were among white males. Because of the instability of the annual age-adjusted death rates (due to the small numbers of events), it is difficult to interpret any mortality trend. During the 2011-2015 period, about 78 percent of the deaths were for men under age 55.

FIGURE 16
Average Annual Age-Adjusted Incidence and Death Rates*
by Race, Pennsylvania Male Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Note: Rates based on less than 20 events are statistically unreliable and are not displayed (ND).

Risk Factors

According to the American Cancer Society, etiological factors are obscure, but cryptorchidism, family and personal history of testicular cancer, and HIV/AIDS infections are associated with increased risk of testicular cancers.

Early Detection

Self-screening for testicular cancer may be beneficial, but conclusive evidence of a benefit is lacking. The American Cancer Society recommends that testicular examinations be included as part of a man's routine cancer-related checkup.

Cancer of the Testis: INCIDENCE (Invasive)

**TABLE
16-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Male Residents, 2006-2015**

Year	All Males*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	396	6.6 (5.9-7.3)	362	7.4 (6.6-8.2)	18	ND
2014	371	6.2 (5.6-6.8)	335	6.8 (6.1-7.5)	11	ND
2013	374	6.4 (5.8-7.0)	357	7.4 (6.6-8.2)	10	ND
2012	390	6.7 (6.0-7.4)	368	7.6 (6.8-8.4)	11	ND
2011	380	6.5 (5.8-7.2)	355	7.3 (6.5-8.1)	13	ND
2010	420	7.2 (6.5-7.9)	399	8.5 (7.7-9.3)	9	ND
2009	379	6.4 (5.8-7.0)	361	7.2 (6.5-7.9)	11	ND
2008	388	6.6 (5.9-7.3)	375	7.6 (6.8-8.4)	9	ND
2007	342	5.9 (5.3-6.5)	326	6.6 (5.9-7.3)	4	ND
2006	357	6.2 (5.6-6.8)	331	6.7 (6.0-7.4)	12	ND

* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

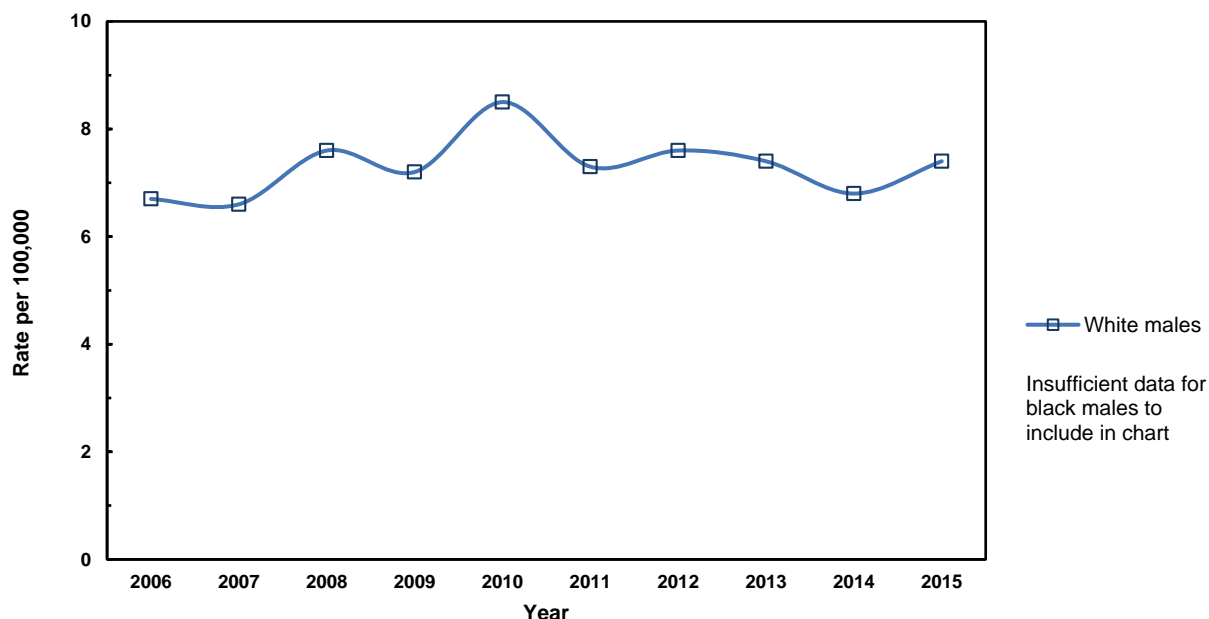
NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below.

CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
16-A**

**Age-adjusted Incidence Rates by Race
Pennsylvania Male Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Testis: INCIDENCE (Invasive)

**TABLE
16-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Male Residents, 2011-2015**

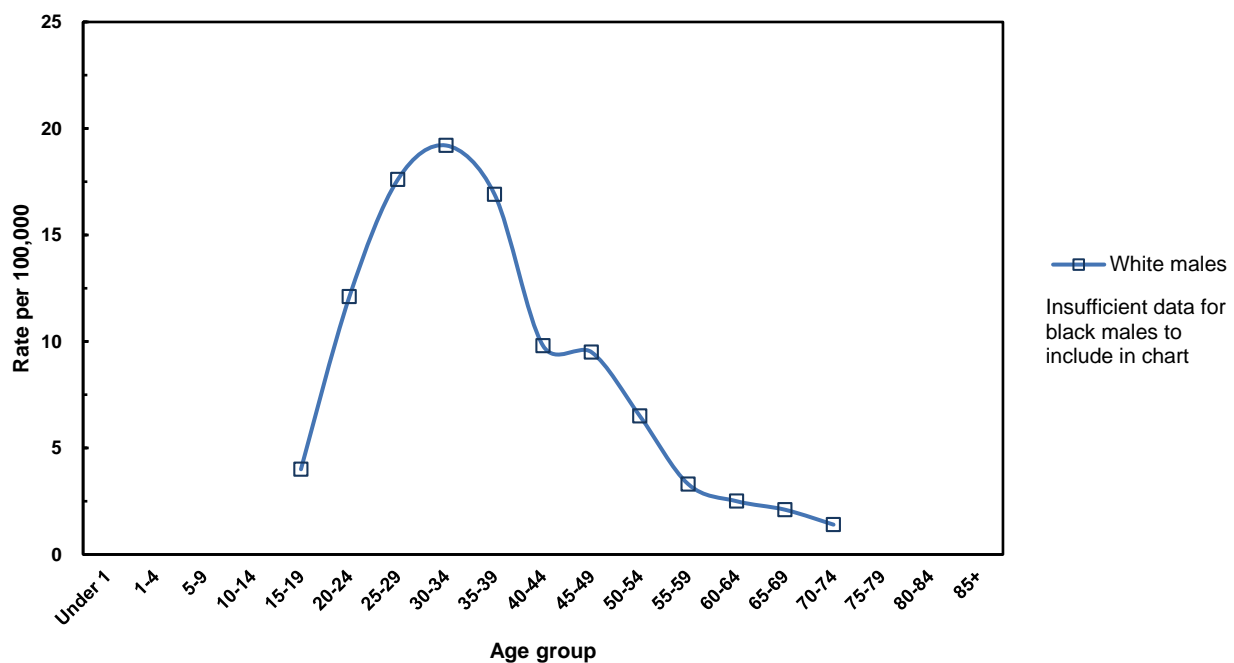
Age Group	All Males	White	Black
Total	6.1	6.8	1.8
Under 1	ND	ND	ND
1-4	ND	ND	ND
5-9	ND	ND	ND
10-14	ND	ND	ND
15-19	3.4	4.0	ND
20-24	10.4	12.1	ND
25-29	15.0	17.6	ND
30-34	17.0	19.2	5.0
35-39	14.8	16.9	4.7
40-44	9.1	9.8	ND
45-49	8.6	9.5	ND
50-54	5.8	6.5	ND
55-59	3.2	3.3	ND
60-64	2.3	2.5	ND
65-69	1.9	2.1	ND
70-74	1.4	1.4	ND
75-79	ND	ND	ND
80-84	ND	ND	ND
85+	ND	ND	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
16-B**

**Average Annual Age-specific Incidence Rates by Race
Pennsylvania Male Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Testis: INCIDENCE (Invasive)

**TABLE
16-C**

**Total Number of Cancer Cases by Age and Race
Pennsylvania Male Residents, 2011-2015**

Age Group	All Males*	White	Black
Total	1,911	1,777	63
Under 1	3	2	0
1-4	3	3	0
5-9	2	1	1
10-14	2	2	0
15-19	75	68	3
20-24	231	210	6
25-29	315	297	7
30-34	332	305	12
35-39	267	251	10
40-44	182	164	8
45-49	187	177	5
50-54	138	133	4
55-59	73	66	5
60-64	44	43	1
65-69	29	28	1
70-74	15	14	0
75-79	8	8	0
80-84	2	2	0
85+	3	3	0

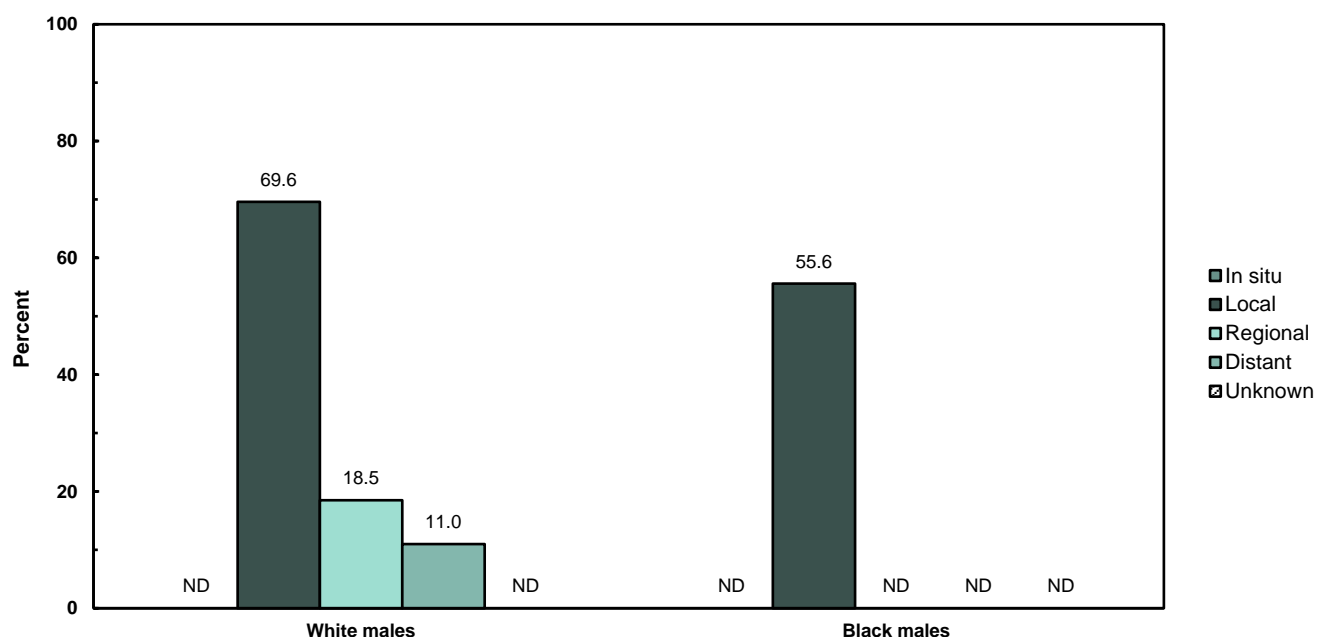
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
16-C**

**Stage of Disease at Diagnosis, Percent by Race
Pennsylvania Male Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 392 - 99.0%

Cancer of the Testis: MORTALITY

**TABLE
16-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Race and Year, Pennsylvania Male Residents, 2006-2015**

Year	All Males*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	21	0.3 (0.2-0.4)	20	0.4 (0.2-0.6)	0	ND
2014	18	ND	16	ND	1	ND
2013	11	ND	11	ND	0	ND
2012	13	ND	11	ND	1	ND
2011	13	ND	11	ND	2	ND
2010	23	0.4 (0.2-0.6)	22	0.4 (0.2-0.6)	1	ND
2009	21	0.3 (0.2-0.4)	21	0.4 (0.2-0.6)	0	ND
2008	19	ND	18	ND	1	ND
2007	22	0.4 (0.2-0.6)	19	ND	3	ND
2006	12	ND	11	ND	1	ND

* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population.

Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER Program.

**FIGURE
16-D**

**Age-adjusted Death Rates by Race
Pennsylvania Male Residents, 2006-2015**

Insufficient data to include a chart

Cancer of the Testis: MORTALITY

**TABLE
16-E**

Number of Deaths and Average Annual Age-specific Death Rates by Race Pennsylvania Male Residents, 2011-2015

Age Group	All Males*		White		Black	
	No.	Rate	No.	Rate	No.	Rate
Total*	76	0.2	69	0.3	4	ND
Under 1	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND
15-19	2	ND	1	ND	0	ND
20-24	6	ND	6	ND	0	ND
25-29	9	ND	9	ND	0	ND
30-34	9	ND	9	ND	0	ND
35-39	13	0.7	9	ND	2	ND
40-44	5	ND	5	ND	0	ND
45-49	8	ND	8	ND	0	ND
50-54	7	ND	6	ND	1	ND
55-59	6	ND	6	ND	0	ND
60-64	3	ND	3	ND	0	ND
65-69	3	ND	3	ND	0	ND
70-74	1	ND	1	ND	0	ND
75-79	1	ND	1	ND	0	ND
80-84	1	ND	0	ND	1	ND
85+	2	ND	2	ND	0	ND

* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
16-E**

Average Annual Age-specific Death Rates by Race Pennsylvania Male Residents, 2011-2015

Insufficient data to include a chart

Cancer of the Testis: INCIDENCE (Invasive)

**TABLE
16-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County, Pennsylvania Male Residents, 2011-2015**

County	Males			County	Males		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	1,911	6.5	(6.2-6.8)				
Adams	13	ND		Juniata	3	ND	
Allegheny	187	6.3	(5.4-7.2)	Lackawanna	37	8.1	(5.5-10.7)
Armstrong	6	ND		Lancaster	77	6.6	(5.1-8.1)
Beaver	34	9.8	(6.5-13.1)	Lawrence	17	ND	
Bedford	7	ND		Lebanon	22	7.5	(4.4-10.6)
Berks	62	6.2	(4.7-7.7)	Lehigh	47	5.8	(4.1-7.5)
Blair	18	ND		Luzerne	39	5.0	(3.4-6.6)
Bradford	10	ND		Lycoming	14	ND	
Bucks	118	8.5	(7.0-10.0)	McKean	5	ND	
Butler	26	6.5	(4.0-9.0)	Mercer	11	ND	
Cambria	32	10.1	(6.6-13.6)	Mifflin	11	ND	
Cameron	0	ND		Monroe	25	6.6	(4.0-9.2)
Carbon	8	ND		Montgomery	142	7.8	(6.5-9.1)
Centre	18	ND		Montour	3	ND	
Chester	75	6.6	(5.1-8.1)	Northampton	48	7.0	(5.0-9.0)
Clarion	5	ND		Northumberland	12	ND	
Clearfield	16	ND		Perry	5	ND	
Clinton	4	ND		Philadelphia	177	4.5	(3.8-5.2)
Columbia	10	ND		Pike	11	ND	
Crawford	6	ND		Potter	3	ND	
Cumberland	32	5.2	(3.4-7.0)	Schuylkill	24	6.7	(4.0-9.4)
Dauphin	36	5.8	(3.9-7.7)	Snyder	6	ND	
Delaware	78	6.3	(4.9-7.7)	Somerset	11	ND	
Elk	2	ND		Sullivan	3	ND	
Erie	43	6.7	(4.7-8.7)	Susquehanna	8	ND	
Fayette	21	6.9	(3.9-9.9)	Tioga	4	ND	
Forest	3	ND		Union	7	ND	
Franklin	22	6.5	(3.8-9.2)	Venango	13	ND	
Fulton	0	ND		Warren	6	ND	
Greene	3	ND		Washington	48	10.5	(7.5-13.5)
Huntingdon	8	ND		Wayne	4	ND	
Indiana	11	ND		Westmoreland	70	9.2	(7.0-11.4)
Jefferson	3	ND		Wyoming	5	ND	
				York	76	7.4	(5.7-9.1)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). In situ cancer cases are excluded. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

Cancer of the Testis: MORTALITY

**TABLE
16-G**

**Number of Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County, Pennsylvania Male Residents, 2011-2015**

County	Males			County	Males		
	No.	Rate	(CI)		No.	Rate	(CI)
All counties	76	0.2	(0.2-0.2)				
Adams	0	ND		Juniata	0	ND	
Allegheny	5	ND		Lackawanna	3	ND	
Armstrong	2	ND		Lancaster	3	ND	
Beaver	0	ND		Lawrence	0	ND	
Bedford	1	ND		Lebanon	2	ND	
Berks	1	ND		Lehigh	0	ND	
Blair	1	ND		Luzerne	3	ND	
Bradford	0	ND		Lycoming	1	ND	
Bucks	3	ND		McKean	0	ND	
Butler	0	ND		Mercer	0	ND	
Cambria	4	ND		Mifflin	0	ND	
Cameron	0	ND		Monroe	3	ND	
Carbon	0	ND		Montgomery	6	ND	
Centre	1	ND		Montour	0	ND	
Chester	0	ND		Northampton	2	ND	
Clarion	1	ND		Northumberland	0	ND	
Clearfield	0	ND		Perry	0	ND	
Clinton	1	ND		Philadelphia	8	ND	
Columbia	0	ND		Pike	1	ND	
Crawford	1	ND		Potter	1	ND	
Cumberland	2	ND		Schuylkill	1	ND	
Dauphin	0	ND		Snyder	1	ND	
Delaware	3	ND		Somerset	1	ND	
Elk	0	ND		Sullivan	0	ND	
Erie	1	ND		Susquehanna	0	ND	
Fayette	0	ND		Tioga	0	ND	
Forest	1	ND		Union	0	ND	
Franklin	1	ND		Venango	0	ND	
Fulton	0	ND		Warren	0	ND	
Greene	0	ND		Washington	1	ND	
Huntingdon	1	ND		Wayne	2	ND	
Indiana	1	ND		Westmoreland	5	ND	
Jefferson	0	ND		Wyoming	0	ND	
				York	1	ND	

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

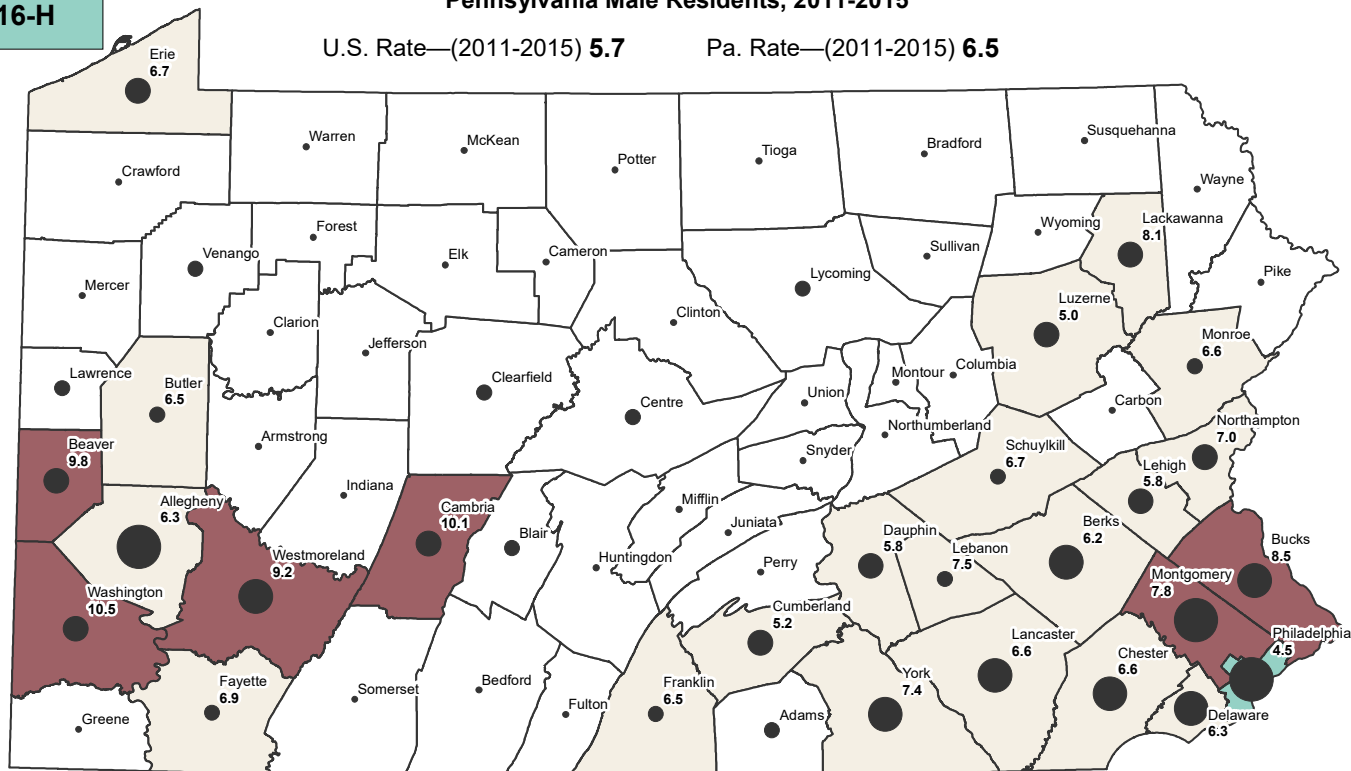
Cancer of the Testis: INCIDENCE (Invasive) and MORTALITY

**MAP
16-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **5.7**

Pa. Rate—(2011-2015) **6.5**



Significantly higher

Significantly lower

Not significantly
different

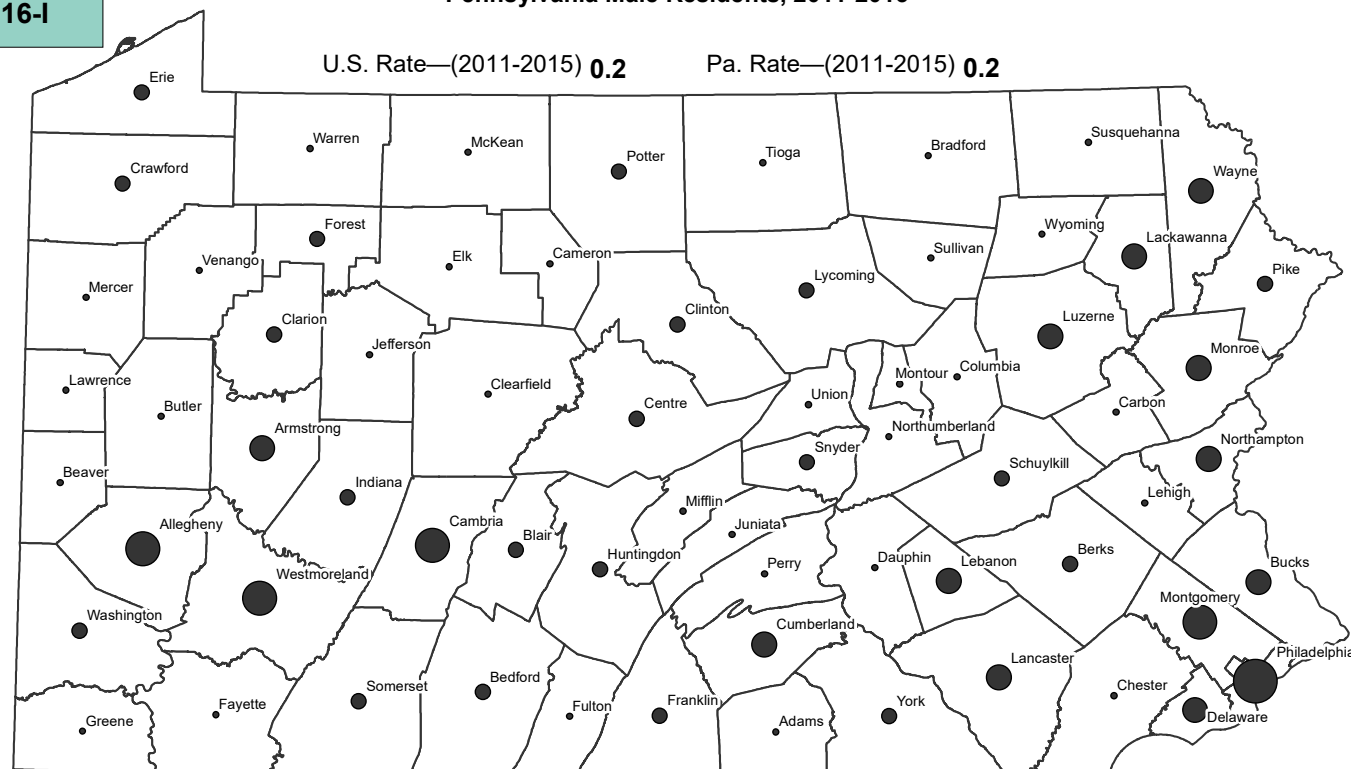
Significance not determined—
less than 20 observed cases

**MAP
16-I**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **0.2**

Pa. Rate—(2011-2015) **0.2**



The symbol, ●, represents the number of invasive cancers or deaths. A larger circle indicates a larger amount of cases for the incidence map and a larger number of deaths for the mortality map.

SOURCES: Pennsylvania Cancer Registry; Pennsylvania Death Certificate Dataset; SEER 18 areas; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Urinary Bladder

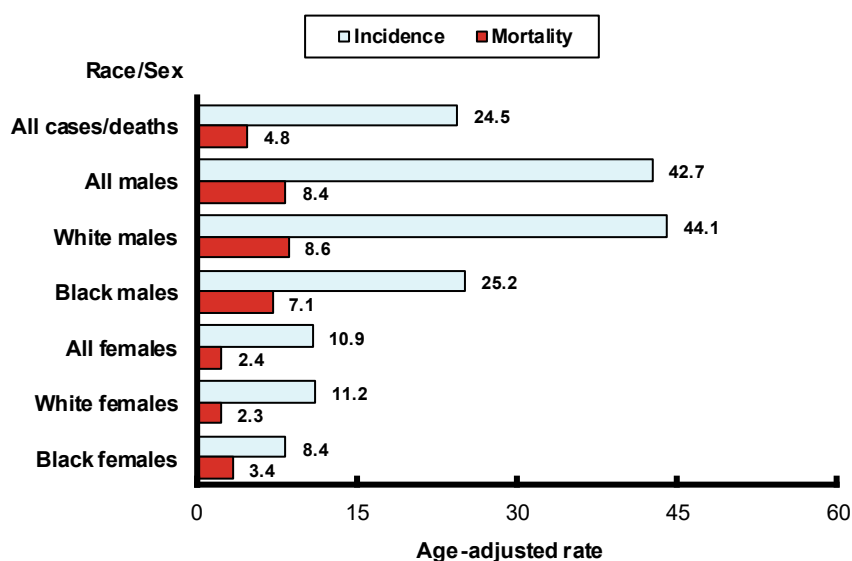
Data Highlights

NOTE: Because of the uncertainty in interpreting the language used by pathologists to describe the extent of invasion, in situ bladder cancers are combined with invasive bladder cancers and are included in the total for all invasive cancer sites combined.

During the five-year period, 2011-2015, the average annual age-adjusted incidence rate for urinary bladder cancer was highest among white males (44.1 per 100,000) compared to 25.2 for black males and 10.9 for all females. In 2015, there were 4,051 new cases of urinary bladder cancer diagnosed among Pennsylvania residents, resulting in an age-adjusted rate of 23.6 — a decrease from 2014, when the age-adjusted rate was 23.9. The annual age-adjusted incidence rates for the period of 2006-2015 have not changed much among white males or white females but each had a slight decreasing trend over this period. There was no discernible trend among black males or black females. During the five-year period, approximately 92 percent of bladder cancer cases were diagnosed among residents 55 years of age or older. White males had the highest average annual age-specific incidence rates during the period of 2011-2015 for age groups over 50. In 2015, 84 percent of urinary bladder cancers were diagnosed at early stages (in situ or local) of the disease, and about 12 percent were diagnosed at late stages (regional or distant).

The role of cigarette smoking as an important risk factor for bladder cancer is well established. According to the American Cancer Society, about half of all bladder cancers in both men and women are attributed to smoking. In 2015, there were 863 deaths among Pennsylvania residents — an increase from the previous year, when there were 845 deaths. This resulted in an age-adjusted rate of 4.9 per 100,000. As observed with the incidence rates, age-adjusted death rates were highest among males. Between 2006 and 2015, annual age-adjusted death rates for white males, black males and white females did not have any discernible trends. It is difficult to interpret any mortality trend among black females because of the instability of the annual age-adjusted death rates (due to the small numbers of events).

FIGURE 17
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, etiological factors are obscure, although tobacco smoking is the greatest factor. Occupational exposures to aromatic amines (e.g., benzidine or beta-naphthylamine) and industries/jobs related to rubber products, leather, textiles, paint products, printing companies, painters, hairdressers, machinists and truck drivers (diesel fumes) can increase risk. Urinary infections, kidney/ bladder stones, schistosomiasis, bladder birth defects (especially exstrophy), arsenic in drinking water, chemotherapy, radiation therapy, low fluid consumption, genetics and family history are associated with increased risk of urinary bladder cancers.

Early Detection

According to the American Cancer Society, screening for the public is not recommended, although bladder cancers can sometimes be found early among high-risk populations using urinalysis, urine cytology and urine tests for tumor markers.

Cancer of the Urinary Bladder: INCIDENCE (Invasive and In Situ)

**TABLE
17-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	4,051	23.6 (22.9-24.3)	3,063	41.2 (39.7-42.7)	2,873	42.7 (41.1-44.3)	142	26.2 (21.9-30.5)	988	10.4 (9.8-11.0)	912	10.8 (10.1-11.5)	57	7.4 (5.5-9.3)
2014	4,028	23.9 (23.2-24.6)	3,015	41.3 (39.8-42.8)	2,837	43.0 (41.4-44.6)	125	23.8 (19.6-28.0)	1,013	10.8 (10.1-11.5)	931	11.1 (10.4-11.8)	64	8.2 (6.2-10.2)
2013	4,198	25.3 (24.5-26.1)	3,164	44.3 (42.8-45.8)	2,963	45.7 (44.1-47.3)	146	29.3 (24.5-34.1)	1,034	11.1 (10.4-11.8)	962	11.5 (10.8-12.2)	56	7.5 (5.5-9.5)
2012	3,993	24.4 (23.6-25.2)	3,020	42.9 (41.4-44.4)	2,832	44.2 (42.6-45.8)	101	21.2 (17.1-25.3)	972	10.5 (9.8-11.2)	891	10.8 (10.1-11.5)	60	7.8 (5.8-9.8)
2011	4,093	25.4 (24.6-26.2)	3,039	43.9 (42.3-45.5)	2,850	45.2 (43.5-46.9)	121	25.3 (20.8-29.8)	1,054	11.7 (11.0-12.4)	948	11.7 (11.0-12.4)	80	11.1 (8.7-13.5)
2010	3,948	24.9 (24.1-25.7)	2,954	44.0 (42.4-45.6)	2,786	45.6 (43.9-47.3)	95	21.9 (17.5-26.3)	994	10.9 (10.2-11.6)	910	11.2 (10.5-11.9)	63	8.9 (6.7-11.1)
2009	3,845	24.6 (23.8-25.4)	2,867	43.7 (42.1-45.3)	2,706	45.0 (43.3-46.7)	106	25.3 (20.5-30.1)	978	10.9 (10.2-11.6)	898	11.1 (10.4-11.8)	62	8.9 (6.7-11.1)
2008	3,906	25.6 (24.8-26.4)	2,963	46.7 (45.0-48.4)	2,797	48.1 (46.3-49.9)	111	26.0 (21.2-30.8)	943	10.7 (10.0-11.4)	881	11.0 (10.3-11.7)	46	6.9 (4.9-8.9)
2007	3,850	25.6 (24.8-26.4)	2,833	46.1 (44.4-47.8)	2,707	48.0 (46.2-49.8)	79	19.0 (14.8-23.2)	1,017	11.5 (10.8-12.2)	944	11.8 (11.0-12.6)	54	8.1 (5.9-10.3)
2006	3,776	25.3 (24.5-26.1)	2,802	46.1 (44.4-47.8)	2,640	47.3 (45.5-49.1)	101	25.4 (20.4-30.4)	974	11.2 (10.5-11.9)	911	11.6 (10.8-12.4)	49	7.6 (5.5-9.7)

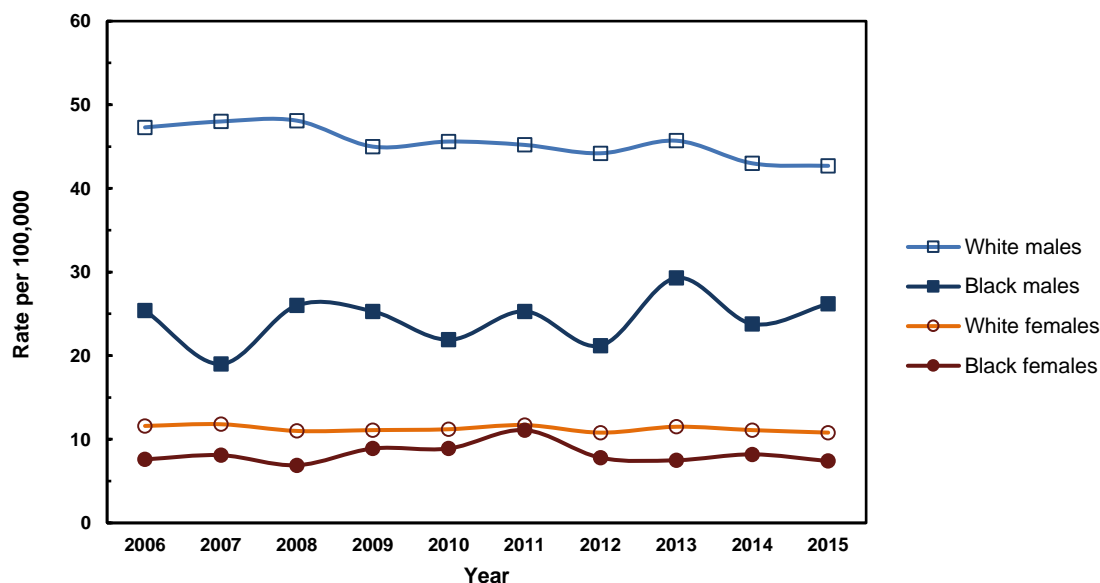
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
17-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Urinary Bladder: INCIDENCE (Invasive and In Situ)

**TABLE
17-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

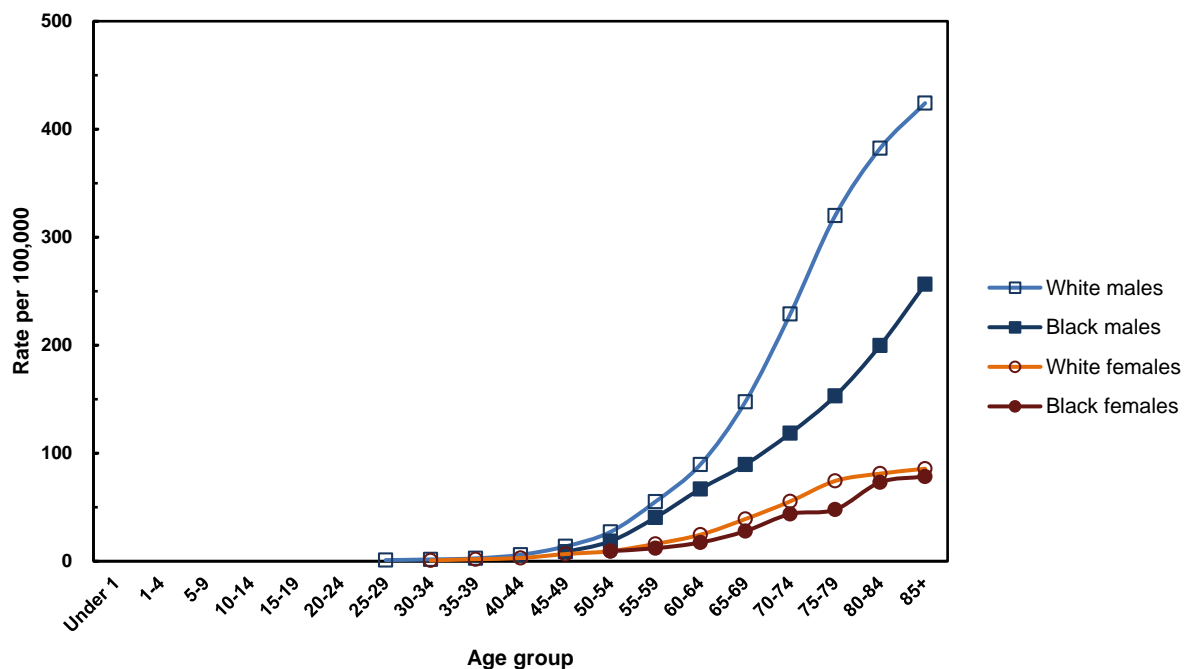
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	31.9	49.0	55.1	18.0	15.5	17.1	8.3
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	ND	ND	ND	ND	ND	ND	ND
25-29	0.7	0.9	1.0	ND	0.5	ND	ND
30-34	1.1	1.5	1.6	ND	0.7	0.7	ND
35-39	2.0	2.4	2.6	ND	1.6	1.8	ND
40-44	4.1	5.5	5.9	ND	2.7	2.9	ND
45-49	9.3	12.8	13.7	8.7	5.8	6.6	ND
50-54	17.6	26.2	27.1	18.4	9.3	9.3	9.3
55-59	34.0	53.3	55.1	40.4	15.6	16.0	12.0
60-64	54.8	88.0	89.5	66.8	23.7	24.5	17.3
65-69	87.0	142.2	147.5	89.5	37.7	39.0	27.8
70-74	129.7	220.4	228.9	118.5	54.0	55.4	43.7
75-79	173.1	306.5	320.0	153.0	71.8	74.3	47.8
80-84	196.1	371.1	382.3	199.7	80.7	81.1	73.0
85+	193.6	419.3	424.1	256.4	85.6	85.6	78.4

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on invasive and in situ cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
17-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Urinary Bladder: INCIDENCE (Invasive and In Situ)

**TABLE
17-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	20,363	15,301	14,355	635	5,061	4,644	317
Under 1	0	0	0	0	0	0	0
1-4	4	2	1	1	2	0	0
5-9	1	1	1	0	0	0	0
10-14	2	2	2	0	0	0	0
15-19	6	2	2	0	4	4	0
20-24	8	4	3	0	4	4	0
25-29	29	18	17	0	11	9	2
30-34	43	30	26	1	13	11	2
35-39	72	43	39	2	29	26	1
40-44	166	111	99	6	55	48	4
45-49	408	279	254	20	129	123	4
50-54	846	618	556	42	228	196	24
55-59	1,588	1,216	1,109	81	372	333	28
60-64	2,212	1,716	1,559	102	495	450	33
65-69	2,765	2,133	2,002	93	632	581	39
70-74	3,044	2,354	2,223	83	690	634	45
75-79	3,117	2,382	2,277	74	735	686	38
80-84	2,891	2,174	2,083	63	717	660	45
85+	3,161	2,216	2,102	67	945	879	52

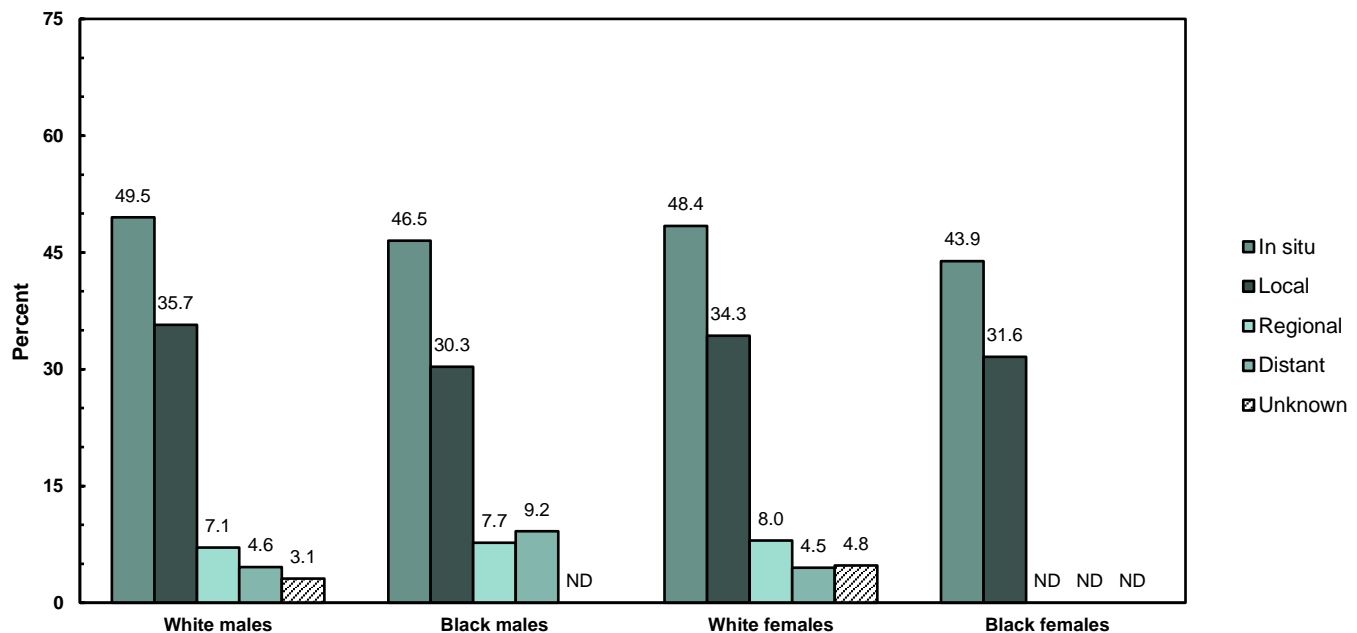
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
17-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Cases Microscopically Confirmed: 3,950 - 97.5%

Cancer of the Urinary Bladder: MORTALITY

**TABLE
17-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	863	4.9 (4.6-5.2)	600	8.4 (7.7-9.1)	553	8.4 (7.7-9.1)	39	8.2 (5.6-10.8)	263	2.5 (2.2-2.8)	237	2.5 (2.2-2.8)	20	2.5 (1.4-3.6)
2014	845	4.8 (4.5-5.1)	597	8.3 (7.6-9.0)	552	8.4 (7.7-9.1)	37	8.3 (5.6-11.0)	248	2.4 (2.1-2.7)	228	2.4 (2.1-2.7)	19	ND
2013	821	4.7 (4.4-5.0)	580	8.3 (7.6-9.0)	552	8.6 (7.9-9.3)	25	5.3 (3.2-7.4)	241	2.3 (2.0-2.6)	213	2.2 (1.9-2.5)	25	3.1 (1.9-4.3)
2012	802	4.7 (4.4-5.0)	568	8.4 (7.7-9.1)	531	8.5 (7.8-9.2)	29	6.8 (4.3-9.3)	234	2.3 (2.0-2.6)	194	2.1 (1.8-2.4)	36	5.1 (3.4-6.8)
2011	844	5.0 (4.7-5.3)	584	8.7 (8.0-9.4)	551	8.9 (8.2-9.6)	30	6.5 (4.2-8.8)	260	2.5 (2.2-2.8)	227	2.4 (2.1-2.7)	31	4.3 (2.8-5.8)
2010	792	4.8 (4.5-5.1)	577	8.8 (8.1-9.5)	550	9.1 (8.3-9.9)	27	6.6 (4.1-9.1)	215	2.2 (1.9-2.5)	197	2.2 (1.9-2.5)	17	ND
2009	787	4.8 (4.5-5.1)	562	8.7 (8.0-9.4)	528	8.9 (8.1-9.7)	33	8.0 (5.3-10.7)	225	2.2 (1.9-2.5)	209	2.3 (2.0-2.6)	16	ND
2008	754	4.7 (4.4-5.0)	518	8.4 (7.7-9.1)	494	8.7 (7.9-9.5)	22	5.3 (3.1-7.5)	236	2.4 (2.1-2.7)	218	2.4 (2.1-2.7)	17	ND
2007	776	5.1 (4.7-5.5)	512	9.0 (8.2-9.8)	485	9.2 (8.4-10.0)	26	7.2 (4.4-10.0)	264	2.8 (2.5-3.1)	239	2.8 (2.4-3.2)	25	3.7 (2.2-5.2)
2006	773	5.1 (4.7-5.5)	535	9.5 (8.7-10.3)	506	9.7 (8.9-10.5)	28	7.3 (4.6-10.0)	238	2.6 (2.3-2.9)	212	2.5 (2.2-2.8)	25	3.8 (2.3-5.3)

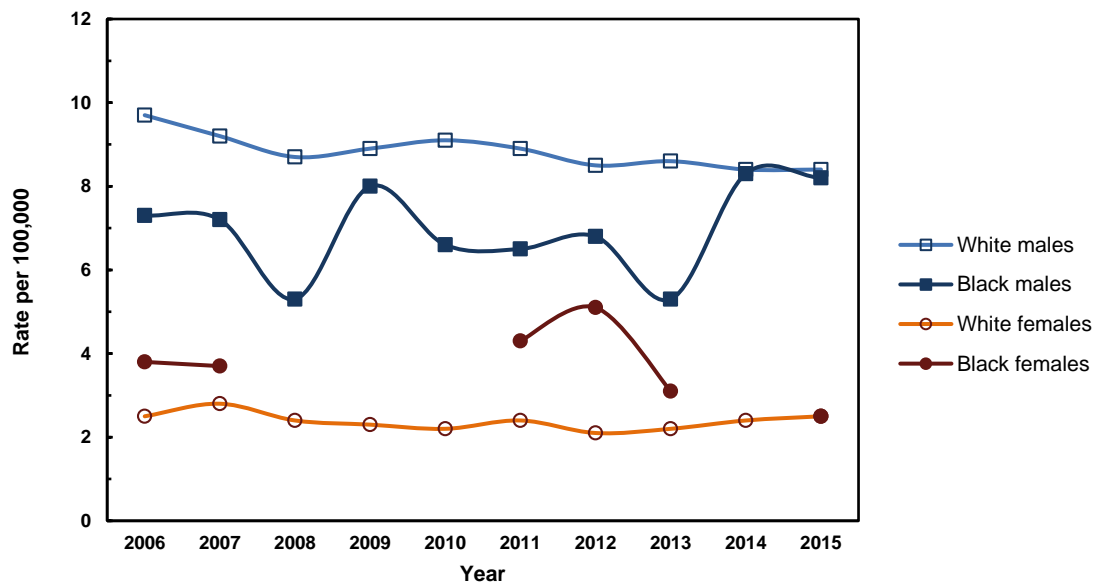
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
17-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Urinary Bladder: MORTALITY

**TABLE
17-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	4,175	6.5	2,929	9.4	2,739	10.5	160	4.5	1,246	3.8	1,099	4.1	131	3.4
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	2	ND	2	ND	2	ND	0	ND	0	ND	0	ND	0	ND
25-29	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
30-34	3	ND	3	ND	3	ND	0	ND	0	ND	0	ND	0	ND
35-39	5	ND	2	ND	2	ND	0	ND	3	ND	1	ND	2	ND
40-44	8	ND	3	ND	1	ND	2	ND	5	ND	3	ND	1	ND
45-49	34	0.8	24	1.1	19	1.0	4	ND	10	0.4	9	ND	0	ND
50-54	90	1.9	73	3.1	59	2.9	11	4.8	17	0.7	13	0.6	4	ND
55-59	188	4.0	135	5.9	124	6.2	10	5.0	53	2.2	38	1.8	14	6.0
60-64	286	7.1	217	11.1	194	11.1	20	13.1	69	3.3	57	3.1	11	5.8
65-69	358	11.3	267	17.8	250	18.4	16	15.4	91	5.4	77	5.2	13	9.3
70-74	511	21.8	378	35.4	350	36.0	23	32.8	133	10.4	116	10.1	17	16.5
75-79	570	31.7	418	53.8	390	54.8	22	45.5	152	14.9	134	14.5	17	21.4
80-84	736	49.9	521	88.9	500	91.8	19	60.2	215	24.2	193	23.7	17	27.6
85+	1,384	84.8	886	167.6	845	170.5	33	126.3	498	45.1	458	44.6	35	52.8

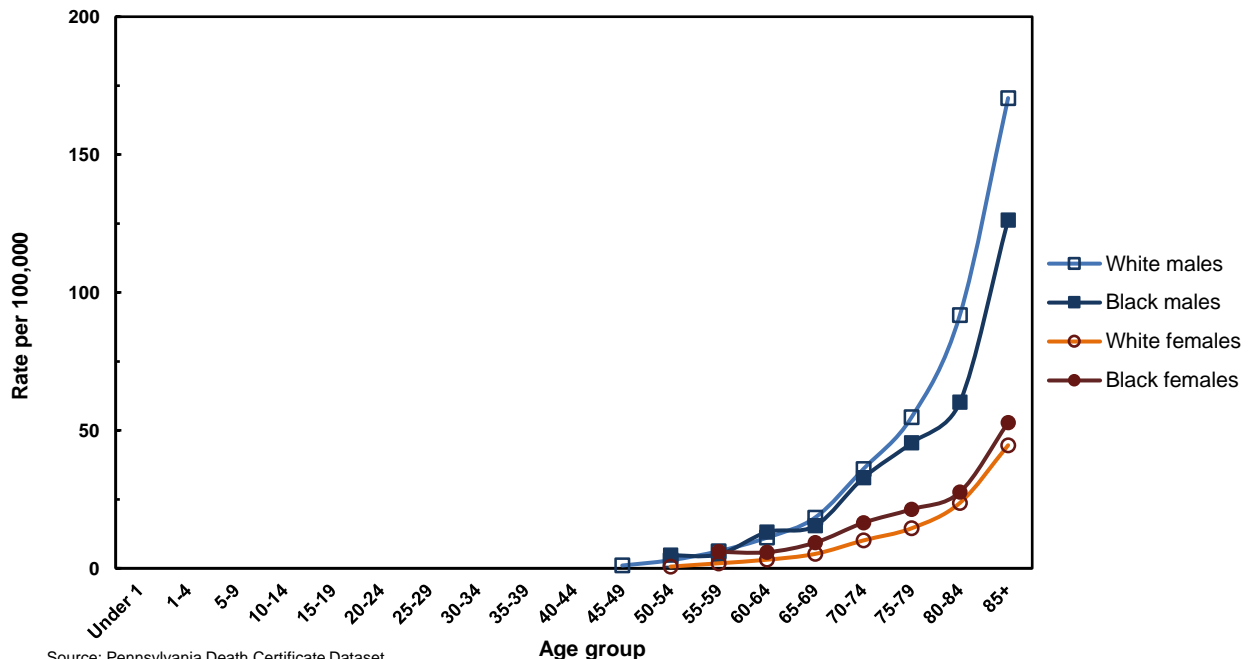
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
17-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Cancer of the Urinary Bladder: INCIDENCE (Invasive and In Situ)

**TABLE
17-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	20,363	15,301	42.7	(42.0-43.4)	5,061	10.9	(10.6-11.2)								
Adams	181	141	44.1	(36.8-51.4)	40	10.8	(7.5-14.1)	Juniata	44	34	42.0	(27.9-56.1)	10	ND	
Allegheny	2,147	1,567	44.1	(41.9-46.3)	580	11.8	(10.8-12.8)	Lackawanna	410	316	48.2	(42.9-53.5)	94	10.8	(8.6-13.0)
Armstrong	123	101	42.9	(34.5-51.3)	22	7.2	(4.2-10.2)	Lancaster	723	570	38.5	(35.3-41.7)	153	8.1	(6.8-9.4)
Beaver	344	257	47.2	(41.4-53.0)	87	11.9	(9.4-14.4)	Lawrence	155	119	39.8	(32.6-47.0)	36	9.5	(6.4-12.6)
Bedford	94	70	39.9	(30.6-49.2)	24	12.4	(7.4-17.4)	Lebanon	230	177	41.9	(35.7-48.1)	53	10.1	(7.4-12.8)
Berks	662	503	44.8	(40.9-48.7)	159	11.3	(9.5-13.1)	Lehigh	608	441	45.9	(41.6-50.2)	167	13.3	(11.3-15.3)
Blair	214	167	42.2	(35.8-48.6)	47	8.9	(6.4-11.4)	Luzerne	590	426	43.8	(39.6-48.0)	164	12.2	(10.3-14.1)
Bradford	105	77	35.5	(27.6-43.4)	28	11.5	(7.2-15.8)	Lycoming	206	153	44.3	(37.3-51.3)	53	12.1	(8.8-15.4)
Bucks	1,090	815	45.4	(42.3-48.5)	275	12.1	(10.7-13.5)	McKean	69	48	36.6	(26.2-47.0)	21	13.4	(7.7-19.1)
Butler	284	213	39.4	(34.1-44.7)	71	10.4	(8.0-12.8)	Mercer	212	156	41.1	(34.7-47.5)	56	11.5	(8.5-14.5)
Cambria	303	225	48.5	(42.2-54.8)	78	13.4	(10.4-16.4)	Mifflin	95	76	49.8	(38.6-61.0)	19	ND	
Cameron	12	10	ND		2	ND		Monroe	273	210	46.9	(40.6-53.2)	63	11.9	(9.0-14.8)
Carbon	134	106	49.7	(40.2-59.2)	28	10.6	(6.7-14.5)	Montgomery	1,291	969	43.0	(40.3-45.7)	322	10.9	(9.7-12.1)
Centre	141	111	32.8	(26.7-38.9)	30	7.6	(4.9-10.3)	Montour	40	29	50.3	(32.0-68.6)	11	ND	
Chester	712	548	43.8	(40.1-47.5)	164	10.1	(8.6-11.6)	Northampton	603	463	53.4	(48.5-58.3)	140	12.4	(10.3-14.5)
Clarion	80	57	47.0	(34.8-59.2)	23	15.4	(9.1-21.7)	Northumberland	177	144	47.3	(39.6-55.0)	33	8.3	(5.5-11.1)
Clearfield	111	89	33.7	(26.7-40.7)	22	6.9	(4.0-9.8)	Perry	64	54	41.6	(30.5-52.7)	10	ND	
Clinton	68	55	46.3	(34.1-58.5)	13	ND		Philadelphia	1,720	1,221	38.8	(36.6-41.0)	498	10.6	(9.7-11.5)
Columbia	107	81	41.1	(32.1-50.1)	26	10.7	(6.6-14.8)	Pike	87	67	33.3	(25.3-41.3)	20	8.6	(4.8-12.4)
Crawford	143	106	38.6	(31.3-45.9)	37	11.1	(7.5-14.7)	Potter	29	24	37.8	(22.7-52.9)	5	ND	
Cumberland	353	262	37.9	(33.3-42.5)	91	10.6	(8.4-12.8)	Schuylkill	293	215	45.2	(39.2-51.2)	78	13.3	(10.3-16.3)
Dauphin	356	278	39.6	(34.9-44.3)	78	8.3	(6.5-10.1)	Snyder	51	39	35.9	(24.6-47.2)	12	ND	
Delaware	805	598	41.6	(38.3-44.9)	207	10.3	(8.9-11.7)	Somerset	133	109	42.3	(34.4-50.2)	24	7.2	(4.3-10.1)
Elk	66	51	45.7	(33.2-58.2)	15	ND		Sullivan	15	11	ND		4	ND	
Erie	442	336	44.4	(39.7-49.1)	106	11.3	(9.1-13.5)	Susquehanna	80	59	40.0	(29.8-50.2)	21	12.8	(7.3-18.3)
Fayette	261	207	48.2	(41.6-54.8)	54	9.9	(7.3-12.5)	Tioga	74	59	39.9	(29.7-50.1)	15	ND	
Forest	13	11	ND		2	ND		Union	49	35	28.0	(18.7-37.3)	14	ND	
Franklin	220	174	38.0	(32.4-43.6)	46	8.4	(6.0-10.8)	Venango	119	96	50.5	(40.4-60.6)	23	11.0	(6.5-15.5)
Fulton	27	18	ND		9	ND		Warren	87	71	49.7	(38.1-61.3)	16	ND	
Greene	55	40	35.0	(24.2-45.8)	15	ND		Washington	362	272	41.5	(36.6-46.4)	90	10.4	(8.3-12.5)
Huntingdon	60	45	31.6	(22.4-40.8)	15	ND		Wayne	107	87	45.1	(35.6-54.6)	20	10.4	(5.8-15.0)
Indiana	161	115	44.7	(36.5-52.9)	46	15.9	(11.3-20.5)	Westmoreland	726	520	42.6	(38.9-46.3)	206	13.3	(11.5-15.1)
Jefferson	87	63	40.9	(30.8-51.0)	24	14.1	(8.5-19.7)	Wyoming	33	23	29.7	(17.6-41.8)	10	ND	
								York	647	511	42.1	(38.4-45.8)	136	9.5	(7.9-11.1)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. With the exception of urinary bladder cancers, all in situ cancer cases are excluded.

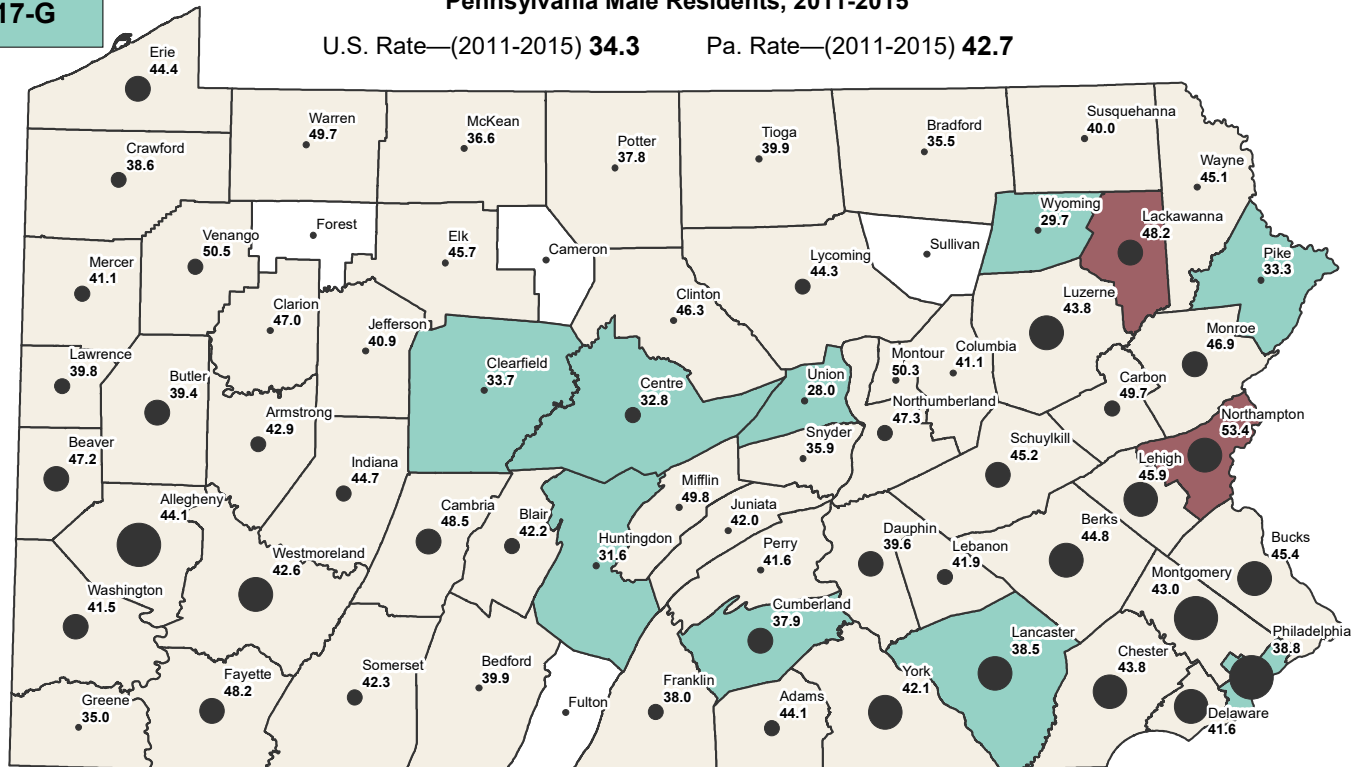
Cancer of the Urinary Bladder: INCIDENCE (Invasive and In Situ)

**MAP
17-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **34.3**

Pa. Rate—(2011-2015) **42.7**



Significantly higher

Significantly lower

Not significantly different

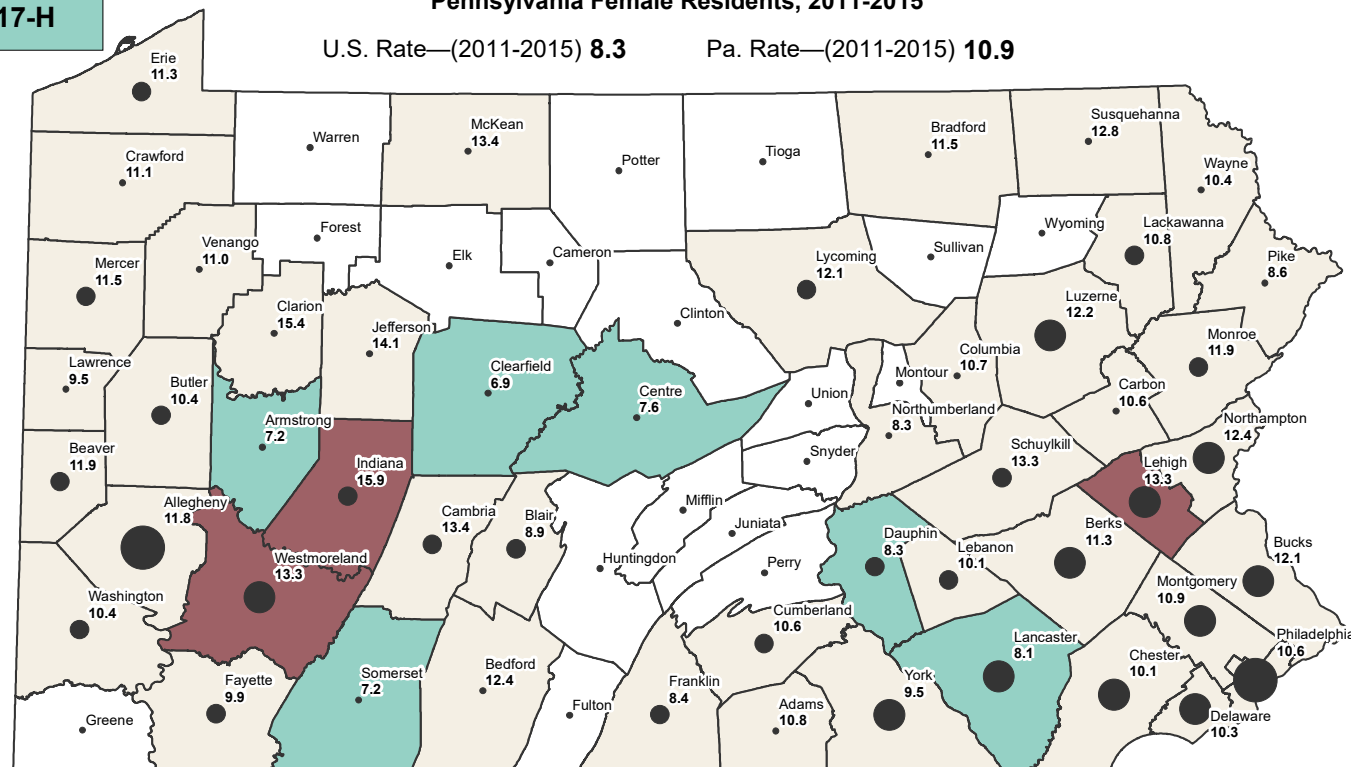
Significance not determined—less than 20 observed cases

**MAP
17-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **8.3**

Pa. Rate—(2011-2015) **10.9**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Urinary Bladder: MORTALITY

**TABLE
17-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	4,175	2,929	8.4	(8.1-8.7)	1,246	2.4	(2.3-2.5)								
Adams	35	26	8.5	(5.2-11.8)	9	ND		Juniata	11	8	ND		3	ND	
Allegheny	476	314	8.9	(7.9-9.9)	162	2.8	(2.4-3.2)	Lackawanna	69	50	7.9	(5.7-10.1)	19	ND	
Armstrong	30	23	10.3	(6.1-14.5)	7	ND		Lancaster	157	111	7.3	(5.9-8.7)	46	2.0	(1.4-2.6)
Beaver	77	54	10.0		23	2.7	(1.6-3.8)	Lawrence	35	28	9.6	(6.0-13.2)	7	ND	
Bedford	14	12	ND		2	ND		Lebanon	45	32	7.9	(5.2-10.6)	13	ND	
Berks	116	77	7.0	(5.4-8.6)	39	2.4	(1.6-3.2)	Lehigh	119	81	8.5	(6.6-10.4)	38	2.6	(1.8-3.4)
Blair	45	30	7.6	(4.9-10.3)	15	ND		Luzerne	115	82	8.9	(7.0-10.8)	33	2.2	(1.4-3.0)
Bradford	21	13	ND		8	ND		Lycoming	49	33	9.9	(6.5-13.3)	16	ND	
Bucks	190	140	8.3	(6.9-9.7)	50	2.0	(1.4-2.6)	McKean	9	7	ND		2	ND	
Butler	57	41	7.7	(5.3-10.1)	16	ND		Mercer	41	33	8.5	(5.6-11.4)	8	ND	
Cambria	53	32	7.0	(4.6-9.4)	21	2.8	(1.6-4.0)	Mifflin	25	14	ND		11	ND	
Cameron	2	1	ND		1	ND		Monroe	48	41	9.9	(6.9-12.9)	7	ND	
Carbon	19	14	ND		5	ND		Montgomery	232	155	6.9	(5.8-8.0)	77	2.2	(1.7-2.7)
Centre	32	26	8.4	(5.2-11.6)	6	ND		Montour	6	4	ND		2	ND	
Chester	129	91	7.8	(6.2-9.4)	38	2.2	(1.5-2.9)	Northampton	111	78	8.9	(6.9-10.9)	33	2.6	(1.7-3.5)
Clarion	17	14	ND		3	ND		Northumberland	41	28	9.1	(5.7-12.5)	13	ND	
Clearfield	29	24	9.5	(5.7-13.3)	5	ND		Perry	11	10	ND		1	ND	
Clinton	24	21	18.6	(10.6-26.6)	3	ND		Philadelphia	405	255	8.5	(7.5-9.5)	150	3.1	(2.6-3.6)
Columbia	20	11	ND		9	ND		Pike	9	6	ND		3	ND	
Crawford	31	25	10.7	(6.5-14.9)	6	ND		Potter	15	11	ND		4	ND	
Cumberland	59	34	4.8	(3.2-6.4)	25	2.6	(1.6-3.6)	Schuylkill	69	49	10.7	(7.7-13.7)	20	2.9	(1.6-4.2)
Dauphin	80	61	9.2	(6.9-11.5)	19	ND		Snyder	16	13	ND		3	ND	
Delaware	161	112	8.0	(6.5-9.5)	49	2.3	(1.7-2.9)	Somerset	27	22	8.1	(4.7-11.5)	5	ND	
Elk	20	15	ND		5	ND		Sullivan	2	2	ND		0	ND	
Erie	98	76	10.1	(7.8-12.4)	22	2.1	(1.2-3.0)	Susquehanna	17	11	ND		6	ND	
Fayette	41	29	6.4	(4.1-8.7)	12	ND		Tioga	14	8	ND		6	ND	
Forest	4	3	ND		1	ND		Union	13	8	ND		5	ND	
Franklin	45	34	7.7	(5.1-10.3)	11	ND		Venango	33	27	15.4	(9.6-21.2)	6	ND	
Fulton	6	1	ND		5	ND		Warren	18	16	ND		2	ND	
Greene	12	7	ND		5	ND		Washington	84	55	8.6	(6.3-10.9)	29	3.0	(1.9-4.1)
Huntingdon	11	10	ND		1	ND		Wayne	25	22	11.9	(6.9-16.9)	3	ND	
Indiana	19	16	ND		3	ND		Westmoreland	164	114	9.4	(7.7-11.1)	50	2.9	(2.1-3.7)
Jefferson	26	21	14.3	(8.2-20.4)	5	ND		Wyoming	8	7	ND		1	ND	
								York	133	100	8.8	(7.1-10.5)	33	2.0	(1.3-2.7)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

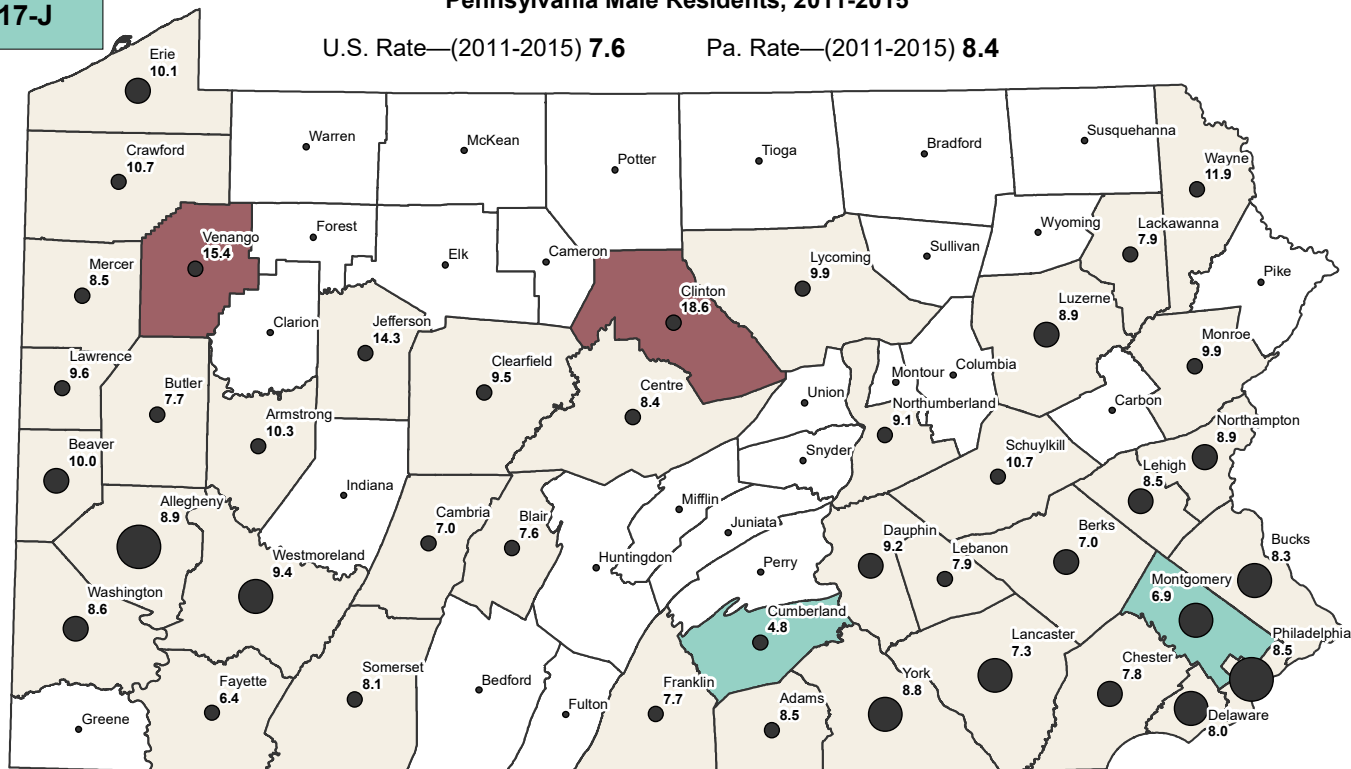
Cancer of the Urinary Bladder: MORTALITY

**MAP
17-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) 7.6

Pa. Rate—(2011-2015) 8.4



Significantly higher

Significantly lower

Not significantly different

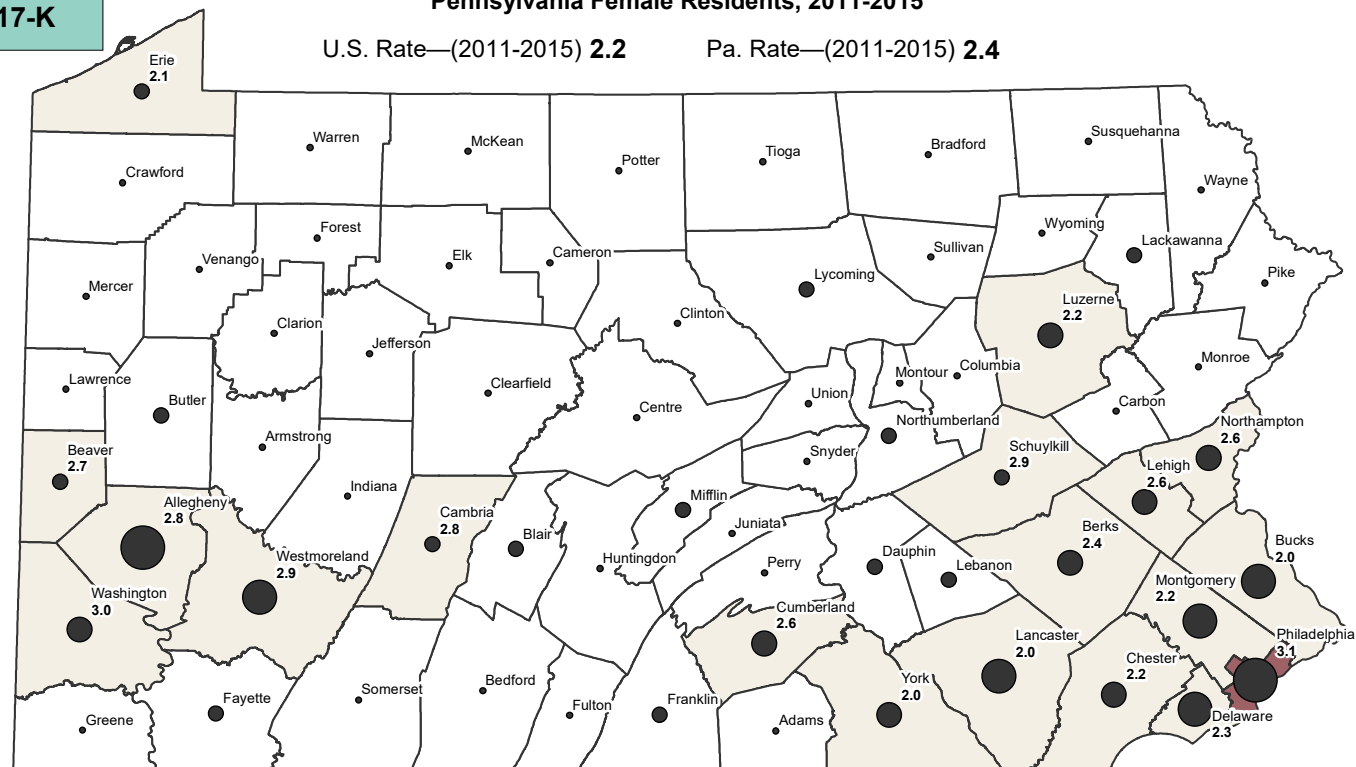
Significance not determined—less than 20 observed cases

**MAP
17-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) 2.2

Pa. Rate—(2011-2015) 2.4



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Kidney and Renal Pelvis

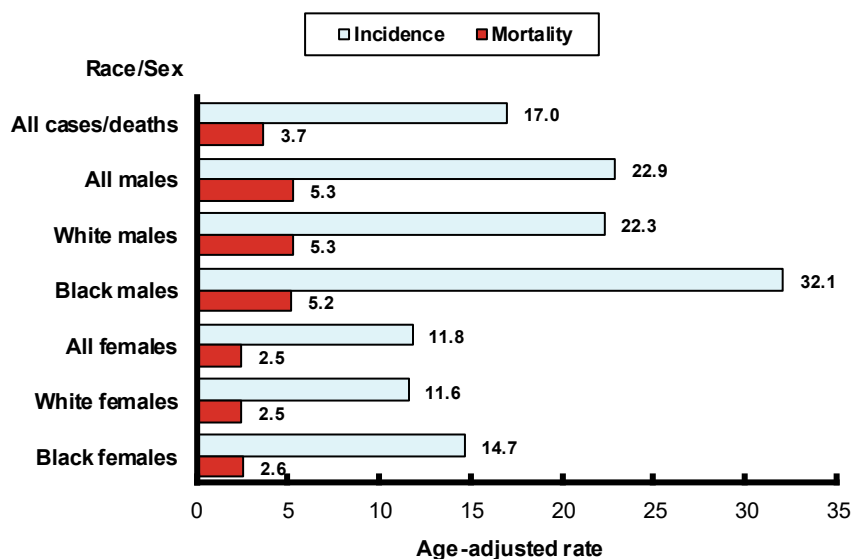
Data Highlights

In 2015, there were 2,825 cases of invasive cancer of the kidney and renal pelvis diagnosed among residents of Pennsylvania — an increase from the 2014 figure of 2,758. Males had an average annual (2011-2015) age-adjusted incidence rate (22.9 per 100,000) of almost twice the female rate (11.8). For the years 2006 through 2015, annual numbers of cases and age-adjusted incidence rates for white males, white females and black females remained fairly stable. The rate for black males had a few fluctuations but increased overall during the period 2006-2015. In 2010, the rate experienced a sharp decrease when it dropped by 38 percent to its lowest annual rate of 20.0 per 100,000. The rate dramatically increased in 2011 to 33.1. The rate rose to 34.1 in 2014, the highest rate observed over the 10-year period, 2006-2015. The rate among black males dropped slightly to 32.2 per 100,000 in 2015.

There are few understood causes of kidney cancer. However, cigarette smoking is an important risk factor. According to the American Cancer Society, risk of developing renal cell carcinoma appears to be related to the amount an individual smokes. As with age-adjusted rates, age-specific incidence rates were much higher among males for most age groups. Approximately 68 percent of the cases for 2015 were diagnosed at early stages (in situ or local) of the disease, and about 29 percent were diagnosed at late stages (regional or distant). During the five-year period of 2011-2015, 86 percent of the invasive cases of kidney and renal pelvis cancers were diagnosed among residents 50 years of age or older.

In 2015, there were 605 resident deaths due to cancer of the kidney and renal pelvis. The average annual (2011-2015) age-adjusted death rate (3.7 per 100,000) was about 78 percent lower than the average annual incidence rate (17.0). Among white males and black males, the annual death rates for kidney/renal pelvis cancer showed a decreasing trend for the period of 2006-2015. The trend over this period was stable among white females. Annual age-adjusted death rates for black females were insufficient for trend analysis due to the small number of deaths.

FIGURE 18
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, etiological factors are obscure. However, tobacco smoking, obesity, workplace exposure to cadmium/herbicides/trichloroethylene/organic solvents, family history, genetics, advanced kidney disease, high blood pressure, and use of diuretics and Phenacetin are associated with increased risk of kidney and renal pelvis cancers.

Early Detection

According to the American Cancer Society, screening for the public is not recommended, although kidney cancers can sometimes be found early among people who are at an increased risk using computed tomography (CT) scans, magnetic resonance imaging (MRI) scans or ultrasound scans.

Cancer of the Kidney and Renal Pelvis: INCIDENCE (Invasive)

**TABLE
18-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,825	17.5 (16.9-18.1)	1,799	24.0 (22.9-25.1)	1,569	23.6 (22.4-24.8)	196	32.2 (27.7-36.7)	1,026	12.0 (11.3-12.7)	891	12.0 (11.2-12.8)	119	15.0 (12.3-17.7)
2014	2,758	17.2 (16.6-17.8)	1,739	23.3 (22.2-24.4)	1,496	22.6 (21.5-23.7)	208	34.1 (29.5-38.7)	1,019	12.0 (11.3-12.7)	873	11.8 (11.0-12.6)	122	15.7 (12.9-18.5)
2013	2,729	17.3 (16.7-17.9)	1,663	22.8 (21.7-23.9)	1,421	21.9 (20.8-23.0)	204	33.0 (28.5-37.5)	1,066	12.6 (11.8-13.4)	924	12.4 (11.6-13.2)	120	15.5 (12.7-18.3)
2012	2,587	16.4 (15.8-17.0)	1,609	22.1 (21.0-23.2)	1,391	21.5 (20.4-22.6)	170	28.1 (23.9-32.3)	978	11.5 (10.8-12.2)	824	11.0 (10.2-11.8)	104	13.8 (11.1-16.5)
2011	2,516	16.2 (15.6-16.8)	1,582	22.4 (21.3-23.5)	1,372	21.8 (20.6-23.0)	184	33.1 (28.3-37.9)	934	11.1 (10.4-11.8)	818	11.0 (10.2-11.8)	102	13.5 (10.9-16.1)
2010	2,471	16.2 (15.6-16.8)	1,522	21.8 (20.7-22.9)	1,381	22.4 (21.2-23.6)	114	20.0 (16.3-23.7)	949	11.4 (10.7-12.1)	815	11.1 (10.3-11.9)	113	16.2 (13.2-19.2)
2009	2,492	16.8 (16.1-17.5)	1,500	22.4 (21.3-23.5)	1,320	21.8 (20.6-23.0)	150	32.3 (27.1-37.5)	992	12.2 (11.4-13.0)	857	11.8 (11.0-12.6)	109	16.2 (13.2-19.2)
2008	2,582	17.7 (17.0-18.4)	1,575	24.1 (22.9-25.3)	1,405	23.7 (22.5-24.9)	142	30.7 (25.7-35.7)	1,007	12.6 (11.8-13.4)	883	12.4 (11.6-13.2)	106	15.9 (12.9-18.9)
2007	2,421	16.6 (15.9-17.3)	1,518	23.4 (22.2-24.6)	1,353	23.0 (21.8-24.2)	139	29.6 (24.7-34.5)	902	11.2 (10.5-11.9)	806	11.2 (10.4-12.0)	88	13.2 (10.4-16.0)
2006	2,488	17.1 (16.4-17.8)	1,482	23.2 (22.0-24.4)	1,343	23.2 (22.0-24.4)	107	21.8 (17.7-25.9)	1,006	12.3 (11.5-13.1)	898	12.2 (11.4-13.0)	89	13.6 (10.8-16.4)

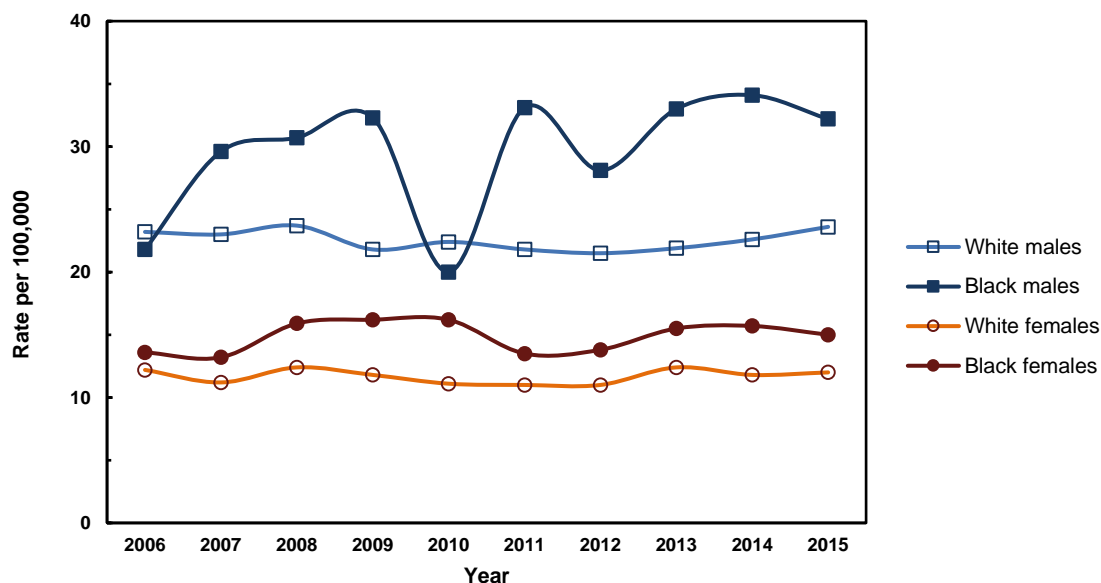
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
18-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Kidney and Renal Pelvis: INCIDENCE (Invasive)

**TABLE
18-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

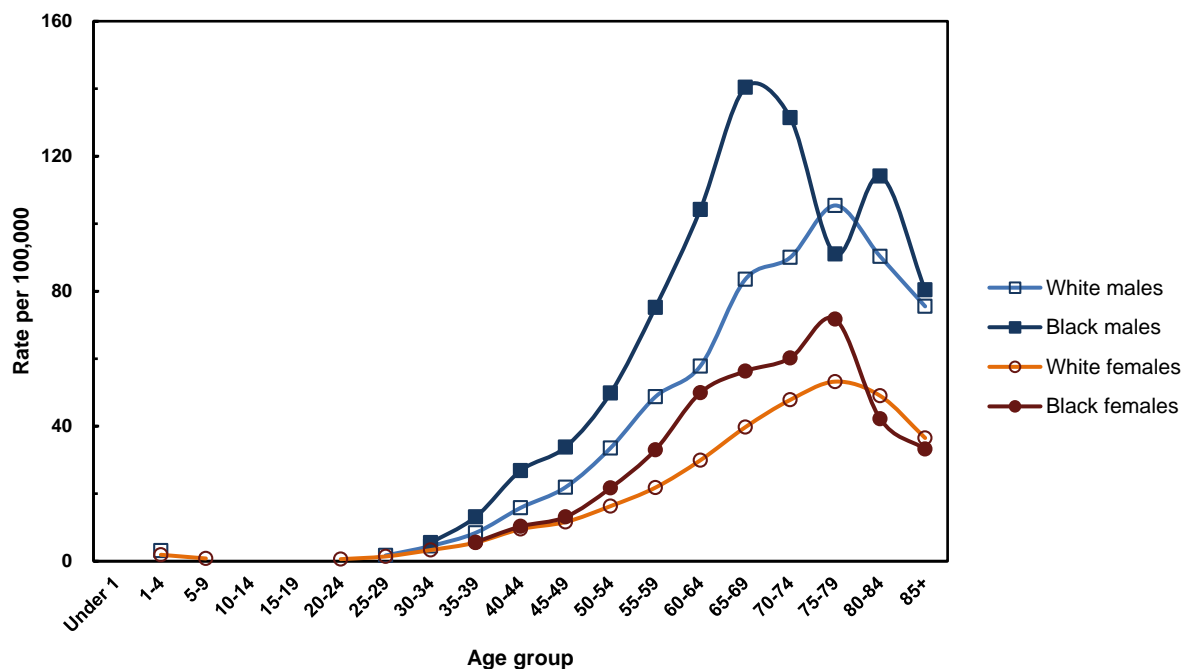
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	21.0	26.9	27.8	27.2	15.4	16.0	14.8
Under 1	1.7	ND	ND	ND	ND	ND	ND
1-4	2.3	2.7	3.1	ND	2.0	1.9	ND
5-9	0.6	0.5	ND	ND	0.8	0.8	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	0.6	0.5	ND	ND	0.6	0.6	ND
25-29	1.6	1.8	1.7	ND	1.4	1.4	ND
30-34	3.8	4.5	4.5	5.5	3.1	3.3	ND
35-39	7.1	8.8	8.4	13.1	5.3	5.5	5.6
40-44	12.9	16.4	15.8	26.8	9.3	9.5	10.3
45-49	17.2	23.0	21.9	33.8	11.5	11.6	13.1
50-54	25.4	34.5	33.5	49.8	16.7	16.3	21.7
55-59	36.3	50.3	48.7	75.2	22.8	21.8	33.0
60-64	46.0	61.6	57.8	104.2	31.5	29.9	49.9
65-69	62.6	87.0	83.5	140.4	40.7	39.7	56.3
70-74	68.5	92.1	90.0	131.4	48.7	47.8	60.2
75-79	75.5	103.3	105.4	91.0	54.3	53.2	71.7
80-84	66.4	92.9	90.3	114.1	49.0	49.0	42.2
85+	50.5	77.2	75.5	80.4	37.7	36.5	33.2

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
18-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Kidney and Renal Pelvis: INCIDENCE (Invasive)

**TABLE
18-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	13,415	8,392	7,249	962	5,023	4,330	567
Under 1	12	5	4	1	7	5	1
1-4	67	39	34	4	28	20	4
5-9	24	10	8	2	14	11	2
10-14	2	1	0	1	1	1	0
15-19	7	2	2	0	5	4	0
20-24	25	12	8	4	13	10	3
25-29	65	37	28	8	28	23	5
30-34	149	88	71	13	61	51	7
35-39	256	159	125	28	97	81	13
40-44	519	330	265	60	189	159	25
45-49	758	501	407	78	257	217	33
50-54	1,224	815	687	114	409	343	56
55-59	1,693	1,148	980	151	545	453	77
60-64	1,858	1,201	1,007	159	657	548	95
65-69	1,987	1,305	1,133	146	682	592	79
70-74	1,607	984	874	92	623	547	62
75-79	1,359	803	750	44	556	491	57
80-84	979	544	492	36	435	399	26
85+	824	408	374	21	416	375	22

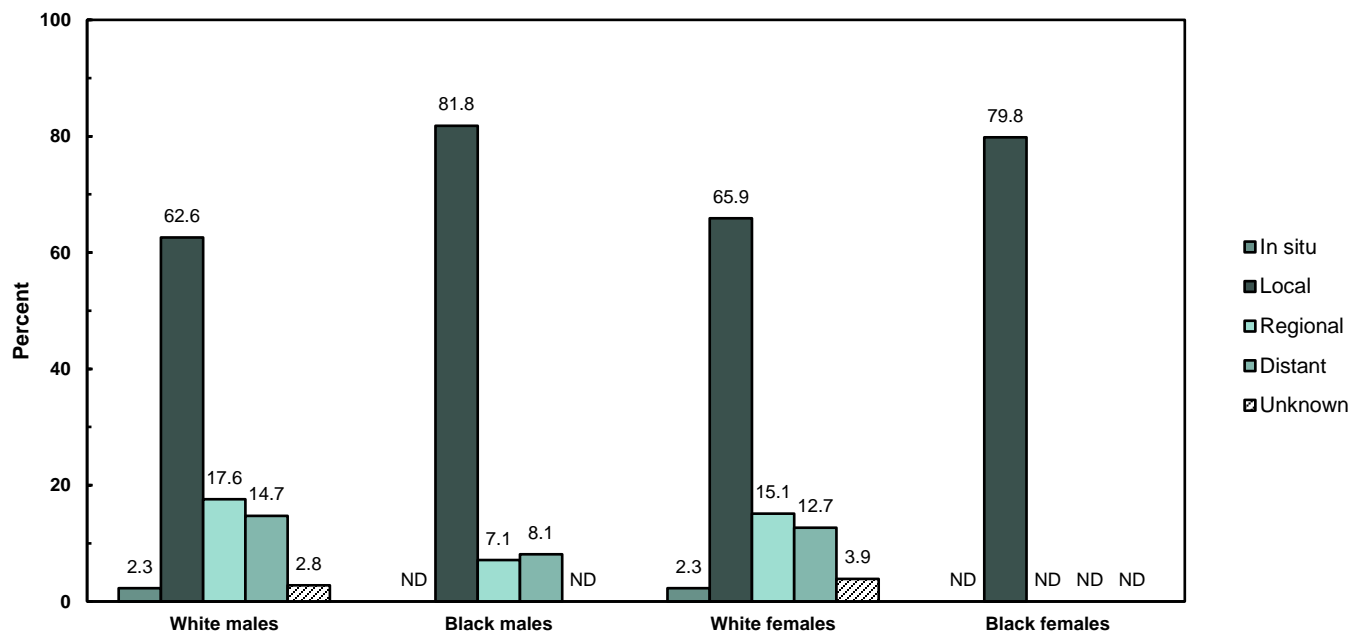
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
18-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Cancer of the Kidney and Renal Pelvis: MORTALITY

**TABLE
18-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	605	3.5 (3.2-3.8)	393	5.3 (4.8-5.8)	365	5.4 (4.8-6.0)	16	ND	212	2.1 (1.8-2.4)	190	2.1 (1.8-2.4)	20	2.6 (1.5-3.7)
2014	605	3.6 (3.3-3.9)	390	5.3 (4.8-5.8)	352	5.3 (4.7-5.9)	29	5.3 (3.4-7.2)	215	2.2 (1.9-2.5)	198	2.3 (2.0-2.6)	15	ND
2013	629	3.8 (3.5-4.1)	375	5.2 (4.7-5.7)	330	5.1 (4.5-5.7)	35	6.4 (4.3-8.5)	254	2.6 (2.3-2.9)	224	2.6 (2.3-2.9)	23	3.0 (1.8-4.2)
2012	651	3.9 (3.6-4.2)	404	5.7 (5.1-6.3)	363	5.6 (5.0-6.2)	34	7.3 (4.8-9.8)	247	2.6 (2.3-2.9)	226	2.6 (2.3-2.9)	17	ND
2011	641	3.9 (3.6-4.2)	372	5.3 (4.8-5.8)	343	5.4 (4.8-6.0)	26	4.6 (2.8-6.4)	269	2.8 (2.5-3.1)	244	2.8 (2.4-3.2)	22	3.0 (1.7-4.3)
2010	623	3.9 (3.6-4.2)	385	5.6 (5.0-6.2)	363	5.9 (5.3-6.5)	21	4.3 (2.5-6.1)	238	2.6 (2.3-2.9)	218	2.6 (2.3-2.9)	18	ND
2009	648	4.2 (3.9-4.5)	403	6.1 (5.5-6.7)	377	6.2 (5.6-6.8)	24	5.6 (3.4-7.8)	245	2.6 (2.3-2.9)	227	2.7 (2.3-3.1)	17	ND
2008	603	3.9 (3.6-4.2)	366	5.7 (5.1-6.3)	339	5.7 (5.1-6.3)	27	5.9 (3.7-8.1)	237	2.7 (2.4-3.0)	219	2.7 (2.3-3.1)	14	ND
2007	569	3.8 (3.5-4.1)	351	5.7 (5.1-6.3)	327	5.8 (5.2-6.4)	23	5.1 (3.0-7.2)	218	2.4 (2.1-2.7)	203	2.5 (2.2-2.8)	14	ND
2006	635	4.3 (4.0-4.6)	371	6.1 (5.5-6.7)	348	6.2 (5.5-6.9)	23	5.5 (3.3-7.7)	264	3.0 (2.6-3.4)	234	2.9 (2.5-3.3)	28	4.3 (2.7-5.9)

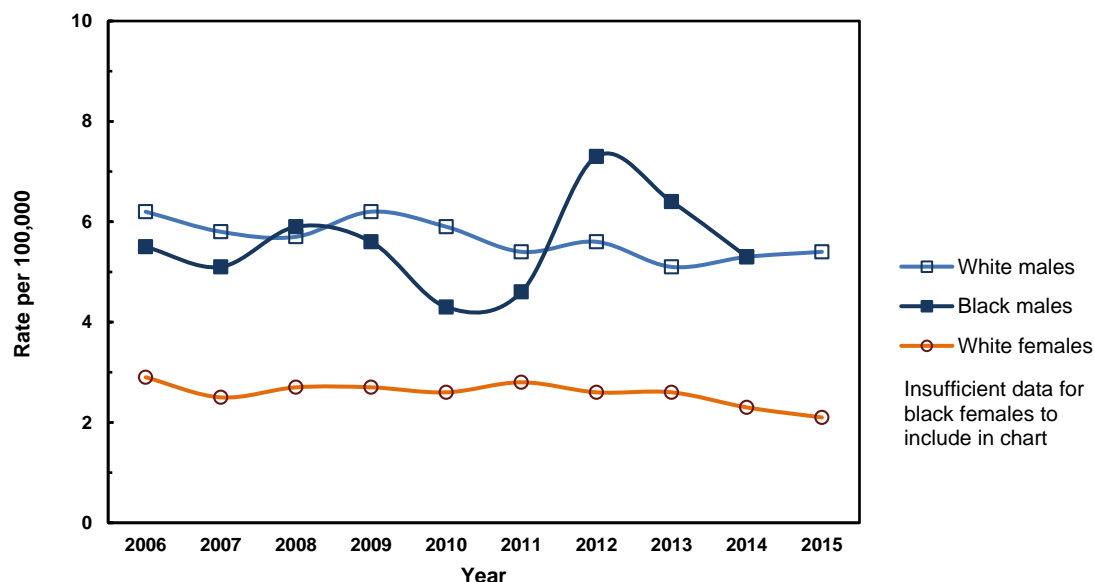
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
18-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Kidney and Renal Pelvis: MORTALITY

**TABLE
18-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	3,131	4.9	1,934	6.2	1,753	6.7	140	4.0	1,197	3.7	1,082	4.0	97	2.5
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
5-9	4	ND	3	ND	3	ND	0	ND	1	ND	1	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	1	ND	0	ND	0	ND	0	ND	1	ND	1	ND	0	ND
20-24	4	ND	2	ND	0	ND	2	ND	2	ND	0	ND	2	ND
25-29	3	ND	2	ND	1	ND	1	ND	1	ND	1	ND	0	ND
30-34	11	0.3	8	ND	6	ND	2	ND	3	ND	2	ND	0	ND
35-39	14	0.4	12	0.7	8	ND	3	ND	2	ND	2	ND	0	ND
40-44	31	0.8	21	1.0	18	1.1	3	ND	10	0.5	8	ND	0	ND
45-49	70	1.6	60	2.8	54	2.9	5	ND	10	0.4	10	0.5	0	ND
50-54	166	3.5	117	5.0	95	4.6	16	7.0	49	2.0	41	2.0	7	ND
55-59	243	5.2	181	7.9	157	7.8	18	9.0	62	2.6	57	2.7	4	ND
60-64	358	8.9	239	12.3	217	12.5	20	13.1	119	5.7	103	5.6	14	7.3
65-69	380	12.0	251	16.7	228	16.8	19	18.3	129	7.7	116	7.8	12	8.6
70-74	414	17.6	275	25.8	251	25.8	16	22.9	139	10.9	127	11.1	11	10.7
75-79	431	23.9	243	31.3	220	30.9	15	31.0	188	18.4	166	18.0	21	26.4
80-84	399	27.1	214	36.5	203	37.3	9	ND	185	20.8	171	21.0	11	17.8
85+	601	36.8	305	57.7	291	58.7	11	42.1	296	26.8	276	26.9	15	22.6

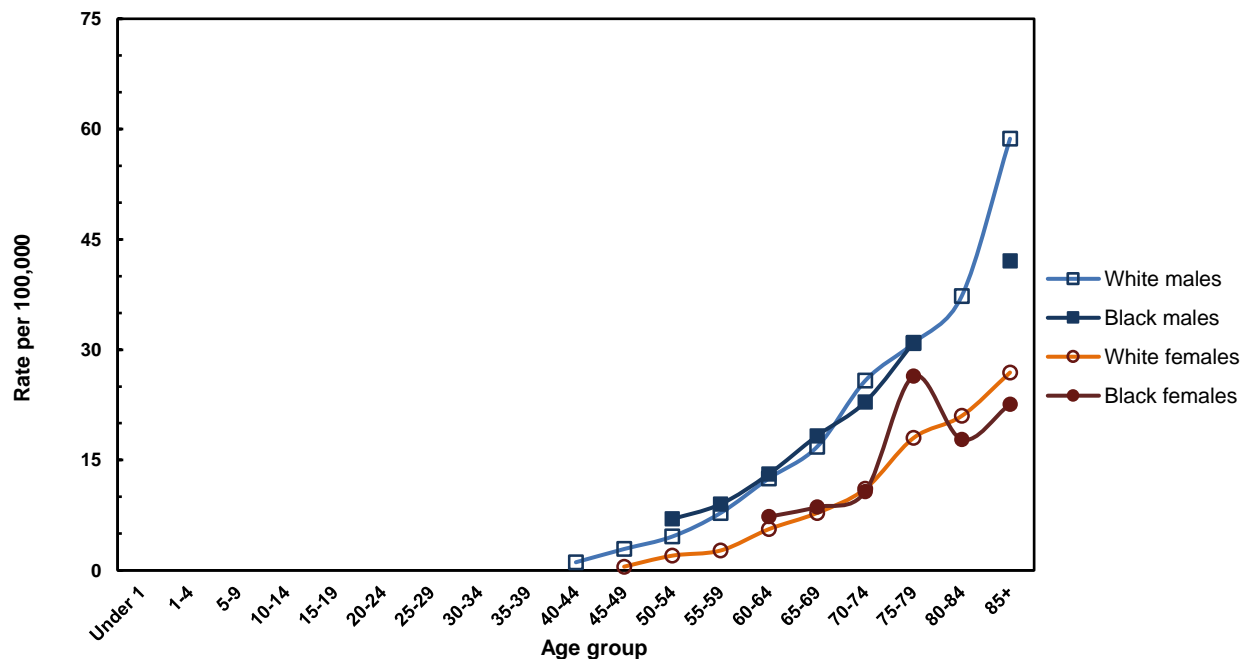
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
18-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Cancer of the Kidney and Renal Pelvis: INCIDENCE (Invasive)

**TABLE
18-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	13,415	8,392	22.9	(22.4-23.4)	5,023	11.8	(11.5-12.1)								
Adams	91	61	19.4	(14.5-24.3)	30	8.5	(5.5-11.5)	Juniata	25	15	ND		10	ND	
Allegheny	1,270	743	21.2	(19.7-22.7)	527	12.2	(11.2-13.2)	Lackawanna	218	144	22.5	(18.8-26.2)	74	9.8	(7.6-12.0)
Armstrong	72	42	18.2	(12.7-23.7)	30	13.0	(8.3-17.7)	Lancaster	455	301	20.3	(18.0-22.6)	154	9.3	(7.8-10.8)
Beaver	187	128	23.9	(19.8-28.0)	59	8.9	(6.6-11.2)	Lawrence	105	69	24.1	(18.4-29.8)	36	11.9	(8.0-15.8)
Bedford	53	29	16.9	(10.7-23.1)	24	13.0	(7.8-18.2)	Lebanon	161	85	21.6	(17.0-26.2)	76	17.4	(13.5-21.3)
Berks	423	277	23.9	(21.1-26.7)	146	11.1	(9.3-12.9)	Lehigh	384	235	23.9	(20.8-27.0)	149	12.5	(10.5-14.5)
Blair	140	81	21.0	(16.4-25.6)	59	12.8	(9.5-16.1)	Luzerne	339	205	21.2	(18.3-24.1)	134	11.7	(9.7-13.7)
Bradford	83	53	26.2	(19.1-33.3)	30	14.0	(9.0-19.0)	Lycoming	121	75	22.4	(17.3-27.5)	46	11.3	(8.0-14.6)
Bucks	698	450	23.9	(21.7-26.1)	248	11.4	(10.0-12.8)	McKean	32	21	17.0	(9.7-24.3)	11	ND	
Butler	181	113	20.8	(17.0-24.6)	68	10.3	(7.9-12.7)	Mercer	134	73	20.4	(15.7-25.1)	61	14.4	(10.8-18.0)
Cambria	166	90	20.8	(16.5-25.1)	76	14.8	(11.5-18.1)	Mifflin	51	35	26.3	(17.6-35.0)	16	ND	
Cameron	4	3	ND		1	ND		Monroe	173	123	24.8	(20.4-29.2)	50	8.5	(6.1-10.9)
Carbon	81	49	21.3	(15.3-27.3)	32	14.6	(9.5-19.7)	Montgomery	822	546	23.5	(21.5-25.5)	276	9.8	(8.6-11.0)
Centre	104	63	17.5	(13.2-21.8)	41	11.2	(7.8-14.6)	Montour	20	15	ND		5	ND	
Chester	445	310	22.2	(19.7-24.7)	135	8.8	(7.3-10.3)	Northampton	391	244	28.3	(24.7-31.9)	147	14.3	(12.0-16.6)
Clarion	46	29	24.3	(15.5-33.1)	17	ND		Northumberland	106	68	21.1	(16.1-26.1)	38	11.5	(7.8-15.2)
Clearfield	85	52	19.4	(14.1-24.7)	33	12.4	(8.2-16.6)	Perry	49	33	22.2	(14.6-29.8)	16	ND	
Clinton	38	22	19.5	(11.4-27.6)	16	ND		Philadelphia	1,686	1,027	29.9	(28.1-31.7)	659	14.9	(13.8-16.0)
Columbia	64	44	21.9	(15.4-28.4)	20	9.4	(5.3-13.5)	Pike	57	36	17.5	(11.8-23.2)	21	10.0	(5.7-14.3)
Crawford	97	55	20.4	(15.0-25.8)	42	13.5	(9.4-17.6)	Potter	16	11	ND		5	ND	
Cumberland	248	159	23.2	(19.6-26.8)	89	10.7	(8.5-12.9)	Schuylkill	172	101	21.3	(17.1-25.5)	71	13.2	(10.1-16.3)
Dauphin	275	176	23.3	(19.9-26.7)	99	11.5	(9.2-13.8)	Snyder	32	20	16.7	(9.4-24.0)	12	ND	
Delaware	543	349	23.3	(20.9-25.7)	194	10.9	(9.4-12.4)	Somerset	93	62	24.4	(18.3-30.5)	31	11.6	(7.5-15.7)
Elk	28	19	ND		9	ND		Sullivan	10	8	ND		2	ND	
Erie	277	165	21.0	(17.8-24.2)	112	12.2	(9.9-14.5)	Susquehanna	47	31	20.7	(13.4-28.0)	16	ND	
Fayette	173	109	24.9	(20.2-29.6)	64	13.2	(10.0-16.4)	Tioga	55	28	21.0	(13.2-28.8)	27	16.9	(10.5-23.3)
Forest	6	5	ND		1	ND		Union	40	27	21.5	(13.4-29.6)	13	ND	
Franklin	165	103	22.8	(18.4-27.2)	62	12.6	(9.5-15.7)	Venango	65	40	22.3	(15.4-29.2)	25	11.4	(6.9-15.9)
Fulton	16	9	ND		7	ND		Warren	55	34	23.2	(15.4-31.0)	21	16.3	(9.3-23.3)
Greene	49	25	21.6	(13.1-30.1)	24	20.1	(12.1-28.1)	Washington	231	141	21.8	(18.2-25.4)	90	11.7	(9.3-14.1)
Huntingdon	50	28	17.0	(10.7-23.3)	22	16.2	(9.4-23.0)	Wayne	51	38	21.0	(14.3-27.7)	13	ND	
Indiana	86	50	18.3	(13.2-23.4)	36	15.2	(10.2-20.2)	Westmoreland	444	274	23.0	(20.3-25.7)	170	12.7	(10.8-14.6)
Jefferson	65	36	24.9	(16.8-33.0)	29	18.2	(11.6-24.8)	Wyoming	31	23	24.7	(14.6-34.8)	8	ND	
								York	435	277	21.4	(18.9-23.9)	158	11.2	(9.5-12.9)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

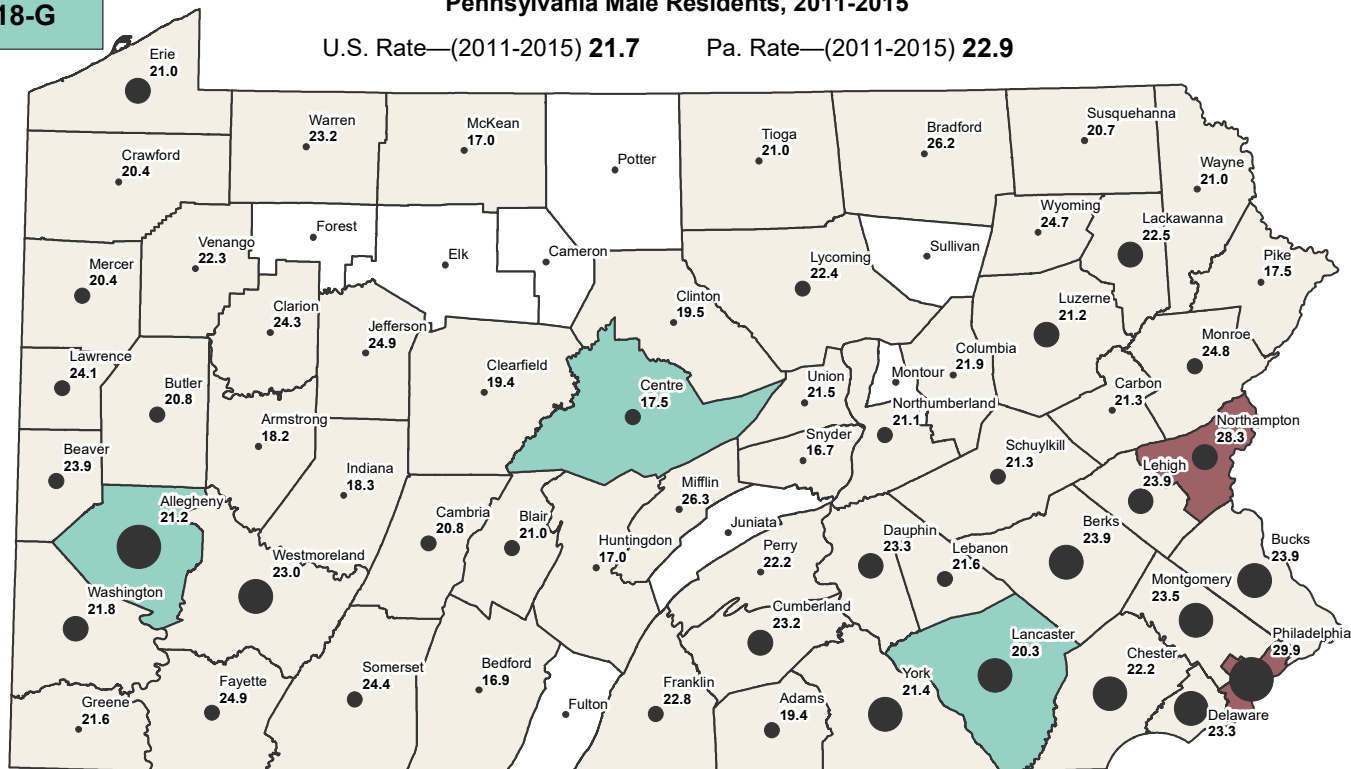
Cancer of the Kidney and Renal Pelvis: INCIDENCE (Invasive)

**MAP
18-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **21.7**

Pa. Rate—(2011-2015) **22.9**



Significantly higher

Significantly lower

Not significantly different

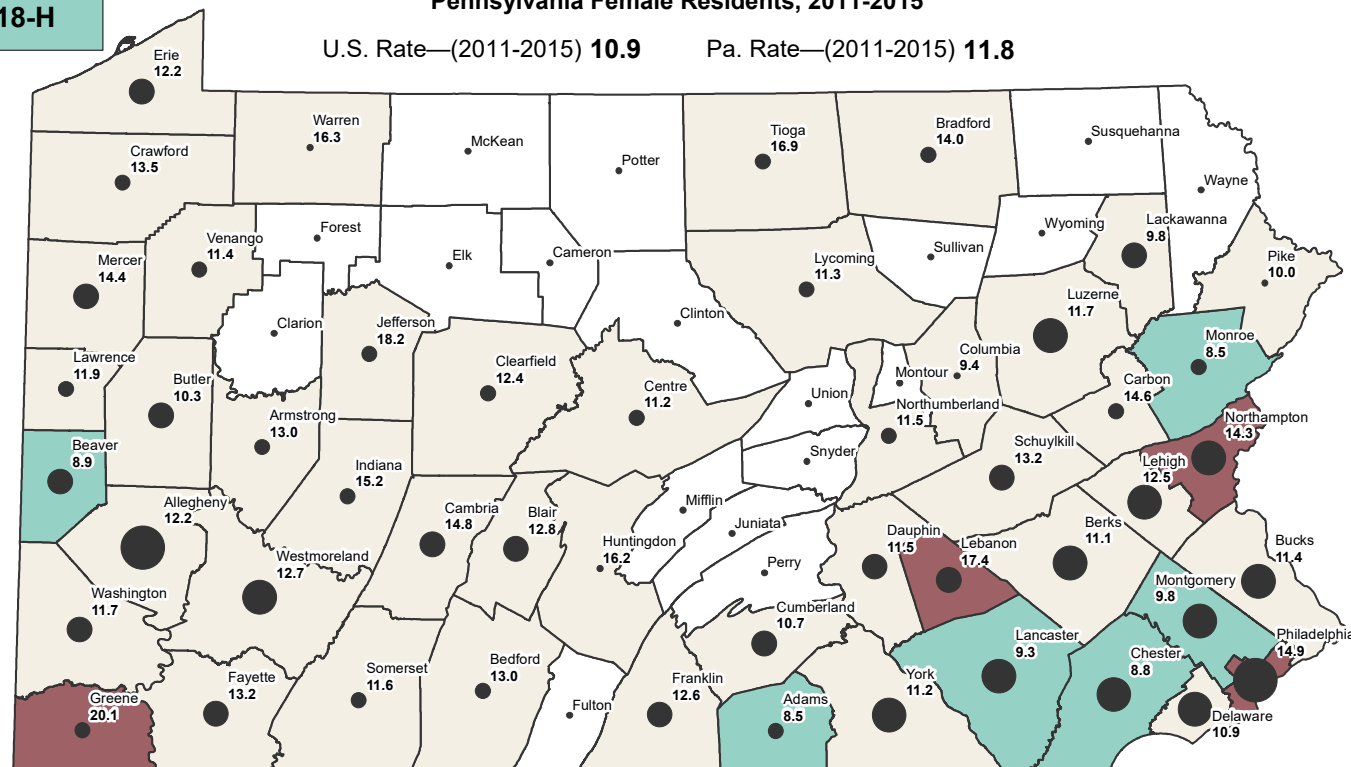
Significance not determined—less than 20 observed cases

**MAP
18-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **10.9**

Pa. Rate—(2011-2015) **11.8**



The symbol, ●, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Kidney and Renal Pelvis: MORTALITY

**TABLE
18-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	3,131	1,934	5.3	(5.1-5.5)	1,197	2.5	(2.4-2.6)								
Adams	27	18	ND		9	ND		Juniata	3	2	ND		1	ND	
Allegheny	361	208	5.8	(5.0-6.6)	153	3.0	(2.5-3.5)	Lackawanna	53	34	5.0	(3.3-6.7)	19	ND	
Armstrong	23	14	ND		9	ND		Lancaster	117	75	5.1	(3.9-6.3)	42	2.2	(1.5-2.9)
Beaver	58	37	6.6	(4.5-8.7)	21	2.9	(1.7-4.1)	Lawrence	32	25	8.5	(5.2-11.8)	7	ND	
Bedford	15	11	ND		4	ND		Lebanon	35	20	4.8	(2.7-6.9)	15	ND	
Berks	80	46	4.1	(2.9-5.3)	34	2.5	(1.7-3.3)	Lehigh	86	54	5.7	(4.2-7.2)	32	2.6	(1.7-3.5)
Blair	34	25	6.2	(3.8-8.6)	9	ND		Luzerne	72	35	3.6	(2.4-4.8)	37	2.6	(1.8-3.4)
Bradford	17	11	ND		6	ND		Lycoming	38	25	7.3	(4.4-10.2)	13	ND	
Bucks	131	83	4.5	(3.5-5.5)	48	2.0	(1.4-2.6)	McKean	5	0	ND		5	ND	
Butler	37	25	4.6	(2.8-6.4)	12	ND		Mercer	24	15	ND		9	ND	
Cambria	44	24	5.5	(3.3-7.7)	20	2.7	(1.5-3.9)	Mifflin	12	8	ND		4	ND	
Cameron	0	0	ND		0	ND		Monroe	31	25	5.9	(3.6-8.2)	6	ND	
Carbon	15	10	ND		5	ND		Montgomery	170	104	4.5	(3.6-5.4)	66	2.0	(1.5-2.5)
Centre	25	12	ND		13	ND		Montour	8	6	ND		2	ND	
Chester	96	65	5.0	(3.8-6.2)	31	1.9	(1.2-2.6)	Northampton	70	42	4.8	(3.3-6.3)	28	2.5	(1.6-3.4)
Clarion	8	4	ND		4	ND		Northumberland	28	15	ND		13	ND	
Clearfield	24	18	ND		6	ND		Perry	7	3	ND		4	ND	
Clinton	15	9	ND		6	ND		Philadelphia	299	181	5.7	(4.9-6.5)	118	2.5	(2.0-3.0)
Columbia	14	10	ND		4	ND		Pike	10	4	ND		6	ND	
Crawford	19	14	ND		5	ND		Potter	8	5	ND		3	ND	
Cumberland	52	37	5.3	(3.6-7.0)	15	ND		Schuylkill	47	25	5.0	(3.0-7.0)	22	3.2	(1.9-4.5)
Dauphin	53	34	4.8	(3.2-6.4)	19	ND		Snyder	12	7	ND		5	ND	
Delaware	135	76	5.4	(4.2-6.6)	59	2.8	(2.1-3.5)	Somerset	22	12	ND		10	ND	
Elk	4	3	ND		1	ND		Sullivan	5	4	ND		1	ND	
Erie	87	55	6.9	(5.1-8.7)	32	3.3	(2.2-4.4)	Susquehanna	11	5	ND		6	ND	
Fayette	26	22	5.2	(3.0-7.4)	4	ND		Tioga	15	8	ND		7	ND	
Forest	3	2	ND		1	ND		Union	20	14	ND		6	ND	
Franklin	42	22	4.6	(2.7-6.5)	20	3.5	(2.0-5.0)	Venango	19	10	ND		9	ND	
Fulton	8	5	ND		3	ND		Warren	17	11	ND		6	ND	
Greene	10	6	ND		4	ND		Washington	70	43	6.4	(4.5-8.3)	27	3.2	(2.0-4.4)
Huntingdon	19	13	ND		6	ND		Wayne	21	14	ND		7	ND	
Indiana	18	14	ND		4	ND		Westmoreland	123	76	6.2	(4.8-7.6)	47	2.7	(1.9-3.5)
Jefferson	12	6	ND		6	ND		Wyoming	6	5	ND		1	ND	
								York	123	83	6.7	(5.3-8.1)	40	2.6	(1.8-3.4)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

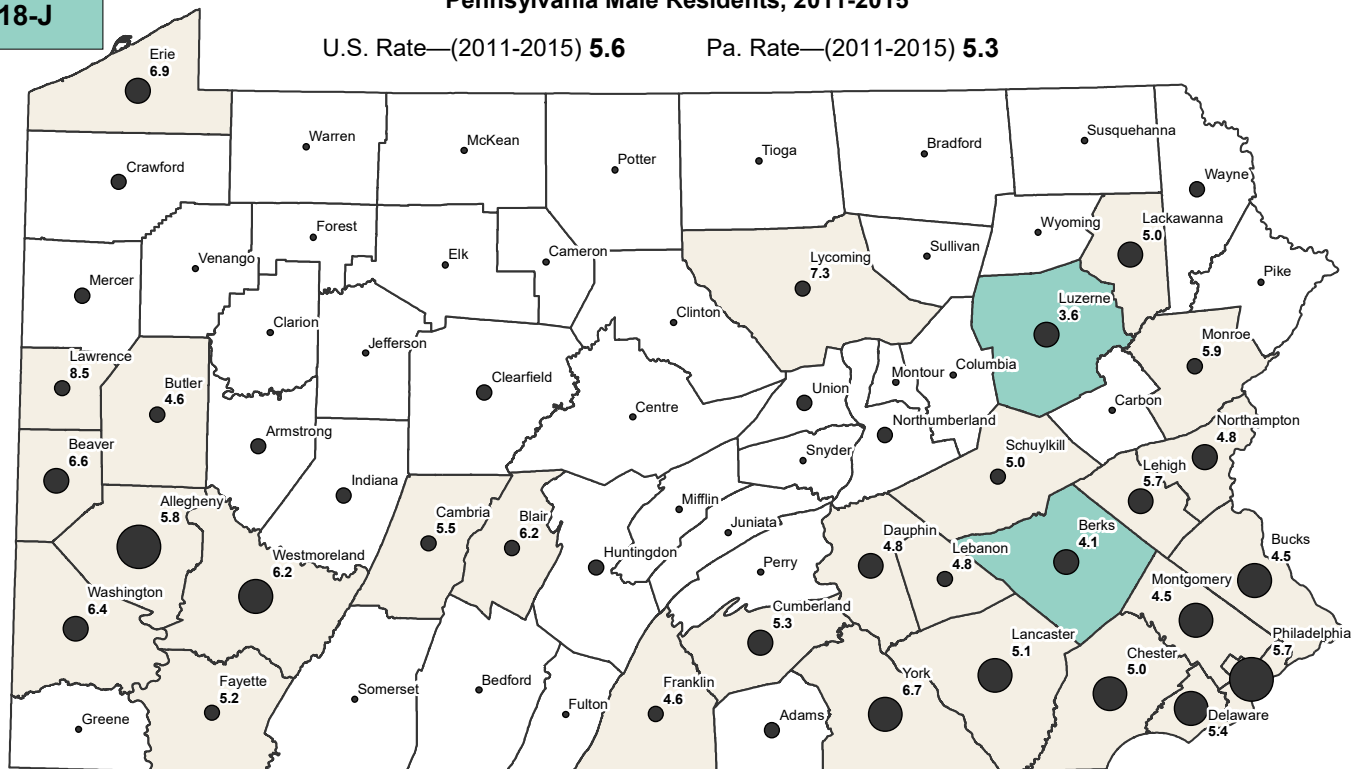
Cancer of the Kidney and Renal Pelvis: MORTALITY

**MAP
18-J**

**Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates
Pennsylvania Male Residents, 2011-2015**

U.S. Rate—(2011-2015) **5.6**

Pa. Rate—(2011-2015) **5.3**



Significantly higher

Significantly lower

Not significantly different

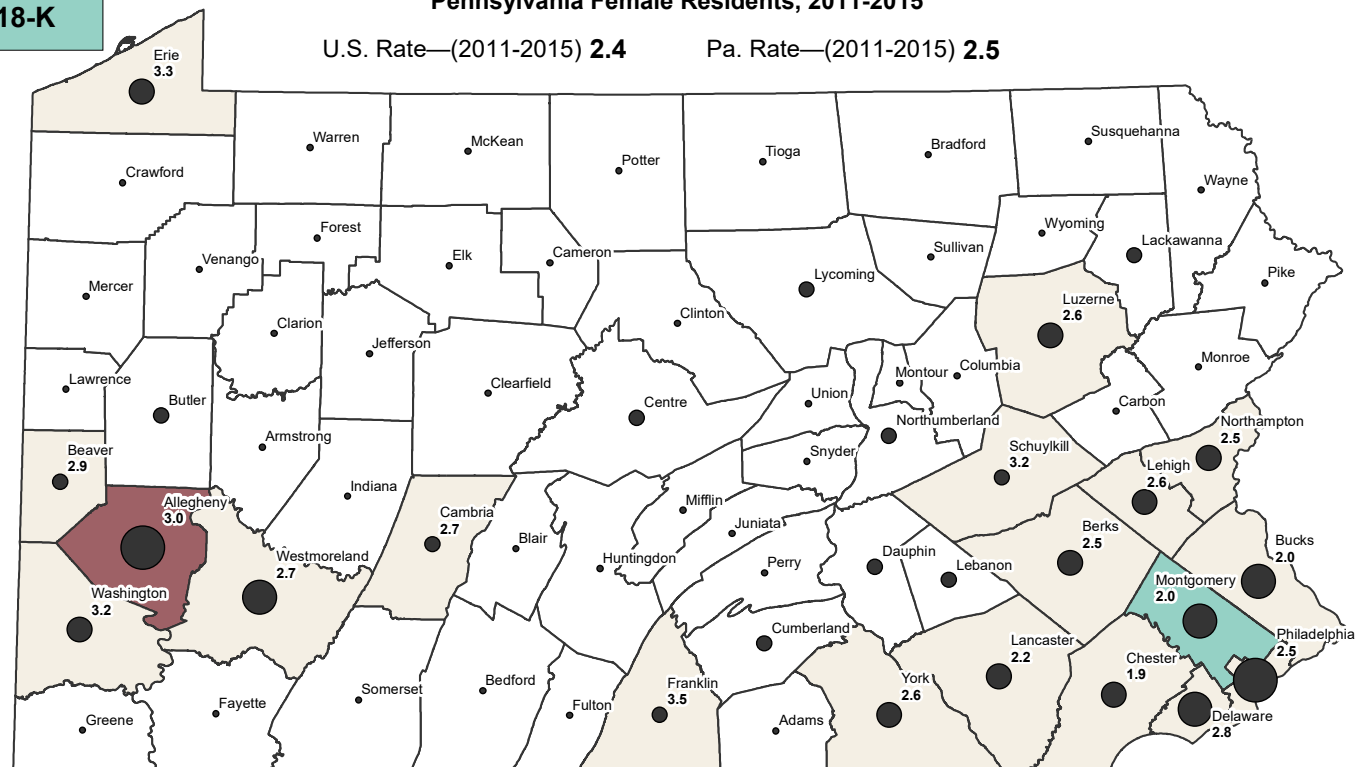
Significance not determined—less than 20 observed cases

**MAP
18-K**

**Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates
Pennsylvania Female Residents, 2011-2015**

U.S. Rate—(2011-2015) **2.4**

Pa. Rate—(2011-2015) **2.5**



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Brain and Other Nervous System

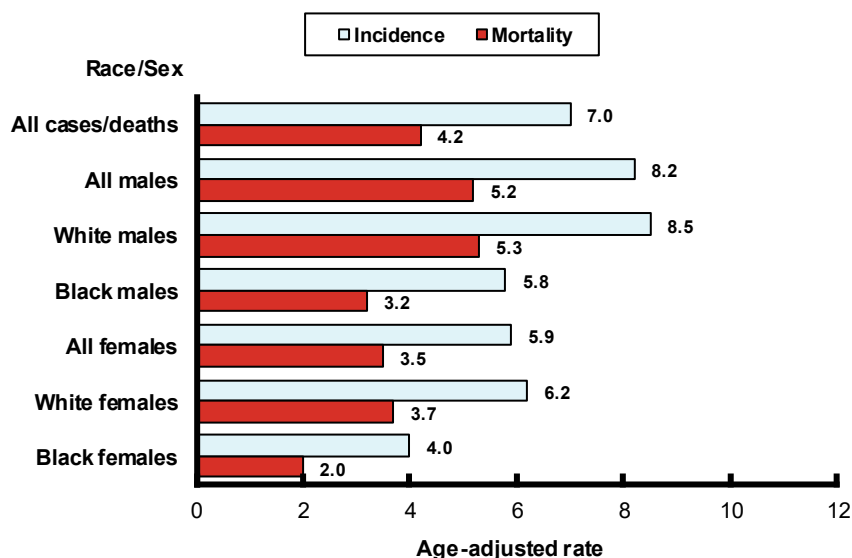
Data Highlights

During 2015, there were 1,028 invasive cases of brain and other central nervous system cancers reported to the Pennsylvania Cancer Registry – an increase from the previous year, 2014, when there were 1,014 cases. The average annual (2011-2015) age-adjusted incidence rate was higher for white males and females than black males and females. In fact, the incidence rate for white males (8.5 per 100,000) was 47 percent higher than the rate for black males (5.8), and the rate for white females (6.2) was 55 percent higher than the rate for black females (4.0). Between 2006 and 2015, the annual age-adjusted incidence rates for white males and white females did not have any obvious trends. Among blacks, the instability of the rates (due to the small number of cases) makes it difficult to interpret any trend.

Approximately 9 percent of invasive brain/other nervous system cancers occurred among residents under age 15 during the five-year period of 2011-2015. Average annual (2011-2015) age-specific incidence rates decreased between the ages of 1 and 24. Thereafter, they increased to about age 84. Age-specific incidence rates were generally higher for white males compared to white females during the 2011-2015 period. Among blacks, the age-specific rates were unstable and too difficult to interpret due to the small number of cases. In 2015, 78 percent of brain/other nervous system cancers were diagnosed at early stages (in situ or local) of the disease, and 14 percent were diagnosed at late stages (regional or distant).

The average annual (2011-2015) age-adjusted death rates by sex and race were highest among white males (5.3 per 100,000) and lowest among black females (2.0). Among most age groups, white males had higher age-specific death rates than white females for the five-year period 2011-2015. There were 719 resident deaths due to cancer of the brain/other nervous system in 2015, resulting in an annual age-adjusted rate of 4.4. The annual age-adjusted death rates by race for the period of 2006-2015 were stable among whites of both sexes but were too difficult to interpret among blacks due to the small number of deaths.

FIGURE 19
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, while some cases show an autosomal dominant pattern, no genetic factor has been found to influence the overall incidence of primary nervous system tumors. Radiation exposure to the head and immune system disorders can increase the risk of developing brain cancers.

Early Detection

According to the American Cancer Society, no screening tests have proven to be effective or are currently being evaluated. Brain cancers can sometimes be found early among people with certain inherited syndromes such as neurofibromatosis or tuberous sclerosis during frequently occurring physical exams.

Cancer of the Brain and Other Nervous System: INCIDENCE (Invasive)

**TABLE
19-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,028	6.8 (6.4-7.2)	560	8.0 (7.3-8.7)	502	8.3 (7.6-9.0)	36	5.4 (3.6-7.2)	468	5.8 (5.3-6.3)	426	6.2 (5.6-6.8)	24	3.1 (1.9-4.3)
2014	1,014	6.9 (6.5-7.3)	569	8.3 (7.6-9.0)	506	8.5 (7.8-9.2)	41	6.5 (4.5-8.5)	445	5.6 (5.1-6.1)	402	5.9 (5.3-6.5)	33	4.2 (2.8-5.6)
2013	1,062	7.3 (6.9-7.7)	564	8.3 (7.6-9.0)	508	8.7 (7.9-9.5)	33	5.3 (3.5-7.1)	498	6.3 (5.7-6.9)	449	6.6 (6.0-7.2)	41	5.4 (3.7-7.1)
2012	1,031	7.1 (6.7-7.5)	575	8.6 (7.9-9.3)	500	8.5 (7.8-9.2)	39	5.9 (4.0-7.8)	455	5.9 (5.4-6.4)	395	6.1 (5.5-6.7)	20	2.6 (1.5-3.7)
2011	1,007	7.0 (6.6-7.4)	539	8.1 (7.4-8.8)	493	8.4 (7.7-9.1)	33	5.9 (3.9-7.9)	468	6.1 (5.5-6.7)	425	6.4 (5.8-7.0)	34	4.6 (3.1-6.1)
2010	1,011	7.1 (6.7-7.5)	563	8.5 (7.8-9.2)	526	9.3 (8.5-10.1)	26	4.6 (2.8-6.4)	448	5.9 (5.4-6.4)	415	6.4 (5.8-7.0)	20	2.8 (1.6-4.0)
2009	975	6.9 (6.5-7.3)	529	8.1 (7.4-8.8)	484	8.3 (7.6-9.0)	27	4.4 (2.7-6.1)	446	5.8 (5.3-6.3)	415	6.1 (5.5-6.7)	26	3.7 (2.3-5.1)
2008	1,009	7.3 (6.8-7.8)	523	8.3 (7.6-9.0)	480	8.5 (7.7-9.3)	37	6.9 (4.7-9.1)	486	6.5 (5.9-7.1)	444	6.7 (6.1-7.3)	21	3.1 (1.8-4.4)
2007	1,025	7.4 (6.9-7.9)	535	8.5 (7.8-9.2)	482	8.7 (7.9-9.5)	37	7.3 (4.9-9.7)	490	6.5 (5.9-7.1)	451	6.7 (6.1-7.3)	29	4.3 (2.7-5.9)
2006	972	7.1 (6.7-7.5)	531	8.6 (7.9-9.3)	479	8.7 (7.9-9.5)	31	5.9 (3.8-8.0)	441	5.9 (5.3-6.5)	401	6.0 (5.4-6.6)	28	4.2 (2.6-5.8)

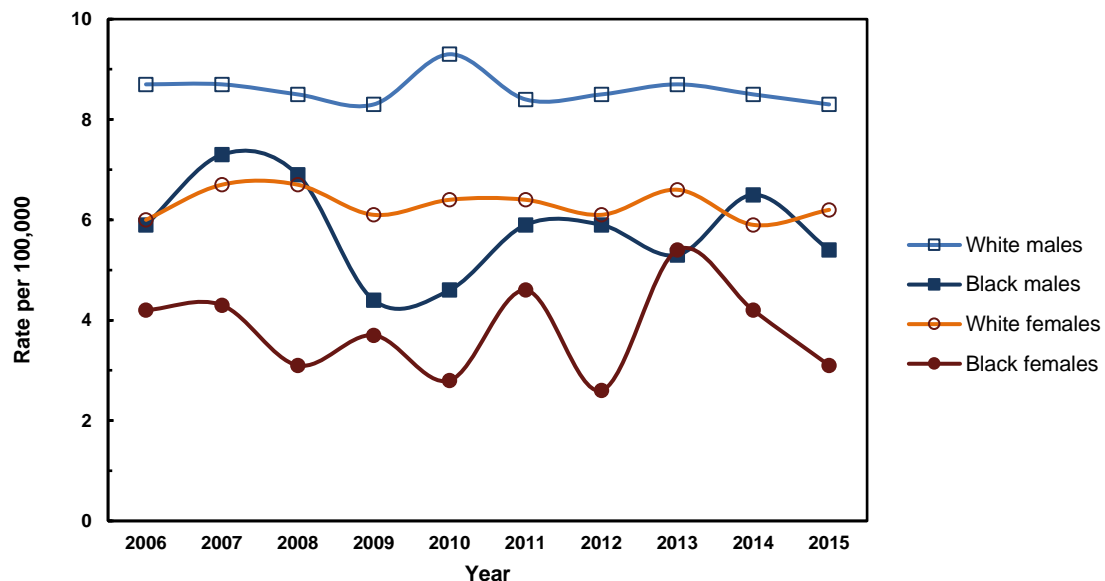
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
19-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Brain and Other Nervous System: INCIDENCE (Invasive)

**TABLE
19-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

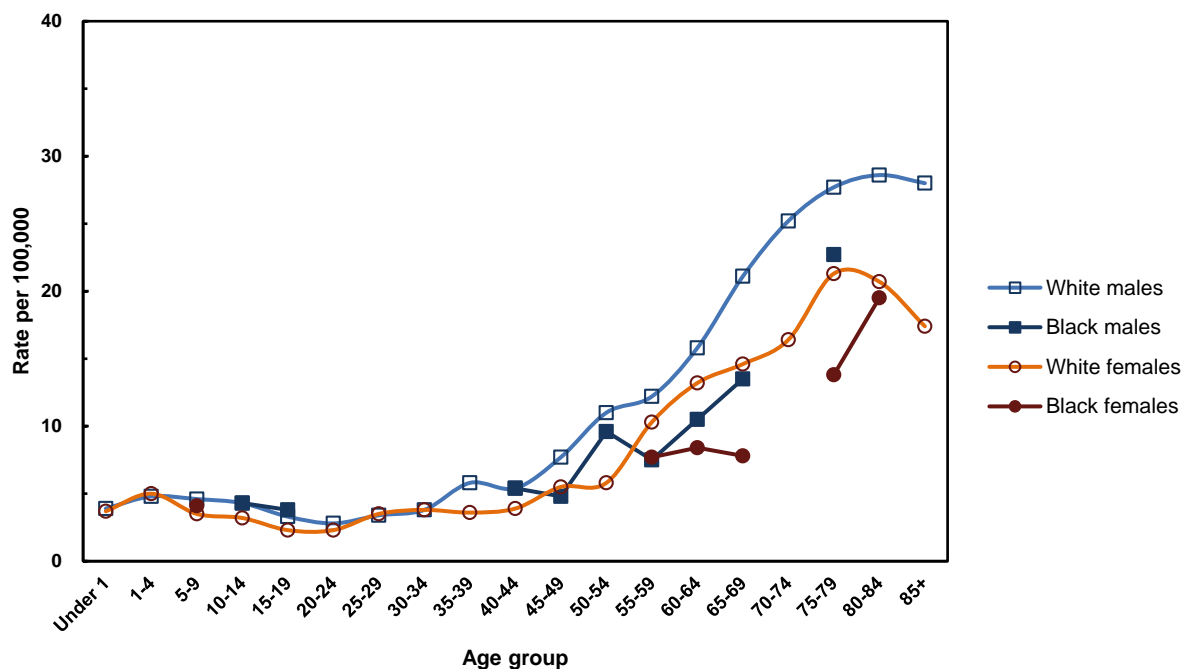
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	8.1	9.0	9.6	5.2	7.1	7.7	4.0
Under 1	3.6	3.3	3.9	ND	4.0	3.7	ND
1-4	4.9	5.0	4.8	ND	4.7	5.0	ND
5-9	4.1	4.5	4.6	ND	3.6	3.5	4.1
10-14	3.5	4.2	4.3	4.3	2.9	3.2	ND
15-19	2.7	3.4	3.3	3.8	2.0	2.3	ND
20-24	2.4	2.7	2.8	ND	2.0	2.3	ND
25-29	3.1	3.3	3.4	ND	2.9	3.5	ND
30-34	3.4	3.3	3.8	ND	3.5	3.8	ND
35-39	4.3	5.5	5.8	ND	3.1	3.6	ND
40-44	4.5	5.2	5.4	5.4	3.8	3.9	ND
45-49	6.1	7.2	7.7	4.8	5.1	5.5	ND
50-54	8.0	10.7	11.0	9.6	5.5	5.8	ND
55-59	10.9	11.7	12.2	7.5	10.1	10.3	7.7
60-64	13.9	15.3	15.8	10.5	12.6	13.2	8.4
65-69	17.3	20.8	21.1	13.5	14.1	14.6	7.8
70-74	19.7	24.4	25.2	ND	15.7	16.4	ND
75-79	23.6	27.4	27.7	22.7	20.6	21.3	13.8
80-84	23.9	29.0	28.6	ND	20.6	20.7	19.5
85+	21.6	28.0	28.0	ND	18.6	17.4	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
19-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Brain and Other Nervous System: INCIDENCE (Invasive)

**TABLE
19-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	5,142	2,807	2,509	182	2,334	2,097	152
Under 1	26	12	11	0	14	10	3
1-4	140	74	53	5	66	52	9
5-9	152	86	68	9	66	49	11
10-14	137	82	66	12	55	47	6
15-19	116	74	56	12	42	38	2
20-24	104	61	48	9	43	39	3
25-29	129	69	58	4	60	56	2
30-34	132	65	60	3	67	59	6
35-39	156	100	86	9	56	53	3
40-44	183	105	90	12	78	65	4
45-49	270	156	143	11	114	103	8
50-54	387	252	225	22	135	122	9
55-59	509	268	246	15	240	213	18
60-64	561	299	275	16	262	242	16
65-69	548	312	287	14	236	217	11
70-74	462	261	245	8	201	188	9
75-79	424	213	197	11	211	197	11
80-84	353	170	156	7	183	168	12
85+	353	148	139	3	205	179	9

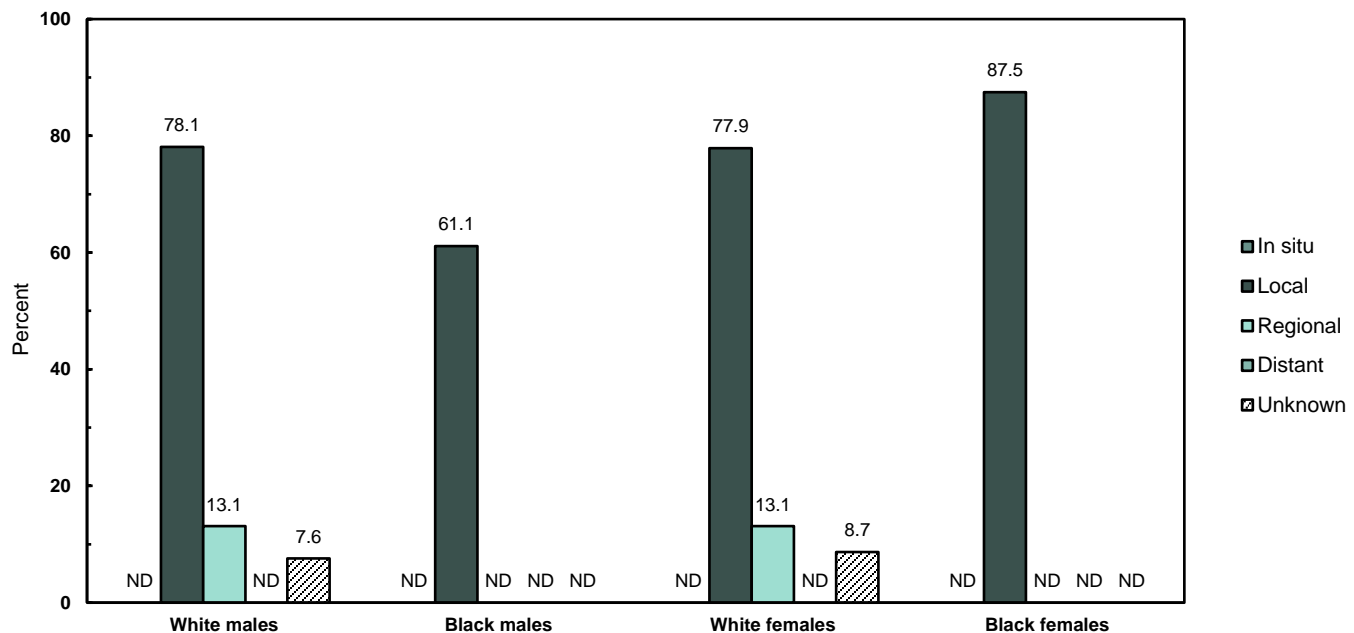
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
19-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

Number and Percent of Invasive Cases Microscopically Confirmed: 861 - 83.8%

Cancer of the Brain and Other Nervous System: MORTALITY

**TABLE
19-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	719	4.4 (4.1-4.7)	413	5.6 (5.1-6.1)	386	5.9 (5.3-6.5)	15	ND	306	3.4 (3.0-3.8)	279	3.6 (3.2-4.0)	13	ND
2014	671	4.2 (3.9-4.5)	374	5.0 (4.5-5.5)	341	5.1 (4.6-5.6)	24	3.9 (2.3-5.5)	297	3.4 (3.0-3.8)	269	3.5 (3.1-3.9)	22	2.8 (1.6-4.0)
2013	693	4.4 (4.1-4.7)	369	5.2 (4.7-5.7)	333	5.3 (4.7-5.9)	24	3.9 (2.3-5.5)	324	3.8 (3.4-4.2)	299	4.0 (3.5-4.5)	16	ND
2012	648	4.2 (3.9-4.5)	356	5.0 (4.5-5.5)	333	5.2 (4.6-5.8)	14	ND	292	3.5 (3.1-3.9)	271	3.7 (3.3-4.1)	14	ND
2011	619	4.0 (3.7-4.3)	346	5.0 (4.5-5.5)	322	5.2 (4.6-5.8)	17	ND	273	3.2 (2.8-3.6)	261	3.5 (3.1-3.9)	11	ND
2010	651	4.2 (3.9-4.5)	364	5.2 (4.7-5.7)	346	5.6 (5.0-6.2)	13	ND	287	3.3 (2.9-3.7)	274	3.6 (3.2-4.0)	10	ND
2009	664	4.4 (4.1-4.7)	354	5.3 (4.7-5.9)	329	5.5 (4.9-6.1)	22	4.2 (2.4-6.0)	310	3.7 (3.3-4.1)	294	3.9 (3.5-4.3)	14	ND
2008	581	4.0 (3.7-4.3)	320	5.0 (4.5-5.5)	298	5.1 (4.5-5.7)	21	4.2 (2.4-6.0)	261	3.3 (2.9-3.7)	248	3.5 (3.1-3.9)	13	ND
2007	598	4.2 (3.9-4.5)	333	5.2 (4.6-5.8)	313	5.5 (4.9-6.1)	19	ND	265	3.3 (2.9-3.7)	251	3.5 (3.1-3.9)	14	ND
2006	569	4.0 (3.7-4.3)	286	4.5 (4.0-5.0)	272	4.8 (4.2-5.4)	10	ND	283	3.6 (3.2-4.0)	268	3.8 (3.3-4.3)	13	ND

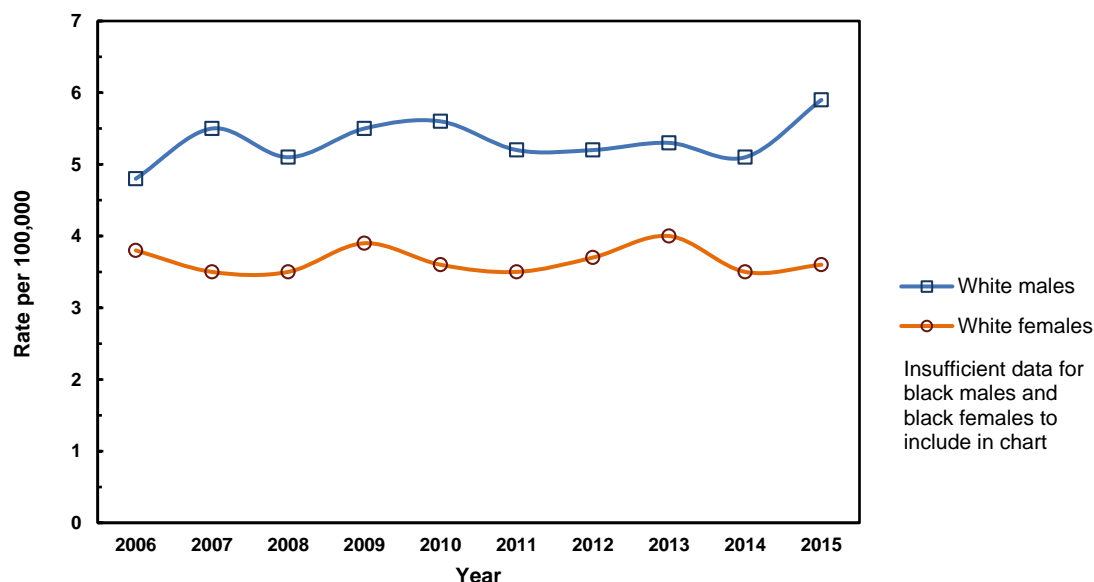
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
19-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Brain and Other Nervous System: MORTALITY

**TABLE
19-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	3,350	5.2	1,858	6.0	1,715	6.6	94	2.7	1,492	4.6	1,379	5.1	76	2.0
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	16	0.6	9	ND	3	ND	3	ND	7	ND	6	ND	1	ND
5-9	43	1.2	28	1.5	23	1.6	1	ND	15	0.8	10	0.7	3	ND
10-14	25	0.6	13	0.7	9	ND	2	ND	12	0.6	9	ND	1	ND
15-19	23	0.5	11	0.5	7	ND	1	ND	12	0.6	8	ND	3	ND
20-24	30	0.7	19	0.9	15	0.9	2	ND	11	0.5	11	0.7	0	ND
25-29	21	0.5	15	0.7	15	0.9	0	ND	6	ND	6	ND	0	ND
30-34	47	1.2	24	1.2	22	1.4	1	ND	23	1.2	21	1.4	1	ND
35-39	62	1.7	40	2.2	32	2.2	7	ND	22	1.2	17	1.2	5	ND
40-44	96	2.4	54	2.7	48	2.9	4	ND	42	2.1	35	2.1	5	ND
45-49	158	3.6	98	4.5	86	4.6	10	4.3	60	2.7	55	2.9	2	ND
50-54	262	5.4	139	5.9	127	6.2	10	4.4	123	5.0	116	5.5	5	ND
55-59	376	8.1	214	9.4	197	9.8	12	6.0	162	6.8	152	7.3	6	ND
60-64	453	11.2	257	13.2	238	13.7	11	7.2	196	9.4	175	9.5	13	6.8
65-69	450	14.2	269	17.9	257	18.9	8	ND	181	10.8	167	11.2	8	ND
70-74	380	16.2	225	21.1	212	21.8	7	ND	155	12.1	150	13.1	3	ND
75-79	338	18.8	175	22.5	167	23.5	5	ND	163	15.9	154	16.7	6	ND
80-84	300	20.3	141	24.1	136	25.0	5	ND	159	17.9	150	18.4	9	ND
85+	270	16.5	127	24.0	121	24.4	5	ND	143	12.9	137	13.3	5	ND

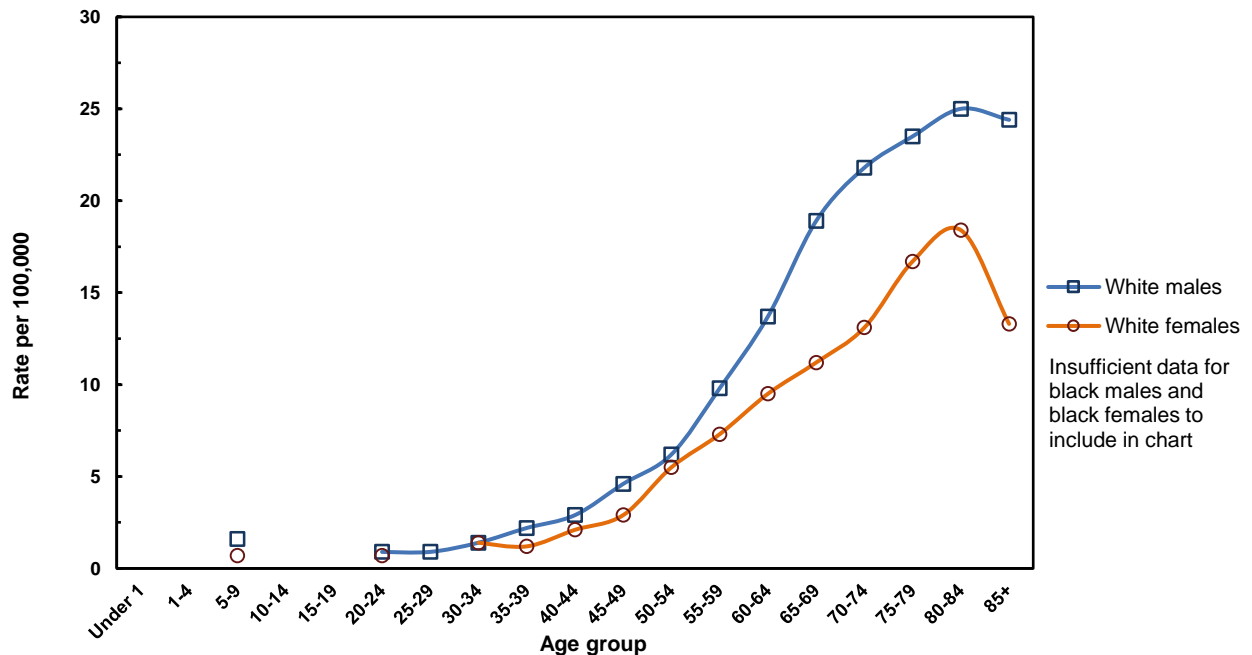
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
19-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Brain and Other Nervous System: INCIDENCE (Invasive)

**TABLE
19-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	5,142	2,807	8.2	(7.9-8.5)	2,334	5.9	(5.7-6.1)								
Adams	44	21	7.3	(4.2-10.4)	23	7.1	(4.2-10.0)	Juniata	7	2	ND		5	ND	
Allegheny	517	283	8.8	(7.8-9.8)	233	6.1	(5.3-6.9)	Lackawanna	97	53	9.5	(6.9-12.1)	44	5.6	(3.9-7.3)
Armstrong	29	17	ND		12	ND		Lancaster	219	113	8.1	(6.6-9.6)	106	6.7	(5.4-8.0)
Beaver	62	35	7.3	(4.9-9.7)	27	4.8	(3.0-6.6)	Lawrence	37	19	ND		18	ND	
Bedford	23	11	ND		12	ND		Lebanon	69	39	10.3	(7.1-13.5)	30	7.1	(4.6-9.6)
Berks	167	82	7.4	(5.8-9.0)	85	6.9	(5.4-8.4)	Lehigh	147	90	9.4	(7.5-11.3)	57	5.6	(4.1-7.1)
Blair	61	34	9.3	(6.2-12.4)	27	6.8	(4.2-9.4)	Luzerne	143	73	8.4	(6.5-10.3)	70	6.7	(5.1-8.3)
Bradford	28	18	ND		10	ND		Lycoming	47	21	6.6	(3.8-9.4)	26	7.2	(4.4-10.0)
Bucks	282	168	9.9	(8.4-11.4)	114	5.9	(4.8-7.0)	McKean	10	4	ND		6	ND	
Butler	79	42	8.4	(5.9-10.9)	37	6.8	(4.6-9.0)	Mercer	47	23	7.0	(4.1-9.9)	24	7.3	(4.4-10.2)
Cambria	59	34	8.3	(5.5-11.1)	25	5.4	(3.3-7.5)	Mifflin	24	12	ND		12	ND	
Cameron	6	3	ND		3	ND		Monroe	55	30	6.0	(3.9-8.1)	25	4.8	(2.9-6.7)
Carbon	30	15	ND		15	ND		Montgomery	319	169	7.9	(6.7-9.1)	150	6.1	(5.1-7.1)
Centre	56	34	9.3	(6.2-12.4)	22	6.4	(3.7-9.1)	Montour	9	5	ND		4	ND	
Chester	207	121	8.8	(7.2-10.4)	86	5.5	(4.3-6.7)	Northampton	113	64	7.9	(6.0-9.8)	49	5.1	(3.7-6.5)
Clarion	12	8	ND		4	ND		Northumberland	46	28	9.5	(6.0-13.0)	18	ND	
Clearfield	36	14	ND		22	8.5	(4.9-12.1)	Perry	24	13	ND		11	ND	
Clinton	15	7	ND		8	ND		Philadelphia	517	289	8.2	(7.3-9.1)	228	5.2	(4.5-5.9)
Columbia	23	10	ND		13	ND		Pike	24	17	ND		7	ND	
Crawford	43	23	8.3	(4.9-11.7)	20	8.3	(4.7-11.9)	Potter	11	7	ND		4	ND	
Cumberland	90	43	6.7	(4.7-8.7)	47	6.1	(4.4-7.8)	Schuylkill	69	34	7.7	(5.1-10.3)	35	8.3	(5.6-11.0)
Dauphin	98	58	7.8	(5.8-9.8)	40	4.8	(3.3-6.3)	Snyder	13	6	ND		7	ND	
Delaware	214	123	8.7	(7.2-10.2)	91	5.2	(4.1-6.3)	Somerset	35	24	9.3	(5.6-13.0)	11	ND	
Elk	21	11	ND		10	ND		Sullivan	4	2	ND		2	ND	
Erie	111	60	8.4	(6.3-10.5)	51	6.2	(4.5-7.9)	Susquehanna	20	8	ND		12	ND	
Fayette	45	22	5.8	(3.4-8.2)	23	5.1	(3.0-7.2)	Tioga	20	13	ND		7	ND	
Forest	2	1	ND		1	ND		Union	19	8	ND		11	ND	
Franklin	59	37	9.0	(6.1-11.9)	22	4.4	(2.6-6.2)	Venango	25	13	ND		12	ND	
Fulton	7	4	ND		3	ND		Warren	27	14	ND		13	ND	
Greene	16	9	ND		7	ND		Washington	93	52	8.9	(6.5-11.3)	41	5.6	(3.9-7.3)
Huntingdon	13	4	ND		9	ND		Wayne	20	8	ND		12	ND	
Indiana	28	17	ND		11	ND		Westmoreland	147	82	7.7	(6.0-9.4)	65	5.7	(4.3-7.1)
Jefferson	14	10	ND		4	ND		Wyoming	16	6	ND		10	ND	
								York	172	87	7.6	(6.0-9.2)	85	6.3	(5.0-7.6)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

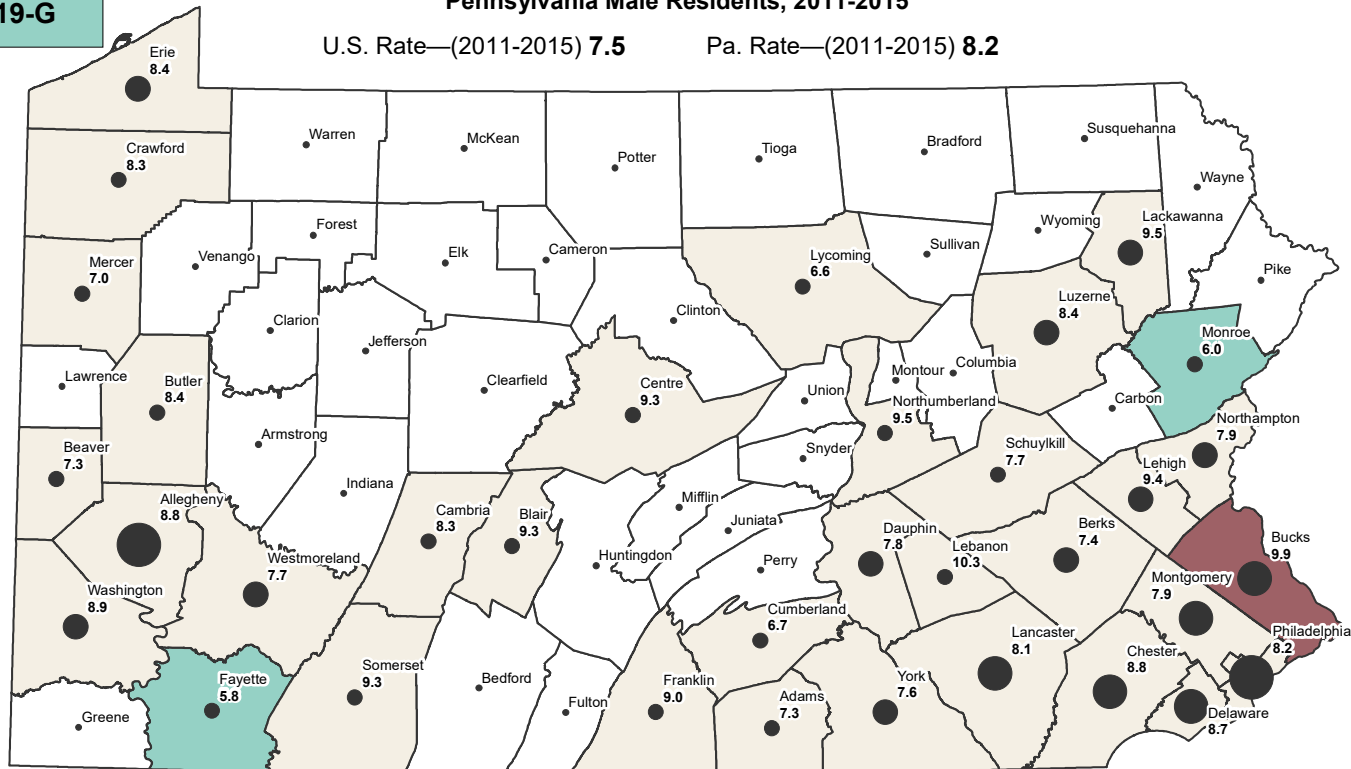
Cancer of the Brain and Other Nervous System: INCIDENCE (Invasive)

**MAP
19-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **7.5**

Pa. Rate—(2011-2015) **8.2**



Significantly higher

Significantly lower

Not significantly
different

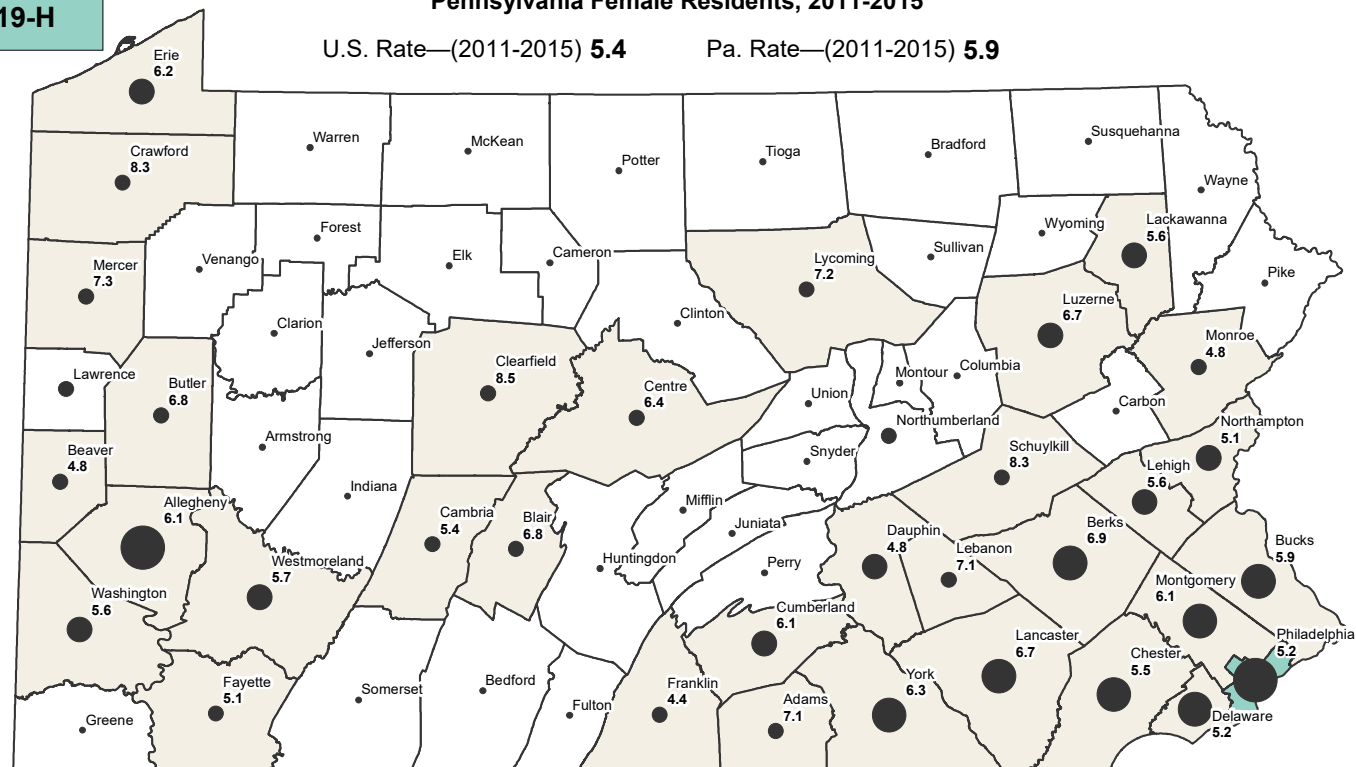
Significance not determined—
less than 20 observed cases

**MAP
19-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **5.4**

Pa. Rate—(2011-2015) **5.9**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Brain and Other Nervous System: MORTALITY

**TABLE
19-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	3,350	1,858	5.2	(5.0-5.4)	1,492	3.5	(3.3-3.7)								
Adams	27	15	ND		12	ND		Juniata	7	3	ND		4	ND	
Allegheny	340	195	5.8	(5.0-6.6)	145	3.4	(2.8-4.0)	Lackawanna	58	26	4.3	(2.6-6.0)	32	4.1	(2.7-5.5)
Armstrong	16	6	ND		10	ND		Lancaster	156	77	5.0	(3.9-6.1)	79	4.9	(3.8-6.0)
Beaver	52	36	6.8	(4.6-9.0)	16	ND		Lawrence	29	15	ND		14	ND	
Bedford	11	6	ND		5	ND		Lebanon	49	26	6.4	(3.9-8.9)	23	5.2	(3.1-7.3)
Berks	104	58	5.2	(3.9-6.5)	46	3.4	(2.4-4.4)	Lehigh	101	61	6.2	(4.6-7.8)	40	3.4	(2.3-4.5)
Blair	50	26	6.7	(4.1-9.3)	24	5.1	(3.1-7.1)	Luzerne	82	42	4.6	(3.2-6.0)	40	3.6	(2.5-4.7)
Bradford	17	9	ND		8	ND		Lycoming	29	15	ND		14	ND	
Bucks	179	112	5.9	(4.8-7.0)	67	3.0	(2.3-3.7)	McKean	8	5	ND		3	ND	
Butler	65	43	7.9	(5.5-10.3)	22	3.9	(2.3-5.5)	Mercer	36	22	5.8	(3.4-8.2)	14	ND	
Cambria	43	26	5.7	(3.5-7.9)	17	ND		Mifflin	19	11	ND		8	ND	
Cameron	3	1	ND		2	ND		Monroe	42	23	4.7	(2.8-6.6)	19	ND	
Carbon	24	6	ND		18	ND		Montgomery	201	107	4.8	(3.9-5.7)	94	3.4	(2.7-4.1)
Centre	37	24	6.5	(3.9-9.1)	13	ND		Montour	3	3	ND		0	ND	
Chester	140	74	5.1	(3.9-6.3)	66	4.1	(3.1-5.1)	Northampton	73	40	4.8	(3.3-6.3)	33	3.2	(2.1-4.3)
Clarion	11	7	ND		4	ND		Northumberland	29	16	ND		13	ND	
Clearfield	14	7	ND		7	ND		Perry	11	7	ND		4	ND	
Clinton	11	3	ND		8	ND		Philadelphia	262	148	4.5	(3.8-5.2)	114	2.5	(2.0-3.0)
Columbia	17	11	ND		6	ND		Pike	15	10	ND		5	ND	
Crawford	31	17	ND		14	ND		Potter	6	3	ND		3	ND	
Cumberland	69	38	5.6	(3.8-7.4)	31	3.7	(2.4-5.0)	Schuylkill	50	25	5.1	(3.1-7.1)	25	4.6	(2.8-6.4)
Dauphin	58	33	4.2	(2.8-5.6)	25	2.9	(1.8-4.0)	Snyder	11	6	ND		5	ND	
Delaware	144	80	5.4	(4.2-6.6)	64	3.5	(2.6-4.4)	Somerset	22	15	ND		7	ND	
Elk	9	7	ND		2	ND		Sullivan	3	1	ND		2	ND	
Erie	56	29	3.9	(2.5-5.3)	27	3.1	(1.9-4.3)	Susquehanna	13	6	ND		7	ND	
Fayette	36	18	ND		18	ND		Tioga	18	11	ND		7	ND	
Forest	4	2	ND		2	ND		Union	9	3	ND		6	ND	
Franklin	42	23	5.3	(3.1-7.5)	19	ND		Venango	22	11	ND		11	ND	
Fulton	3	2	ND		1	ND		Warren	19	9	ND		10	ND	
Greene	10	10	ND		0	ND		Washington	63	34	5.1	(3.4-6.8)	29	3.7	(2.4-5.0)
Huntingdon	11	6	ND		5	ND		Wayne	11	6	ND		5	ND	
Indiana	15	11	ND		4	ND		Westmoreland	109	62	5.6	(4.2-7.0)	47	3.3	(2.4-4.2)
Jefferson	11	8	ND		3	ND		Wyoming	7	3	ND		4	ND	
								York	117	57	4.7	(3.5-5.9)	60	4.2	(3.1-5.3)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

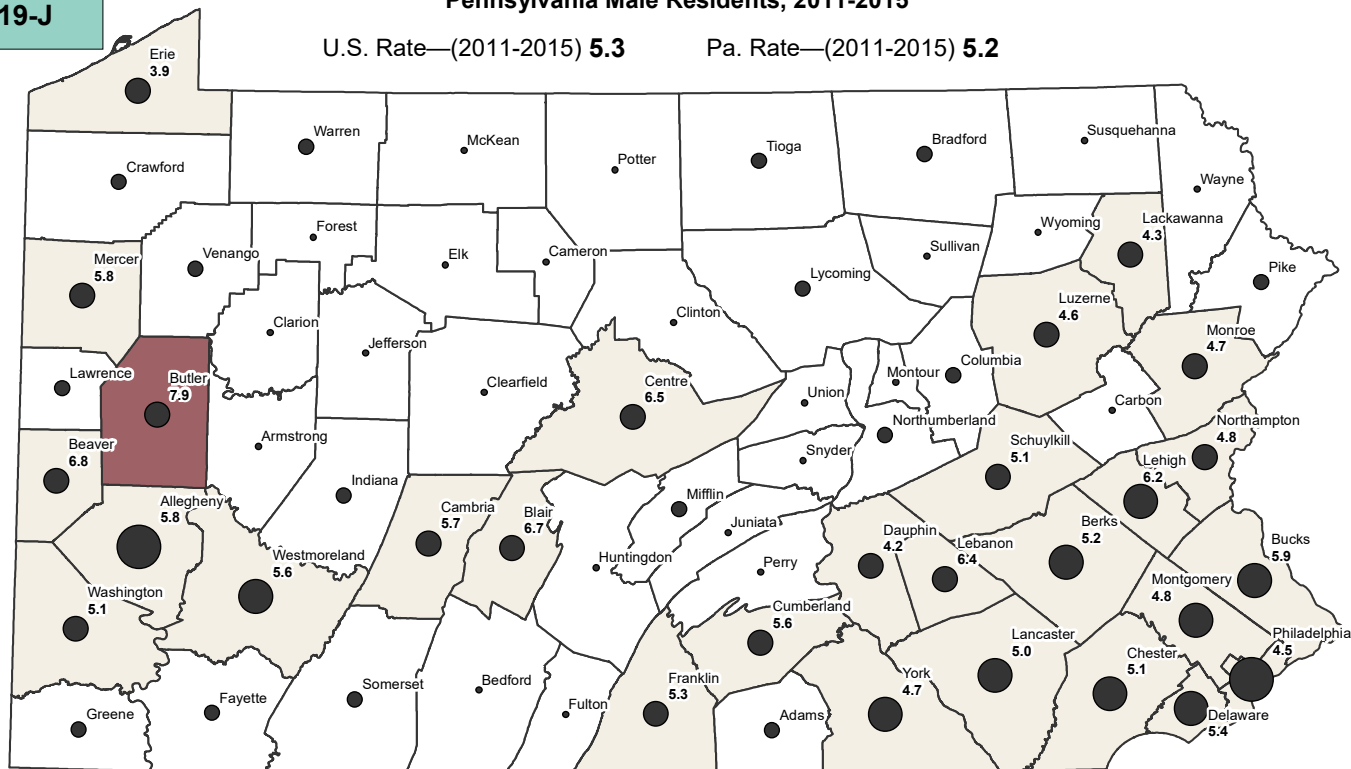
Cancer of the Brain and Other Nervous System: MORTALITY

**MAP
19-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **5.3**

Pa. Rate—(2011-2015) **5.2**



Significantly higher

Significantly lower

Not significantly
different

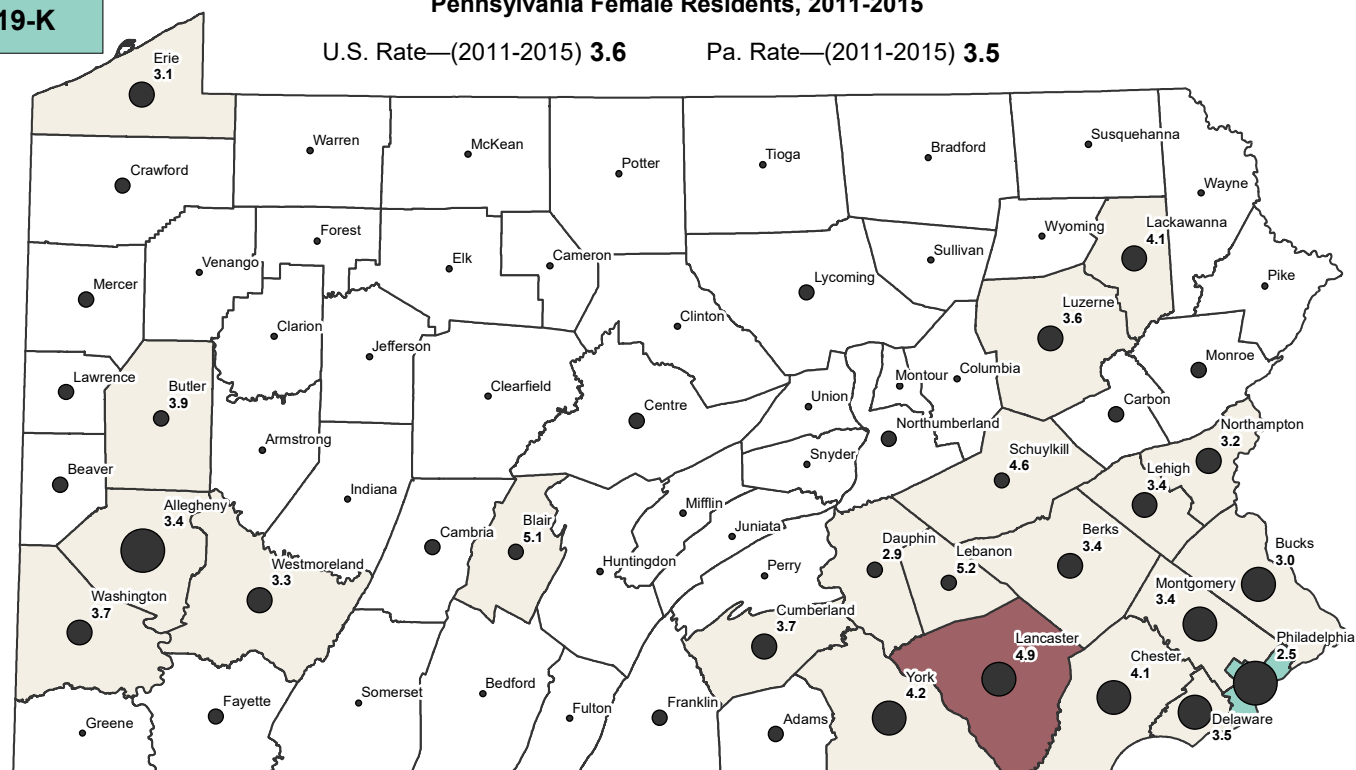
Significance not determined—
less than 20 observed cases

**MAP
19-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **3.6**

Pa. Rate—(2011-2015) **3.5**



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Thyroid

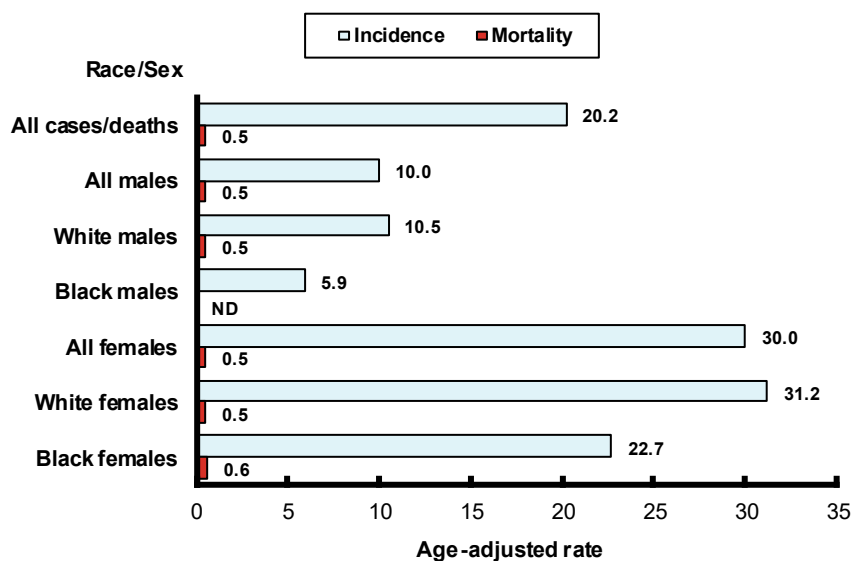
Data Highlights

In Pennsylvania, the average annual (2011-2015) age-adjusted incidence rate for thyroid cancer among females (30.0 per 100,000) was three times the rate for males (10.0). In addition, white females had an elevated risk for thyroid cancer compared to black females. Specifically, the average annual age-adjusted incidence rate for thyroid cancer among white females (31.2) was 37 percent higher than the rate for black females (22.7).

The number of cases of invasive thyroid cancer decreased from 2,649 in 2014 to 2,647 cases in 2015. The 2015 age-adjusted incidence rate (19.3) was about 25 percent higher than the 2006 rate (15.4); however, the rate has become more stable in recent years. Higher incidence rates among females suggest the role of hormonal factors in the etiology. Approximately 24 percent of the invasive thyroid cancer cases diagnosed between 2011 and 2015 occurred among residents under 40 years of age. In 2015, 73 percent of the thyroid cancers were diagnosed at early stages (in situ or local) of the disease, and 26 percent were diagnosed at late stages (regional or distant).

Unlike the incidence rates, the average annual (2011-2015) age-adjusted death rates for cancer of the thyroid were the same for males and females, 0.5 per 100,000. The rate for black males was considered statistically unreliable due to the small number of deaths. In 2015, there were 78 thyroid cancer deaths among all Pennsylvania residents. Males and females each accounted for 39 deaths (50 percent) during 2015. The age-adjusted death rates among white males showed an increasing trend for the period of 2006-2015 while the rates among white females showed no discernible trend. The instability of the annual age-adjusted death rates, due to the small numbers of deaths each year, makes it difficult to interpret the mortality trends for blacks during this 10-year period.

FIGURE 20
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Note: Rates based on less than 20 events are statistically unreliable and are not displayed (ND).

Risk Factors

According to the American Cancer Society, although etiological factors are obscure, exposure to radiation, diets low in iodine (rare in the United States) and several hereditary conditions are associated with an increased risk of thyroid cancer.

Early Detection

According to the American Cancer Society, though there is no recommended screening test to find thyroid cancer early, most cases of thyroid cancer can be found early through routine checkups.

Cancer of the Thyroid: INCIDENCE (Invasive)

**TABLE
20-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,647	19.3 (18.6-20.0)	681	9.8 (9.1-10.5)	620	10.3 (9.5-11.1)	36	5.8 (3.9-7.7)	1,966	28.7 (27.4-30.0)	1,698	29.8 (28.4-31.2)	167	22.2 (18.8-25.6)
2014	2,649	19.4 (18.7-20.1)	687	9.9 (9.2-10.6)	601	10.0 (9.2-10.8)	50	7.8 (5.6-10.0)	1,962	28.6 (27.3-29.9)	1,715	29.8 (28.4-31.2)	151	20.3 (17.1-23.5)
2013	2,853	20.8 (20.0-21.6)	700	10.2 (9.4-11.0)	638	10.7 (9.9-11.5)	32	5.0 (3.3-6.7)	2,153	31.2 (29.9-32.5)	1,895	32.7 (31.2-34.2)	183	24.2 (20.7-27.7)
2012	2,843	20.7 (19.9-21.5)	698	10.2 (9.4-11.0)	652	10.9 (10.1-11.7)	23	4.2 (2.5-5.9)	2,145	30.9 (29.6-32.2)	1,863	31.7 (30.3-33.1)	170	22.7 (19.3-26.1)
2011	2,833	20.7 (19.9-21.5)	691	10.0 (9.3-10.7)	626	10.4 (9.6-11.2)	36	6.4 (4.3-8.5)	2,142	30.9 (29.6-32.2)	1,871	31.8 (30.4-33.2)	179	24.3 (20.7-27.9)
2010	2,728	20.3 (19.5-21.1)	697	10.4 (9.6-11.2)	627	10.9 (10.0-11.8)	41	7.5 (5.2-9.8)	2,031	29.8 (28.5-31.1)	1,815	32.0 (30.5-33.5)	147	21.1 (17.7-24.5)
2009	2,686	20.2 (19.4-21.0)	652	10.0 (9.2-10.8)	607	10.5 (9.7-11.3)	26	5.4 (3.3-7.5)	2,034	30.1 (28.8-31.4)	1,801	30.9 (29.5-32.3)	149	21.9 (18.4-25.4)
2008	2,497	19.0 (18.3-19.7)	612	9.6 (8.8-10.4)	562	9.9 (9.1-10.7)	33	6.7 (4.4-9.0)	1,885	28.0 (26.7-29.3)	1,655	28.4 (27.0-29.8)	137	20.6 (17.2-24.0)
2007	2,219	16.9 (16.2-17.6)	504	7.9 (7.2-8.6)	466	8.2 (7.5-8.9)	19	ND	1,715	25.5 (24.3-26.7)	1,518	26.0 (24.7-27.3)	105	15.6 (12.6-18.6)
2006	2,016	15.4 (14.7-16.1)	455	7.1 (6.4-7.8)	422	7.4 (6.7-8.1)	18	ND	1,561	23.3 (22.1-24.5)	1,392	24.0 (22.7-25.3)	96	14.7 (11.8-17.6)

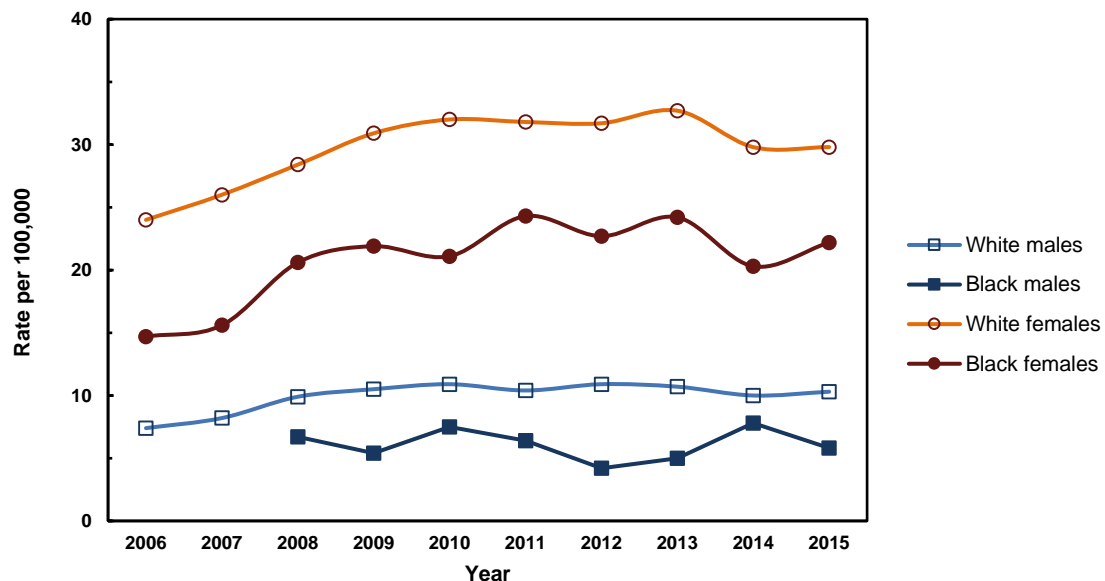
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
20-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Thyroid: INCIDENCE (Invasive)

**TABLE
20-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

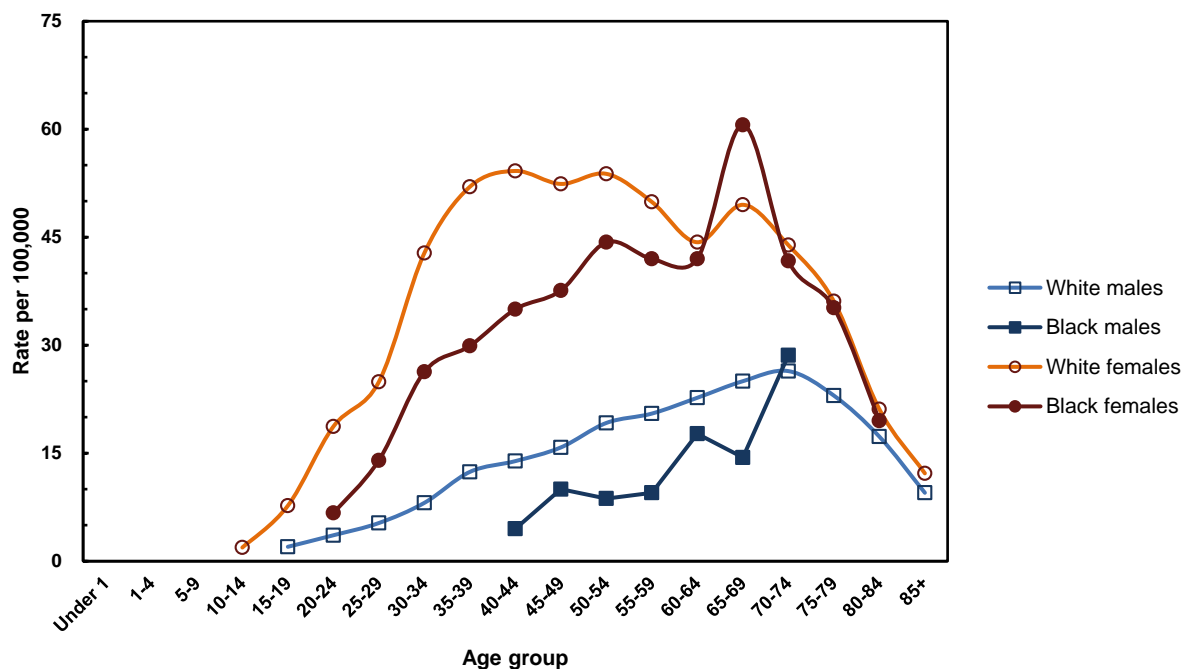
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	21.6	11.1	12.1	5.0	31.7	33.4	22.2
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	1.1	ND	ND	ND	1.8	1.9	ND
15-19	4.2	1.7	2.0	ND	6.7	7.7	ND
20-24	9.7	3.1	3.6	ND	16.5	18.7	6.7
25-29	14.3	5.0	5.3	ND	23.7	24.9	14.0
30-34	23.9	7.7	8.1	ND	40.3	42.8	26.3
35-39	30.2	11.4	12.4	ND	48.9	52.0	29.9
40-44	32.2	13.1	13.9	4.5	51.1	54.2	35.0
45-49	33.5	15.6	15.8	10.0	50.9	52.4	37.6
50-54	35.9	18.1	19.2	8.7	53.1	53.8	44.3
55-59	34.8	19.4	20.5	9.5	49.4	49.9	42.0
60-64	33.7	22.4	22.7	17.7	44.3	44.3	42.0
65-69	38.1	24.2	25.0	14.4	50.6	49.5	60.6
70-74	35.6	26.4	26.4	28.6	43.3	43.9	41.7
75-79	30.4	22.5	23.0	ND	36.4	36.1	35.2
80-84	19.8	17.2	17.3	ND	21.5	21.1	19.5
85+	11.3	9.3	9.5	ND	12.3	12.2	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
20-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Cancer of the Thyroid: INCIDENCE (Invasive)

**TABLE
20-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	13,825	3,457	3,137	177	10,368	9,042	850
Under 1	0	0	0	0	0	0	0
1-4	3	0	0	0	3	2	0
5-9	4	0	0	0	4	4	0
10-14	43	9	7	0	34	28	2
15-19	178	38	34	4	140	127	7
20-24	425	69	63	3	356	314	22
25-29	591	106	90	5	485	403	39
30-34	930	150	129	8	780	662	66
35-39	1,096	206	184	7	890	761	69
40-44	1,299	262	233	10	1,037	906	85
45-49	1,474	340	293	23	1,134	984	95
50-54	1,726	427	395	20	1,299	1,130	114
55-59	1,623	443	413	19	1,180	1,037	98
60-64	1,361	437	396	27	924	812	80
65-69	1,211	363	339	15	848	738	85
70-74	836	282	256	20	554	503	43
75-79	547	175	164	9	372	333	28
80-84	292	101	94	5	191	172	12
85+	185	49	47	2	136	125	5

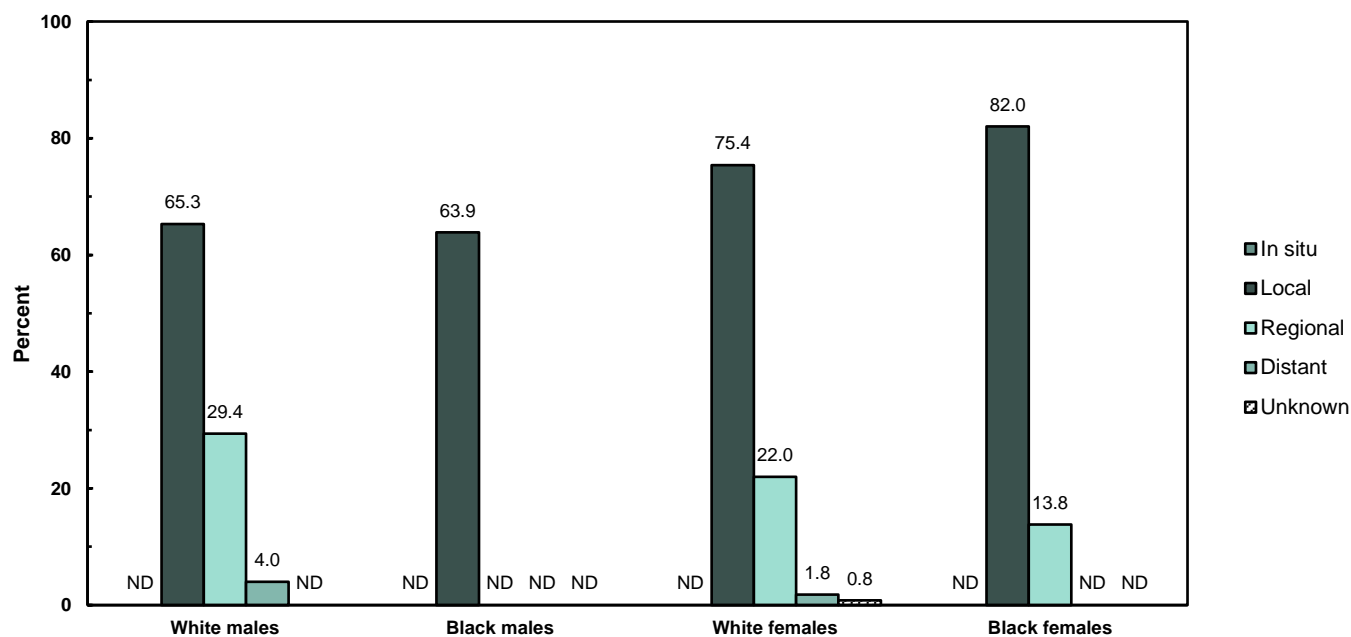
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
20-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Invasive Cases Microscopically Confirmed: 2,633 - 99.5%

Cancer of the Thyroid: MORTALITY

**TABLE
20-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	78	0.5 (0.4-0.6)	39	0.6 (0.4-0.8)	34	0.5 (0.3-0.7)	5	ND	39	0.4 (0.3-0.5)	34	0.4 (0.3-0.5)	5	ND
2014	93	0.5 (0.4-0.6)	41	0.6 (0.4-0.8)	36	0.5 (0.3-0.7)	5	ND	52	0.5 (0.4-0.6)	44	0.5 (0.4-0.6)	7	ND
2013	84	0.5 (0.4-0.6)	34	0.5 (0.3-0.7)	33	0.5 (0.3-0.7)	1	ND	50	0.5 (0.4-0.6)	44	0.5 (0.4-0.6)	4	ND
2012	85	0.5 (0.4-0.6)	33	0.5 (0.3-0.7)	32	0.5 (0.3-0.7)	1	ND	52	0.6 (0.4-0.8)	44	0.5 (0.4-0.6)	6	ND
2011	77	0.5 (0.4-0.6)	39	0.6 (0.4-0.8)	36	0.6 (0.4-0.8)	3	ND	38	0.4 (0.3-0.5)	34	0.4 (0.3-0.5)	3	ND
2010	89	0.5 (0.4-0.6)	37	0.6 (0.4-0.8)	34	0.5 (0.3-0.7)	3	ND	52	0.5 (0.4-0.6)	51	0.6 (0.4-0.8)	1	ND
2009	85	0.5 (0.4-0.6)	29	0.4 (0.3-0.5)	28	0.5 (0.3-0.7)	1	ND	56	0.6 (0.4-0.8)	47	0.6 (0.4-0.8)	7	ND
2008	78	0.5 (0.4-0.6)	27	0.4 (0.2-0.6)	24	0.4 (0.2-0.6)	2	ND	51	0.5 (0.4-0.6)	46	0.5 (0.4-0.6)	4	ND
2007	82	0.5 (0.4-0.6)	33	0.5 (0.3-0.7)	30	0.5 (0.3-0.7)	3	ND	49	0.5 (0.4-0.6)	41	0.5 (0.3-0.7)	7	ND
2006	67	0.5 (0.4-0.6)	30	0.5 (0.3-0.7)	29	0.5 (0.3-0.7)	1	ND	37	0.4 (0.3-0.5)	33	0.4 (0.3-0.5)	4	ND

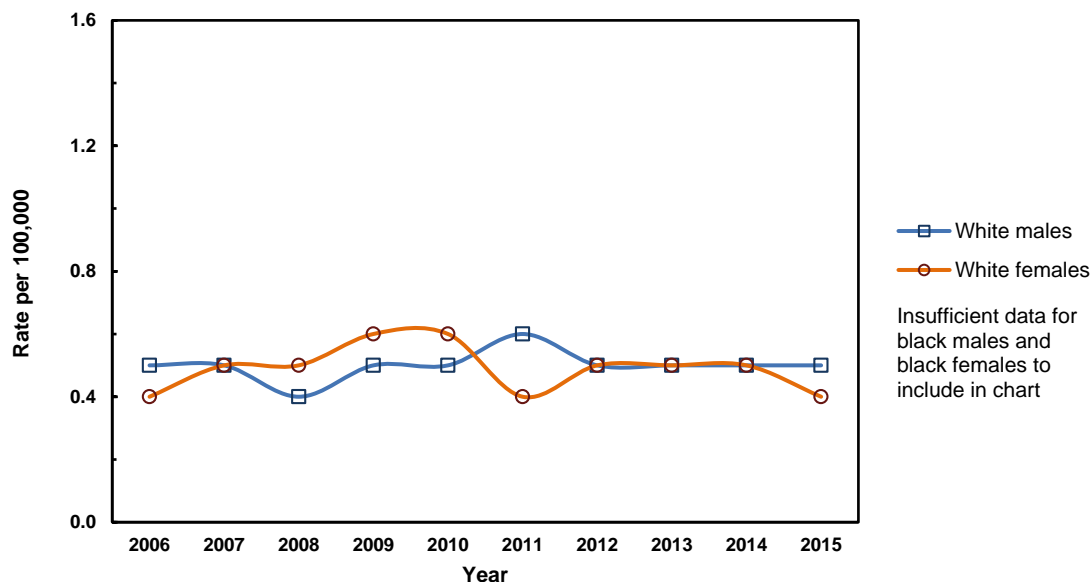
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
20-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Thyroid: MORTALITY

**TABLE
20-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	417	0.7	186	0.6	171	0.7	15	0.4	231	0.7	200	0.7	25	0.7
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	3	ND	2	ND	2	ND	0	ND	1	ND	1	ND	0	ND
20-24	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
25-29	2	ND	0	ND	0	ND	0	ND	2	ND	2	ND	0	ND
30-34	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
35-39	2	ND	1	ND	1	ND	0	ND	1	ND	1	ND	0	ND
40-44	3	ND	2	ND	2	ND	0	ND	1	ND	1	ND	0	ND
45-49	9	ND	5	ND	3	ND	2	ND	4	ND	3	ND	0	ND
50-54	19	0.4	9	ND	7	ND	2	ND	10	0.4	7	ND	2	ND
55-59	26	0.6	17	0.7	15	0.7	2	ND	9	ND	7	ND	2	ND
60-64	38	0.9	19	1.0	16	0.9	3	ND	19	0.9	13	0.7	6	ND
65-69	44	1.4	21	1.4	20	1.5	1	ND	23	1.4	21	1.4	2	ND
70-74	60	2.6	29	2.7	27	2.8	2	ND	31	2.4	26	2.3	4	ND
75-79	52	2.9	22	2.8	19	2.7	3	ND	30	2.9	28	3.0	2	ND
80-84	61	4.1	28	4.8	28	5.1	0	ND	33	3.7	28	3.4	4	ND
85+	98	6.0	31	5.9	31	6.3	0	ND	67	6.1	62	6.0	3	ND

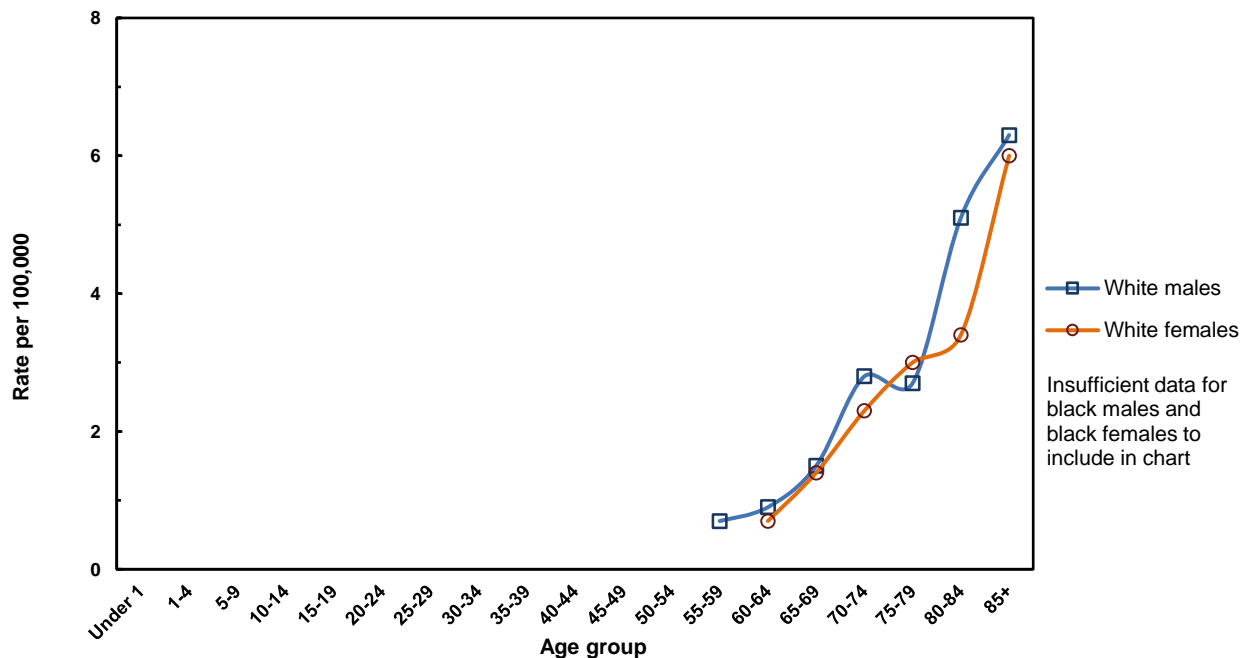
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
20-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Cancer of the Thyroid: INCIDENCE (Invasive)

**TABLE
20-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	13,825	3,457	10.0	(9.7-10.3)	10,368	30.0	(29.4-30.6)								
Adams	111	29	10.3	(6.6-14.0)	82	29.7	(23.3-36.1)	Juniata	26	4	ND		22	35.8	(20.8-50.8)
Allegheny	1,633	371	11.4	(10.2-12.6)	1,262	36.4	(34.4-38.4)	Lackawanna	216	40	6.8	(4.7-8.9)	176	29.3	(25.0-33.6)
Armstrong	77	19	ND		58	31.0	(23.0-39.0)	Lancaster	502	134	10.1	(8.4-11.8)	368	26.2	(23.5-28.9)
Beaver	207	56	12.2	(9.0-15.4)	151	33.5	(28.2-38.8)	Lawrence	131	35	14.0	(9.4-18.6)	96	39.8	(31.8-47.8)
Bedford	68	13	ND		55	41.7	(30.7-52.7)	Lebanon	148	35	9.5	(6.4-12.6)	113	33.9	(27.6-40.2)
Berks	380	107	9.3	(7.5-11.1)	273	25.1	(22.1-28.1)	Lehigh	382	95	10.3	(8.2-12.4)	287	29.9	(26.4-33.4)
Blair	122	27	6.9	(4.3-9.5)	95	28.3	(22.6-34.0)	Luzerne	358	76	8.4	(6.5-10.3)	282	32.8	(29.0-36.6)
Bradford	47	8	ND		39	24.1	(16.5-31.7)	Lycoming	176	39	12.0	(8.2-15.8)	137	43.7	(36.4-51.0)
Bucks	710	202	11.4	(9.8-13.0)	508	28.5	(26.0-31.0)	McKean	41	10	ND		31	28.9	(18.7-39.1)
Butler	291	97	19.1	(15.3-22.9)	194	36.9	(31.7-42.1)	Mercer	143	36	10.2	(6.9-13.5)	107	35.5	(28.8-42.2)
Cambria	137	38	10.0	(6.8-13.2)	99	27.9	(22.4-33.4)	Mifflin	52	12	ND		40	34.3	(23.7-44.9)
Cameron	6	2	ND		4	ND		Monroe	122	38	7.6	(5.2-10.0)	84	18.2	(14.3-22.1)
Carbon	81	21	10.3	(5.9-14.7)	60	33.1	(24.7-41.5)	Montgomery	902	267	12.4	(10.9-13.9)	635	28.7	(26.5-30.9)
Centre	103	34	8.9	(5.9-11.9)	69	19.6	(15.0-24.2)	Montour	27	6	ND		21	38.0	(21.7-54.3)
Chester	684	171	12.6	(10.7-14.5)	513	38.5	(35.2-41.8)	Northampton	385	90	11.0	(8.7-13.3)	295	36.0	(31.9-40.1)
Clarion	39	9	ND		30	30.5	(19.6-41.4)	Northumberland	115	38	13.7	(9.3-18.1)	77	33.7	(26.2-41.2)
Clearfield	64	20	7.6	(4.3-10.9)	44	20.6	(14.5-26.7)	Perry	41	12	ND		29	23.0	(14.6-31.4)
Clinton	41	12	ND		29	29.7	(18.9-40.5)	Philadelphia	1,335	290	8.2	(7.3-9.1)	1,045	25.1	(23.6-26.6)
Columbia	72	14	ND		58	34.7	(25.8-43.6)	Pike	61	19	ND		42	27.6	(19.3-35.9)
Crawford	87	21	8.6	(4.9-12.3)	66	29.7	(22.5-36.9)	Potter	9	2	ND		7	ND	
Cumberland	164	43	6.5	(4.6-8.4)	121	19.2	(15.8-22.6)	Schuylkill	136	31	7.3	(4.7-9.9)	105	28.5	(23.0-34.0)
Dauphin	228	47	6.9	(4.9-8.9)	181	23.4	(20.0-26.8)	Snyder	42	12	ND		30	28.8	(18.5-39.1)
Delaware	614	158	10.5	(8.9-12.1)	456	30.2	(27.4-33.0)	Somerset	92	24	10.4	(6.2-14.6)	68	37.8	(28.8-46.8)
Elk	32	5	ND		27	33.3	(20.7-45.9)	Sullivan	9	2	ND		7	ND	
Erie	273	49	6.6	(4.8-8.4)	224	30.4	(26.4-34.4)	Susquehanna	39	7	ND		32	26.4	(17.3-35.5)
Fayette	177	46	12.1	(8.6-15.6)	131	35.3	(29.3-41.3)	Tioga	28	5	ND		23	20.8	(12.3-29.3)
Forest	8	5	ND		3	ND		Union	38	11	ND		27	28.2	(17.6-38.8)
Franklin	107	36	8.9	(6.0-11.8)	71	17.7	(13.6-21.8)	Venango	73	15	ND		58	40.3	(29.9-50.7)
Fulton	19	5	ND		14	ND		Warren	36	8	ND		28	27.7	(17.4-38.0)
Greene	49	17	ND		32	31.2	(20.4-42.0)	Washington	269	74	12.0	(9.3-14.7)	195	33.8	(29.1-38.5)
Huntingdon	43	16	ND		27	26.7	(16.6-36.8)	Wayne	53	20	13.0	(7.3-18.7)	33	22.3	(14.7-29.9)
Indiana	92	23	10.3	(6.1-14.5)	69	31.3	(23.9-38.7)	Westmoreland	496	110	10.3	(8.4-12.2)	386	38.9	(35.0-42.8)
Jefferson	41	9	ND		32	27.7	(18.1-37.3)	Wyoming	38	13	ND		25	32.2	(19.6-44.8)
								York	497	117	9.5	(7.8-11.2)	380	32.1	(28.9-35.3)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

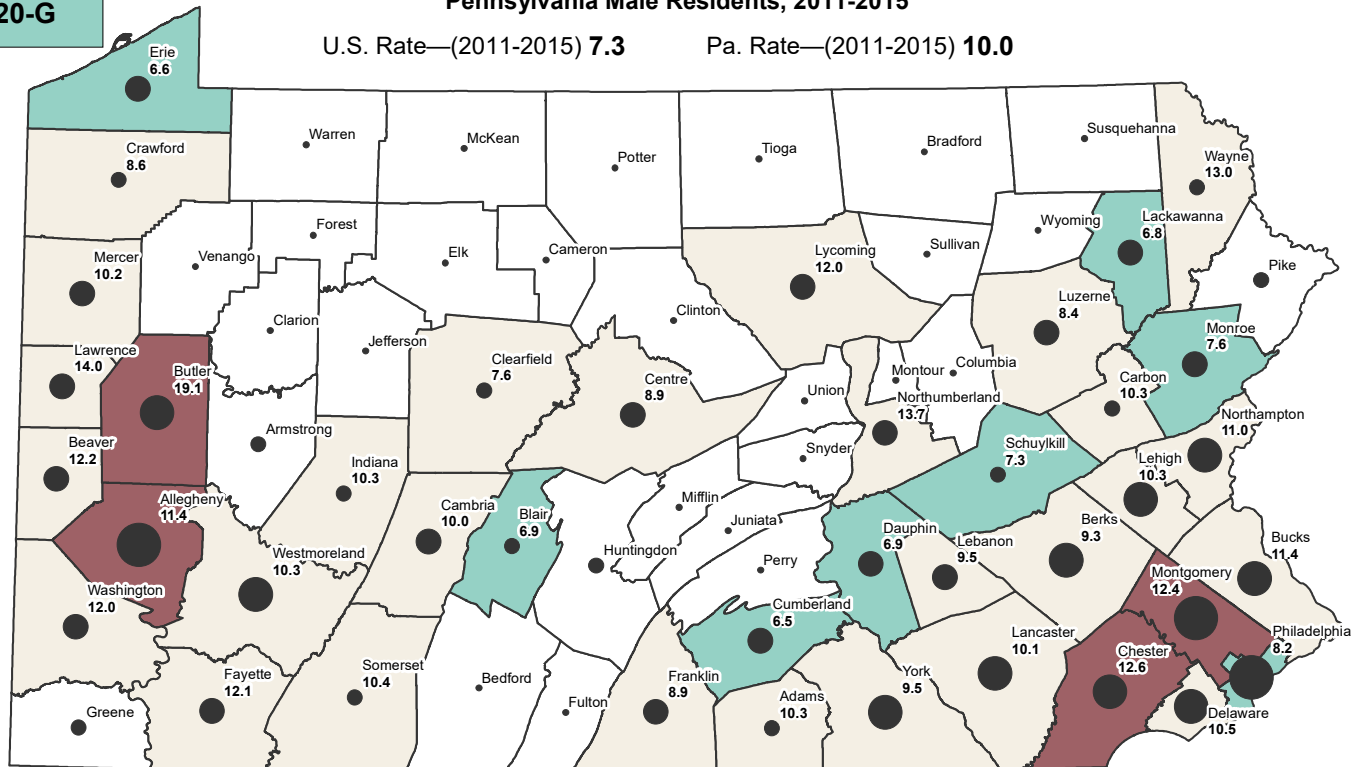
Cancer of the Thyroid: INCIDENCE (Invasive)

**MAP
20-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **7.3**

Pa. Rate—(2011-2015) **10.0**



Significantly higher

Significantly lower

Not significantly different

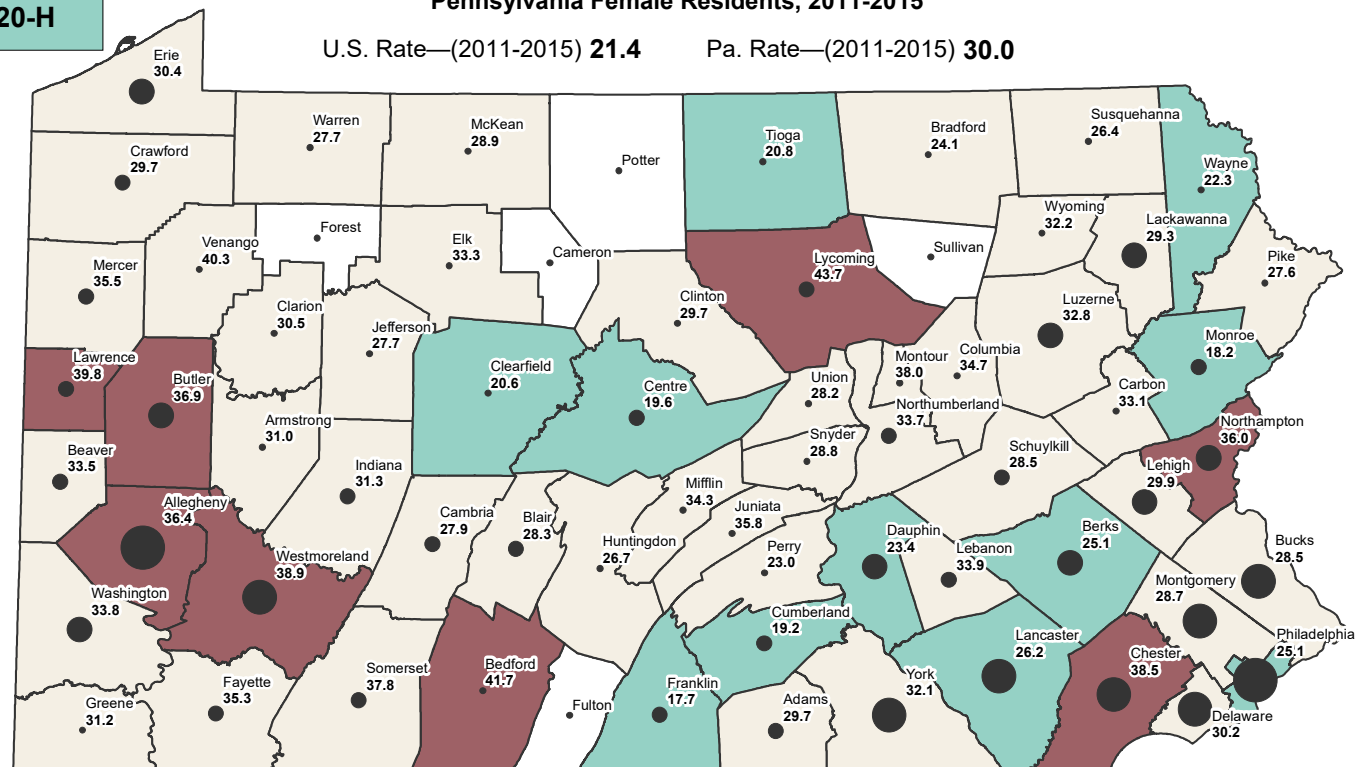
Significance not determined—less than 20 observed cases

**MAP
20-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **21.4**

Pa. Rate—(2011-2015) **30.0**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Cancer of the Thyroid: MORTALITY

**TABLE
20-1**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	417	186	0.5	(0.4-0.6)	231	0.5	(0.4-0.6)								
Adams	3	1	ND		2	ND		Juniata	3	1	ND		2	ND	
Allegheny	44	18	ND		26	0.5	(0.3-0.7)	Lackawanna	6	3	ND		3	ND	
Armstrong	3	2	ND		1	ND		Lancaster	16	3	ND		13	ND	
Beaver	8	5	ND		3	ND		Lawrence	7	1	ND		6	ND	
Bedford	7	2	ND		5	ND		Lebanon	0	0	ND		0	ND	
Berks	12	8	ND		4	ND		Lehigh	7	2	ND		5	ND	
Blair	11	3	ND		8	ND		Luzerne	10	5	ND		5	ND	
Bradford	2	2	ND		0	ND		Lycoming	3	2	ND		1	ND	
Bucks	21	11	ND		10	ND		McKean	1	1	ND		0	ND	
Butler	5	2	ND		3	ND		Mercer	10	5	ND		5	ND	
Cambria	3	2	ND		1	ND		Mifflin	1	1	ND		0	ND	
Cameron	1	1	ND		0	ND		Monroe	3	3	ND		0	ND	
Carbon	2	0	ND		2	ND		Montgomery	31	12	ND		19	ND	
Centre	3	2	ND		1	ND		Montour	1	1	ND		0	ND	
Chester	7	3	ND		4	ND		Northampton	12	5	ND		7	ND	
Clarion	1	0	ND		1	ND		Northumberland	4	2	ND		2	ND	
Clearfield	2	2	ND		0	ND		Perry	3	2	ND		1	ND	
Clinton	3	1	ND		2	ND		Philadelphia	48	25	0.8	(0.5-1.1)	23	0.5	(0.3-0.7)
Columbia	5	2	ND		3	ND		Pike	1	0	ND		1	ND	
Crawford	2	0	ND		2	ND		Potter	1	0	ND		1	ND	
Cumberland	5	3	ND		2	ND		Schuylkill	4	1	ND		3	ND	
Dauphin	9	4	ND		5	ND		Snyder	1	1	ND		0	ND	
Delaware	11	3	ND		8	ND		Somerset	3	2	ND		1	ND	
Elk	2	0	ND		2	ND		Sullivan	1	0	ND		1	ND	
Erie	6	2	ND		4	ND		Susquehanna	1	0	ND		1	ND	
Fayette	6	3	ND		3	ND		Tioga	1	0	ND		1	ND	
Forest	0	0	ND		0	ND		Union	0	0	ND		0	ND	
Franklin	3	1	ND		2	ND		Venango	0	0	ND		0	ND	
Fulton	2	2	ND		0	ND		Warren	1	1	ND		0	ND	
Greene	3	2	ND		1	ND		Washington	12	7	ND		5	ND	
Huntingdon	0	0	ND		0	ND		Wayne	5	0	ND		5	ND	
Indiana	3	3	ND		0	ND		Westmoreland	14	7	ND		7	ND	
Jefferson	5	2	ND		3	ND		Wyoming	0	0	ND		0	ND	
								York	6	1	ND		5	ND	

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

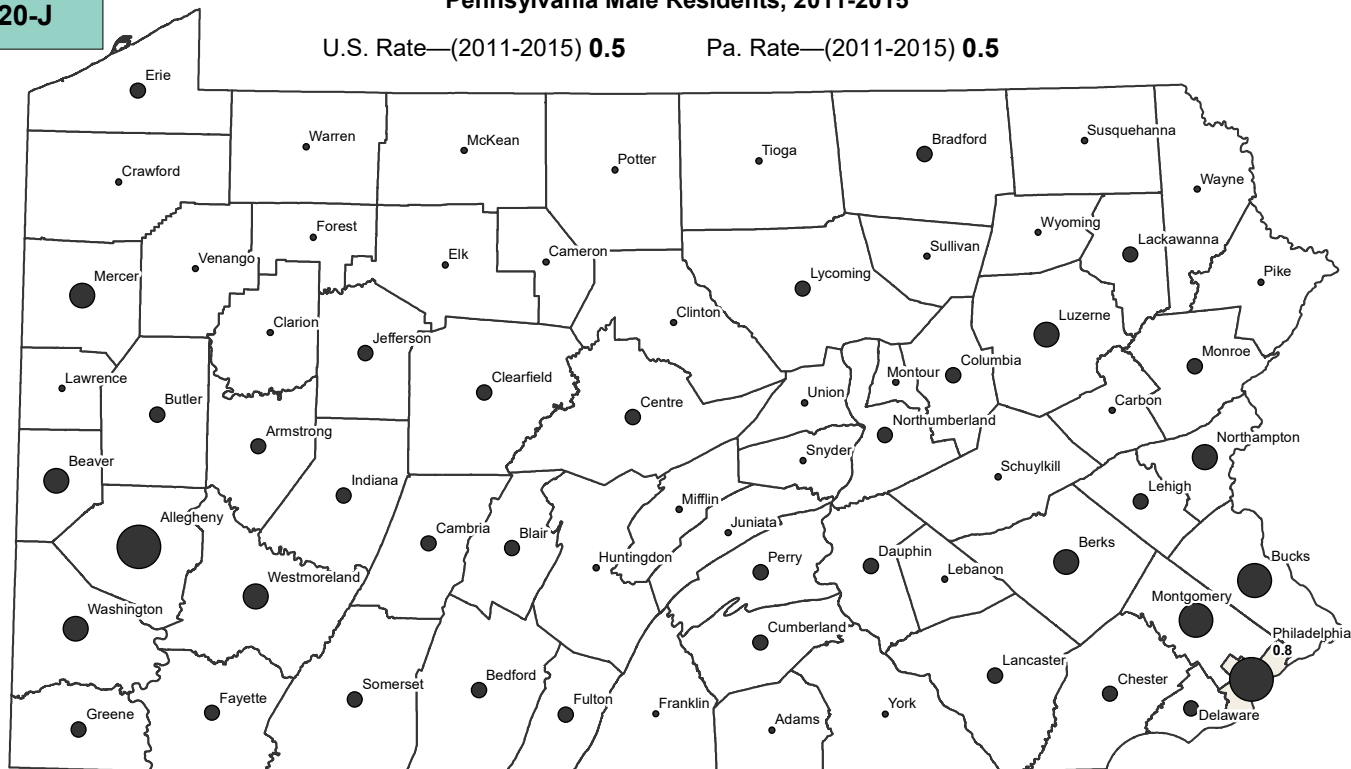
Cancer of the Thyroid: MORTALITY

**MAP
20-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **0.5**

Pa. Rate—(2011-2015) **0.5**

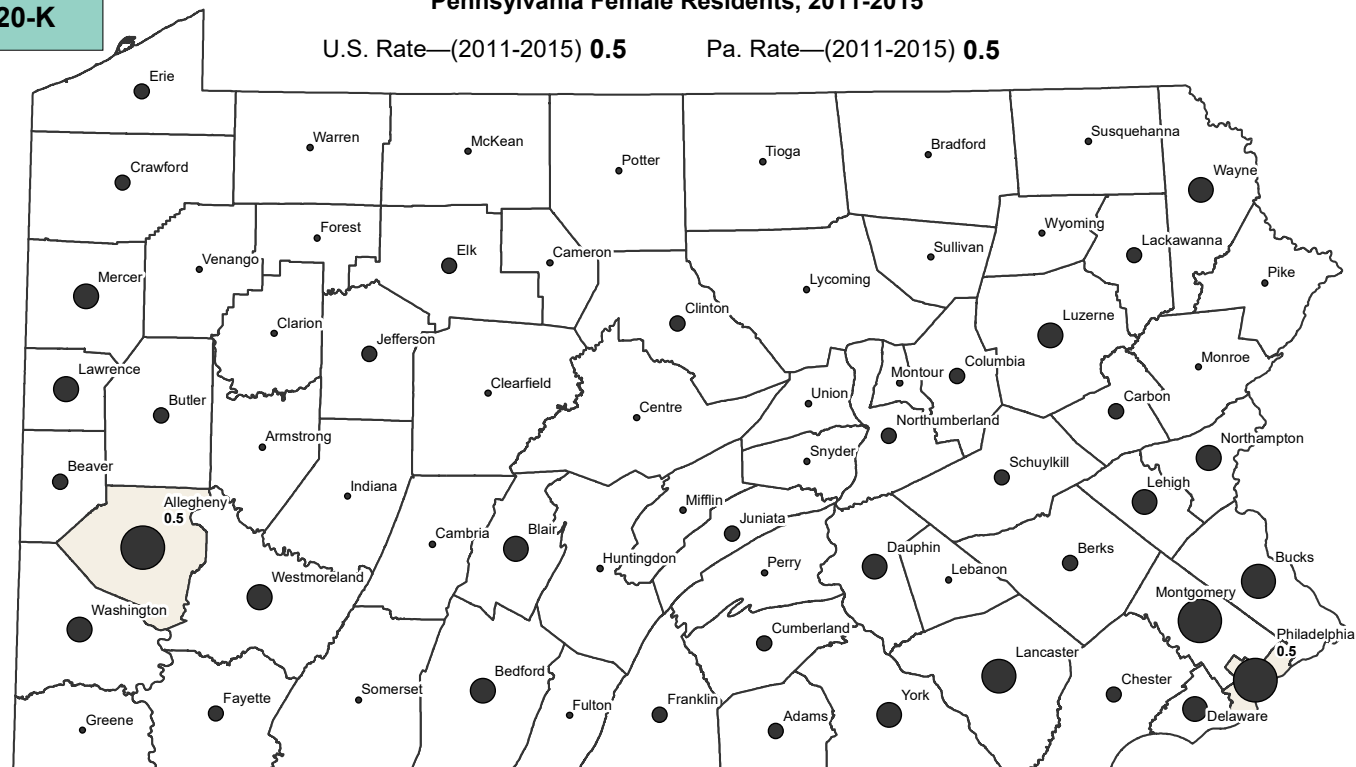


**MAP
20-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **0.5**

Pa. Rate—(2011-2015) **0.5**



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Non-Hodgkin Lymphoma

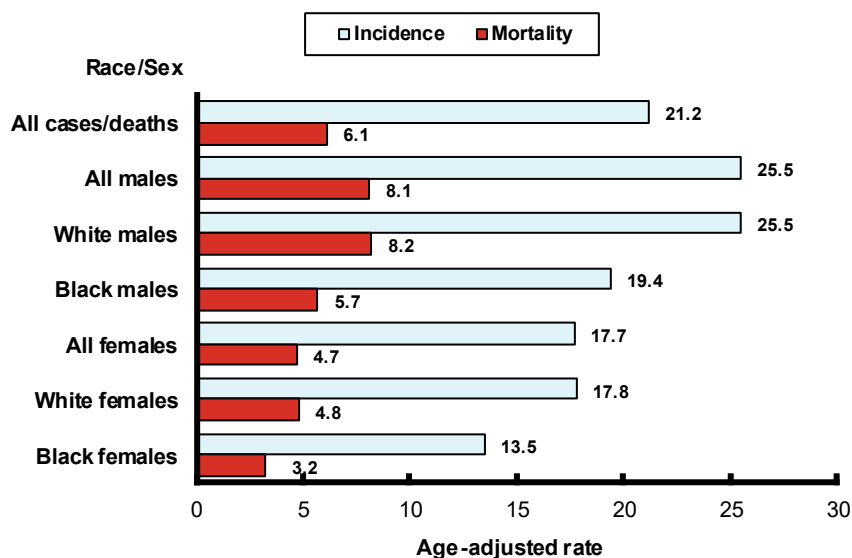
Data Highlights

Although little is understood about the causes of non-Hodgkin lymphoma, its study has aided researchers in understanding the immune response and carcinogenic mechanisms. Non-Hodgkin lymphoma is a type of cancer that originates in the immune system's lymphocytes (white blood cells). As the name suggests, non-Hodgkin lymphomas represent all lymphomas that are not classified as Hodgkin lymphomas. However, it should be noted that non-Hodgkin lymphomas include many distinct and unrelated types of lymphoma. The 2011-2015 average annual age-adjusted incidence rate was 44 percent higher for males (25.5 per 100,000) than females (17.7). The rate for white males (25.5) was about 31 percent higher than the rate for black males (19.4).

There were 3,407 new cases of non-Hodgkin lymphoma diagnosed among Pennsylvania residents in 2015 – a decrease from the previous year, 2014, when there were 3,465 new cases. The annual age-adjusted incidence rates by sex and race for 2006 through 2015 have not changed much among white males and white females. Annual rates among black males varied with a high of 21.0 in 2011 and a low of 17.0 in 2015. The rates among black females reached a high of 16.1 in 2014 before decreasing 33 percent in 2015 to a rate of 10.8. The age-specific incidence curve, based on 2011-2015 data, began rising sharply around age 50. White males had the highest age-specific incidence rates of the four sex/race groups beginning at age 60. During the period 2011-2015, about 88 percent of the cases were diagnosed among residents 50 years of age or older. In 2015, 53 percent of non-Hodgkin lymphoma were diagnosed at late stages (III/IV) of the disease, and 40 percent were diagnosed at early stages (I or II).

In 2015, there were 992 deaths among Pennsylvania residents, resulting in an age-adjusted rate of 5.8 per 100,000 – a slight decrease from the 1,026 deaths and rate of 6.0 observed in 2014. As seen with incidence rates, the 2011-2015 average annual age-adjusted death rates by sex and race were highest among white males (8.2). The average annual (2011-2015) age-specific death rates were highest among white males 70 years of age or older. During the 10-year period of 2006 through 2015, both white males and white females have experienced declines in age-adjusted death rates. The small annual numbers of deaths among black males and black females make the annual rates difficult to interpret.

FIGURE 21
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, excess exposure to benzene and certain herbicides and insecticides (weed and insect killing substances), exposure to radiation, immune system deficiency, HIV, autoimmune diseases, certain infections, organ transplants, being overweight or obese, and having breast implants are suggestive.

Early Detection

No screening tests have proven to be effective or are currently being evaluated.

Non-Hodgkin Lymphoma: INCIDENCE

**TABLE
21-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	3,407	20.9 (20.2-21.6)	1,809	24.7 (23.6-25.8)	1,639	25.1 (23.9-26.3)	112	17.0 (13.9-20.1)	1,597	17.8 (16.9-18.7)	1,453	18.4 (17.5-19.3)	90	10.8 (8.6-13.0)
2014	3,465	21.4 (20.7-22.1)	1,872	25.9 (24.7-27.1)	1,676	26.0 (24.8-27.2)	124	20.7 (17.1-24.3)	1,593	18.0 (17.1-18.9)	1,411	17.9 (17.0-18.8)	124	16.1 (13.3-18.9)
2013	3,327	20.7 (20.0-21.4)	1,744	24.3 (23.2-25.4)	1,567	24.3 (23.1-25.5)	108	18.0 (14.6-21.4)	1,583	17.8 (16.9-18.7)	1,419	17.9 (17.0-18.8)	117	15.1 (12.4-17.8)
2012	3,364	21.3 (20.6-22.0)	1,817	25.9 (24.7-27.1)	1,604	25.5 (24.3-26.7)	119	20.8 (17.1-24.5)	1,547	17.6 (16.7-18.5)	1,355	17.2 (16.3-18.1)	106	14.1 (11.4-16.8)
2011	3,365	21.4 (20.7-22.1)	1,880	26.8 (25.6-28.0)	1,696	26.8 (25.5-28.1)	117	21.0 (17.2-24.8)	1,485	17.1 (16.2-18.0)	1,345	17.3 (16.4-18.2)	84	11.2 (8.8-13.6)
2010	3,191	20.7 (20.0-21.4)	1,680	24.6 (23.4-25.8)	1,496	24.5 (23.3-25.7)	106	19.9 (16.1-23.7)	1,511	17.6 (16.7-18.5)	1,377	17.9 (17.0-18.8)	87	12.4 (9.8-15.0)
2009	3,302	22.0 (21.2-22.8)	1,773	27.2 (25.9-28.5)	1,607	27.2 (25.9-28.5)	108	20.1 (16.3-23.9)	1,529	18.0 (17.1-18.9)	1,383	18.0 (17.1-18.9)	95	14.2 (11.3-17.1)
2008	3,130	21.2 (20.5-21.9)	1,596	25.1 (23.9-26.3)	1,463	25.3 (24.0-26.6)	90	18.2 (14.4-22.0)	1,534	18.4 (17.5-19.3)	1,410	18.6 (17.6-19.6)	87	12.9 (10.2-15.6)
2007	2,982	20.4 (19.7-21.1)	1,548	24.6 (23.4-25.8)	1,410	24.7 (23.4-26.0)	96	19.4 (15.5-23.3)	1,433	17.3 (16.4-18.2)	1,308	17.4 (16.5-18.3)	82	12.5 (9.8-15.2)
2006	3,066	21.2 (20.4-22.0)	1,619	26.0 (24.7-27.3)	1,485	26.2 (24.9-27.5)	91	18.1 (14.4-21.8)	1,447	17.4 (16.5-18.3)	1,351	18.0 (17.0-19.0)	67	10.3 (7.8-12.8)

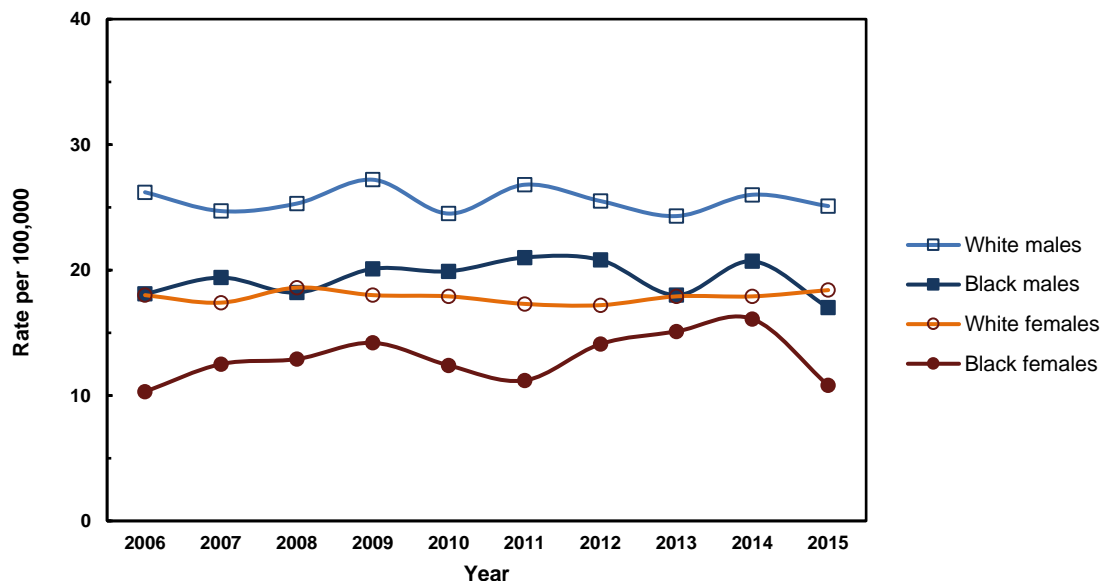
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
21-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Non-Hodgkin Lymphoma: INCIDENCE

**TABLE
21-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

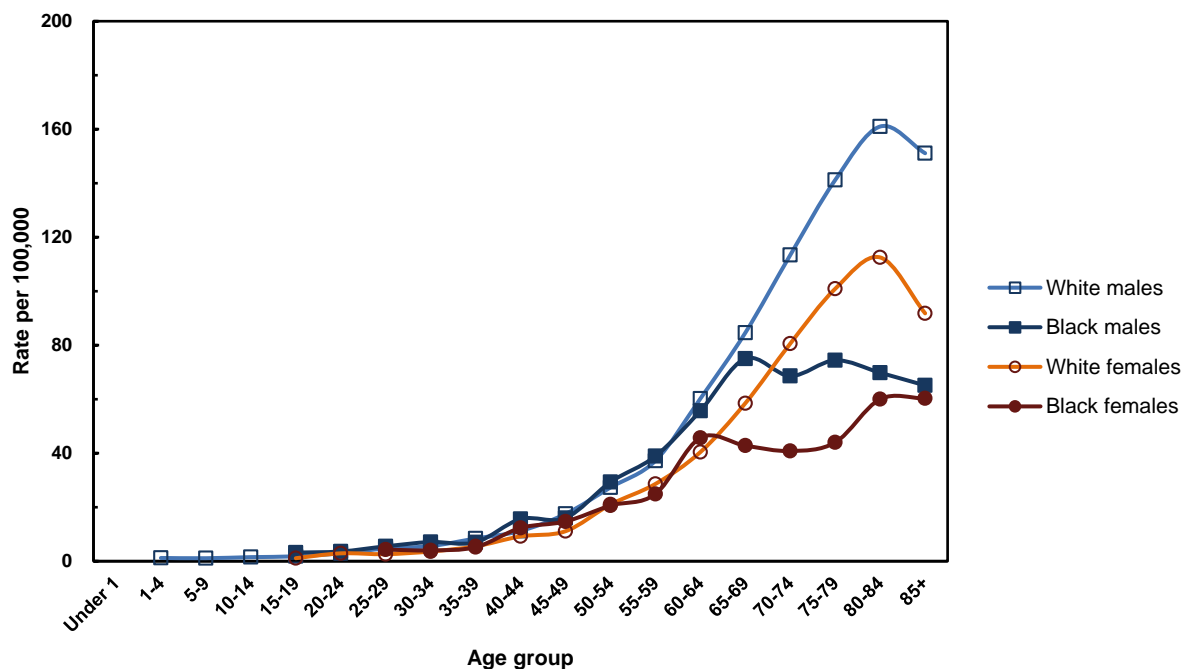
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	26.5	29.2	31.4	16.4	23.9	25.8	13.6
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	0.7	1.0	1.2	ND	ND	ND	ND
5-9	0.6	1.1	1.1	ND	ND	ND	ND
10-14	1.1	1.7	1.5	ND	0.6	ND	ND
15-19	1.7	2.2	1.8	3.2	1.1	1.1	ND
20-24	2.8	3.1	2.9	3.6	2.6	2.9	ND
25-29	3.7	4.6	4.7	5.5	2.7	2.6	4.3
30-34	4.9	5.9	5.6	7.1	3.8	3.6	4.0
35-39	6.7	8.0	8.4	7.0	5.4	5.5	5.2
40-44	11.0	12.2	11.2	15.6	9.8	9.2	12.3
45-49	14.5	17.3	17.5	16.0	11.8	11.1	14.7
50-54	24.5	27.8	27.3	29.3	21.4	21.0	20.6
55-59	33.5	38.2	37.2	38.9	28.9	28.6	24.9
60-64	50.6	60.4	60.2	55.7	41.5	40.4	45.7
65-69	70.6	84.9	84.6	75.0	57.8	58.5	42.8
70-74	92.8	111.1	113.4	68.6	77.4	80.6	40.8
75-79	114.9	138.3	141.2	74.4	97.1	100.9	44.0
80-84	128.5	158.2	161.0	69.8	108.8	112.5	60.0
85+	110.2	149.3	151.1	65.1	91.5	91.8	60.3

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
21-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Non-Hodgkin Lymphoma: INCIDENCE

**TABLE
21-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	16,928	9,122	8,182	580	7,805	6,983	521
Under 1	7	5	5	0	2	2	0
1-4	21	15	13	1	6	6	0
5-9	24	20	16	2	4	3	0
10-14	44	33	23	5	11	7	2
15-19	71	47	31	10	24	18	2
20-24	124	68	50	12	55	49	4
25-29	152	96	79	15	56	42	12
30-34	189	115	89	17	74	55	10
35-39	243	145	124	15	98	80	12
40-44	445	245	188	35	200	154	30
45-49	640	376	324	37	264	208	37
50-54	1,180	657	561	67	523	441	53
55-59	1,562	871	750	78	691	595	58
60-64	2,044	1,177	1,049	85	867	740	87
65-69	2,243	1,274	1,148	78	969	872	60
70-74	2,177	1,187	1,101	48	990	922	42
75-79	2,069	1,075	1,005	36	994	932	35
80-84	1,894	927	877	22	967	915	37
85+	1,799	789	749	17	1,010	942	40

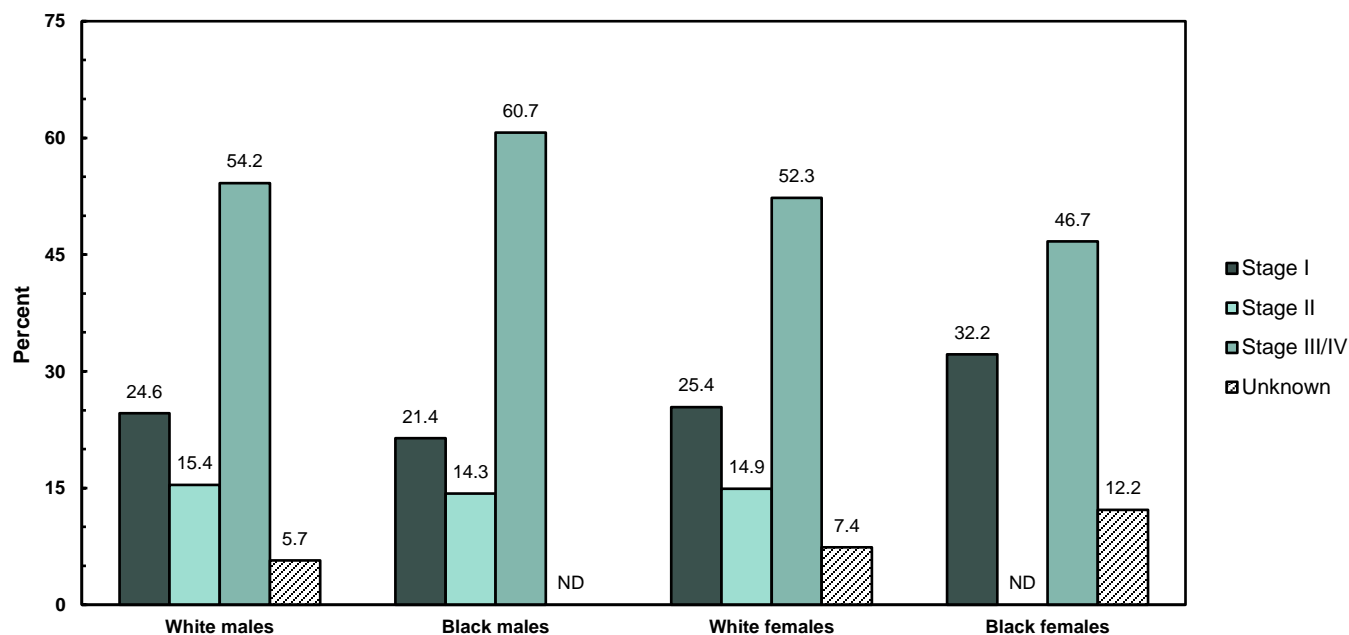
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
21-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Cases Microscopically Confirmed: 3,297 - 96.8%

Non-Hodgkin Lymphoma: MORTALITY

**TABLE
21-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	992	5.8 (5.4-6.2)	551	7.8 (7.1-8.5)	505	7.9 (7.2-8.6)	28	5.3 (3.3-7.3)	441	4.4 (4.0-4.8)	409	4.5 (4.1-4.9)	21	2.6 (1.5-3.7)
2014	1,026	6.0 (5.6-6.4)	564	7.9 (7.2-8.6)	530	8.1 (7.4-8.8)	22	4.8 (2.8-6.8)	462	4.6 (4.2-5.0)	432	4.7 (4.3-5.1)	21	2.6 (1.5-3.7)
2013	997	5.9 (5.5-6.3)	539	7.6 (7.0-8.2)	492	7.6 (6.9-8.3)	38	7.1 (4.8-9.4)	458	4.7 (4.3-5.1)	415	4.6 (4.2-5.0)	29	3.9 (2.5-5.3)
2012	1,062	6.4 (6.0-6.8)	573	8.3 (7.6-9.0)	527	8.4 (7.7-9.1)	29	5.7 (3.6-7.8)	489	4.9 (4.5-5.3)	454	5.0 (4.5-5.5)	29	4.0 (2.5-5.5)
2011	1,075	6.5 (6.1-6.9)	611	8.9 (8.2-9.6)	571	9.1 (8.4-9.8)	30	5.6 (3.6-7.6)	464	4.8 (4.4-5.2)	441	5.0 (4.5-5.5)	20	2.7 (1.5-3.9)
2010	1,074	6.6 (6.2-7.0)	566	8.4 (7.7-9.1)	531	8.7 (8.0-9.4)	31	5.7 (3.7-7.7)	508	5.3 (4.8-5.8)	467	5.3 (4.8-5.8)	33	4.9 (3.2-6.6)
2009	1,074	6.8 (6.4-7.2)	571	8.9 (8.2-9.6)	530	9.0 (8.2-9.8)	38	7.9 (5.4-10.4)	503	5.3 (4.8-5.8)	468	5.4 (4.9-5.9)	32	4.7 (3.1-6.3)
2008	1,104	7.2 (6.8-7.6)	586	9.4 (8.6-10.2)	549	9.7 (8.9-10.5)	34	7.2 (4.8-9.6)	518	5.6 (5.1-6.1)	486	5.8 (5.3-6.3)	27	4.0 (2.5-5.5)
2007	1,109	7.4 (7.0-7.8)	561	9.3 (8.5-10.1)	538	9.7 (8.9-10.5)	19	ND	548	6.0 (5.5-6.5)	511	6.1 (5.6-6.6)	34	5.2 (3.5-6.9)
2006	1,091	7.4 (7.0-7.8)	575	9.7 (8.9-10.5)	537	9.9 (9.1-10.7)	36	8.0 (5.4-10.6)	516	5.7 (5.2-6.2)	479	5.8 (5.3-6.3)	37	5.7 (3.9-7.5)

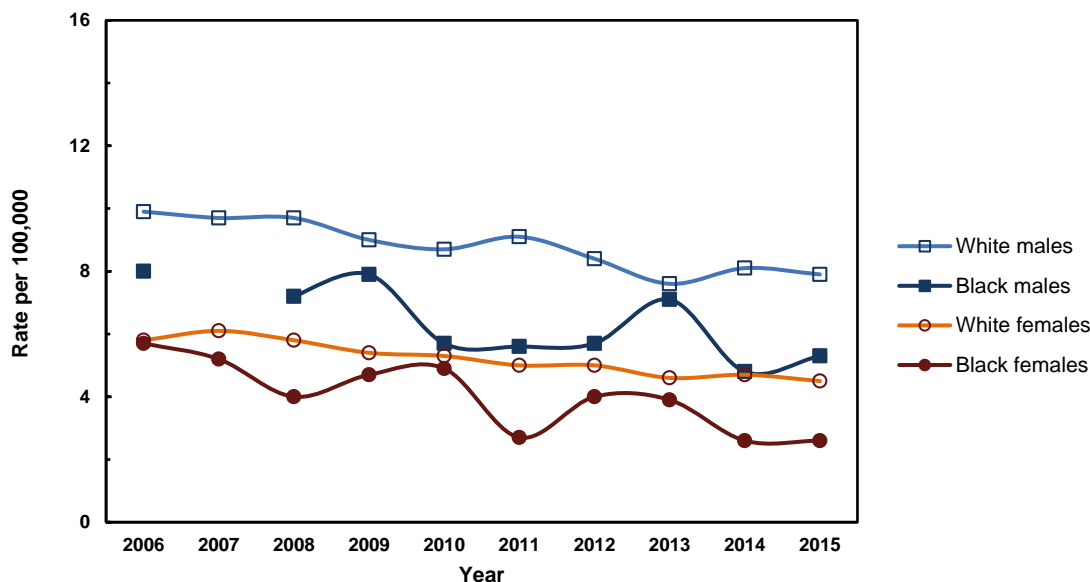
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
21-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Non-Hodgkin Lymphoma: MORTALITY

**TABLE
21-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	5,152	8.1	2,838	9.1	2,625	10.1	147	4.2	2,314	7.1	2,151	7.9	120	3.1
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	2	ND	1	ND	1	ND	0	ND	1	ND	1	ND	0	ND
10-14	4	ND	4	ND	4	ND	0	ND	0	ND	0	ND	0	ND
15-19	3	ND	1	ND	1	ND	0	ND	2	ND	2	ND	0	ND
20-24	9	ND	7	ND	7	ND	0	ND	2	ND	2	ND	0	ND
25-29	12	0.3	8	ND	4	ND	4	ND	4	ND	3	ND	0	ND
30-34	16	0.4	11	0.6	7	ND	2	ND	5	ND	3	ND	1	ND
35-39	22	0.6	14	0.8	12	0.8	2	ND	8	ND	5	ND	3	ND
40-44	43	1.1	27	1.3	22	1.3	4	ND	16	0.8	9	ND	6	ND
45-49	83	1.9	55	2.5	47	2.5	7	ND	28	1.3	22	1.2	5	ND
50-54	151	3.1	108	4.6	95	4.6	8	ND	43	1.8	38	1.8	3	ND
55-59	281	6.0	191	8.4	169	8.4	17	8.5	90	3.8	81	3.9	8	ND
60-64	404	10.0	257	13.2	229	13.1	22	14.4	147	7.0	129	7.0	17	8.9
65-69	513	16.1	312	20.8	280	20.6	24	23.1	201	12.0	188	12.6	6	ND
70-74	630	26.9	372	34.8	340	35.0	16	22.9	258	20.2	239	20.9	11	10.7
75-79	765	42.5	411	52.9	389	54.7	11	22.7	354	34.6	329	35.6	14	17.6
80-84	911	61.8	485	82.8	464	85.2	16	50.7	426	48.0	406	49.9	13	21.1
85+	1,303	79.8	574	108.6	554	111.8	14	53.6	729	66.0	694	67.6	33	49.8

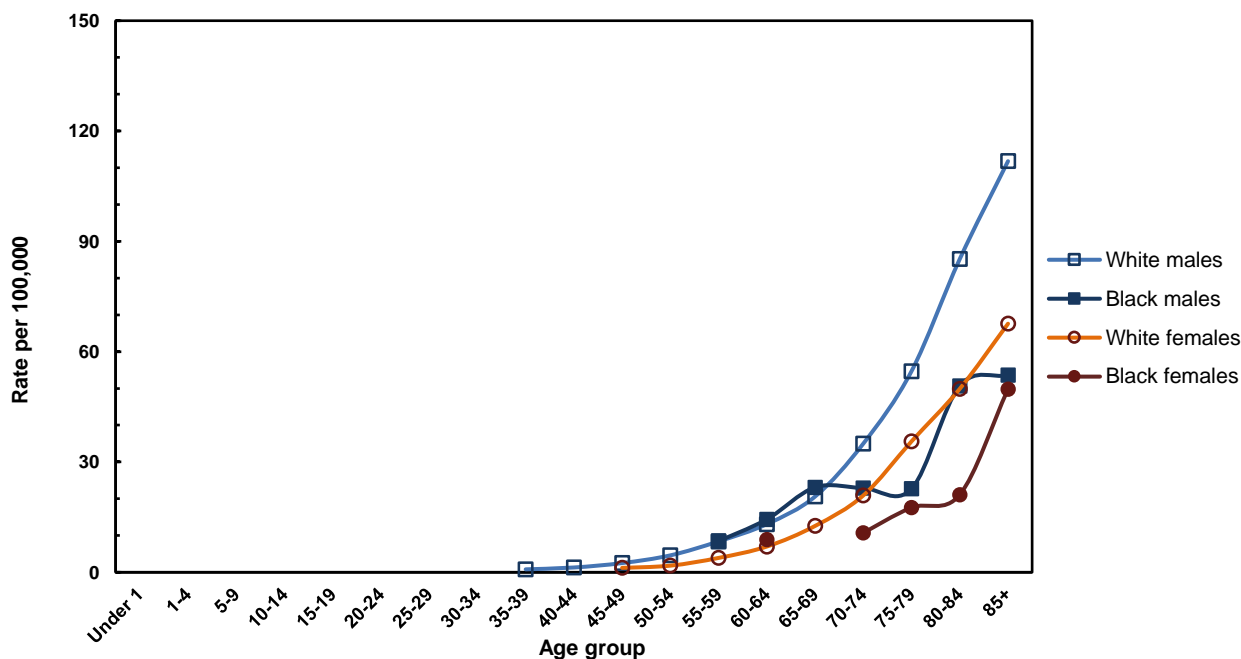
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
21-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Non-Hodgkin Lymphoma: INCIDENCE

**TABLE
21-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	16,928	9,122	25.5	(25.0-26.0)	7,805	17.7	(17.3-18.1)								
Adams	146	77	24.4	(18.9-29.9)	69	19.7	(15.1-24.3)	Juniata	31	19	ND		12	ND	
Allegheny	1,731	889	25.8	(24.1-27.5)	842	18.5	(17.3-19.7)	Lackawanna	238	129	19.9	(16.5-23.3)	109	13.4	(10.9-15.9)
Armstrong	104	64	28.3	(21.4-35.2)	40	14.0	(9.7-18.3)	Lancaster	663	375	25.7	(23.1-28.3)	288	17.0	(15.0-19.0)
Beaver	267	133	24.9	(20.7-29.1)	134	18.3	(15.2-21.4)	Lawrence	114	58	20.7	(15.4-26.0)	56	16.2	(12.0-20.4)
Bedford	64	31	18.5	(12.0-25.0)	33	16.6	(10.9-22.3)	Lebanon	183	105	25.5	(20.6-30.4)	78	15.3	(11.9-18.7)
Berks	564	315	28.3	(25.2-31.4)	249	18.2	(15.9-20.5)	Lehigh	458	229	23.5	(20.5-26.5)	229	19.8	(17.2-22.4)
Blair	197	98	24.7	(19.8-29.6)	99	19.7	(15.8-23.6)	Luzerne	495	270	27.9	(24.6-31.2)	225	18.2	(15.8-20.6)
Bradford	93	56	28.2	(20.8-35.6)	37	17.6	(11.9-23.3)	Lycoming	169	92	25.9	(20.6-31.2)	77	19.3	(15.0-23.6)
Bucks	909	496	27.6	(25.2-30.0)	413	19.0	(17.2-20.8)	McKean	47	26	18.7	(11.5-25.9)	21	13.1	(7.5-18.7)
Butler	278	150	26.9	(22.6-31.2)	128	20.1	(16.6-23.6)	Mercer	154	86	22.4	(17.7-27.1)	68	15.7	(12.0-19.4)
Cambria	223	112	24.4	(19.9-28.9)	111	19.2	(15.6-22.8)	Mifflin	65	33	21.5	(14.2-28.8)	32	19.8	(12.9-26.7)
Cameron	8	3	ND		5	ND		Monroe	177	104	22.4	(18.1-26.7)	73	14.1	(10.9-17.3)
Carbon	90	47	22.3	(15.9-28.7)	43	16.0	(11.2-20.8)	Montgomery	1,140	615	27.5	(25.3-29.7)	524	18.5	(16.9-20.1)
Centre	160	99	27.4	(22.0-32.8)	61	15.1	(11.3-18.9)	Montour	39	20	34.9	(19.6-50.2)	19	ND	
Chester	634	371	27.7	(24.9-30.5)	263	16.7	(14.7-18.7)	Northampton	454	254	28.9	(25.3-32.5)	200	18.4	(15.8-21.0)
Clarion	52	30	25.0	(16.1-33.9)	22	15.5	(9.0-22.0)	Northumberland	154	86	29.7	(23.4-36.0)	68	18.1	(13.8-22.4)
Clearfield	107	56	21.8	(16.1-27.5)	51	17.8	(12.9-22.7)	Perry	76	41	31.2	(21.6-40.8)	35	22.9	(15.3-30.5)
Clinton	52	26	22.0	(13.5-30.5)	26	19.4	(11.9-26.9)	Philadelphia	1,620	835	24.7	(23.0-26.4)	785	17.4	(16.2-18.6)
Columbia	110	57	30.9	(22.9-38.9)	53	22.0	(16.1-27.9)	Pike	67	44	24.9	(17.5-32.3)	23	11.0	(6.5-15.5)
Crawford	128	75	28.4	(22.0-34.8)	53	17.2	(12.6-21.8)	Potter	21	11	ND		10	ND	
Cumberland	303	169	24.9	(21.1-28.7)	134	14.9	(12.4-17.4)	Schuylkill	227	125	26.9	(22.2-31.6)	102	18.6	(15.0-22.2)
Dauphin	290	153	22.2	(18.7-25.7)	137	15.3	(12.7-17.9)	Snyder	67	36	32.0	(21.5-42.5)	31	22.4	(14.5-30.3)
Delaware	681	361	25.8	(23.1-28.5)	320	17.1	(15.2-19.0)	Somerset	111	58	21.7	(16.1-27.3)	53	17.7	(12.9-22.5)
Elk	44	24	23.1	(13.9-32.3)	20	15.5	(8.7-22.3)	Sullivan	14	10	ND		4	ND	
Erie	333	166	21.5	(18.2-24.8)	167	18.5	(15.7-21.3)	Susquehanna	39	21	14.4	(8.2-20.6)	18	ND	
Fayette	201	96	22.3	(17.8-26.8)	105	20.2	(16.3-24.1)	Tioga	46	25	18.8	(11.4-26.2)	21	12.9	(7.4-18.4)
Forest	9	6	ND		3	ND		Union	67	46	37.6	(26.7-48.5)	21	14.7	(8.4-21.0)
Franklin	202	125	27.0	(22.3-31.7)	77	13.7	(10.6-16.8)	Venango	73	43	22.5	(15.8-29.2)	30	14.4	(9.2-19.6)
Fulton	28	13	ND		15	ND		Warren	47	29	19.8	(12.6-27.0)	18	ND	
Greene	51	26	22.5	(13.9-31.1)	25	19.5	(11.9-27.1)	Washington	301	163	25.0	(21.2-28.8)	138	17.6	(14.7-20.5)
Huntingdon	84	41	27.5	(19.1-35.9)	43	29.2	(20.5-37.9)	Wayne	83	51	27.9	(20.2-35.6)	32	15.4	(10.1-20.7)
Indiana	100	50	19.4	(14.0-24.8)	50	16.2	(11.7-20.7)	Westmoreland	577	301	24.9	(22.1-27.7)	276	18.4	(16.2-20.6)
Jefferson	52	27	19.5	(12.1-26.9)	25	14.9	(9.1-20.7)	Wyoming	42	18	ND		24	25.7	(15.4-36.0)
								York	574	322	26.7	(23.8-29.6)	252	17.5	(15.3-19.7)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program.

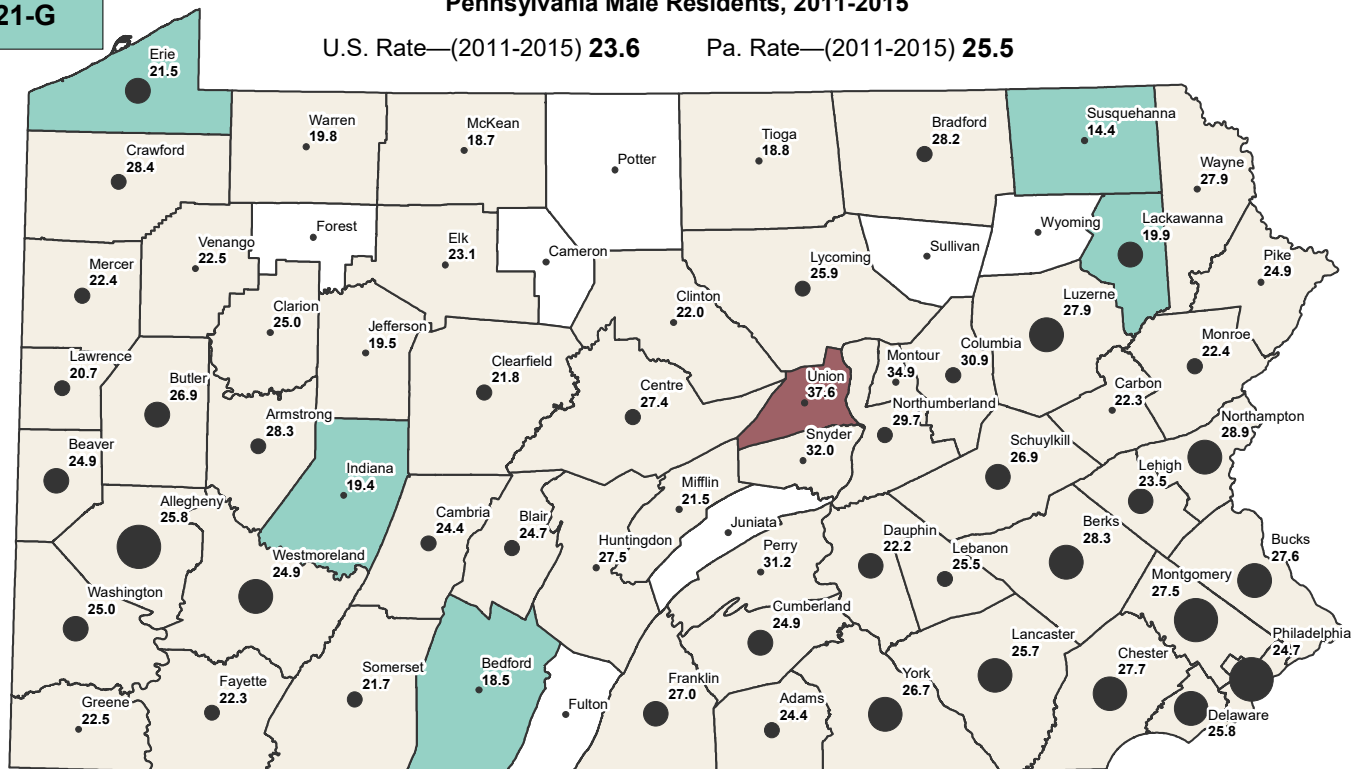
Non-Hodgkin Lymphoma: INCIDENCE

**MAP
21-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **23.6**

Pa. Rate—(2011-2015) **25.5**



Significantly higher

Significantly lower

Not significantly different

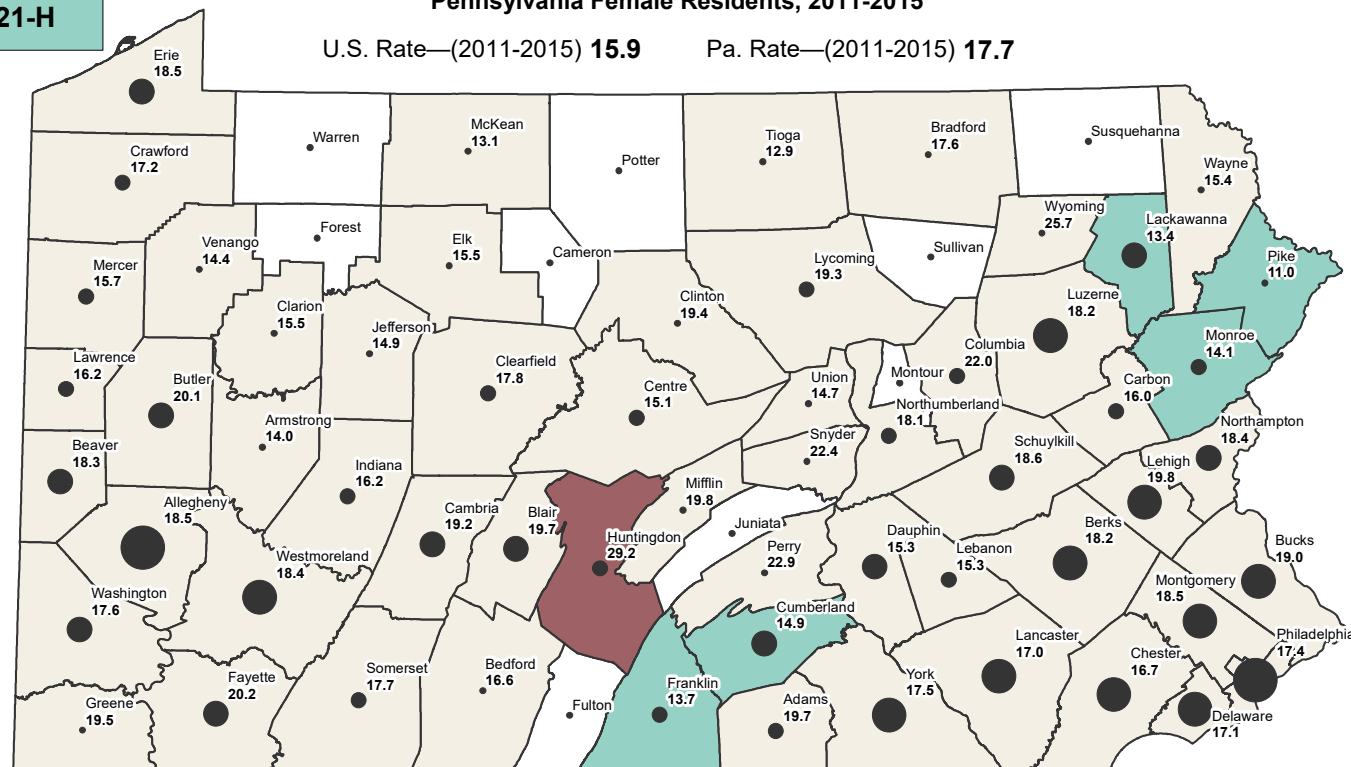
Significance not determined—less than 20 observed cases

**MAP
21-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **15.9**

Pa. Rate—(2011-2015) **17.7**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Non-Hodgkin Lymphoma: MORTALITY

**TABLE
21-1**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

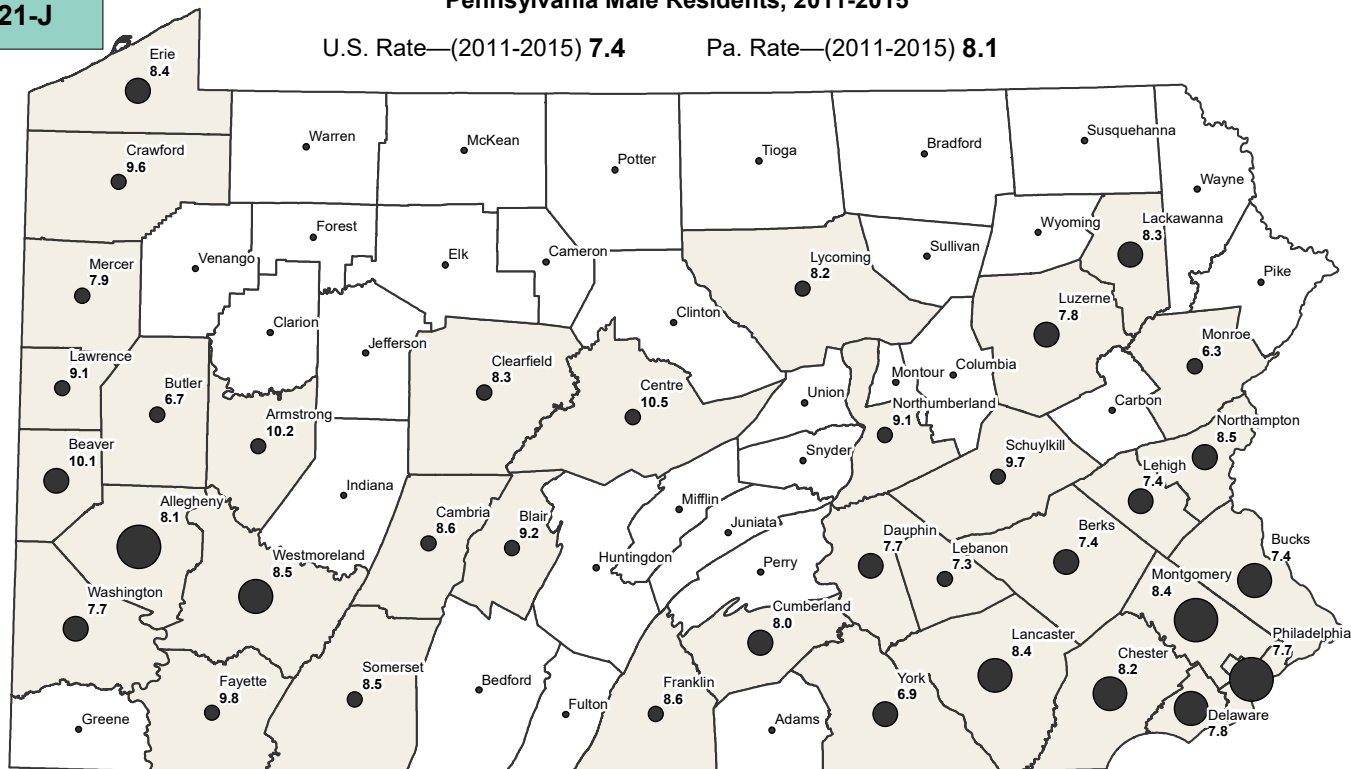
County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	5,152	2,838	8.1	(7.8-8.4)	2,314	4.7	(4.5-4.9)								
Adams	37	16	ND		21	5.4	(3.1-7.7)	Juniata	12	6	ND		6	ND	
Allegheny	532	284	8.1	(7.2-9.0)	248	4.8	(4.2-5.4)	Lackawanna	100	53	8.3	(6.1-10.5)	47	4.8	(3.4-6.2)
Armstrong	40	24	10.2	(6.1-14.3)	16	ND		Lancaster	206	125	8.4	(6.9-9.9)	81	3.9	(3.1-4.7)
Beaver	95	56	10.1	(7.5-12.7)	39	4.5	(3.1-5.9)	Lawrence	46	25	9.1	(5.5-12.7)	21	4.9	(2.8-7.0)
Bedford	28	12	ND		16	ND		Lebanon	54	30	7.3	(4.7-9.9)	24	4.4	(2.6-6.2)
Berks	140	83	7.4	(5.8-9.0)	57	3.6	(2.7-4.5)	Lehigh	135	70	7.4	(5.7-9.1)	65	4.8	(3.6-6.0)
Blair	64	38	9.2	(6.3-12.1)	26	4.3	(2.6-6.0)	Luzerne	145	76	7.8	(6.0-9.6)	69	4.8	(3.7-5.9)
Bradford	31	16	ND		15	ND		Lycoming	52	28	8.2	(5.2-11.2)	24	5.4	(3.2-7.6)
Bucks	230	129	7.4	(6.1-8.7)	101	4.2	(3.4-5.0)	McKean	14	11	ND		3	ND	
Butler	71	35	6.7	(4.5-8.9)	36	5.6	(3.8-7.4)	Mercer	58	30	7.9	(5.1-10.7)	28	5.8	(3.7-7.9)
Cambria	62	38	8.6	(5.9-11.3)	24	4.2	(2.5-5.9)	Mifflin	25	16	ND		9	ND	
Cameron	2	0	ND		2	ND		Monroe	50	27	6.3	(3.9-8.7)	23	4.5	(2.7-6.3)
Carbon	30	17	ND		13	ND		Montgomery	329	190	8.4	(7.2-9.6)	139	4.3	(3.6-5.0)
Centre	55	33	10.5	(6.9-14.1)	22	4.9	(2.9-6.9)	Montour	14	10	ND		4	ND	
Chester	169	102	8.2	(6.6-9.8)	67	4.1	(3.1-5.1)	Northampton	123	71	8.5	(6.5-10.5)	52	4.1	(3.0-5.2)
Clarion	14	10	ND		4	ND		Northumberland	54	27	9.1	(5.7-12.5)	27	6.7	(4.2-9.2)
Clearfield	40	21	8.3	(4.8-11.8)	19	ND		Perry	23	14	ND		9	ND	
Clinton	22	9	ND		13	ND		Philadelphia	454	242	7.7	(6.7-8.7)	212	4.4	(3.8-5.0)
Columbia	29	13	ND		16	ND		Pike	16	10	ND		6	ND	
Crawford	45	25	9.6	(5.8-13.4)	20	6.3	(3.5-9.1)	Potter	5	2	ND		3	ND	
Cumberland	98	53	8.0	(5.8-10.2)	45	4.5	(3.2-5.8)	Schuylkill	75	45	9.7	(6.9-12.5)	30	4.9	(3.1-6.7)
Dauphin	86	50	7.7	(5.6-9.8)	36	3.6	(2.4-4.8)	Snyder	22	13	ND		9	ND	
Delaware	198	109	7.8	(6.3-9.3)	89	4.2	(3.3-5.1)	Somerset	43	23	8.5	(5.0-12.0)	20	5.7	(3.2-8.2)
Elk	18	12	ND		6	ND		Sullivan	3	1	ND		2	ND	
Erie	110	61	8.4	(6.3-10.5)	49	4.8	(3.5-6.1)	Susquehanna	22	9	ND		13	ND	
Fayette	71	41	9.8	(6.8-12.8)	30	4.9	(3.1-6.7)	Tioga	14	7	ND		7	ND	
Forest	6	3	ND		3	ND		Union	22	13	ND		9	ND	
Franklin	62	39	8.6	(5.9-11.3)	23	3.7	(2.2-5.2)	Venango	29	15	ND		14	ND	
Fulton	7	3	ND		4	ND		Warren	19	9	ND		10	ND	
Greene	17	8	ND		9	ND		Washington	100	51	7.7	(5.6-9.8)	49	5.4	(3.9-6.9)
Huntingdon	29	13	ND		16	ND		Wayne	24	12	ND		12	ND	
Indiana	32	18	ND		14	ND		Westmoreland	198	104	8.5	(6.9-10.1)	94	5.7	(4.5-6.9)
Jefferson	30	15	ND		15	ND		Wyoming	13	8	ND		5	ND	
								York	153	79	6.9	(5.4-8.4)	74	4.8	(3.7-5.9)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

**MAP
21-J**

U.S. Rate—(2011-2015) **7.4**

Pa. Rate—(2011-2015) **8.1**

Significantly higher

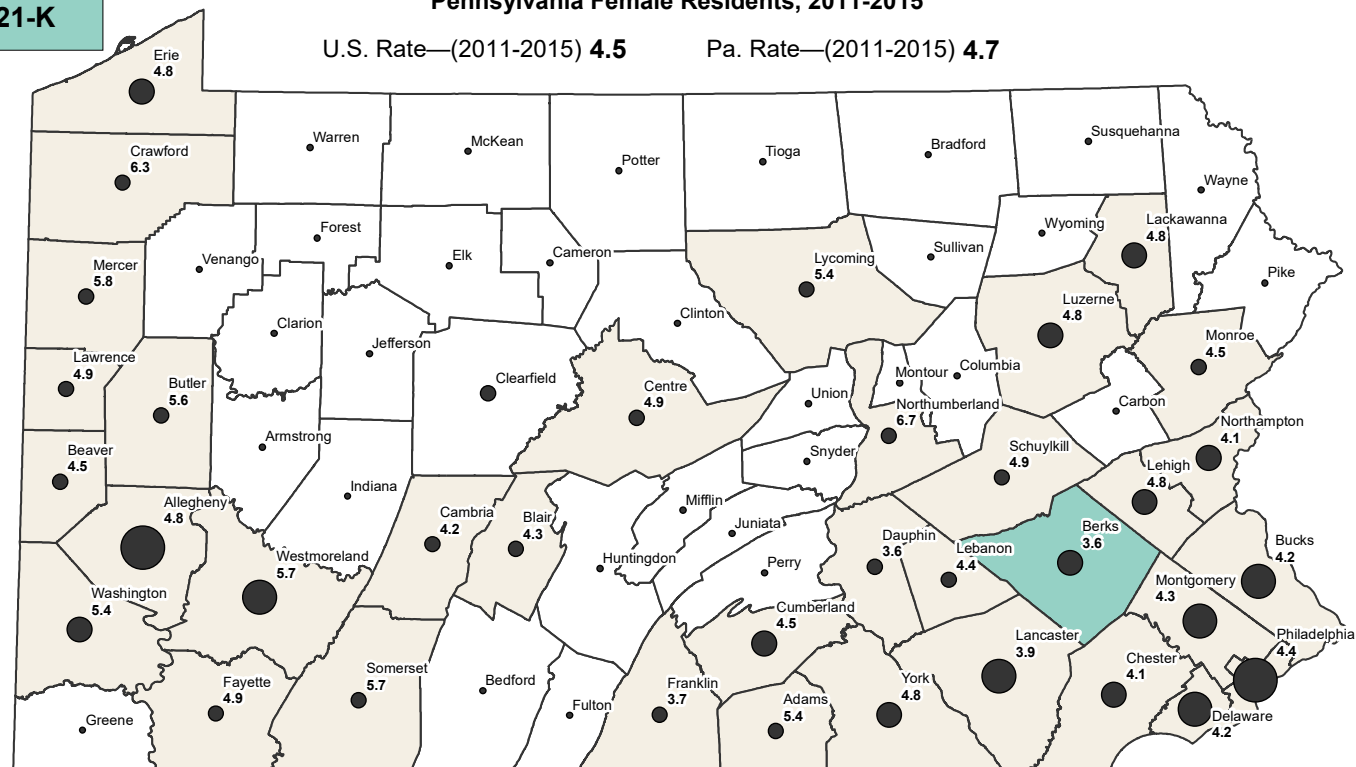
Significantly lower

Not significantly different

Significance not determined—
less than 20 observed cases

**MAP
21-K**

U.S. Rate—(2011-2015) **4.5**

Pa. Rate—(2011-2015) **4.7**

The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

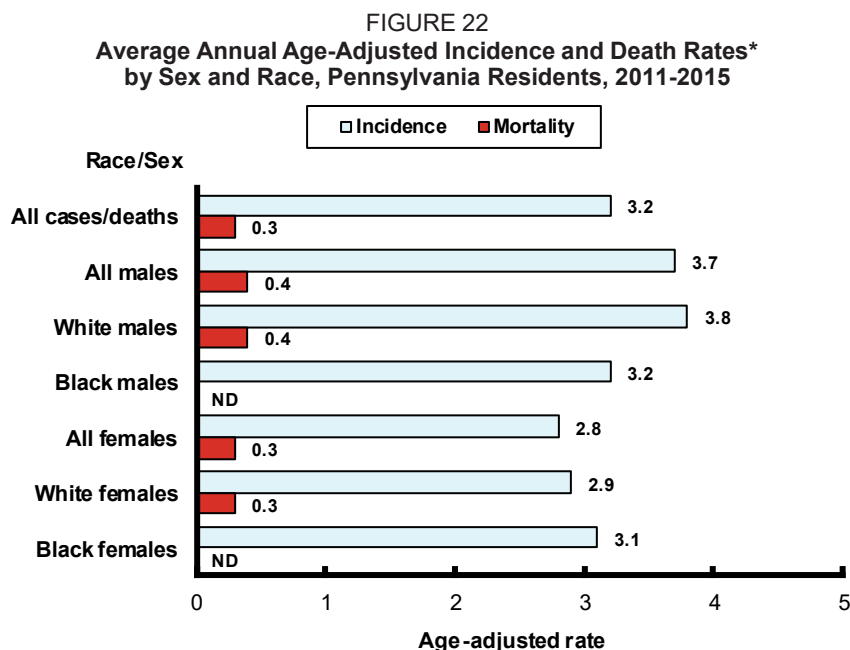
Hodgkin Lymphoma

Data Highlights

Hodgkin lymphoma is a group of similar cancers that originate in the immune system's lymphocytes (white blood cells). The 2011-2015 average annual age-adjusted incidence rate for Hodgkin lymphoma was 32 percent higher for males (3.7 per 100,000) than for females (2.8). The highest average annual rate for 2011-2015 was among white males (3.8 per 100,000) and lowest among white females (2.9). In 2015, there were 399 cases of Hodgkin lymphoma diagnosed among Pennsylvania residents and reported to the Pennsylvania Cancer Registry, resulting in an age-adjusted rate of 3.0.

In Pennsylvania, approximately 48 percent of Hodgkin lymphoma cases diagnosed during the 2011-2015 period were under the age of 40. The curves for the age-specific incidence rates were bimodal; the rates rose sharply in young adults, peaking for the 25-29 age group, then falling to lows for the 55-59 age group before peaking again in the 75-79 age range. In 2015, about 42 percent of the Hodgkin lymphoma cases were diagnosed at stage III/IV of the disease, and less than 4 percent of the cases had an unknown stage.

The 2011-2015 average annual age-adjusted death rate for Hodgkin lymphoma was higher among males (0.4 per 100,000) than females (0.3). In 2015, there were 58 Hodgkin lymphoma deaths among residents, which resulted in an age-adjusted death rate of 0.4. White males and white females showed decreasing trends in the age-adjusted incidence rate over the period 2006-2015. Due to the small numbers of deaths for black residents, the annual death rates were unstable, making interpretation of trends difficult. United States mortality data (Surveillance, Epidemiology and End Results program) showed a decreasing trend of annual age-adjusted death rates from 1.3 per 100,000 in 1975 to 0.3 per 100,000 in 2015.



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset

* rate per 100,000 using the U.S. standard population

Note: Rates based on less than 20 events are statistically unreliable and are not displayed (ND).

Risk Factors

According to the American Cancer Society, etiological factors are unknown, although mononucleosis (mono/Epstein-Barr virus), HIV infection, a weakened immune system and a family history of Hodgkin lymphoma are suggestive.

Early Detection

No screening tests have proven to be effective or are currently being evaluated.

Hodgkin Lymphoma: INCIDENCE

**TABLE
22-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	399	3.0 (2.7-3.3)	234	3.6 (3.1-4.1)	201	3.7 (3.2-4.2)	22	3.0 (1.7-4.3)	165	2.5 (2.1-2.9)	135	2.5 (2.1-2.9)	21	2.5 (1.4-3.6)
2014	457	3.5 (3.2-3.8)	246	3.8 (3.3-4.3)	221	4.1 (3.6-4.6)	17	ND	211	3.2 (2.8-3.6)	175	3.2 (2.7-3.7)	32	4.3 (2.8-5.8)
2013	402	3.1 (2.8-3.4)	224	3.6 (3.1-4.1)	184	3.5 (3.0-4.0)	30	4.6 (3.0-6.2)	178	2.7 (2.3-3.1)	156	2.8 (2.4-3.2)	16	ND
2012	428	3.2 (2.9-3.5)	242	3.7 (3.2-4.2)	214	3.9 (3.4-4.4)	17	ND	185	2.8 (2.4-3.2)	150	2.7 (2.3-3.1)	27	3.6 (2.2-5.0)
2011	429	3.3 (3.0-3.6)	233	3.7 (3.2-4.2)	205	3.8 (3.3-4.3)	25	3.9 (2.4-5.4)	196	3.0 (2.6-3.4)	170	3.1 (2.6-3.6)	20	2.8 (1.6-4.0)
2010	411	3.1 (2.8-3.4)	219	3.4 (2.9-3.9)	187	3.5 (3.0-4.0)	24	3.7 (2.2-5.2)	192	2.9 (2.5-3.3)	170	3.1 (2.6-3.6)	15	ND
2009	446	3.5 (3.2-3.8)	236	3.9 (3.4-4.4)	206	3.8 (3.3-4.3)	23	3.7 (2.2-5.2)	210	3.2 (2.8-3.6)	179	3.2 (2.7-3.7)	26	3.7 (2.3-5.1)
2008	418	3.3 (3.0-3.6)	230	3.7 (3.2-4.2)	209	3.9 (3.4-4.4)	14	ND	188	2.9 (2.5-3.3)	163	2.9 (2.5-3.3)	20	3.0 (1.7-4.3)
2007	418	3.3 (3.0-3.6)	218	3.5 (3.0-4.0)	194	3.6 (3.1-4.1)	17	ND	200	3.0 (2.6-3.4)	178	3.1 (2.6-3.6)	19	ND
2006	421	3.3 (3.0-3.6)	215	3.5 (3.0-4.0)	194	3.7 (3.2-4.2)	19	ND	206	3.1 (2.7-3.5)	185	3.3 (2.8-3.8)	16	ND

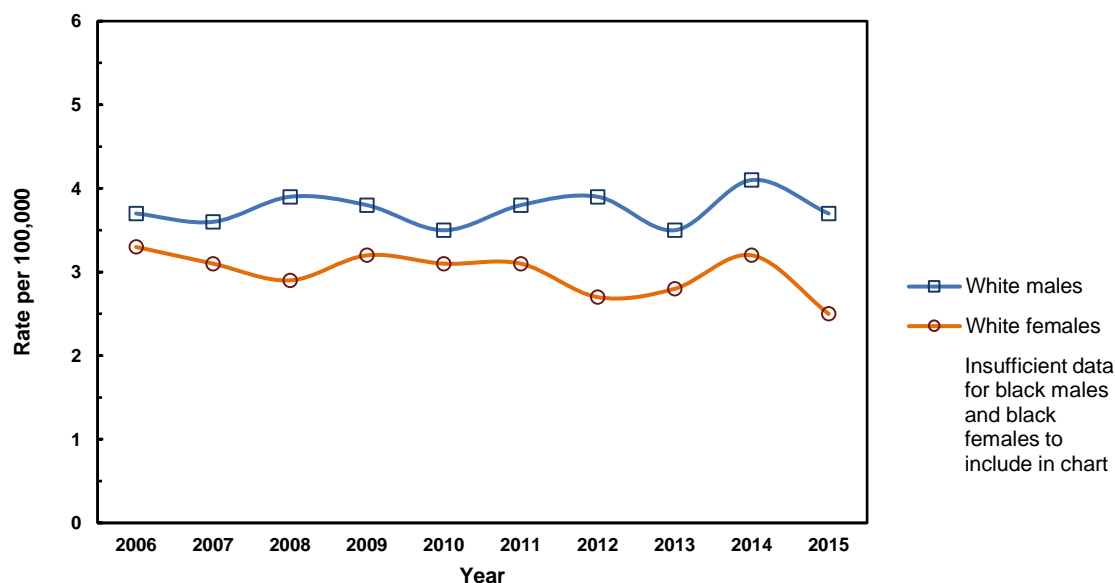
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
22-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Hodgkin Lymphoma: INCIDENCE

**TABLE
22-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

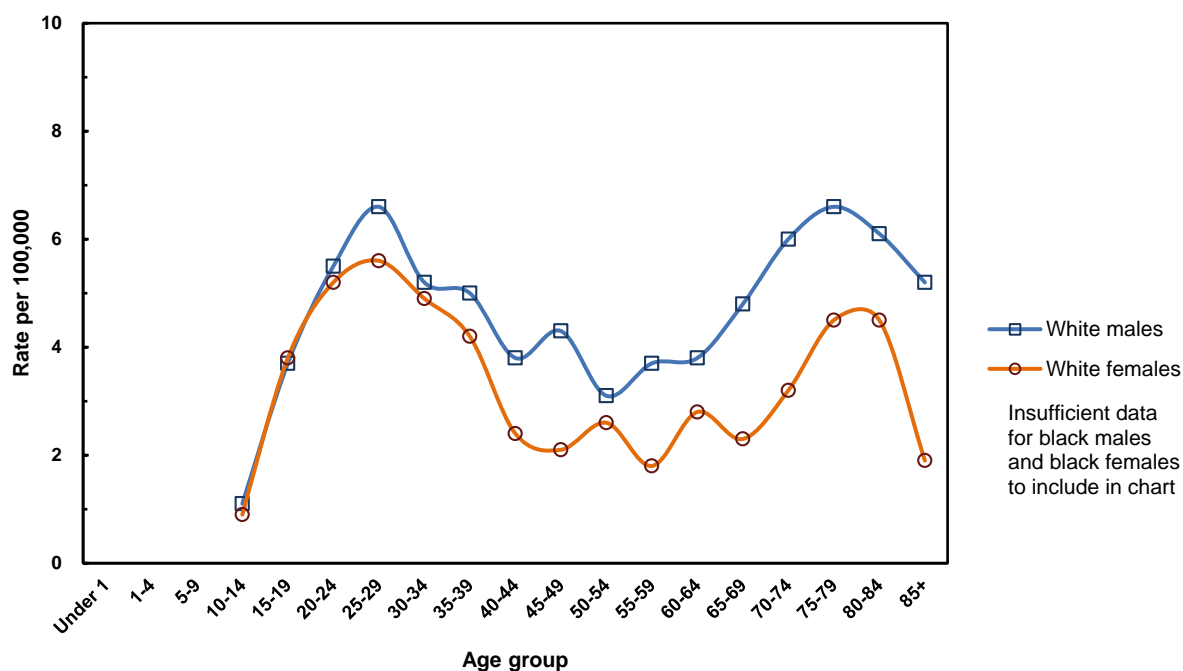
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	3.3	3.8	3.9	3.1	2.9	2.9	3.0
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	0.3	ND	ND	ND	ND	ND	ND
10-14	1.1	1.1	1.1	ND	1.1	0.9	ND
15-19	3.5	3.4	3.7	ND	3.6	3.8	ND
20-24	4.8	5.2	5.5	3.8	4.5	5.2	ND
25-29	5.8	6.1	6.6	4.7	5.4	5.6	5.7
30-34	4.8	4.9	5.2	4.2	4.6	4.9	4.8
35-39	4.6	4.9	5.0	5.6	4.3	4.2	5.2
40-44	3.3	3.7	3.8	ND	2.8	2.4	5.3
45-49	3.3	4.5	4.3	6.5	2.1	2.1	ND
50-54	3.0	3.3	3.1	5.7	2.7	2.6	3.9
55-59	2.8	3.9	3.7	ND	1.8	1.8	ND
60-64	3.2	3.5	3.8	ND	2.9	2.8	ND
65-69	3.5	4.7	4.8	ND	2.4	2.3	ND
70-74	4.4	5.9	6.0	ND	3.1	3.2	ND
75-79	5.2	6.3	6.6	ND	4.3	4.5	ND
80-84	4.9	5.8	6.1	ND	4.3	4.5	ND
85+	2.9	4.9	5.2	ND	2.0	1.9	ND

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
22-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Hodgkin Lymphoma: INCIDENCE

**TABLE
22-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	2,115	1,179	1,025	111	935	786	116
Under 1	0	0	0	0	0	0	0
1-4	1	0	0	0	1	0	0
5-9	12	8	4	2	4	3	0
10-14	41	21	17	2	20	14	5
15-19	150	74	64	8	76	63	7
20-24	212	115	96	13	97	88	7
25-29	240	129	112	13	110	90	16
30-34	185	95	82	10	90	76	12
35-39	166	88	74	12	78	62	12
40-44	132	75	63	7	57	40	13
45-49	144	97	80	15	47	39	8
50-54	144	78	63	13	66	54	10
55-59	132	88	75	7	44	37	6
60-64	129	69	66	2	60	51	8
65-69	111	70	65	3	41	34	7
70-74	103	63	58	2	40	37	2
75-79	93	49	47	2	44	42	1
80-84	72	34	33	0	38	37	0
85+	48	26	26	0	22	19	2

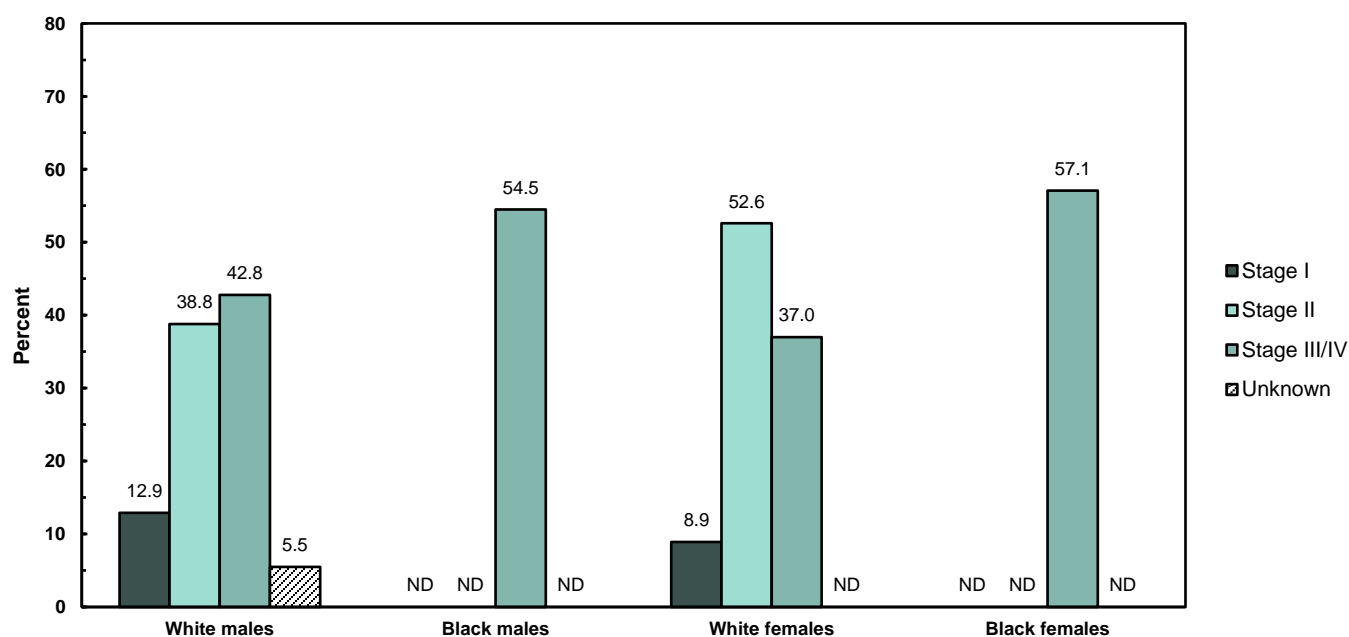
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
22-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Cases Microscopically Confirmed: 393 - 98.5%

Hodgkin Lymphoma: MORTALITY

**TABLE
22-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	58	0.4 (0.3-0.5)	30	0.4 (0.3-0.5)	29	0.5 (0.3-0.7)	1	ND	28	0.3 (0.2-0.4)	24	0.3 (0.2-0.4)	3	ND
2014	34	0.2 (0.1-0.3)	20	0.3 (0.2-0.4)	19	ND	1	ND	14	ND	13	ND	1	ND
2013	46	0.3 (0.2-0.4)	22	0.3 (0.2-0.4)	20	0.3 (0.2-0.4)	0	ND	24	0.3 (0.2-0.4)	23	0.3 (0.2-0.4)	1	ND
2012	64	0.4 (0.3-0.5)	35	0.5 (0.3-0.7)	33	0.5 (0.3-0.7)	1	ND	29	0.3 (0.2-0.4)	20	0.2 (0.1-0.3)	6	ND
2011	54	0.4 (0.3-0.5)	26	0.4 (0.2-0.6)	24	0.4 (0.2-0.6)	2	ND	28	0.3 (0.2-0.4)	27	0.3 (0.2-0.4)	1	ND
2010	53	0.4 (0.3-0.5)	27	0.4 (0.2-0.6)	25	0.4 (0.2-0.6)	2	ND	26	0.3 (0.2-0.4)	24	0.3 (0.2-0.4)	2	ND
2009	57	0.4 (0.3-0.5)	27	0.4 (0.2-0.6)	25	0.4 (0.2-0.6)	2	ND	30	0.4 (0.3-0.5)	27	0.4 (0.2-0.6)	3	ND
2008	52	0.4 (0.3-0.5)	28	0.4 (0.3-0.5)	27	0.5 (0.3-0.7)	1	ND	24	0.3 (0.2-0.4)	19	ND	3	ND
2007	62	0.4 (0.3-0.5)	37	0.6 (0.4-0.8)	36	0.7 (0.5-0.9)	1	ND	25	0.3 (0.2-0.4)	23	0.3 (0.2-0.4)	2	ND
2006	85	0.6 (0.5-0.7)	53	0.9 (0.7-1.1)	47	0.9 (0.6-1.2)	6	ND	32	0.4 (0.3-0.5)	28	0.4 (0.3-0.5)	3	ND

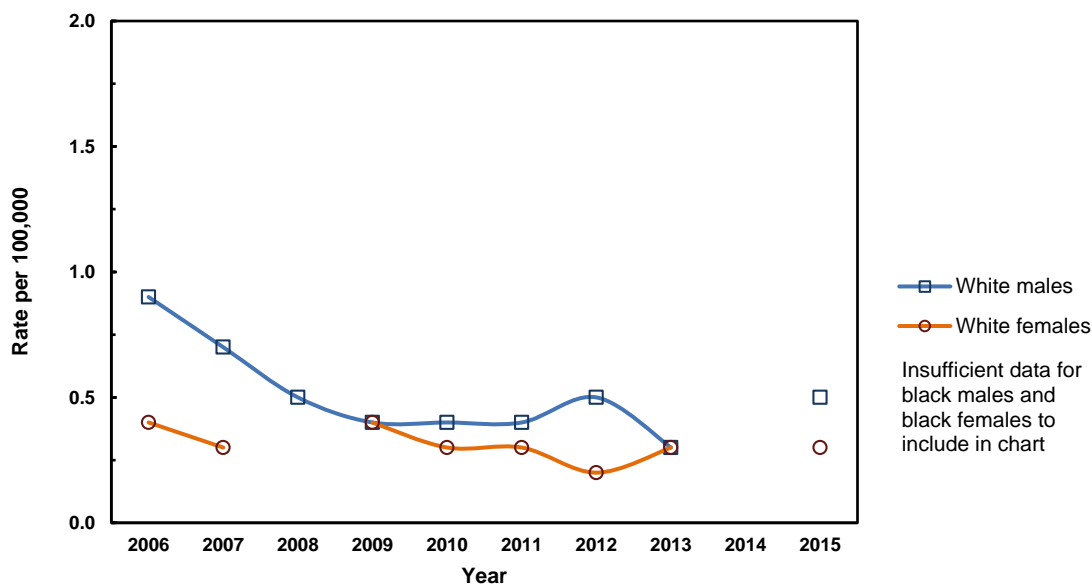
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
22-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Hodgkin Lymphoma: MORTALITY

**TABLE
22-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	256	0.4	133	0.4	125	0.5	5	ND	123	0.4	107	0.4	12	0.3
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	3	ND	1	ND	0	ND	1	ND	2	ND	2	ND	0	ND
20-24	9	ND	6	ND	5	ND	0	ND	3	ND	2	ND	0	ND
25-29	5	ND	4	ND	4	ND	0	ND	1	ND	1	ND	0	ND
30-34	8	ND	4	ND	2	ND	1	ND	4	ND	2	ND	2	ND
35-39	6	ND	2	ND	2	ND	0	ND	4	ND	4	ND	0	ND
40-44	6	ND	2	ND	2	ND	0	ND	4	ND	3	ND	1	ND
45-49	12	0.3	8	ND	7	ND	1	ND	4	ND	2	ND	2	ND
50-54	15	0.3	7	ND	7	ND	0	ND	8	ND	8	ND	0	ND
55-59	17	0.4	8	ND	7	ND	0	ND	9	ND	5	ND	3	ND
60-64	18	0.4	8	ND	8	ND	0	ND	10	0.5	8	ND	2	ND
65-69	30	0.9	17	1.1	16	1.2	1	ND	13	0.8	13	0.9	0	ND
70-74	30	1.3	21	2.0	20	2.1	1	ND	9	ND	9	ND	0	ND
75-79	28	1.6	15	1.9	15	2.1	0	ND	13	1.3	12	1.3	0	ND
80-84	32	2.2	14	2.4	14	2.6	0	ND	18	2.0	17	2.1	0	ND
85+	37	2.3	16	3.0	16	3.2	0	ND	21	1.9	19	1.9	2	ND

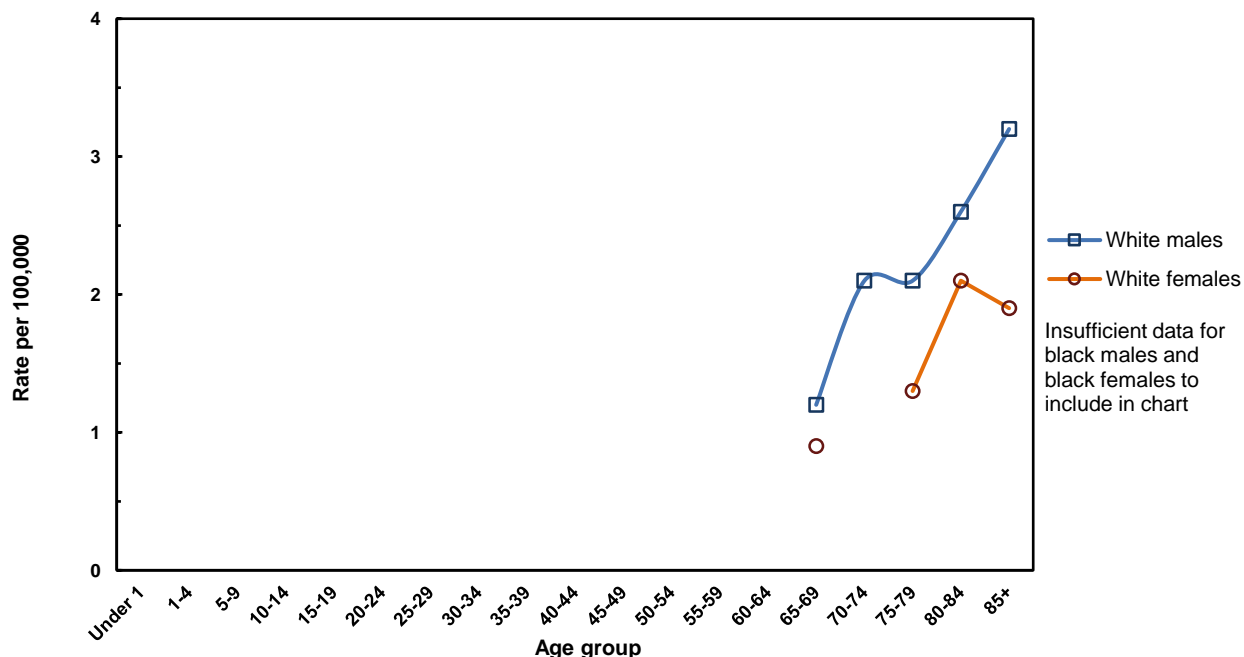
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
22-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Hodgkin Lymphoma: INCIDENCE

**TABLE
22-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	2,115	1,179	3.7	(3.5-3.9)	935	2.8	(2.6-3.0)								
Adams	18	9	ND		9	ND		Juniata	3	1	ND		2	ND	
Allegheny	199	110	3.6	(2.9-4.3)	88	2.6	(2.1-3.1)	Lackawanna	37	24	3.9	(2.3-5.5)	13	ND	
Armstrong	6	4	ND		2	ND		Lancaster	86	52	4.1	(3.0-5.2)	34	2.3	(1.5-3.1)
Beaver	40	26	5.5	(3.4-7.6)	14	ND		Lawrence	15	12	ND		3	ND	
Bedford	7	5	ND		2	ND		Lebanon	18	13	ND		5	ND	
Berks	84	50	5.0	(3.6-6.4)	34	3.1	(2.1-4.1)	Lehigh	62	29	3.4	(2.2-4.6)	33	3.7	(2.4-5.0)
Blair	15	10	ND		5	ND		Luzerne	56	31	3.8	(2.5-5.1)	25	2.9	(1.8-4.0)
Bradford	11	7	ND		4	ND		Lycoming	18	8	ND		10	ND	
Bucks	88	48	3.1	(2.2-4.0)	40	2.7	(1.9-3.5)	McKean	6	6	ND		0	ND	
Butler	25	14	ND		11	ND		Mercer	18	13	ND		5	ND	
Cambria	18	14	ND		4	ND		Mifflin	6	4	ND		2	ND	
Cameron	1	0	ND		1	ND		Monroe	29	18	ND		11	ND	
Carbon	13	8	ND		5	ND		Montgomery	151	76	3.7	(2.9-4.5)	75	3.8	(2.9-4.7)
Centre	16	10	ND		6	ND		Montour	2	2	ND		0	ND	
Chester	66	34	2.6	(1.7-3.5)	32	2.4	(1.6-3.2)	Northampton	45	24	3.2	(1.9-4.5)	21	2.6	(1.5-3.7)
Clarion	2	1	ND		1	ND		Northumberland	19	11	ND		8	ND	
Clearfield	13	6	ND		7	ND		Perry	4	2	ND		2	ND	
Clinton	9	4	ND		5	ND		Philadelphia	259	139	3.9	(3.3-4.5)	120	2.9	(2.4-3.4)
Columbia	14	8	ND		6	ND		Pike	7	3	ND		4	ND	
Crawford	18	14	ND		4	ND		Potter	5	4	ND		1	ND	
Cumberland	42	22	3.3	(1.9-4.7)	20	3.3	(1.9-4.7)	Schuylkill	37	22	5.8	(3.4-8.2)	15	ND	
Dauphin	42	21	3.1	(1.8-4.4)	21	3.1	(1.8-4.4)	Snyder	6	5	ND		1	ND	
Delaware	95	48	3.7	(2.7-4.7)	47	3.2	(2.3-4.1)	Somerset	25	13	ND		12	ND	
Elk	5	3	ND		2	ND		Sullivan	3	1	ND		2	ND	
Erie	34	21	3.0	(1.7-4.3)	13	ND		Susquehanna	7	5	ND		2	ND	
Fayette	25	14	ND		11	ND		Tioga	5	3	ND		2	ND	
Forest	0	0	ND		0	ND		Union	8	3	ND		5	ND	
Franklin	17	12	ND		5	ND		Venango	4	2	ND		2	ND	
Fulton	6	5	ND		1	ND		Warren	7	3	ND		4	ND	
Greene	5	1	ND		4	ND		Washington	37	19	ND		18	ND	
Huntingdon	7	4	ND		3	ND		Wayne	12	7	ND		5	ND	
Indiana	11	3	ND		8	ND		Westmoreland	69	35	3.8	(2.5-5.1)	34	3.8	(2.5-5.1)
Jefferson	12	9	ND		3	ND		Wyoming	5	2	ND		3	ND	
								York	80	42	4.0	(2.8-5.2)	38	3.6	(2.5-4.7)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program.

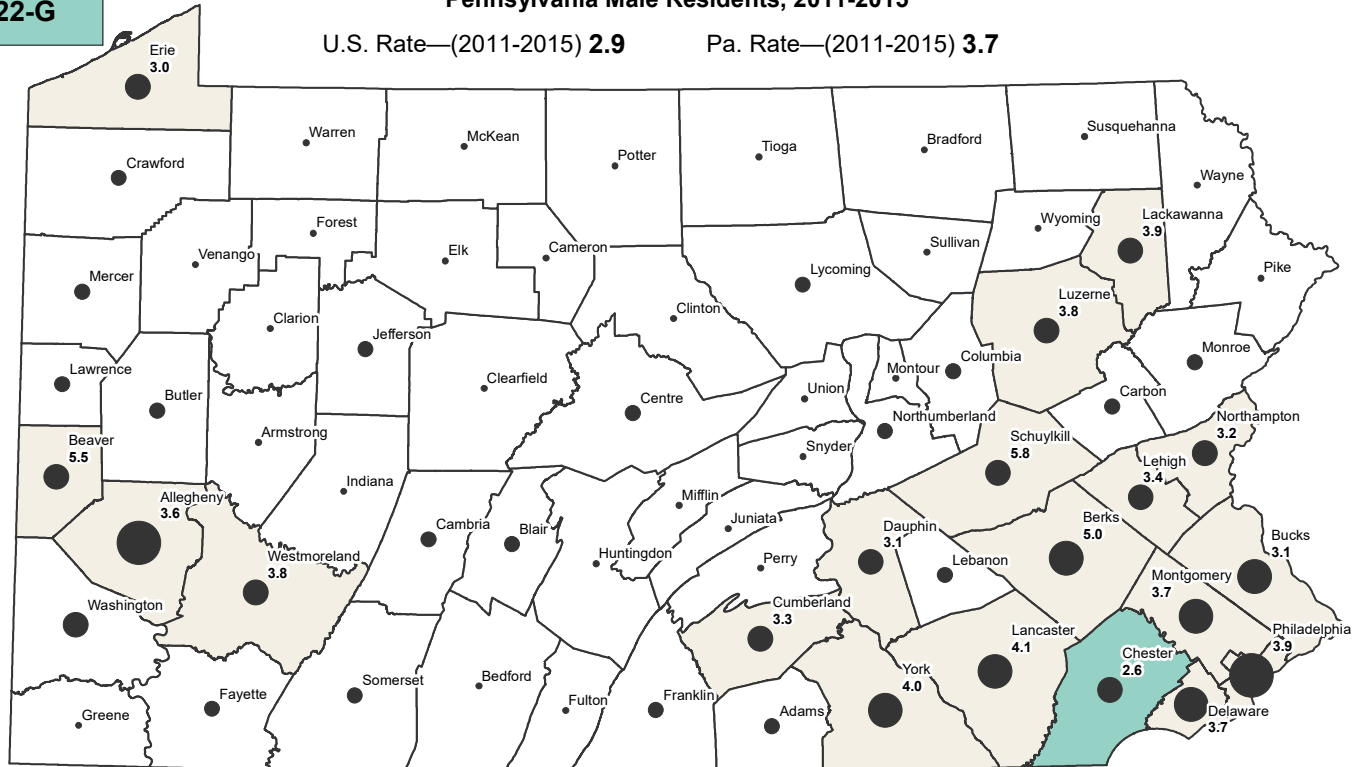
Hodgkin Lymphoma: INCIDENCE

**MAP
22-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **2.9**

Pa. Rate—(2011-2015) **3.7**



Significantly higher

Significantly lower

Not significantly
different

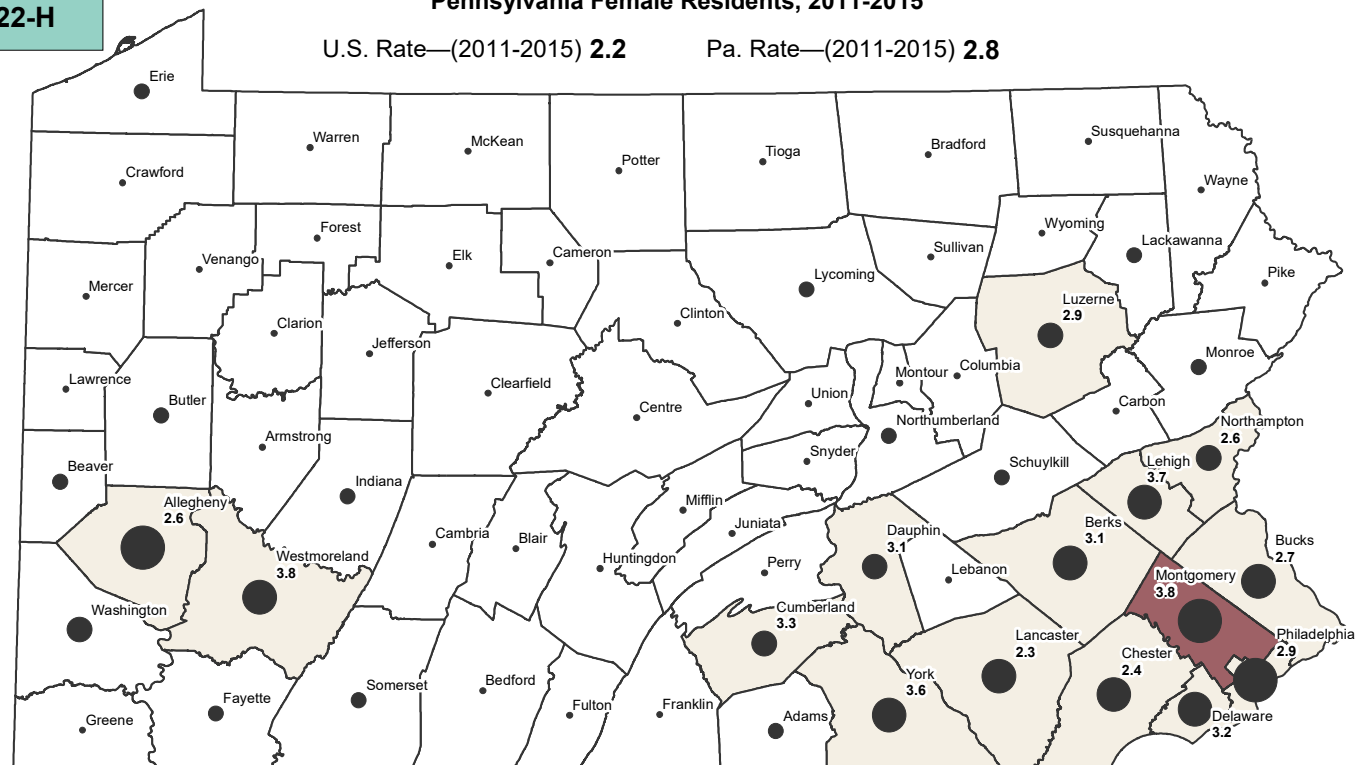
Significance not determined—
less than 20 observed cases

**MAP
22-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **2.2**

Pa. Rate—(2011-2015) **2.8**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Hodgkin Lymphoma: MORTALITY

**TABLE
22-1**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	256	133	0.4	(0.3-0.5)	123	0.3	(0.2-0.4)								
Adams	0	0	ND		0	ND		Juniata	1	1	ND		0	ND	
Allegheny	22	14	ND		8	ND		Lackawanna	6	3	ND		3	ND	
Armstrong	1	0	ND		1	ND		Lancaster	6	1	ND		5	ND	
Beaver	6	3	ND		3	ND		Lawrence	3	2	ND		1	ND	
Bedford	0	0	ND		0	ND		Lebanon	3	3	ND		0	ND	
Berks	13	8	ND		5	ND		Lehigh	7	4	ND		3	ND	
Blair	3	2	ND		1	ND		Luzerne	6	4	ND		2	ND	
Bradford	4	2	ND		2	ND		Lycoming	2	1	ND		1	ND	
Bucks	12	8	ND		4	ND		McKean	1	1	ND		0	ND	
Butler	4	1	ND		3	ND		Mercer	4	4	ND		0	ND	
Cambria	3	1	ND		2	ND		Mifflin	1	0	ND		1	ND	
Cameron	0	0	ND		0	ND		Monroe	3	1	ND		2	ND	
Carbon	0	0	ND		0	ND		Montgomery	18	8	ND		10	ND	
Centre	1	0	ND		1	ND		Montour	0	0	ND		0	ND	
Chester	7	3	ND		4	ND		Northampton	4	2	ND		2	ND	
Clarion	0	0	ND		0	ND		Northumberland	2	0	ND		2	ND	
Clearfield	1	0	ND		1	ND		Perry	1	1	ND		0	ND	
Clinton	2	1	ND		1	ND		Philadelphia	32	12	ND		20	0.4	(0.2-0.6)
Columbia	0	0	ND		0	ND		Pike	0	0	ND		0	ND	
Crawford	1	1	ND		0	ND		Potter	2	1	ND		1	ND	
Cumberland	6	3	ND		3	ND		Schuylkill	9	7	ND		2	ND	
Dauphin	5	2	ND		3	ND		Snyder	0	0	ND		0	ND	
Delaware	8	5	ND		3	ND		Somerset	1	0	ND		1	ND	
Elk	1	1	ND		0	ND		Sullivan	0	0	ND		0	ND	
Erie	7	4	ND		3	ND		Susquehanna	0	0	ND		0	ND	
Fayette	4	2	ND		2	ND		Tioga	0	0	ND		0	ND	
Forest	0	0	ND		0	ND		Union	3	2	ND		1	ND	
Franklin	1	0	ND		1	ND		Venango	0	0	ND		0	ND	
Fulton	1	1	ND		0	ND		Warren	0	0	ND		0	ND	
Greene	1	1	ND		0	ND		Washington	4	2	ND		2	ND	
Huntingdon	3	2	ND		1	ND		Wayne	1	0	ND		1	ND	
Indiana	2	0	ND		2	ND		Westmoreland	6	3	ND		3	ND	
Jefferson	4	3	ND		1	ND		Wyoming	1	0	ND		1	ND	
								York	6	2	ND		4	ND	

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

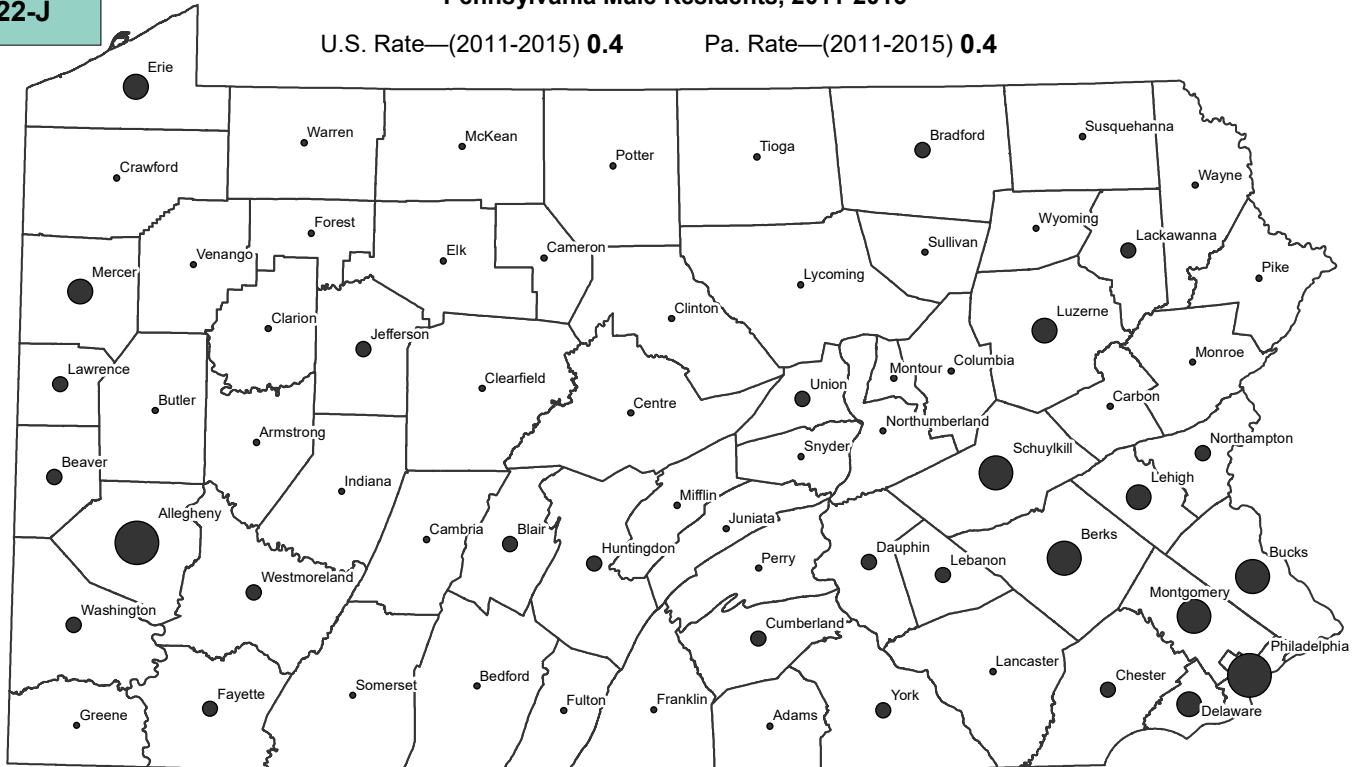
Hodgkin Lymphoma: MORTALITY

MAP
22-J

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **0.4**

Pa. Rate—(2011-2015) **0.4**



Significantly higher

Significantly lower

Not significantly
different

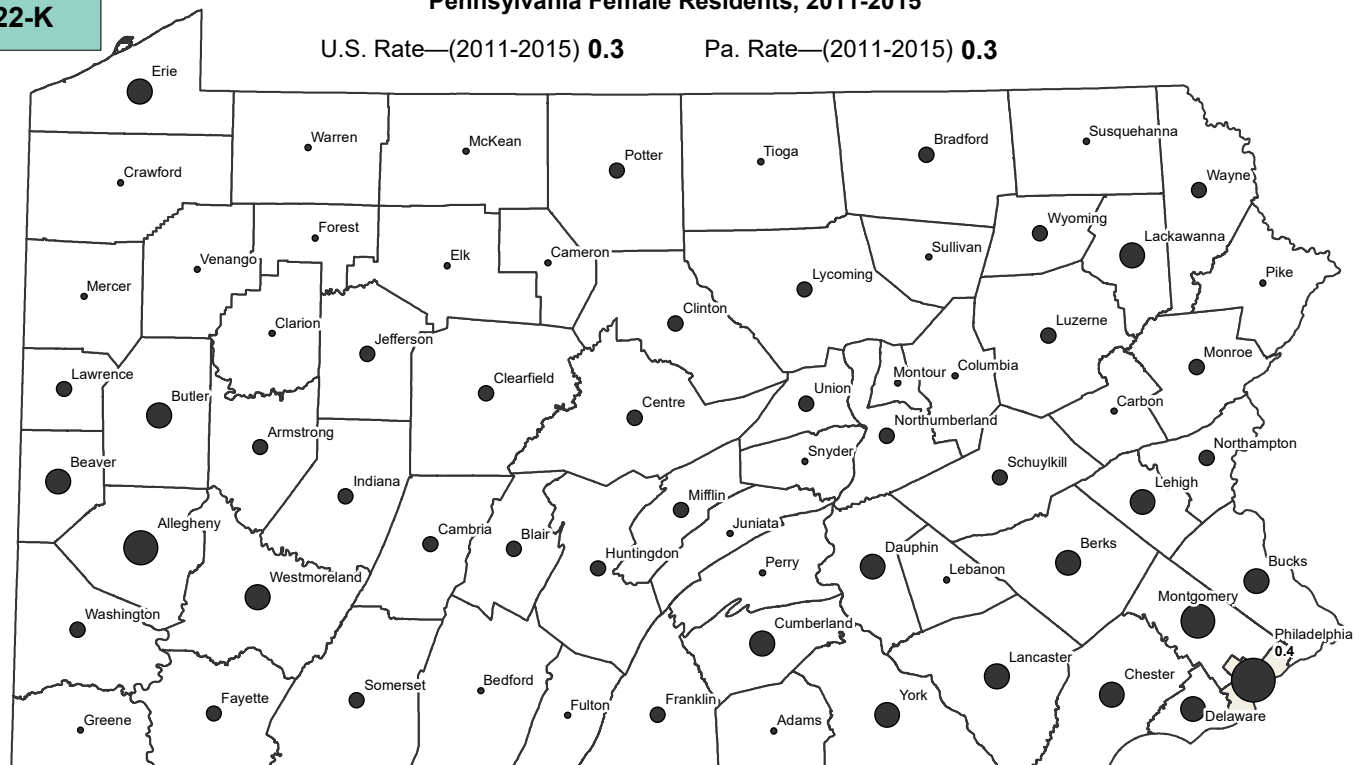
Significance not determined—
less than 20 observed cases

MAP
22-K

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **0.3**

Pa. Rate—(2011-2015) **0.3**



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Myeloma

Data Highlights

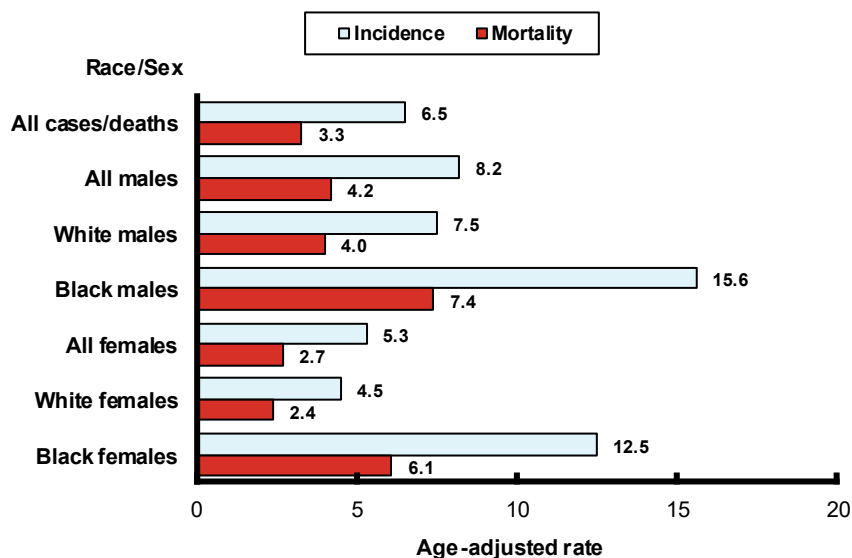
Myeloma is a group of cancers that affect the immune system's plasma cells, often resulting in the formation of tumors in the bone marrow. The 2011-2015 average annual age-adjusted incidence rates for Pennsylvania showed that blacks had higher risk for myeloma compared to whites. The average annual rates for black male and black female residents were 15.6 per 100,000 and 12.5, respectively, compared to 7.5 for white males and 4.5 for white females. The 2011-2015 average annual age-adjusted incidence rate for males (8.2) was about 55 percent higher than the rate for females (5.3).

Myeloma accounted for 1,158 cancer cases diagnosed among Pennsylvania residents in 2015, resulting in an age-adjusted rate of 6.8. Annual age-adjusted incidence rates between 2006 and 2015 showed increasing trends for all four race/sex groups. Like many types of cancer, myeloma has a strong association with age. Approximately 79 percent of the cases diagnosed during the five-year period of 2011-2015 were for Pennsylvania residents 60 years of age or older. The average annual (2011-2015) age-specific incidence rates for myeloma were higher among black males and females for most age groups, compared to whites.

The death rates for myeloma were similar to the incidence rates, largely because nearly all cases were diagnosed at an advanced stage of the disease (see NOTE: below). Ninety-seven percent of myelomas were diagnosed at the distant stage in 2015. In 2015, there were 607 deaths among Pennsylvania residents due to myeloma — an increase from the 2014 figure of 530. This resulted in an age-adjusted rate of 3.5 per 100,000, also up slightly from 3.2 in 2014. During the 10-year period 2006-2015, myeloma death rates among white females showed a decreasing trend. The death rates among white males, black males and black females displayed no evident trends. The average annual (2011-2015) age-specific death rates showed that black males and black females generally had the highest rates.

NOTE: This site includes myeloma and plasmacytomas (plasma cell tumors, malignant). Myeloma cancers are always staged as distant. However, plasmacytomas can be staged as other than distant.

FIGURE 23
Average Annual Age-Adjusted Incidence and Death Rates*
by Sex and Race, Pennsylvania Residents, 2011-2015



Sources: Pennsylvania Cancer Registry and Pennsylvania Death Certificate Dataset
* rate per 100,000 using the U.S. standard population

Risk Factors

According to the American Cancer Society, etiological factors are unknown, although blacks are predisposed. Family history of myeloma, obesity and plasma cell diseases (e.g., solitary plasmacytoma and monoclonal gammopathy of undetermined significance – MGUS) are suggestive.

Early Detection

No screening tests have proven to be effective or are currently being evaluated.

Myeloma: INCIDENCE

**TABLE
23-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,158	6.8 (6.4-7.2)	634	8.5 (7.8-9.2)	546	8.2 (7.5-8.9)	74	13.6 (10.5-16.7)	524	5.6 (5.1-6.1)	408	4.9 (4.4-5.4)	107	13.7 (11.1-16.3)
2014	1,141	6.9 (6.5-7.3)	640	8.7 (8.0-9.4)	533	8.1 (7.4-8.8)	95	17.8 (14.2-21.4)	501	5.5 (5.0-6.0)	382	4.6 (4.1-5.1)	107	14.5 (11.8-17.2)
2013	1,045	6.4 (6.0-6.8)	586	8.1 (7.4-8.8)	480	7.4 (6.7-8.1)	90	16.8 (13.3-20.3)	459	5.1 (4.6-5.6)	367	4.5 (4.0-5.0)	83	11.3 (8.9-13.7)
2012	1,000	6.3 (5.9-6.7)	553	7.8 (7.1-8.5)	437	6.8 (6.2-7.4)	75	14.5 (11.2-17.8)	447	5.0 (4.5-5.5)	338	4.3 (3.8-4.8)	82	11.2 (8.8-13.6)
2011	986	6.2 (5.8-6.6)	549	7.9 (7.2-8.6)	461	7.3 (6.6-8.0)	75	15.2 (11.8-18.6)	437	4.9 (4.4-5.4)	339	4.2 (3.8-4.6)	85	11.8 (9.3-14.3)
2010	988	6.2 (5.8-6.6)	522	7.5 (6.9-8.1)	444	7.1 (6.4-7.8)	65	13.5 (10.2-16.8)	466	5.2 (4.7-5.7)	372	4.6 (4.1-5.1)	83	11.6 (9.1-14.1)
2009	948	6.1 (5.7-6.5)	506	7.6 (6.9-8.3)	420	6.9 (6.2-7.6)	67	14.8 (11.3-18.3)	442	5.1 (4.6-5.6)	349	4.4 (3.9-4.9)	86	12.6 (9.9-15.3)
2008	857	5.6 (5.2-6.0)	471	7.3 (6.6-8.0)	396	6.7 (6.0-7.4)	60	13.1 (9.8-16.4)	386	4.5 (4.1-4.9)	315	4.0 (3.6-4.4)	68	10.3 (7.9-12.7)
2007	879	5.9 (5.5-6.3)	459	7.4 (6.7-8.1)	400	7.1 (6.4-7.8)	50	11.1 (8.0-14.2)	420	4.9 (4.4-5.4)	343	4.3 (3.8-4.8)	70	10.6 (8.1-13.1)
2006	800	5.4 (5.0-5.8)	415	6.6 (6.0-7.2)	343	6.0 (5.4-6.6)	65	14.6 (11.1-18.1)	385	4.5 (4.1-4.9)	312	4.0 (3.6-4.4)	65	10.1 (7.6-12.6)

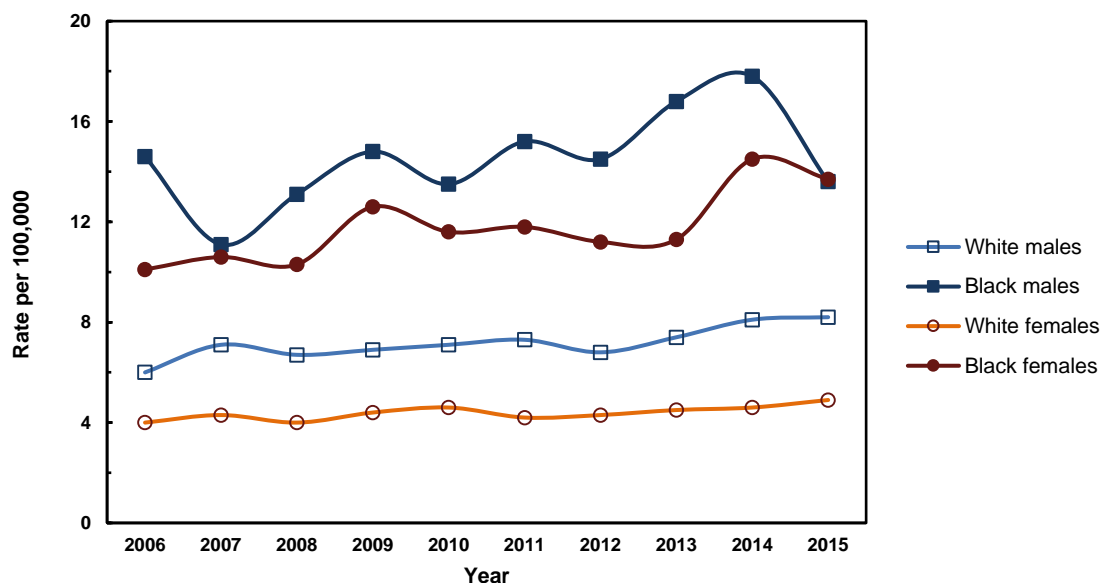
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
23-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Myeloma: INCIDENCE

**TABLE
23-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

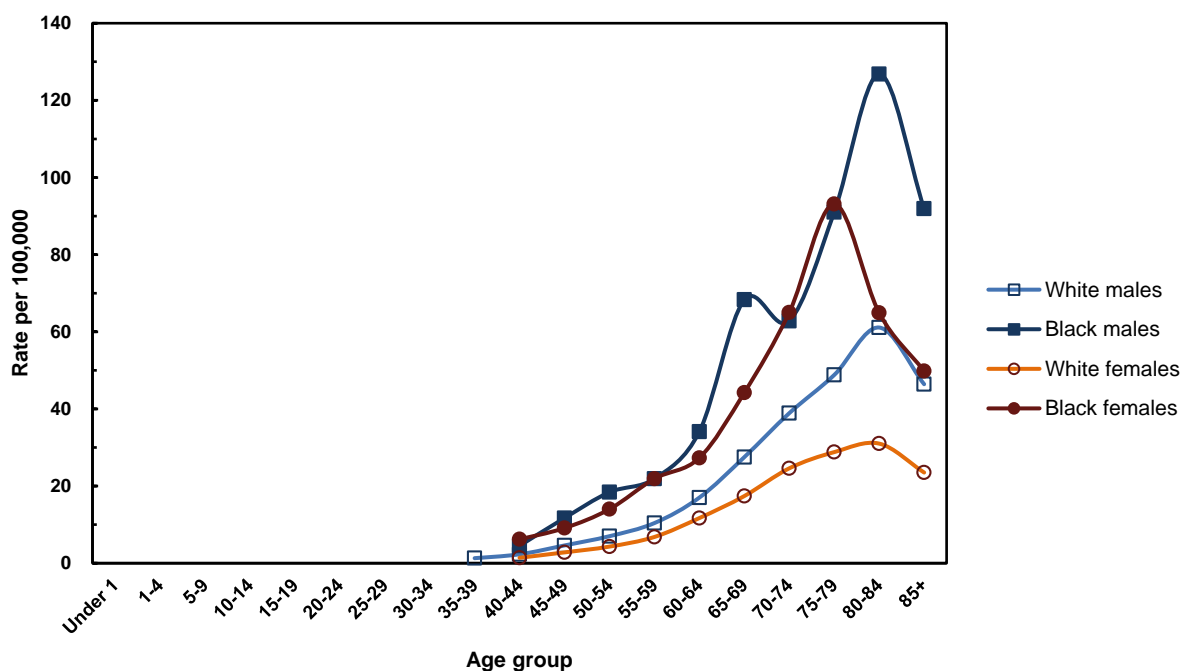
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	8.3	9.5	9.4	11.6	7.2	6.8	12.1
Under 1	ND	ND	ND	ND	ND	ND	ND
1-4	ND	ND	ND	ND	ND	ND	ND
5-9	ND	ND	ND	ND	ND	ND	ND
10-14	ND	ND	ND	ND	ND	ND	ND
15-19	ND	ND	ND	ND	ND	ND	ND
20-24	ND	ND	ND	ND	ND	ND	ND
25-29	ND	ND	ND	ND	ND	ND	ND
30-34	0.3	ND	ND	ND	ND	ND	ND
35-39	1.1	1.4	1.3	ND	0.8	ND	ND
40-44	2.3	2.5	2.3	4.5	2.1	1.4	6.2
45-49	4.3	5.2	4.6	11.7	3.5	2.8	9.1
50-54	6.7	8.2	7.0	18.4	5.3	4.3	14.0
55-59	9.7	11.4	10.4	21.9	8.1	6.8	21.9
60-64	15.6	18.4	17.0	34.1	13.0	11.7	27.3
65-69	24.8	30.4	27.5	68.3	19.7	17.4	44.2
70-74	34.1	41.0	38.9	62.8	28.2	24.6	65.0
75-79	42.0	52.2	48.8	91.0	34.2	28.8	93.1
80-84	46.8	66.2	61.1	126.8	34.0	31.0	64.9
85+	33.6	50.0	46.4	91.9	25.7	23.5	49.8

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
23-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Myeloma: INCIDENCE

**TABLE
23-C**

Total Number of Cancer Cases by Age, Sex and Race Pennsylvania Residents, 2011-2015

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	5,330	2,962	2,457	409	2,368	1,834	464
Under 1	0	0	0	0	0	0	0
1-4	1	0	0	0	1	1	0
5-9	0	0	0	0	0	0	0
10-14	0	0	0	0	0	0	0
15-19	1	1	0	1	0	0	0
20-24	1	1	1	0	0	0	0
25-29	2	1	0	1	1	1	0
30-34	10	4	2	2	6	1	4
35-39	41	26	19	7	15	8	7
40-44	94	51	39	10	43	24	15
45-49	191	113	85	27	78	53	23
50-54	323	193	144	42	130	90	36
55-59	455	261	209	44	194	142	51
60-64	631	359	297	52	272	214	52
65-69	787	456	373	71	331	259	62
70-74	799	438	378	44	361	282	67
75-79	756	406	347	44	350	266	74
80-84	690	388	333	40	302	252	40
85+	548	264	230	24	284	241	33

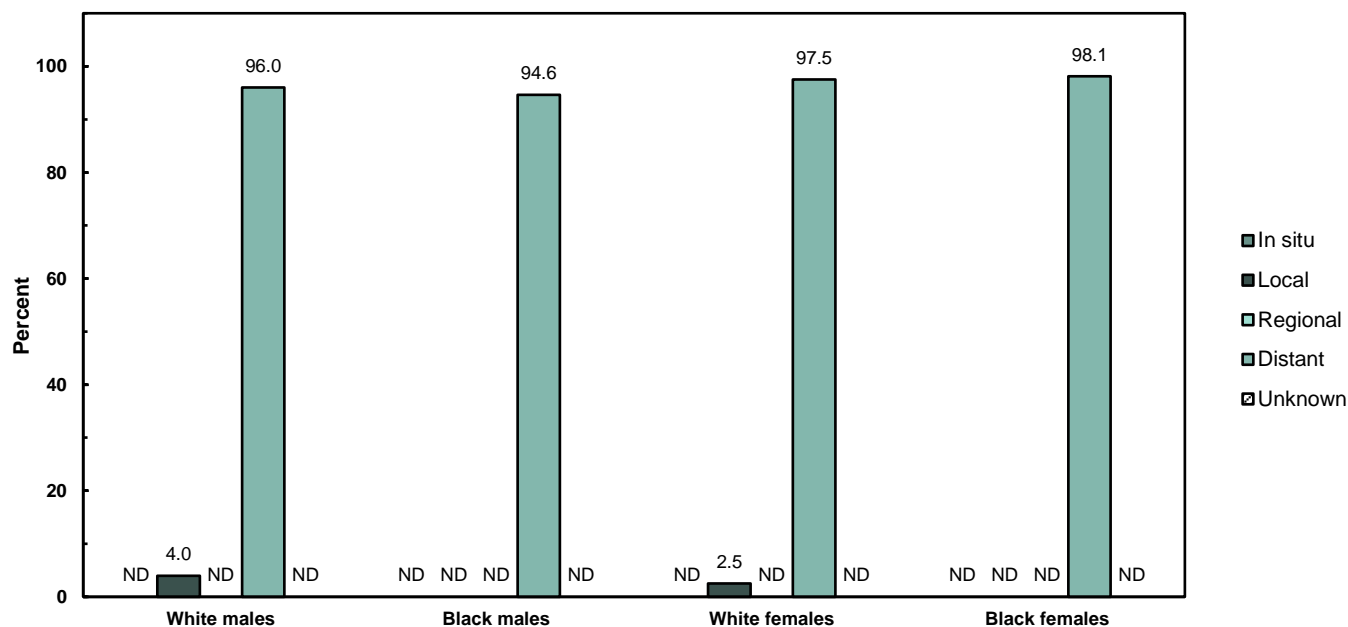
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
23-C**

Stage of Disease at Diagnosis, Percent by Sex and Race Pennsylvania Residents, 2015



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Cases Microscopically Confirmed: 1,036 - 89.5%

Myeloma: MORTALITY

**TABLE
23-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	607	3.5 (3.2-3.8)	337	4.7 (4.2-5.2)	290	4.4 (3.9-4.9)	39	8.4 (5.8-11.0)	270	2.7 (2.4-3.0)	207	2.3 (2.0-2.6)	57	7.3 (5.4-9.2)
2014	530	3.2 (2.9-3.5)	293	4.1 (3.6-4.6)	249	3.8 (3.3-4.3)	41	8.6 (6.0-11.2)	237	2.5 (2.2-2.8)	187	2.2 (1.9-2.5)	46	6.3 (4.5-8.1)
2013	557	3.3 (3.0-3.6)	294	4.2 (3.7-4.7)	252	4.0 (3.5-4.5)	33	7.5 (4.9-10.1)	263	2.7 (2.4-3.0)	216	2.4 (2.1-2.7)	41	5.8 (4.0-7.6)
2012	517	3.1 (2.8-3.4)	267	3.8 (3.3-4.3)	234	3.6 (3.1-4.1)	21	4.6 (2.6-6.6)	250	2.7 (2.4-3.0)	197	2.3 (2.0-2.6)	45	6.0 (4.2-7.8)
2011	563	3.4 (3.1-3.7)	292	4.3 (3.8-4.8)	256	4.2 (3.7-4.7)	35	7.9 (5.3-10.5)	271	2.8 (2.5-3.1)	231	2.7 (2.4-3.0)	38	4.9 (3.3-6.5)
2010	573	3.5 (3.2-3.8)	280	4.2 (3.7-4.7)	244	4.0 (3.5-4.5)	35	8.1 (5.4-10.8)	293	3.1 (2.7-3.5)	253	2.9 (2.5-3.3)	39	5.6 (3.8-7.4)
2009	462	3.0 (2.7-3.3)	252	3.9 (3.4-4.4)	211	3.6 (3.1-4.1)	37	8.0 (5.4-10.6)	210	2.3 (2.0-2.6)	167	2.0 (1.7-2.3)	43	6.3 (4.4-8.2)
2008	550	3.6 (3.3-3.9)	292	4.6 (4.1-5.1)	257	4.5 (3.9-5.1)	35	8.6 (5.8-11.4)	258	2.8 (2.5-3.1)	218	2.6 (2.3-2.9)	38	5.7 (3.9-7.5)
2007	512	3.4 (3.1-3.7)	263	4.4 (3.9-4.9)	228	4.2 (3.7-4.7)	34	8.3 (5.5-11.1)	249	2.8 (2.5-3.1)	216	2.6 (2.3-2.9)	32	4.8 (3.1-6.5)
2006	526	3.5 (3.2-3.8)	253	4.2 (3.7-4.7)	216	4.0 (3.5-4.5)	37	8.4 (5.7-11.1)	273	3.0 (2.6-3.4)	235	2.9 (2.5-3.3)	36	5.5 (3.7-7.3)

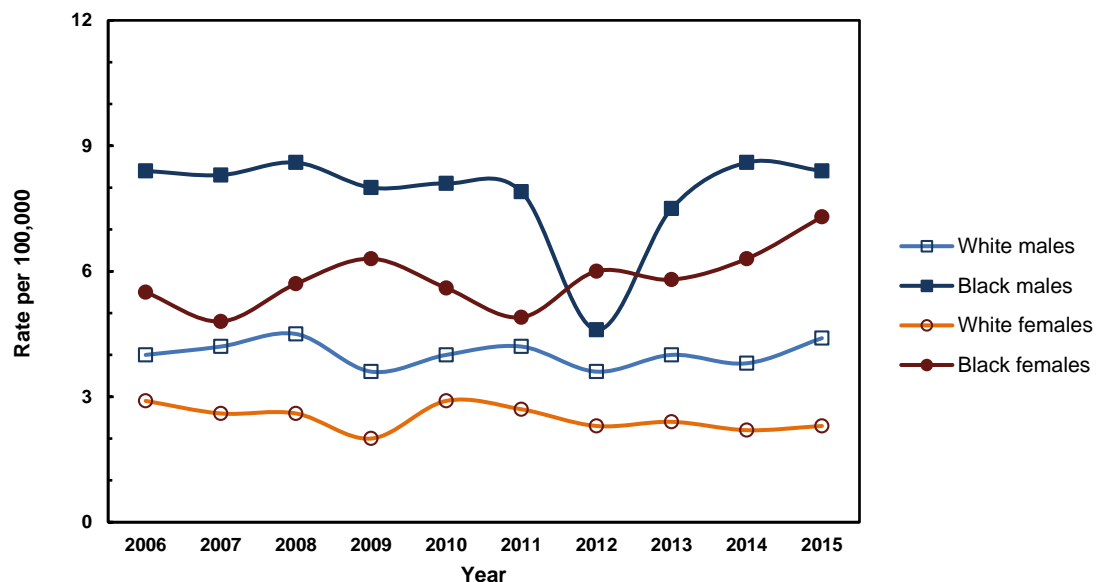
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
23-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Myeloma: MORTALITY

**TABLE
23-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	2,774	4.3	1,483	4.8	1,281	4.9	169	4.8	1,291	4.0	1,038	3.8	227	5.9
Under 1	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
1-4	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
5-9	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
10-14	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
15-19	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
20-24	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
25-29	1	ND	1	ND	1	ND	0	ND	0	ND	0	ND	0	ND
30-34	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND
35-39	8	ND	4	ND	4	ND	0	ND	4	ND	4	ND	0	ND
40-44	23	0.6	12	0.6	9	ND	2	ND	11	0.5	8	ND	2	ND
45-49	35	0.8	26	1.2	19	1.0	6	ND	9	ND	4	ND	3	ND
50-54	96	2.0	62	2.6	44	2.1	14	6.1	34	1.4	25	1.2	7	ND
55-59	144	3.1	89	3.9	75	3.7	13	6.5	55	2.3	41	2.0	13	5.6
60-64	226	5.6	116	6.0	103	5.9	10	6.6	110	5.3	78	4.3	30	15.7
65-69	339	10.7	195	13.0	164	12.1	26	25.0	144	8.6	109	7.3	30	21.4
70-74	385	16.4	202	18.9	178	18.3	23	32.8	183	14.3	140	12.2	40	38.8
75-79	434	24.1	241	31.0	212	29.8	22	45.5	193	18.9	156	16.9	33	41.5
80-84	511	34.7	272	46.4	242	44.4	25	79.3	239	26.9	210	25.8	28	45.4
85+	572	35.0	263	49.8	230	46.4	28	107.2	309	28.0	263	25.6	41	61.8

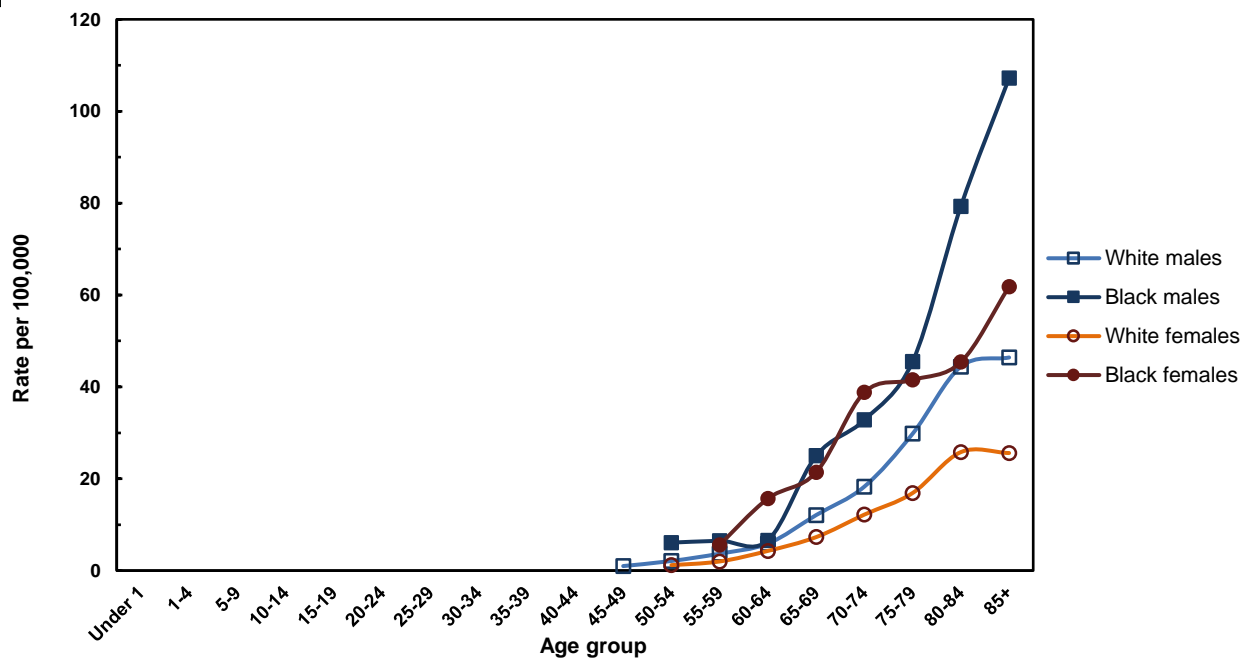
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
23-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Myeloma: INCIDENCE

**TABLE
23-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	5,330	2,962	8.2	(7.9-8.5)	2,368	5.3	(5.1-5.5)								
Adams	46	26	8.6	(5.3-11.9)	20	5.1	(2.9-7.3)	Juniata	11	6	ND		5	ND	
Allegheny	559	318	9.1	(8.1-10.1)	241	5.1	(4.5-5.7)	Lackawanna	84	54	8.4	(6.2-10.6)	30	3.6	(2.3-4.9)
Armstrong	35	17	ND		18	ND		Lancaster	195	117	7.9	(6.5-9.3)	78	4.3	(3.3-5.3)
Beaver	80	47	8.3	(5.9-10.7)	33	4.6	(3.0-6.2)	Lawrence	37	18	ND		19	ND	
Bedford	20	12	ND		8	ND		Lebanon	56	31	7.6	(4.9-10.3)	25	4.9	(3.0-6.8)
Berks	189	107	9.5	(7.7-11.3)	82	6.4	(5.0-7.8)	Lehigh	168	93	9.9	(7.9-11.9)	75	6.5	(5.0-8.0)
Blair	51	30	7.5	(4.8-10.2)	21	4.2	(2.4-6.0)	Luzerne	141	86	8.6	(6.8-10.4)	55	4.4	(3.2-5.6)
Bradford	32	15	ND		17	ND		Lycoming	64	37	11.2	(7.6-14.8)	27	5.9	(3.7-8.1)
Bucks	235	145	8.1	(6.8-9.4)	90	4.0	(3.2-4.8)	McKean	13	8	ND		5	ND	
Butler	72	41	7.1	(4.9-9.3)	31	4.8	(3.1-6.5)	Mercer	44	24	6.3	(3.8-8.8)	20	4.8	(2.7-6.9)
Cambria	56	22	4.6	(2.7-6.5)	34	5.5	(3.7-7.3)	Mifflin	21	14	ND		7	ND	
Cameron	2	2	ND		0	ND		Monroe	71	38	7.5	(5.1-9.9)	33	6.2	(4.1-8.3)
Carbon	30	17	ND		13	ND		Montgomery	331	185	8.1	(6.9-9.3)	146	5.1	(4.3-5.9)
Centre	31	17	ND		14	ND		Montour	8	6	ND		2	ND	
Chester	200	113	8.5	(6.9-10.1)	87	5.4	(4.3-6.5)	Northampton	149	76	9.1	(7.1-11.1)	73	7.0	(5.4-8.6)
Clarion	22	12	ND		10	ND		Northumberland	39	21	6.9	(3.9-9.9)	18	ND	
Clearfield	32	16	ND		16	ND		Perry	17	9	ND		8	ND	
Clinton	10	5	ND		5	ND		Philadelphia	721	360	11.0	(9.9-12.1)	361	8.0	(7.2-8.8)
Columbia	25	12	ND		13	ND		Pike	31	22	10.9	(6.3-15.5)	9	ND	
Crawford	40	22	8.7	(5.1-12.3)	18	ND		Potter	10	8	ND		2	ND	
Cumberland	90	58	8.2	(6.1-10.3)	32	3.5	(2.3-4.7)	Schuylkill	64	41	8.7	(6.0-11.4)	23	4.1	(2.4-5.8)
Dauphin	85	49	6.6	(4.8-8.4)	36	4.1	(2.8-5.4)	Snyder	16	10	ND		6	ND	
Delaware	200	100	6.9	(5.5-8.3)	100	5.2	(4.2-6.2)	Somerset	40	19	ND		21	7.0	(4.0-10.0)
Elk	11	7	ND		4	ND		Sullivan	6	4	ND		2	ND	
Erie	88	46	5.9	(4.2-7.6)	42	4.6	(3.2-6.0)	Susquehanna	16	5	ND		11	ND	
Fayette	56	23	4.9	(2.9-6.9)	33	5.8	(3.8-7.8)	Tioga	16	13	ND		3	ND	
Forest	3	2	ND		1	ND		Union	18	9	ND		9	ND	
Franklin	62	34	7.3	(4.8-9.8)	28	4.9	(3.1-6.7)	Venango	17	8	ND		9	ND	
Fulton	4	1	ND		3	ND		Warren	20	12	ND		8	ND	
Greene	10	5	ND		5	ND		Washington	80	51	7.7	(5.6-9.8)	29	3.5	(2.2-4.8)
Huntingdon	16	10	ND		6	ND		Wayne	15	7	ND		8	ND	
Indiana	29	16	ND		13	ND		Westmoreland	173	99	8.1	(6.5-9.7)	74	4.8	(3.7-5.9)
Jefferson	24	14	ND		10	ND		Wyoming	11	8	ND		3	ND	
								York	182	102	8.3	(6.7-9.9)	80	5.6	(4.4-6.8)

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

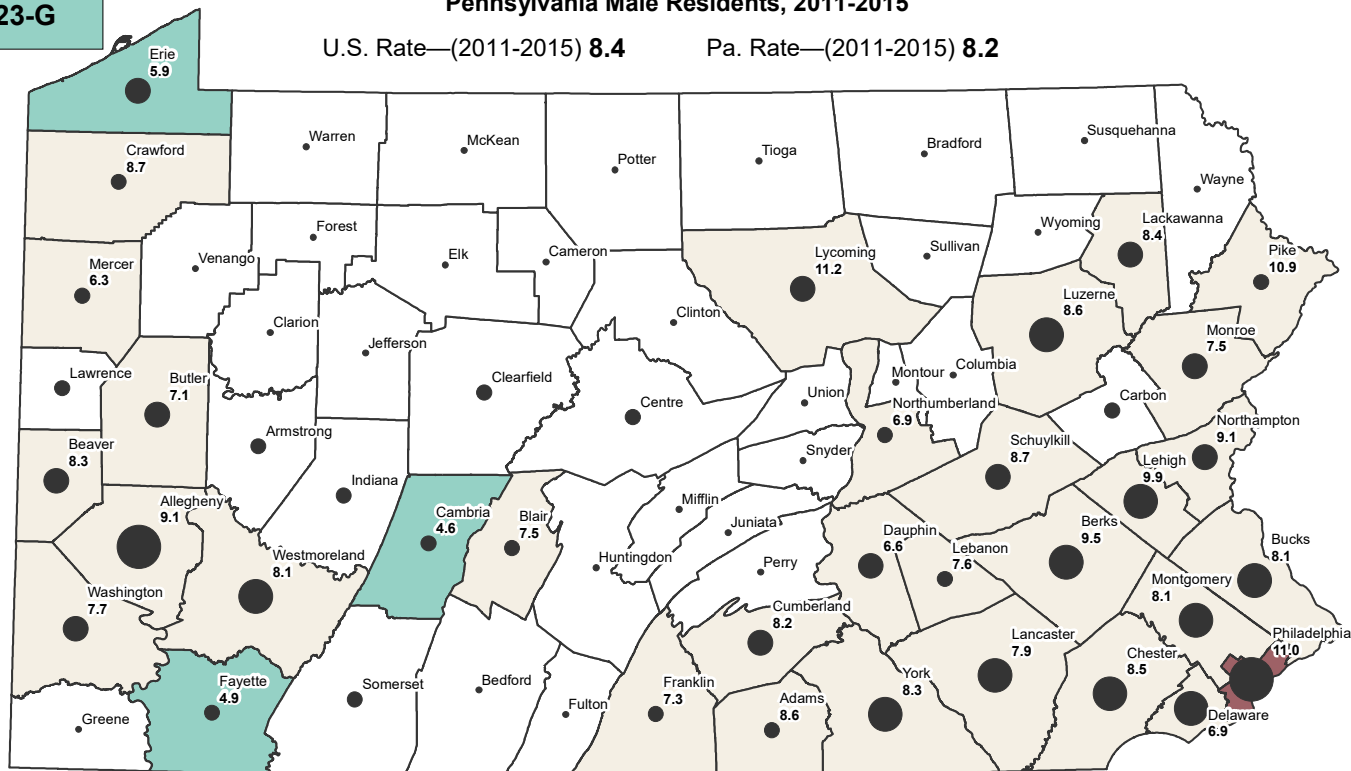
Myeloma: INCIDENCE

**MAP
23-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **8.4**

Pa. Rate—(2011-2015) **8.2**



Significantly higher

Significantly lower

Not significantly
different

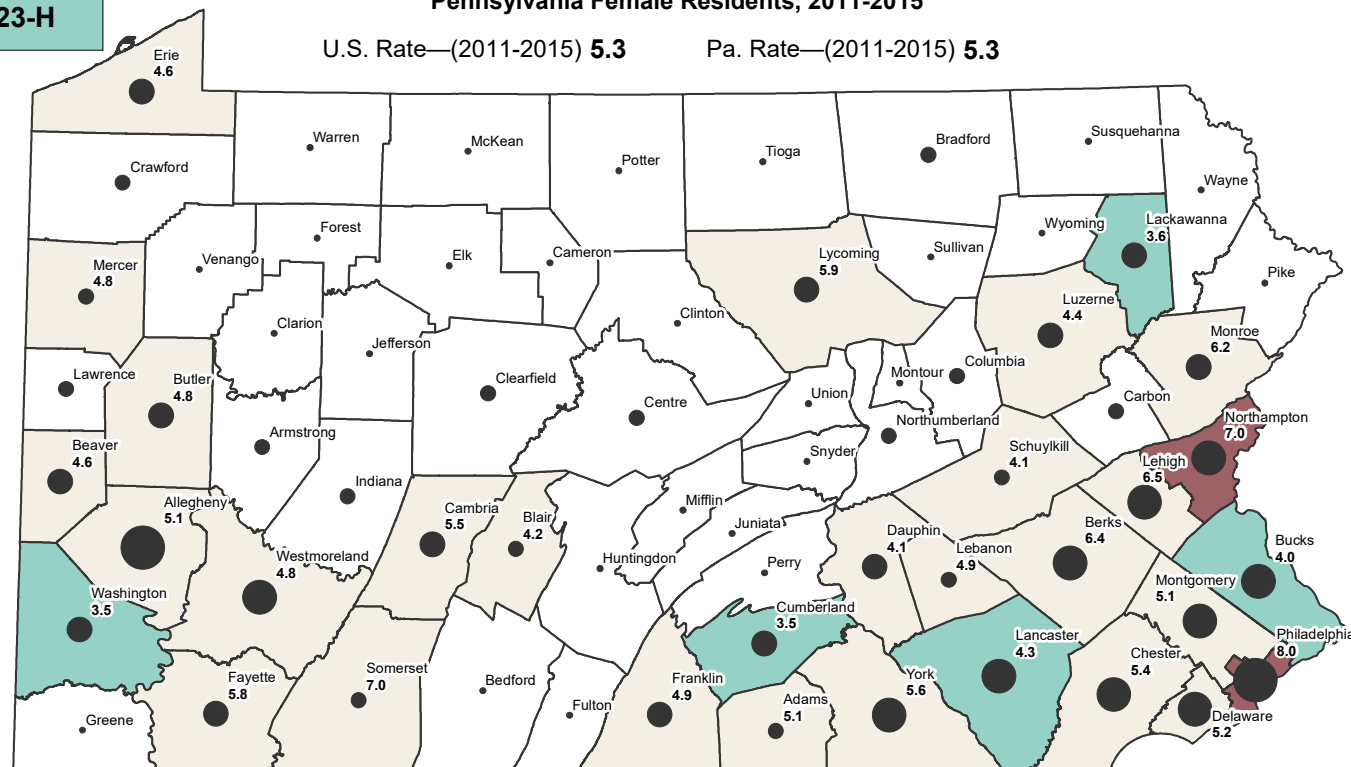
Significance not determined—
less than 20 observed cases

**MAP
23-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **5.3**

Pa. Rate—(2011-2015) **5.3**



The symbol, ●, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Myeloma: MORTALITY

**TABLE
23-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	2,774	1,483	4.2	(4.0-4.4)	1,291	2.7	(2.6-2.8)								
Adams	18	9	ND		9	ND		Juniata	8	5	ND		3	ND	
Allegheny	290	152	4.3	(3.6-5.0)	138	2.7	(2.2-3.2)	Lackawanna	55	32	5.0	(3.3-6.7)	23	2.6	(1.5-3.7)
Armstrong	14	8	ND		6	ND		Lancaster	114	62	4.2	(3.2-5.2)	52	2.7	(2.0-3.4)
Beaver	41	22	3.9	(2.3-5.5)	19	ND		Lawrence	28	14	ND		14	ND	
Bedford	12	6	ND		6	ND		Lebanon	26	14	ND		12	ND	
Berks	73	43	4.0	(2.8-5.2)	30	2.2	(1.4-3.0)	Lehigh	67	39	4.1	(2.8-5.4)	28	2.1	(1.3-2.9)
Blair	29	13	ND		16	ND		Luzerne	61	34	3.4	(2.3-4.5)	27	1.8	(1.1-2.5)
Bradford	12	5	ND		7	ND		Lycoming	32	16	ND		16	ND	
Bucks	129	82	4.8	(3.8-5.8)	47	1.9	(1.4-2.4)	McKean	3	0	ND		3	ND	
Butler	32	15	ND		17	ND		Mercer	18	9	ND		9	ND	
Cambria	32	14	ND		18	ND		Mifflin	10	7	ND		3	ND	
Cameron	1	1	ND		0	ND		Monroe	35	15	ND		20	3.9	(2.2-5.6)
Carbon	14	6	ND		8	ND		Montgomery	161	90	4.0	(3.2-4.8)	71	2.3	(1.8-2.8)
Centre	18	10	ND		8	ND		Montour	3	1	ND		2	ND	
Chester	109	69	5.5	(4.2-6.8)	40	2.4	(1.7-3.1)	Northampton	74	46	5.5	(3.9-7.1)	28	2.3	(1.4-3.2)
Clarion	14	9	ND		5	ND		Northumberland	24	12	ND		12	ND	
Clearfield	21	10	ND		11	ND		Perry	12	8	ND		4	ND	
Clinton	9	4	ND		5	ND		Philadelphia	353	157	5.0	(4.2-5.8)	196	4.1	(3.5-4.7)
Columbia	19	10	ND		9	ND		Pike	12	8	ND		4	ND	
Crawford	21	13	ND		8	ND		Potter	2	2	ND		0	ND	
Cumberland	39	23	3.4	(2.0-4.8)	16	ND		Schuylkill	28	18	ND		10	ND	
Dauphin	54	31	4.8	(3.1-6.5)	23	2.5	(1.5-3.5)	Snyder	7	3	ND		4	ND	
Delaware	125	67	4.8	(3.7-5.9)	58	3.0	(2.2-3.8)	Somerset	21	10	ND		11	ND	
Elk	12	8	ND		4	ND		Sullivan	2	0	ND		2	ND	
Erie	60	30	4.1	(2.6-5.6)	30	3.1	(2.0-4.2)	Susquehanna	8	5	ND		3	ND	
Fayette	29	12	ND		17	ND		Tioga	7	7	ND		0	ND	
Forest	1	1	ND		0	ND		Union	15	6	ND		9	ND	
Franklin	34	22	4.8	(2.8-6.8)	12	ND		Venango	14	7	ND		7	ND	
Fulton	3	2	ND		1	ND		Warren	11	5	ND		6	ND	
Greene	4	2	ND		2	ND		Washington	45	25	3.9	(2.4-5.4)	20	2.0	(1.1-2.9)
Huntingdon	11	4	ND		7	ND		Wayne	13	6	ND		7	ND	
Indiana	17	11	ND		6	ND		Westmoreland	108	54	4.3	(3.2-5.4)	54	3.3	(2.4-4.2)
Jefferson	14	6	ND		8	ND		Wyoming	4	1	ND		3	ND	
								York	82	45	3.9	(2.8-5.0)	37	2.4	(1.6-3.2)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

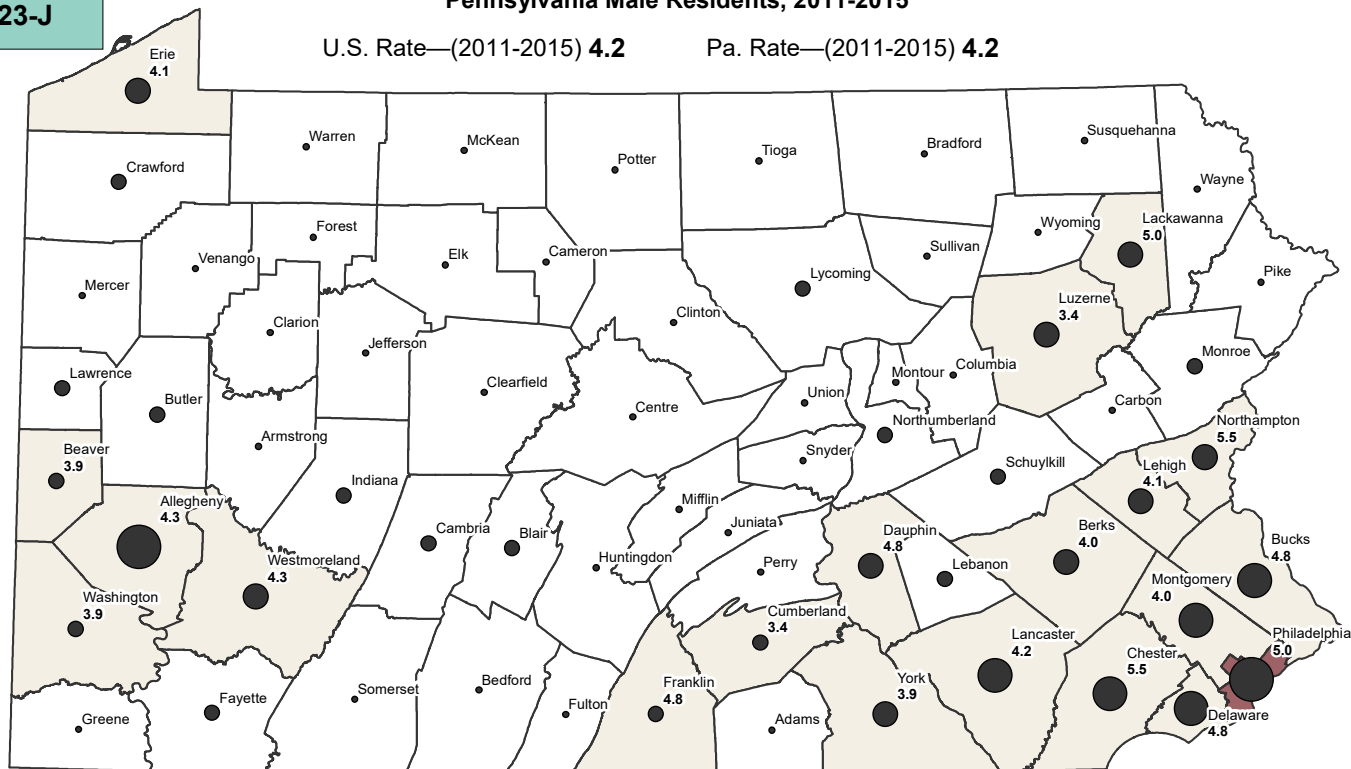
Myeloma: MORTALITY

**MAP
23-J**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **4.2**

Pa. Rate—(2011-2015) **4.2**



Significantly higher

Significantly lower

Not significantly
different

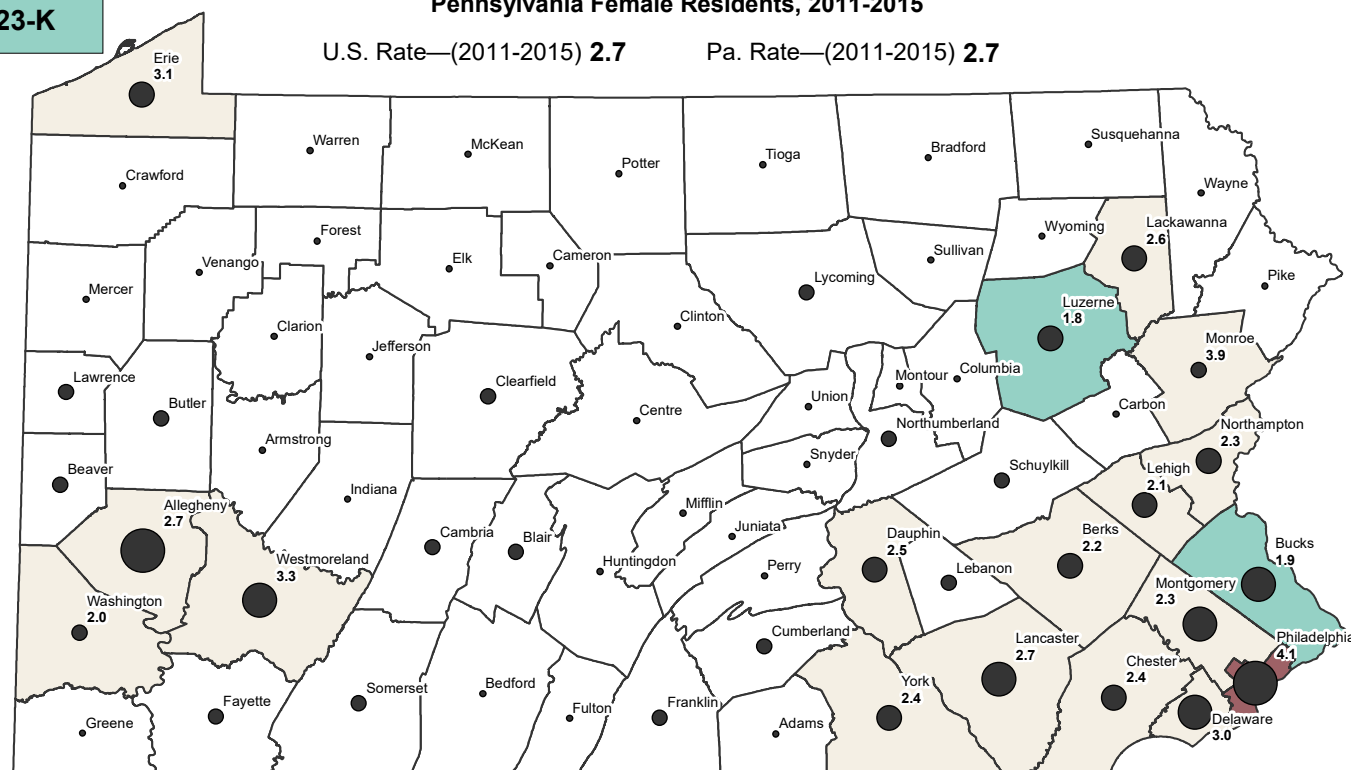
Significance not determined—
less than 20 observed cases

**MAP
23-K**

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **2.7**

Pa. Rate—(2011-2015) **2.7**



The symbol, ●, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Leukemia

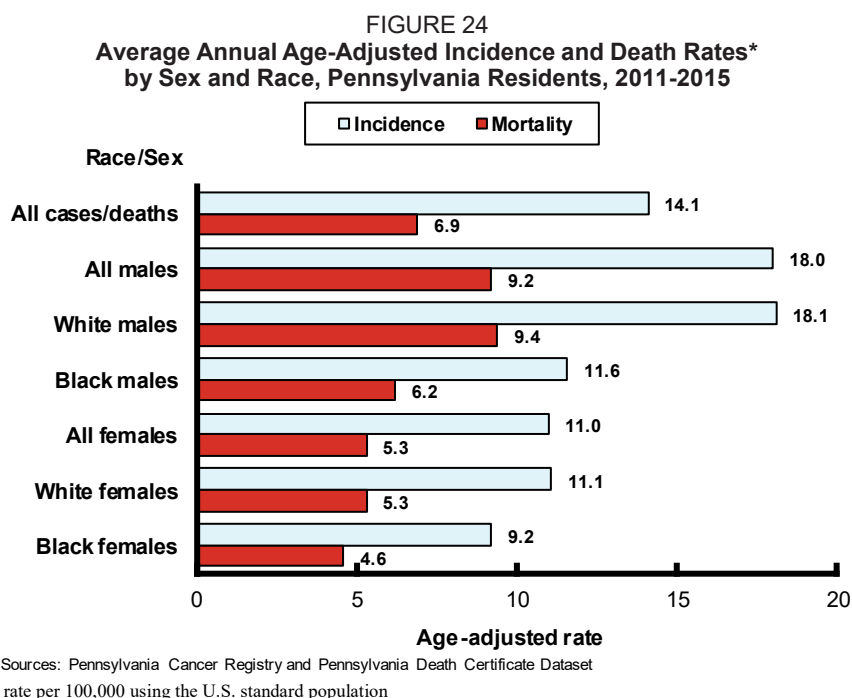
Data Highlights

Leukemia is a diverse group of blood and/or bone marrow cancers that usually affect leukocytes (a type of white blood cell). The 2011-2015 average annual age-adjusted incidence rate for leukemia was much higher for males (18.0 per 100,000) than for females (11.0). The 2,302 cases of leukemia diagnosed in 2015 among residents resulted in an age-adjusted rate of 14.4 – an increase from 2014, when there were 2,252 cases, yielding an age-adjusted rate of 14.2. Annual age-adjusted incidence rates for the period of 2006-2015 did not have any obvious trends among the four sex/race groups. White males consistently had the highest rates among the four sex/race groups.

About 5 percent of leukemia cases occurred among children under 15 years of age during the period of 2011-2015. Among children under 15, the highest incidence rates occurred for those under 5 years of age. The average annual age-specific incidence rates for the five-year period of 2011-2015 decreased from infancy through 29 years of age and then began to rise, especially for ages over 60.

There were 1,088 deaths due to leukemia among Pennsylvania residents in 2015, resulting in an age-adjusted rate of 6.4 per 100,000 — the lowest age-adjusted rate observed during the 10-year period 2006-2015. As observed with leukemia incidence rates, the 2011-2015 average annual age-adjusted death rates were higher for males (9.2) than for females (5.3). Annual age-adjusted death rates from 2006 to 2015 showed decreasing trends for white males, black males and white females. There was no evident trend among black females over this period. White males generally had the highest age-specific death rates. Average annual (2011-2015) age-specific death rates for males were generally higher than the rates for females, especially for ages 70 and older.

NOTE: This site includes leukemia and myeloid sarcomas (granulocytic sarcoma and chloroma). Most leukemias are staged as distant, apart from death certificate-only cases, which are staged as unknown. However, myeloid sarcomas can be staged as other than distant.



Risk Factors

According to the American Cancer Society, suggestive risks include high dose radiation exposure, certain chemical exposures (benzene, chemotherapy drugs), Epstein-Barr virus (mononucleosis), tobacco smoking, inherited syndromes, immune system suppression, human t-cell leukemia viruses, chromosomal nondisjunction syndromes and polycythemia vera (and other blood disorders).

Early Detection

No screening tests have proven to be effective or are currently being evaluated.

Leukemia: INCIDENCE

**TABLE
24-A**

**Number of Cancer Cases, Age-adjusted Incidence Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Cases*		Males						Females					
	All Races*		White		Black		All Races*		White		Black		All Races*	
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	2,302	14.4 (13.8-15.0)	1,356	18.8 (17.8-19.8)	1,225	19.0 (17.9-20.1)	79	13.3 (10.4-16.2)	946	11.1 (10.4-11.8)	858	11.7 (10.9-12.5)	66	8.1 (6.1-10.1)
2014	2,252	14.2 (13.6-14.8)	1,327	18.8 (17.8-19.8)	1,200	19.0 (17.9-20.1)	71	12.0 (9.2-14.8)	925	10.6 (9.9-11.3)	835	10.9 (10.2-11.6)	59	7.5 (5.6-9.4)
2013	2,089	13.4 (12.8-14.0)	1,194	17.0 (16.0-18.0)	1,082	17.2 (16.2-18.2)	65	10.7 (8.1-13.3)	895	10.8 (10.1-11.5)	788	10.8 (10.0-11.6)	70	9.3 (7.1-11.5)
2012	2,116	13.7 (13.1-14.3)	1,194	17.3 (16.3-18.3)	1,044	17.1 (16.1-18.1)	61	10.4 (7.8-13.0)	922	10.9 (10.2-11.6)	764	10.4 (9.7-11.1)	76	10.2 (7.9-12.5)
2011	2,223	14.6 (14.0-15.2)	1,246	18.2 (17.2-19.2)	1,127	18.4 (17.3-19.5)	60	11.4 (8.5-14.3)	977	11.8 (11.1-12.5)	855	11.8 (11.0-12.6)	81	10.9 (8.5-13.3)
2010	2,036	13.5 (12.9-14.1)	1,155	17.2 (16.2-18.2)	1,018	17.1 (16.0-18.2)	79	14.8 (11.5-18.1)	881	10.6 (9.9-11.3)	792	11.0 (10.2-11.8)	58	8.3 (6.2-10.4)
2009	1,937	13.1 (12.5-13.7)	1,107	17.1 (16.1-18.1)	994	17.1 (16.0-18.2)	56	11.5 (8.5-14.5)	830	9.9 (9.2-10.6)	738	9.9 (9.2-10.6)	55	7.7 (5.7-9.7)
2008	1,769	12.2 (11.6-12.8)	996	15.8 (14.8-16.8)	894	15.7 (14.7-16.7)	67	14.3 (10.9-17.7)	773	9.7 (9.0-10.4)	698	9.8 (9.1-10.5)	56	8.4 (6.2-10.6)
2007	1,806	12.7 (12.1-13.3)	1,043	17.0 (16.0-18.0)	930	16.8 (15.7-17.9)	65	14.5 (11.0-18.0)	763	9.7 (9.0-10.4)	686	9.7 (9.0-10.4)	47	7.0 (5.0-9.0)
2006	1,857	13.1 (12.5-13.7)	1,024	16.8 (15.8-17.8)	923	16.8 (15.7-17.9)	59	12.3 (9.2-15.4)	833	10.3 (9.6-11.0)	751	10.4 (9.7-11.1)	45	6.8 (4.8-8.8)

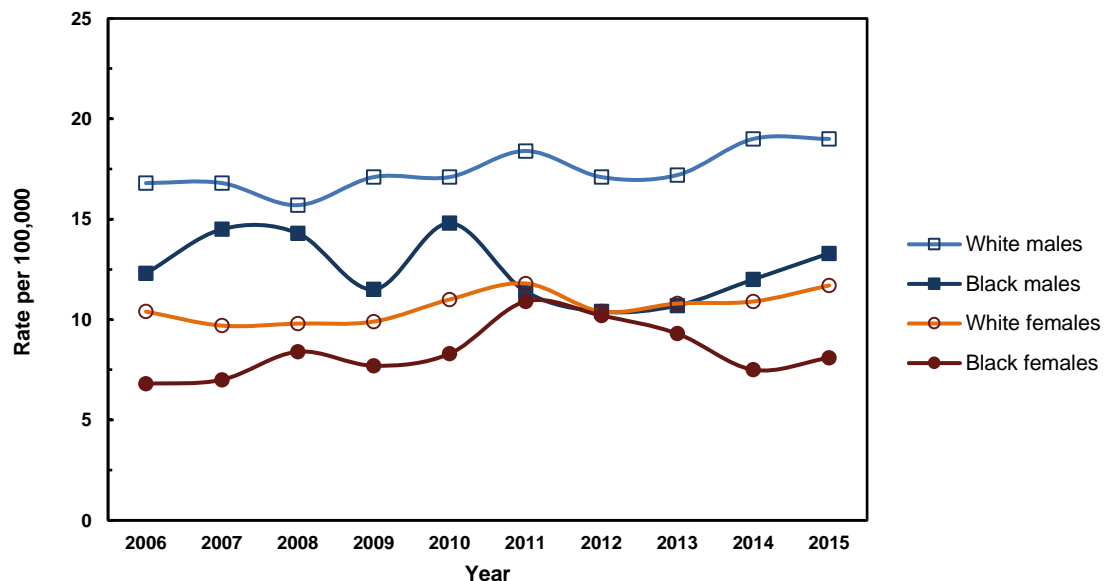
* Includes unknown/other race and sex.

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
24-A**

**Age-adjusted Incidence Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Cancer Registry

Leukemia: INCIDENCE

**TABLE
24-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

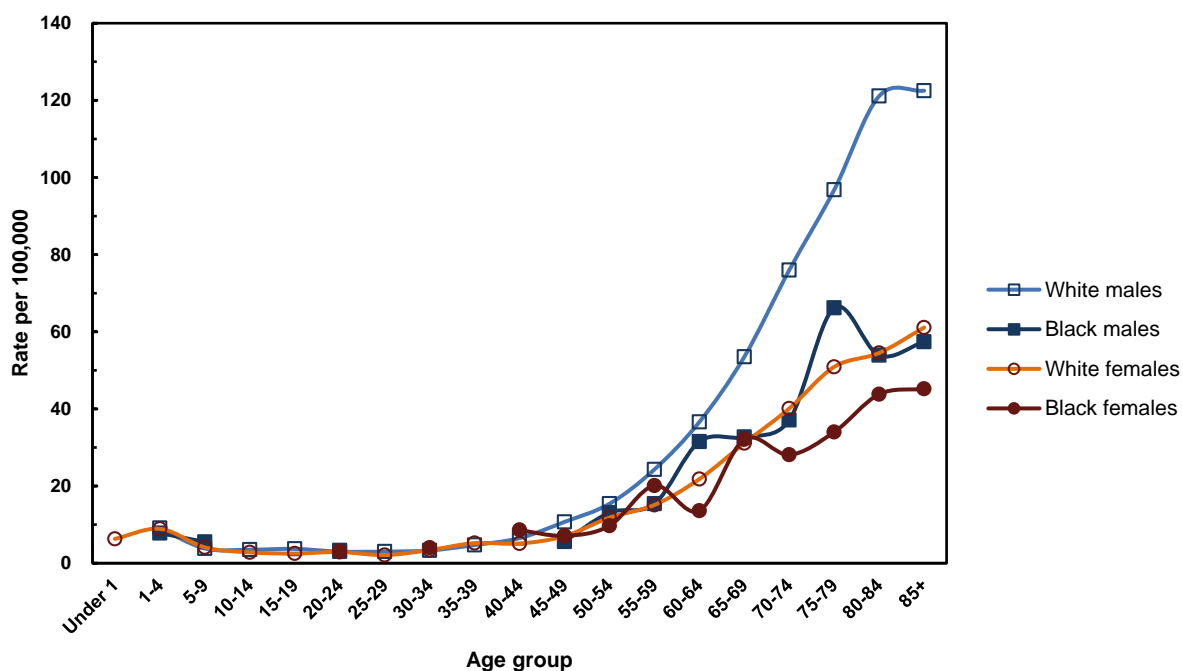
Age Group	All Cases	Males			Females		
		All Races	White	Black	All Races	White	Black
Total	17.2	20.2	21.8	9.5	14.3	15.1	9.2
Under 1	4.3	3.6	ND	ND	5.2	6.3	ND
1-4	8.8	9.4	9.1	7.8	8.1	8.9	ND
5-9	4.1	4.3	3.8	5.5	3.8	4.1	ND
10-14	3.3	3.7	3.5	ND	2.8	2.8	ND
15-19	3.0	3.4	3.7	ND	2.6	2.5	ND
20-24	2.9	3.0	3.0	3.3	2.8	2.9	3.1
25-29	2.6	3.0	3.0	ND	2.3	2.1	ND
30-34	3.4	3.4	3.3	ND	3.4	3.4	4.0
35-39	4.8	4.9	4.7	ND	4.6	5.2	ND
40-44	5.8	6.2	6.5	ND	5.5	5.1	8.6
45-49	8.5	10.1	10.7	5.6	7.0	7.0	7.1
50-54	13.3	15.2	15.4	13.1	11.5	11.8	9.7
55-59	19.5	23.6	24.3	15.4	15.6	15.1	20.1
60-64	28.8	37.1	36.6	31.5	21.0	21.8	13.6
65-69	41.5	52.5	53.5	32.7	31.6	31.1	32.1
70-74	55.0	74.0	76.0	37.1	39.2	40.1	28.1
75-79	69.9	95.5	96.8	66.2	50.4	50.9	34.0
80-84	80.9	120.3	121.1	53.9	54.9	54.5	43.8
85+	83.4	124.9	122.5	57.4	63.5	61.1	45.2

SOURCE: Pennsylvania Cancer Registry

NOTES: Rates are per 100,000 population and are based on only invasive cancer cases. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
24-B**

**Average Annual Age-specific Incidence Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Cancer Registry

Leukemia: INCIDENCE

**TABLE
24-C**

**Total Number of Cancer Cases by Age, Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Cases*	Males			Females		
		All Races*	White	Black	All Races*	White	Black
Total	10,982	6,317	5,678	336	4,665	4,100	352
Under 1	31	13	9	0	18	17	0
1-4	252	138	100	18	114	93	7
5-9	151	81	55	15	70	57	6
10-14	127	74	54	7	53	41	5
15-19	130	75	64	7	55	41	7
20-24	128	67	52	11	61	48	10
25-29	109	62	50	6	47	34	9
30-34	132	66	53	9	66	52	10
35-39	173	89	69	9	84	76	3
40-44	236	125	109	8	111	85	21
45-49	374	219	198	13	155	131	18
50-54	641	359	316	30	282	249	25
55-59	910	538	490	31	372	313	47
60-64	1,163	724	638	48	439	399	26
65-69	1,317	787	726	34	530	464	45
70-74	1,291	790	738	26	501	459	29
75-79	1,258	742	689	32	516	470	27
80-84	1,193	705	660	17	488	443	27
85+	1,361	660	607	15	701	627	30

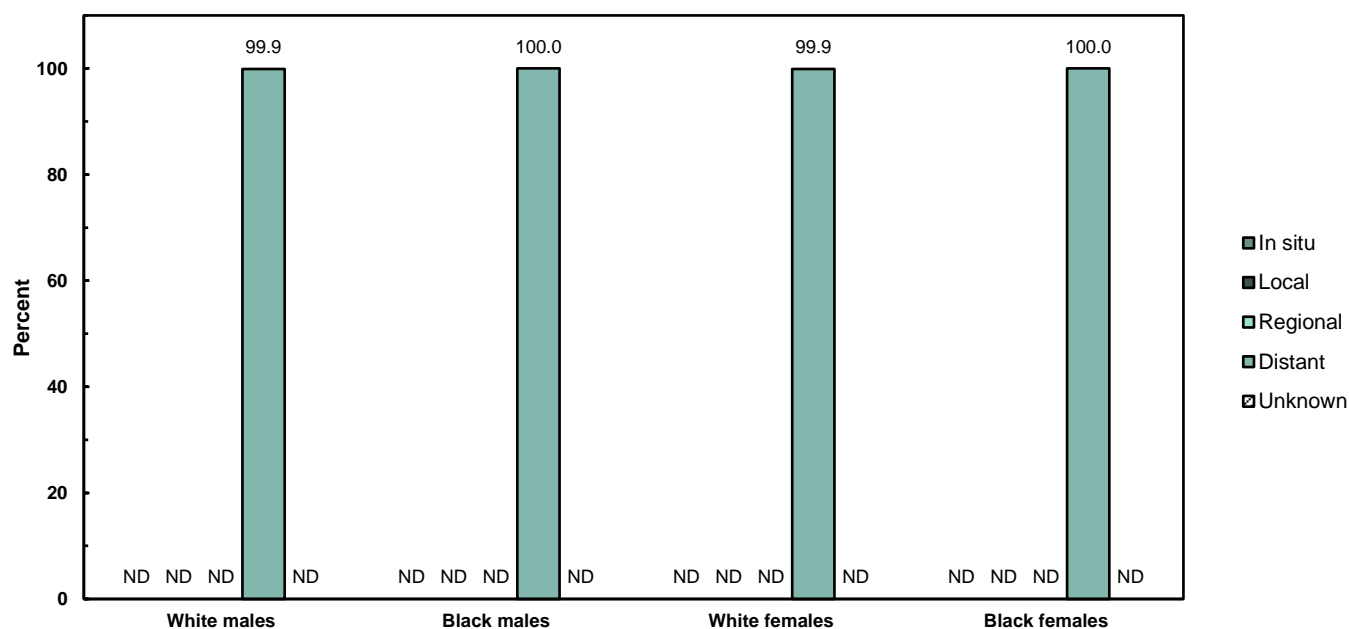
* Includes any unknowns

SOURCE: Pennsylvania Cancer Registry

NOTE: Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
24-C**

**Stage of Disease at Diagnosis, Percent by Sex and Race
Pennsylvania Residents, 2015**



Source: Pennsylvania Cancer Registry

NOTE: Percentages based on less than 10 events are statistically unreliable and not displayed (ND).

Number and Percent of Cases Microscopically Confirmed: 2,037 - 88.5%

Leukemia: MORTALITY

**TABLE
24-D**

**Number of Cancer Deaths, Age-adjusted Death Rates and 95% Confidence Intervals
by Sex, Race and Year, Pennsylvania Residents, 2006-2015**

Year	All Deaths*		Males						Females					
	All Races*		White		Black		All Races*		White		Black			
	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)	No.	Rate (CI)
2015	1,088	6.4 (6.0-6.8)	623	8.7 (8.0-9.4)	576	8.9 (8.2-9.6)	33	6.3 (4.2-8.4)	465	4.9 (4.5-5.3)	425	5.0 (4.5-5.5)	27	3.4 (2.1-4.7)
2014	1,134	6.8 (6.4-7.2)	635	9.1 (8.4-9.8)	587	9.3 (8.5-10.1)	33	5.3 (3.5-7.1)	499	5.1 (4.7-5.5)	455	5.2 (4.7-5.7)	33	4.1 (2.7-5.5)
2013	1,114	6.8 (6.4-7.2)	620	8.8 (8.1-9.5)	577	9.0 (8.3-9.7)	31	6.1 (4.0-8.2)	494	5.3 (4.8-5.8)	446	5.3 (4.8-5.8)	34	4.6 (3.1-6.1)
2012	1,170	7.2 (6.8-7.6)	654	9.5 (8.8-10.2)	605	9.7 (8.9-10.5)	30	6.0 (3.9-8.1)	516	5.6 (5.1-6.1)	462	5.6 (5.1-6.1)	39	5.2 (3.6-6.8)
2011	1,194	7.4 (7.0-7.8)	673	9.9 (9.2-10.6)	631	10.2 (9.4-11.0)	36	7.1 (4.8-9.4)	521	5.6 (5.1-6.1)	473	5.6 (5.1-6.1)	42	5.8 (4.0-7.6)
2010	1,127	7.1 (6.7-7.5)	621	9.4 (8.7-10.1)	580	9.7 (8.9-10.5)	37	7.6 (5.2-10.0)	506	5.5 (5.0-6.0)	467	5.6 (5.1-6.1)	34	5.2 (3.5-6.9)
2009	1,157	7.5 (7.1-7.9)	653	10.2 (9.4-11.0)	608	10.4 (9.6-11.2)	40	8.8 (6.1-11.5)	504	5.6 (5.1-6.1)	467	5.7 (5.2-6.2)	35	5.1 (3.4-6.8)
2008	1,193	7.9 (7.5-8.3)	682	11.0 (10.2-11.8)	642	11.3 (10.4-12.2)	35	8.1 (5.4-10.8)	511	5.7 (5.2-6.2)	465	5.7 (5.2-6.2)	41	6.2 (4.3-8.1)
2007	1,136	7.6 (7.2-8.0)	639	10.7 (9.9-11.5)	591	10.8 (9.9-11.7)	41	9.5 (6.6-12.4)	497	5.6 (5.1-6.1)	456	5.6 (5.1-6.1)	34	5.1 (3.4-6.8)
2006	1,134	7.7 (7.3-8.1)	574	9.8 (9.0-10.6)	534	10.0 (9.2-10.8)	36	8.5 (5.7-11.3)	560	6.5 (6.0-7.0)	527	6.7 (6.1-7.3)	29	4.4 (2.8-6.0)

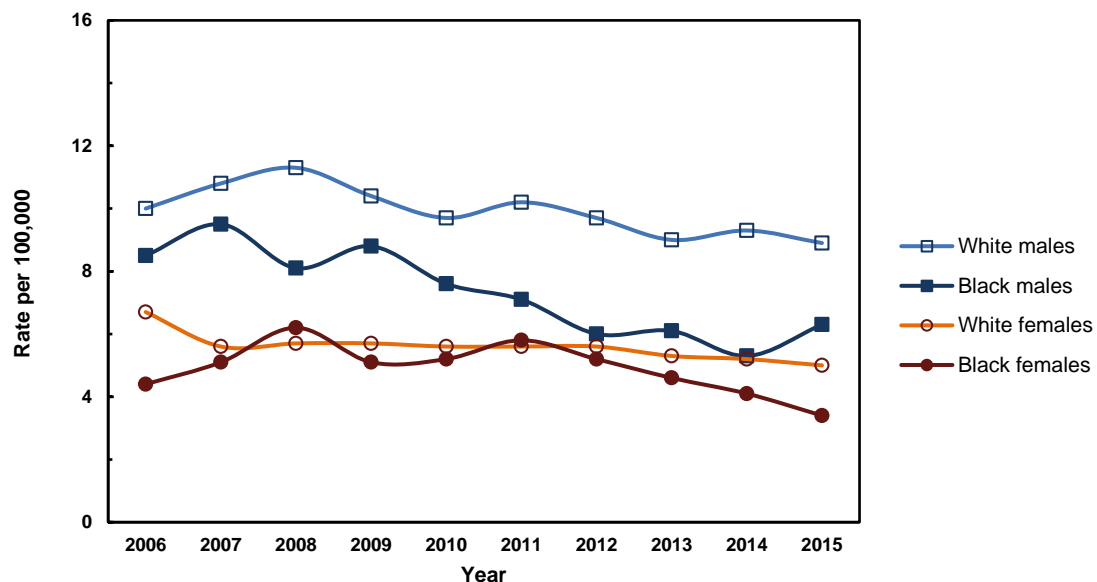
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND) above and below. CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

**FIGURE
24-D**

**Age-adjusted Death Rates by Sex and Race
Pennsylvania Residents, 2006-2015**



Source: Pennsylvania Death Certificate Dataset

Leukemia: MORTALITY

**TABLE
24-E**

**Number of Deaths and Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**

Age Group	All Deaths*		Males						Females					
			All Races*		White		Black		All Races*		White		Black	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Total*	5,700	8.9	3,205	10.3	2,976	11.4	163	4.6	2,495	7.6	2,261	8.3	175	4.6
Under 1	2	ND	1	ND	1	ND	0	ND	1	ND	0	ND	0	ND
1-4	17	0.6	5	ND	3	ND	2	ND	12	0.9	9	ND	1	ND
5-9	15	0.4	8	ND	7	ND	1	ND	7	ND	5	ND	2	ND
10-14	20	0.5	10	0.5	8	ND	2	ND	10	0.5	9	ND	1	ND
15-19	26	0.6	14	0.6	5	ND	2	ND	12	0.6	11	0.7	1	ND
20-24	50	1.1	28	1.3	21	1.2	5	ND	22	1.0	15	0.9	7	ND
25-29	31	0.7	15	0.7	13	0.8	1	ND	16	0.8	10	0.6	2	ND
30-34	36	0.9	21	1.1	19	1.2	0	ND	15	0.8	13	0.8	1	ND
35-39	39	1.1	17	0.9	13	0.9	1	ND	22	1.2	15	1.0	1	ND
40-44	65	1.6	23	1.1	16	1.0	6	ND	42	2.1	31	1.9	9	ND
45-49	92	2.1	56	2.6	45	2.4	8	ND	36	1.6	27	1.4	9	ND
50-54	185	3.8	111	4.7	97	4.7	12	5.2	74	3.0	60	2.9	11	4.3
55-59	259	5.5	157	6.9	138	6.9	15	7.5	102	4.3	83	4.0	14	6.0
60-64	440	10.9	292	15.0	257	14.7	27	17.7	148	7.1	131	7.1	13	6.8
65-69	542	17.1	334	22.3	309	22.8	18	17.3	208	12.4	183	12.3	17	12.1
70-74	672	28.6	406	38.0	379	39.0	18	25.7	266	20.8	243	21.2	20	19.4
75-79	860	47.8	485	62.4	464	65.2	16	33.1	375	36.6	351	38.0	15	18.9
80-84	997	67.6	574	98.0	552	101.3	16	50.7	423	47.6	401	49.3	17	27.6
85+	1,352	82.8	648	122.6	629	126.9	13	49.8	704	63.7	664	64.7	34	51.3

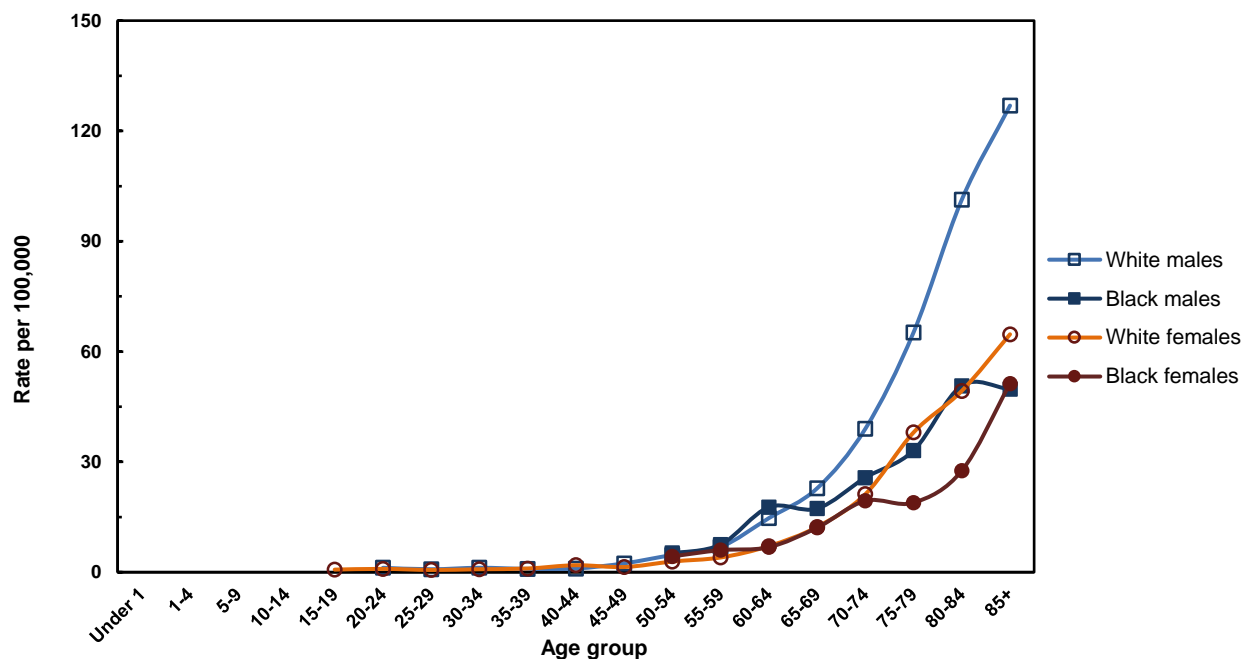
* Includes any unknowns

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Rates are per 100,000 for each specified group. Crude rates based on less than 10 events are statistically unreliable and are not displayed (ND) above and below. Cancer primary site/type groupings follow the site definitions used by the National Cancer Institute's SEER program.

**FIGURE
24-E**

**Average Annual Age-specific Death Rates by Sex and Race
Pennsylvania Residents, 2011-2015**



Source: Pennsylvania Death Certificate Dataset

Leukemia: INCIDENCE

**TABLE
24-F**

**Number of Cases, Average Annual Age-adjusted Incidence Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Cases	Males			Females			County	Total Cases	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	10,982	6,317	18.0	(17.6-18.4)	4,665	11.0	(10.7-11.3)								
Adams	101	54	17.8	(13.1-22.5)	47	14.5	(10.4-18.6)	Juniata	25	12	ND		13	ND	
Allegheny	1,210	675	19.7	(18.2-21.2)	535	12.4	(11.3-13.5)	Lackawanna	161	88	14.4	(11.4-17.4)	73	9.2	(7.1-11.3)
Armstrong	58	38	17.1	(11.7-22.5)	20	8.0	(4.5-11.5)	Lancaster	541	292	19.7	(17.4-22.0)	249	14.6	(12.8-16.4)
Beaver	158	101	19.2	(15.5-22.9)	57	8.3	(6.1-10.5)	Lawrence	95	61	21.9	(16.4-27.4)	34	11.0	(7.3-14.7)
Bedford	53	32	19.0	(12.4-25.6)	21	11.6	(6.6-16.6)	Lebanon	120	70	18.0	(13.8-22.2)	50	10.7	(7.7-13.7)
Berks	361	221	19.3	(16.8-21.8)	140	10.8	(9.0-12.6)	Lehigh	302	186	20.3	(17.4-23.2)	116	10.1	(8.3-11.9)
Blair	145	81	19.9	(15.6-24.2)	64	13.6	(10.3-16.9)	Luzerne	321	186	19.4	(16.6-22.2)	135	11.3	(9.4-13.2)
Bradford	71	36	19.3	(13.0-25.6)	35	15.1	(10.1-20.1)	Lycoming	116	66	19.6	(14.9-24.3)	50	13.0	(9.4-16.6)
Bucks	479	272	15.5	(13.7-17.3)	207	10.0	(8.6-11.4)	McKean	33	17	ND		16	ND	
Butler	178	89	17.4	(13.8-21.0)	89	14.1	(11.2-17.0)	Mercer	103	65	17.5	(13.2-21.8)	38	9.5	(6.5-12.5)
Cambria	169	101	23.1	(18.6-27.6)	68	12.5	(9.5-15.5)	Mifflin	37	23	15.7	(9.3-22.1)	14	ND	
Cameron	5	3	ND		2	ND		Monroe	146	78	17.6	(13.7-21.5)	68	13.1	(10.0-16.2)
Carbon	65	39	20.5	(14.1-26.9)	26	12.1	(7.4-16.8)	Montgomery	611	363	16.6	(14.9-18.3)	248	8.9	(7.8-10.0)
Centre	92	61	18.0	(13.5-22.5)	31	8.3	(5.4-11.2)	Montour	26	18	ND		8	ND	
Chester	471	291	22.1	(19.6-24.6)	180	11.7	(10.0-13.4)	Northampton	306	190	22.4	(19.2-25.6)	116	11.9	(9.7-14.1)
Clarion	30	17	ND		13	ND		Northumberland	92	55	18.7	(13.8-23.6)	37	11.3	(7.7-14.9)
Clearfield	72	40	16.4	(11.3-21.5)	32	10.8	(7.1-14.5)	Perry	45	28	25.7	(16.2-35.2)	17	ND	
Clinton	39	24	20.4	(12.2-28.6)	15	ND		Philadelphia	897	482	14.4	(13.1-15.7)	415	9.3	(8.4-10.2)
Columbia	72	37	20.7	(14.0-27.4)	35	17.2	(11.5-22.9)	Pike	59	34	17.2	(11.4-23.0)	25	15.2	(9.2-21.2)
Crawford	88	53	20.3	(14.8-25.8)	35	12.5	(8.4-16.6)	Potter	9	6	ND		3	ND	
Cumberland	179	108	16.2	(13.1-19.3)	71	8.8	(6.8-10.8)	Schuylkill	143	89	19.2	(15.2-23.2)	54	10.1	(7.4-12.8)
Dauphin	202	109	15.4	(12.5-18.3)	93	11.0	(8.8-13.2)	Snyder	36	16	ND		20	16.5	(9.3-23.7)
Delaware	402	224	15.3	(13.3-17.3)	178	9.9	(8.4-11.4)	Somerset	89	51	19.1	(13.9-24.3)	38	14.2	(9.7-18.7)
Elk	43	21	19.0	(10.9-27.1)	22	20.9	(12.2-29.6)	Sullivan	8	3	ND		5	ND	
Erie	243	151	19.5	(16.4-22.6)	92	10.7	(8.5-12.9)	Susquehanna	29	13	ND		16	ND	
Fayette	103	63	15.8	(11.9-19.7)	40	8.1	(5.6-10.6)	Tioga	51	29	20.4	(13.0-27.8)	22	15.1	(8.8-21.4)
Forest	2	2	ND		0	ND		Union	35	22	17.8	(10.4-25.2)	13	ND	
Franklin	125	76	17.1	(13.3-20.9)	49	9.5	(6.8-12.2)	Venango	50	37	21.8	(14.8-28.8)	13	ND	
Fulton	14	7	ND		7	ND		Warren	35	22	15.9	(9.3-22.5)	13	ND	
Greene	35	23	19.6	(11.6-27.6)	12	ND		Washington	200	115	18.1	(14.8-21.4)	85	11.2	(8.8-13.6)
Huntingdon	52	22	15.7	(9.1-22.3)	30	22.8	(14.6-31.0)	Wayne	39	23	14.4	(8.5-20.3)	16	ND	
Indiana	85	43	17.8	(12.5-23.1)	42	15.4	(10.7-20.1)	Westmoreland	358	206	18.7	(16.1-21.3)	152	10.4	(8.7-12.1)
Jefferson	47	28	19.4	(12.2-26.6)	19	ND		Wyoming	23	11	ND		12	ND	
							York	392	218	18.9	(16.4-21.4)	174	13.2	(11.2-15.2)	

SOURCE: Pennsylvania Cancer Registry

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings match the National Cancer Institute's SEER program. In situ cancer cases are excluded.

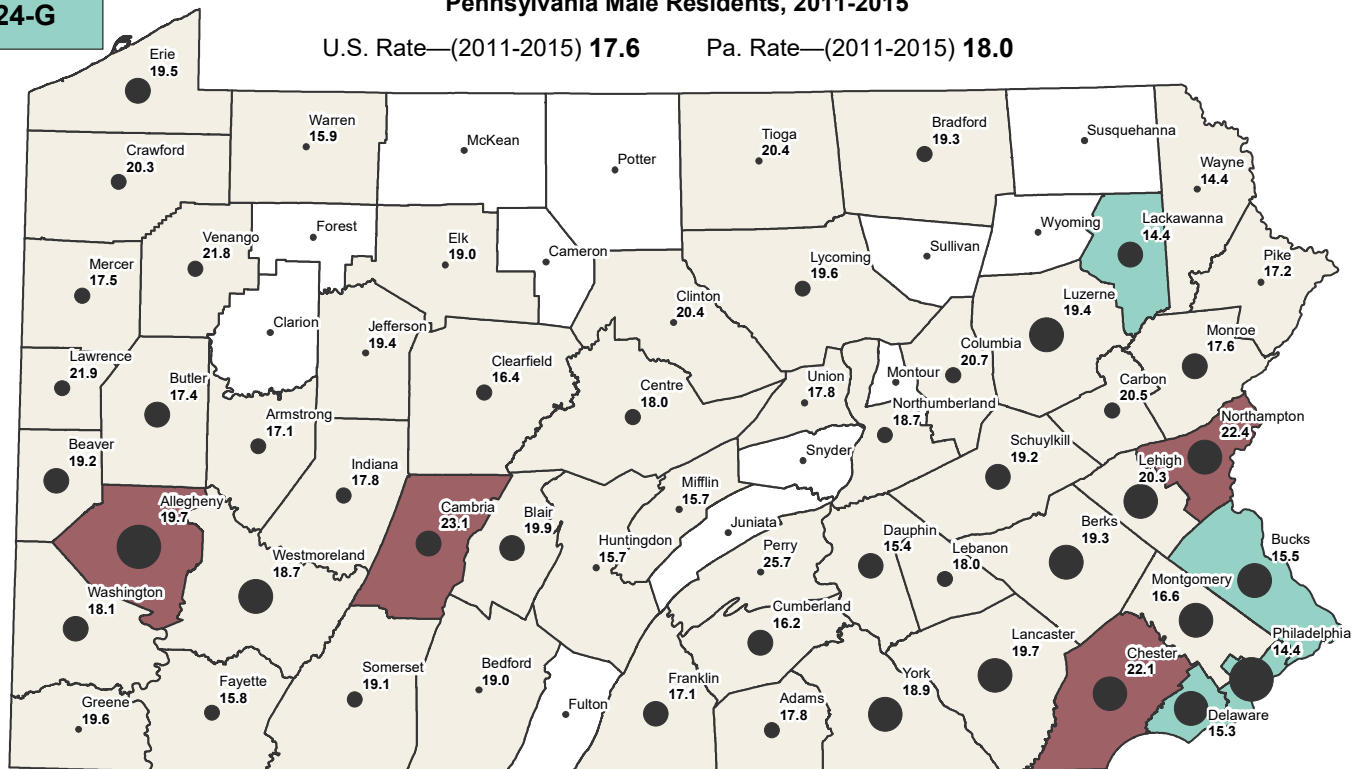
Leukemia: INCIDENCE

**MAP
24-G**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) **17.6**

Pa. Rate—(2011-2015) **18.0**



Significantly higher

Significantly lower

Not significantly different

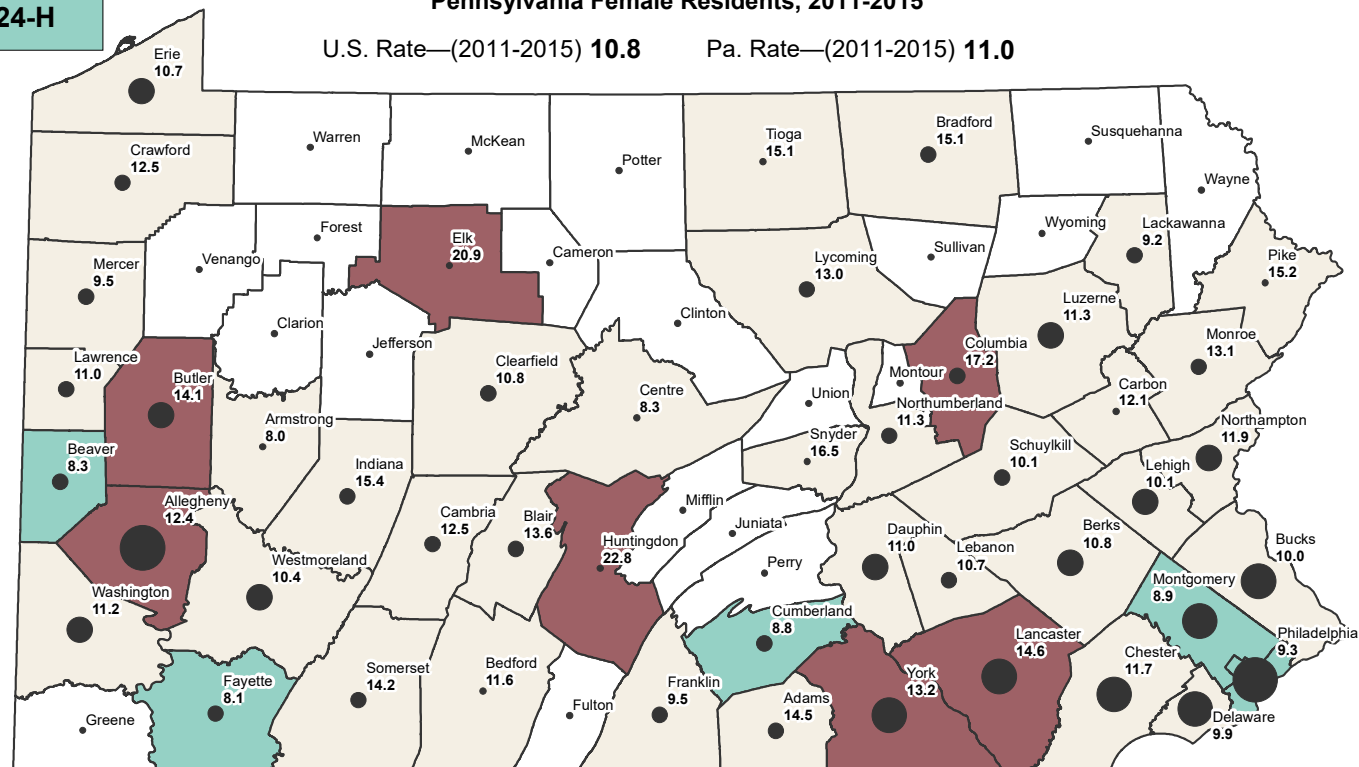
Significance not determined—less than 20 observed cases

**MAP
24-H**

Significant Differences Between Pennsylvania County and State Age-adjusted Incidence Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) **10.8**

Pa. Rate—(2011-2015) **11.0**



The symbol, •, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

SOURCES: Pennsylvania Cancer Registry, SEER 18 areas

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

Leukemia: MORTALITY

**TABLE
24-I**

**Number of Cancer Deaths, Average Annual Age-adjusted Death Rates and 95% Confidence Intervals
by County and Sex, Pennsylvania Residents, 2011-2015**

County	Total Deaths	Males			Females			County	Total Deaths	Males			Females		
		No.	Rate	(CI)	No.	Rate	(CI)			No.	Rate	(CI)	No.	Rate	(CI)
All counties	5,700	3,205	9.2	(8.9-9.5)	2,495	5.3	(5.1-5.5)								
Adams	63	41	13.2	(9.2-17.2)	22	5.9	(3.4-8.4)	Juniata	18	9	ND		9	ND	
Allegheny	585	327	9.4	(8.4-10.4)	258	5.1	(4.5-5.7)	Lackawanna	131	70	11.1	(8.5-13.7)	61	7.1	(5.3-8.9)
Armstrong	34	16	ND		18	ND		Lancaster	247	137	9.3	(7.7-10.9)	110	5.7	(4.6-6.8)
Beaver	97	53	9.6	(7.0-12.2)	44	5.7	(4.0-7.4)	Lawrence	52	33	12.2	(8.0-16.4)	19	ND	
Bedford	20	12	ND		8	ND		Lebanon	65	38	9.1	(6.2-12.0)	27	5.2	(3.2-7.2)
Berks	199	118	10.5	(8.6-12.4)	81	5.8	(4.5-7.1)	Lehigh	158	103	11.1	(9.0-13.2)	55	4.4	(3.2-5.6)
Blair	71	38	9.4	(6.4-12.4)	33	6.0	(4.0-8.0)	Luzerne	168	91	9.8	(7.8-11.8)	77	5.5	(4.3-6.7)
Bradford	32	12	ND		20	7.9	(4.4-11.4)	Lycoming	64	39	11.0	(7.5-14.5)	25	5.5	(3.3-7.7)
Bucks	299	166	9.7	(8.2-11.2)	133	5.8	(4.8-6.8)	McKean	20	15	ND		5	ND	
Butler	102	57	10.9	(8.1-13.7)	45	6.7	(4.7-8.7)	Mercer	53	31	8.5	(5.5-11.5)	22	5.2	(3.0-7.4)
Cambria	61	37	8.2	(5.6-10.8)	24	4.3	(2.6-6.0)	Mifflin	24	12	ND		12	ND	
Cameron	6	4	ND		2	ND		Monroe	67	47	11.4	(8.1-14.7)	20	3.8	(2.1-5.5)
Carbon	38	28	13.5	(8.5-18.5)	10	ND		Montgomery	333	177	8.0	(6.8-9.2)	156	5.1	(4.3-5.9)
Centre	44	31	9.7	(6.3-13.1)	13	ND		Montour	6	4	ND		2	ND	
Chester	178	110	9.1	(7.4-10.8)	68	4.1	(3.1-5.1)	Northampton	150	81	9.5	(7.4-11.6)	69	5.9	(4.5-7.3)
Clarion	23	14	ND		9	ND		Northumberland	47	31	10.0	(6.5-13.5)	16	ND	
Clearfield	54	28	11.4	(7.2-15.6)	26	7.5	(4.6-10.4)	Perry	24	12	ND		12	ND	
Clinton	21	11	ND		10	ND		Philadelphia	465	236	7.6	(6.6-8.6)	229	4.8	(4.2-5.4)
Columbia	28	18	ND		10	ND		Pike	17	9	ND		8	ND	
Crawford	33	22	8.6	(5.0-12.2)	11	ND		Potter	5	4	ND		1	ND	
Cumberland	99	55	8.4	(6.2-10.6)	44	5.1	(3.6-6.6)	Schuylkill	77	42	9.0	(6.3-11.7)	35	5.2	(3.5-6.9)
Dauphin	121	60	8.8	(6.6-11.0)	61	6.6	(4.9-8.3)	Snyder	22	10	ND		12	ND	
Delaware	213	115	8.0	(6.5-9.5)	98	5.2	(4.2-6.2)	Somerset	40	28	10.7	(6.7-14.7)	12	ND	
Elk	23	13	ND		10	ND		Sullivan	4	3	ND		1	ND	
Erie	106	60	8.4	(6.3-10.5)	46	5.0	(3.6-6.4)	Susquehanna	18	9	ND		9	ND	
Fayette	68	37	9.2	(6.2-12.2)	31	5.5	(3.6-7.4)	Tioga	24	12	ND		12	ND	
Forest	4	2	ND		2	ND		Union	16	9	ND		7	ND	
Franklin	66	39	8.7	(6.0-11.4)	27	4.6	(2.9-6.3)	Venango	26	19	ND		7	ND	
Fulton	10	6	ND		4	ND		Warren	24	15	ND		9	ND	
Greene	17	7	ND		10	ND		Washington	117	66	10.4	(7.9-12.9)	51	6.1	(4.4-7.8)
Huntingdon	20	11	ND		9	ND		Wayne	25	15	ND		10	ND	
Indiana	46	21	8.8	(5.0-12.6)	25	7.5	(4.6-10.4)	Westmoreland	192	107	9.1	(7.4-10.8)	85	5.2	(4.1-6.3)
Jefferson	24	15	ND		9	ND		Wyoming	8	4	ND		4	ND	
								York	188	103	9.0	(7.3-10.7)	85	6.1	(4.8-7.4)

SOURCE: Pennsylvania Death Certificate Dataset

NOTES: Age-adjusted rates are per 100,000 and are computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are statistically unreliable and are not displayed (ND). CI = 95% confidence interval based on a formula for estimating the standard error or SE (see Technical Notes). Cancer primary site/type groupings follow the primary site definitions used by the National Cancer Institute's SEER program.

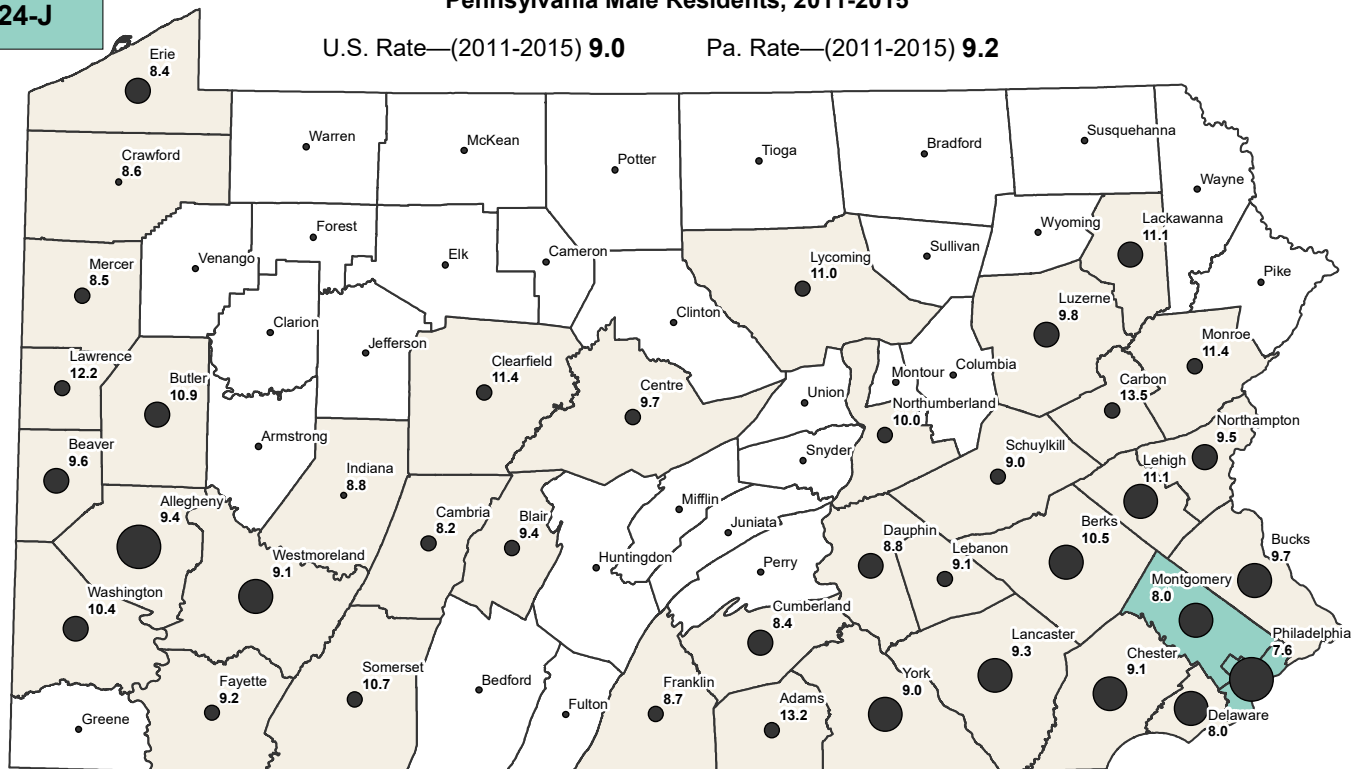
Leukemia: MORTALITY

MAP
24-J

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Male Residents, 2011-2015

U.S. Rate—(2011-2015) 9.0

Pa. Rate—(2011-2015) 9.2



Significantly higher

Significantly lower

Not significantly
different

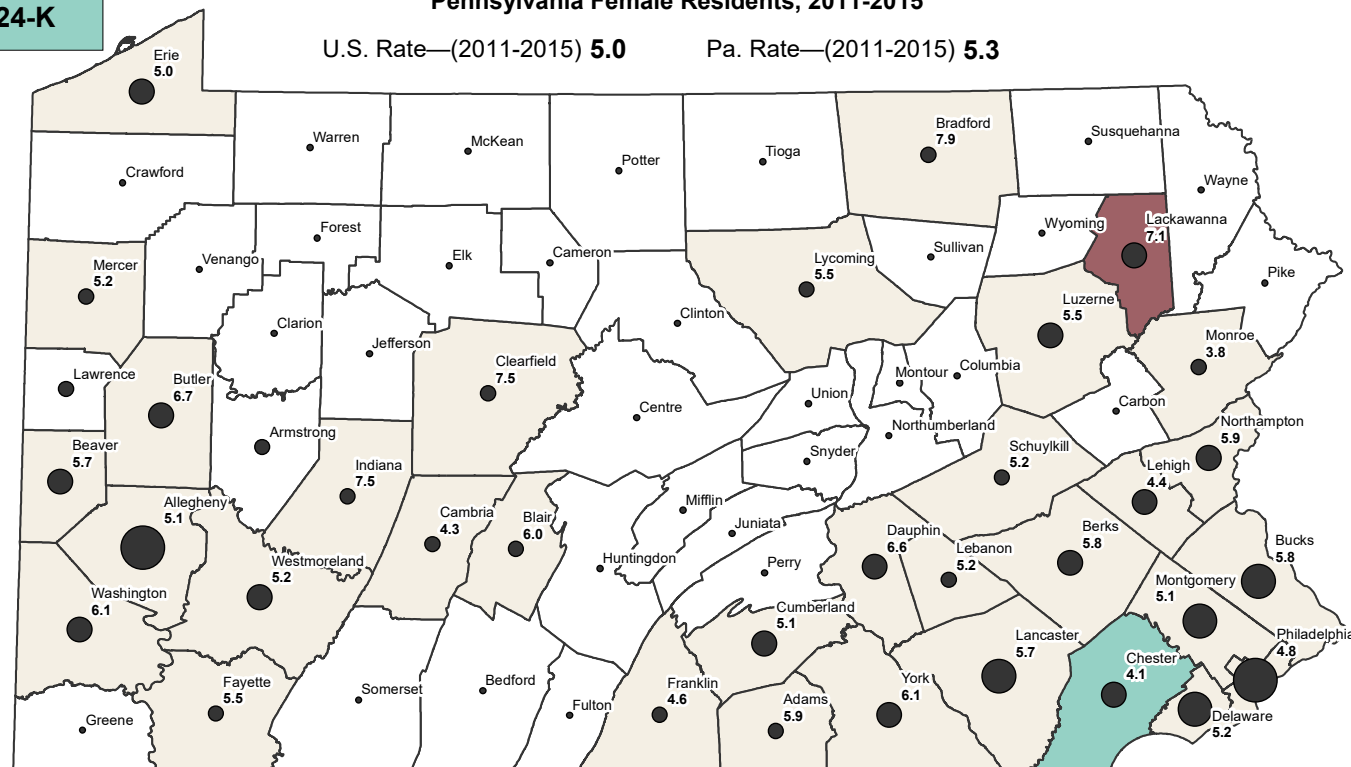
Significance not determined—
less than 20 observed cases

MAP
24-K

Significant Differences Between Pennsylvania County and State Age-adjusted Death Rates Pennsylvania Female Residents, 2011-2015

U.S. Rate—(2011-2015) 5.0

Pa. Rate—(2011-2015) 5.3



The symbol, •, represents the number of deaths. A larger circle indicates a larger amount of deaths.

SOURCES: Pennsylvania Death Certificate Dataset; US Mortality Files

NOTE: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard population. Rates based on less than 20 events are considered statistically unreliable.

TECHNICAL NOTES

A. SOURCES OF DATA

1. Incidence:

The Pennsylvania Cancer Registry (PCR) requires all data items included on the Required Data Set for Reporting Facilities to be reported for each cancer case. A list of consolidated data items is included in Appendix E.

Abstracts are primarily reported from the hospital cancer registry or health information management department. Every acute care hospital and laboratory is required to report all cases newly diagnosed and/or treated at that facility. If an individual had more than one primary tumor, each tumor is reported and counted. Thus, counts (cases) reported in this publication are based on the number of cancer tumors rather than the number of people. All primary malignancies, including in situ cases (except in situ cervix uteri cancers), are reported – apart from squamous and basal cell carcinomas of the skin. These lesions are, however, reported for skin of mucocutaneous junctures. Beginning with cases diagnosed on or after Jan. 1, 2004, all primary intracranial and central nervous system tumors are reportable, although not included in this publication.

The PCR also collects cancer cases from non-hospital sources, such as laboratories, radiation treatment centers, medical oncology centers, physician offices, nursing homes/hospices and other hospital outpatient units/surgery centers.

A policy change of the Department of Veterans Affairs (VA) resulted in no reporting of cancer cases by VA hospitals in Pa. for 2006-2010. Reporting from VA hospitals has been re-established.

Starting with the 1999 edition, cancer primary site groupings used in this report follow the definitions used by the National Cancer Institute's SEER program. Unless otherwise noted, only invasive (and in situ cases of urinary bladder) cancers are included in the counts and rates of cancer cases appearing in this report and may not be comparable to statistics appearing in previous Pennsylvania Cancer Incidence and Mortality annual reports

2. Mortality:

Pennsylvania's certificate of death is the source document for the cancer mortality data contained in this report. Death certificates are usually completed by hospital personnel, physicians and funeral directors.

There is a cutoff date of March 1 of the following year for compiling annual mortality files, e.g., the cutoff date for 2015 death certificates was March 1, 2016. Any data pertaining to a 2015 death for which a certificate was filed after the cutoff date are not included in the initial release of data, including the annual report of vital statistics, "Pennsylvania Vital Statistics 2015." Files are then updated on an annual basis with data from certificates received after the cutoff date, and corrections to previously filed records are made at these times. Therefore, it is possible that cancer mortality data obtained from updated files by

the Division of Health Informatics may differ slightly from the data that appear in this report.

3. Population:

The 2000 U.S. standard population used in calculating age-adjusted rates is shown below:

AGE	POPULATION
All ages	274,633,642
Under 1	3,794,901
1-4	15,191,619
5-9	19,919,840
10-14	20,056,779
15-19	19,819,518
20-24	18,257,225
25-29	17,722,067
30-34	19,511,370
35-39	22,179,956
40-44	22,479,229
45-49	19,805,793
50-54	17,224,359
55-59	13,307,234
60-64	10,654,272
65-69	94,09,940
70-74	8,725,574
75-79	7,414,559
80-84	4,900,234
85+	4,259,173

Population estimates for the years 1986-1989 (white and all races), 1991-1999, 2001-2009 and 2011-2015 (white, black and all races) used to compute rates were produced jointly by the census bureau and the State Data Center of the Pennsylvania State University at Harrisburg under the Federal-State Cooperative Program for Local Population Estimates. The estimates are published by the census bureau in Current Population Reports, Series P-26. Numbers are generated by a combination of a component procedure that depends on administrative records and a regression method. The estimates of state (white and all races) and county total populations for earlier years are revised by the census bureau from time to time. The 2000 and 2010 state and county populations by age, sex and race used in this report are based on the U.S. Bureau of the Census enumerated population figures as of April 1, 2010. Beginning with 2013 data, population estimates were calculated as single-race categories. In other words, multiple race populations were not included in the estimates of white and black populations. The 2015 Pennsylvania population figures by age, sex and race used to compute rates appear in Appendix B. Copies of other Pennsylvania and county population data used for this report can be obtained by

contacting the Division of Health Informatics.

B. DATA QUALITY

1. Incidence:

The quality of cancer incidence data presented in this report is directly related to the completeness and accuracy of the information reported. The PCR works to ensure that the information received is as complete and accurate as possible and maintains two major program operations for improving the quality of information received — the data quality and field programs.

The internal data quality program focuses on assuring the completeness, timeliness and accuracy of data reported to the PCR. Completeness and timeliness are monitored through management reports to identify compliance to monthly reporting requirements. To ensure accuracy, relational validations and value ranges are routinely run against computerized files. Data items reported to the PCR include basic identifying and demographic characteristics of each patient and medical information about the cancer, including site, histology, laterality, method of diagnosis and stage of disease. Reports are routinely edited for completeness and consistency according to national standards. Cases are also edited for consistency between coded data items and text information contained in electronic text fields and photocopies of health record reports provided to the PCR. This type of visual editing is performed to detect discrepancies not detectable by the computer edits. Telephone contacts are made if clarification of information is necessary to correct or confirm a suspected error.

Reports are received from each facility, independently of other institutions. Therefore, patients who are diagnosed at one facility and receive treatment at a second facility are reported twice to the PCR. Multiple reports on the same person are identified using a computerized matching system. Once matches are identified, the reports are compared to determine whether the tumors represent the same primary or independent primaries. Counts (cases) listed in this publication are based on the number of primaries rather than the number of people.

The PCR field program involves field representatives monitoring the completeness, accuracy and timeliness of facility reporting. Internal reports identify facilities for follow-up when not in compliance with monthly reporting requirements. Annual reconciliation of cancer cases is performed by comparing cancer patients seen at each facility with cases reported by the facility. Cases not reported are reviewed and submitted if reporting criteria are met. Field staff develop and conduct training for staff at reporting facilities and visually review cases submitted by new facility contacts to assure data accuracy. Timeliness is monitored by calculating the percent of cases reported within 180 days for each facility. A list of cases reported after 180 days is provided to the facility to identify problem cases. PCR field representatives also conduct periodic quality assessment reviews at acute care hospitals in the commonwealth. During the review, case-finding completeness, data quality through reabstracting studies, and timeliness of reporting are evaluated. At the end of the review, findings and recommendations are discussed with hospital personnel. Results of the review are documented in a written report and sent to the hospital.

The PCR also maintains a toll-free telephone number for use by

staff at reporting facilities to answer any questions or concerns regarding the correct completion of their cancer reports. In addition, educational programs are conducted by PCR staff. Persons responsible for reporting to the PCR across the state are encouraged to attend.

The PCR currently has agreements with the states of Alabama, Alaska, Arkansas, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Montana, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Puerto Rico, South Carolina, Tennessee, Texas, Virginia, Washington, West Virginia, Wisconsin and Wyoming for exchange of data on Pennsylvania resident cases that were diagnosed and/or treated in other states.

2. Mortality:

The Bureau of Health Statistics and Registries also maintains query and field programs for monitoring and improving the quality of data collected on death certificates.

The query program is a system used to follow back with hospital personnel, funeral directors and/or physicians concerning incomplete or conflicting information. The follow-back contact is usually done by telephone and is based on both a manual and a computer editing procedure.

The field program attempts to improve death certificate information by educating the participants in the death registration system, i.e., hospital personnel, funeral directors, physicians, etc., of the uses and importance of mortality statistics. The field program completes this mission by conducting seminars with various associations representing the types of individuals listed above. In addition to regularly scheduled seminars, the field representatives make site visits when problems with registration relating to a particular area or institution are discovered.

The National Center for Health Statistics (NCHS) monitors Pennsylvania's coding of statistical data on death certificates. A 0.5 percent sample of death records coded and submitted monthly by the state is used as a quality control mechanism by NCHS. NCHS codes these sample records independently and then conducts an item-by-item computer match of codes entered by the state and NCHS. NCHS has established a 2 percent upper limit for a coding difference involving any one data item of these sample records, except for cause of death. A 5 percent limit is established for that item, due to the complexity of the coding.

Deaths relating to Pennsylvania residents occurring in another state are included in this report. The inclusion of these data is made possible by an agreement among all registration areas in the United States for resident exchange of copies of death certificates.

C. DATA CONFIDENTIALITY

1. Incidence:

The PCR maintains the confidentiality of the information in the reports submitted. Strict security measures are taken to ensure confidentiality. Published reports and documents released by the Department of Health include only aggregate data. The identification of patients is strictly prohibited by the Pennsylvania Can-

cer Control, Prevention and Research Act (Act 224), except for specific approved research purposes and with strict supervision by the Department of Health.

2. Mortality:

The confidentiality of death certificates is strictly maintained by the Division of Health Informatics. All published reports of vital statistics contain only aggregated data. Individually identifiable information is only released, as provided for in Act 66, Vital Statistics Law of 1953, for health research purposes and to government agencies in pursuance of their official duties upon completion, review and approval of an application for access to protected data. Certified copies are also released to family members or legal representatives for determination of personal or property rights.

D. GEOGRAPHIC ALLOCATION of RESIDENCE

Allocation of events by place of residence is sometimes difficult because classification depends entirely on the statement of the usual place of residence as furnished by the patient/informant at the time the original death certificate or medical record is being completed. For various reasons, this statement may be incorrect or incomplete. For example, mailing addresses often differ from the actual physical addresses. When the residential address is a rural delivery number, or if an unincorporated place is given, it may be impossible to allocate the event to the correct minor civil division (city, borough, township).

The addresses on the Pennsylvania cancer abstracts have been matched to an address reference file. One of the purposes of matching the addresses is to correctly assign the minor civil division. Addresses that cannot be matched include post office boxes and most rural route and rural delivery addresses. The population-weighted centroids of the zip codes are used to assign the minor civil division for these unmatched addresses. Approximately 90 percent of the addresses from the abstracts are matched to the address reference file. The remaining addresses are assigned a minor civil division based on the population-weighted centroid of the zip code.

E. COMPARABILITY of ICD-O and ICD CODES

Appendix C shows a comparability table of ICD-O-2 (International Classification of Diseases for Oncology - Second Edition), ICD-O-3 (International Classification of Diseases for Oncology - Third Edition), ICD-9 (International Classification of Diseases - Ninth Revision) and ICD-10 (International Classification of Diseases - Tenth Revision) codes for 23 primary cancer sites. Starting in 2001, cancer incidence data were coded according to ICD-O-3. Previous cancer incidence reports were based on ICD-O-2 coding. Although the topography codes, which indicate the site of origin of a neoplasm, are identical in ICD-O-2 and ICD-O-3, the morphology codes, which records the kind of tumor that has developed and how it behaves, may be slightly different. Also, because of this change, some additional morphology codes are now reportable to the PCR. Beginning in 2010, the ICD-O-3 recode with adjustment for WHO 2008 hematopoietic histologies was used and, as a result, Mesothelioma and Kaposi Sarcoma are excluded from many primary sites. In addition, new histologies for hematopoietic cancers are included or grouped differently. Details on reportable cancers are provided in Appendix A.

To determine the underlying cause of death for the cancer mortality data, the ICD-9 classification system was used from 1979 through 1998. Starting with 1999 data, the cause-of-death classification system was changed from ICD-9 to ICD-10. The change from ICD-9 to ICD-10 may affect the reporting of cancer deaths, thereby creating discontinuity in mortality trend data.

The rationale for periodic revisions to the ICD and ICD-O systems has been to reflect advances in medical science and changes in diagnostic terminology. The Surveillance Epidemiology End Results (SEER) Site Groupings that appeared in the appendix of the publication SEER Cancer Statistics Review by the National Cancer Institute (see section H References) was used as a guide in determining comparability.

It should be noted that, for some cancer sites, no absolute equivalence in coding between mortality and morbidity can ever be achieved. Revisions and updates of established coding structures, varying coding practices, differences in coding structures between the ICD-O and ICD codes, and differences in the level of detail in reporting incidence and mortality data are just some of the major obstacles in achieving true comparability. Users of the data in this report should keep in mind these potential problems related to determining coding equivalencies.

F. DEFINITIONS OF TERMS

CASE: An incidence of a primary site of cancer as reportable to the PCR. See Appendix A for details on reportable cancers. Unless otherwise noted, the statistics appearing in this report are only for invasive (and in situ cases for urinary bladder) cancers. A cancer patient may have more than one primary site of cancer. In this report, the number of cases refers to the number of primary sites reported, not the number of people.

SITE: The primary organ or tissue of the body where the malignancy has been determined by microscopic examination, endoscopy, radiology, clinical examination or other method of diagnosis to be the place of origin.

MULTIPLE PRIMARY DETERMINATION: If a person is diagnosed with more than one solid malignant tumor or benign and borderline central nervous system tumor, a separate report must be submitted for each primary. Because the PCR receives abstracts from hospital and non-hospital reporting sources, standard rules are applied to determine if multiple abstracts received for the same person represent new primaries or previously reported primaries. The PCR, like other central registries in the United States, follows the rules published by the SEER Program for determination of multiple primaries. For solid tumors diagnosed on or after Jan. 1, 2007, the PCR requires the use of The 2007 Multiple Primary and Histology Coding Rules. If diagnosed prior to Jan. 1, 2007, rules documented in the SEER Program Coding and Staging Manual 2004, page 7-18, are used to determine multiple primaries. For multiple primary determination of hematopoietic and lymphoid malignancies diagnosed on or after Jan. 1, 2010, the PCR uses the SEER Hematopoietic and Lymphoid Neoplasm Database and Manual. For cases diagnosed prior to Jan. 1, 2010, the SEER table Single Versus Subsequent Primaries of Lymphatic and Hematopoietic Diseases, 2/28/2001 is used.

STAGE OF DISEASE: The classification system which groups cases into broad categories according to how far the disease has spread from the site of origin at the time of diagnosis. SEER Summary Stage 2000 is the data item used to express these categories. For 2001-2003 and 2015 cases, the SEER Summary Staging Manual 2000 was used directly to categorize stage of disease at diagnosis for all sites, as well as for Hodgkin and non-Hodgkin lymphomas. SEER Summary Stage 2000 values for cases diagnosed between 2004 and 2014 were derived from the Collaborative Stage Algorithm. Prior to 2001, the Summary Staging Guide 1977 of the SEER Reporting Program was used to categorize stage of disease. These changes may affect the classification of stage, thereby creating discontinuity in cancer incidence trend data by stage.

The five categories used in both the guide and the manual are: in situ, localized only, regional, distant and unknown. In addition, for cases diagnosed in 2001 and after, the regional stage is sub-categorized by method of spread as a) regional by direct extension only; b) regional by lymph nodes involved only; c) regional by both direct extension and lymph node involvement; and d) regional, not otherwise specified. These stage categories are defined below.

IN SITU - An in situ diagnosis means that the cancer has not penetrated or spread beyond the basement membrane of the epithelial tissue involved. Microscopic examination is necessary to make this determination. Other terms used instead of in situ include non-invasive, pre-invasive, non-infiltrating, intra-epithelial and Stage 0.

LOCAL - A cancer that is invasive but is confined entirely to the organ of origin. The lesion does not extend beyond the outer limits of the primary organ, and there is no evidence of metastasis anywhere else in the body.

REGIONAL - A cancer which has extended beyond the limits of the organ of origin with no evidence of distant metastasis. The regional subcategories are:

(a) Regional by direct extension only: invasion of the cancer through the entire wall of the organ of origin into surrounding organs and/or adjacent tissues.

(b) Regional lymph nodes involved only: the cancer invades the walls of lymphatics where cells travel through lymphatic vessels to nearby lymph nodes, are filtered out and begin to grow in the nodes.

(c) Regional by both direct extension and lymph node involvement: the cancer has extended beyond the limits of the primary site by a combination of direct extension and lymph node involvement.

(d) Regional, not otherwise specified: The cancer has extended beyond the primary site with no evidence of distant metastases, but it is unclear whether the tissues are involved by direct extension or lymph nodes.

DISTANT - Cancer cells have broken away from the primary cancer, have traveled to other parts of the body and have begun to grow at the new location. Distant stage is also called remote, diffuse, disseminated, metastatic or secondary disease. This category includes all leukemias and myelomas (systemic dis-

ease).

ANN ARBOR STAGING CLASSIFICATION - The summary stage categories for Hodgkin and non-Hodgkin lymphomas are based on the Ann Arbor Staging Classification and limited to localized, regional not otherwise specified, distant and unknown.

MICROSCOPIC CONFIRMATION: The microscopic examination of tissue or cells from the site of a suspected cancer for verifying a malignancy. Microscopically confirmed diagnoses are based on specimens from biopsy, frozen section, surgery, blood morphology, bone marrow, autopsy, sputum, secretions, body fluids, aspiration, washings, brushings, smears and sediment.

G. RATES

1. Definitions:

CRUDE RATE - The total number of events per 100,000 total population

AGE-SPECIFIC RATE - Number of events for a specified age group per 100,000 population in the same age group

AGE-ADJUSTED RATE (Direct Method) - Age-specific rates for a selected population are applied to a standard population to calculate what rate **would be expected** if the selected population had the same age distribution as the standard. The total of these **expected** events divided by the total of the standard population and multiplied by 100,000 yields the age-adjusted rate per 100,000. (It is important to use the same standard population in the computation of each age-adjusted rate to allow comparability. In this report, the 2000 U.S. standard population was used. See section A3 for a list of these population figures. Also note that age-adjusted rates should never be compared with any other type of rate or be used as absolute measurements of vital events.)

WARNING: Beginning with the 2014 edition of this report, 19 age groups were used for age adjustment. The age-adjusted rates in previous editions used 18 age groups for age adjustment and are not comparable to the age-adjusted rates that appear in this report. The report used the 2000 standard million population for calculation of all age-adjusted rates from 1999-2014. Beginning with the 2015 edition of this report, the 2000 standard population is used for age-adjusted rate calculations. Age-adjusted rates that appeared in previous editions (1985-1998) used the 1970 standard and are not comparable to more recent editions.

2. Reliability of Rates:

Precautions should always be taken when comparing any rates, especially crude rates, based on vital events and population. Both the numbers of events and the characteristics of the population are important indicators of a rate's real value.

All statistics are subject to variation by chance. Rates based on unusually small or large numbers of events over a specified period, or on sparsely populated geographic areas, should be of concern and caution. When small events or populations are evident in calculating/studying rates, multiple-year summary rates will sometimes provide a much better perspective or measure-

ment of an outcome. Expanding the period studied enlarges the absolute numbers of events and adds more credence to a statement regarding a rate.

There are many characteristics of a population that can also render a crude rate of little use. Any unique demographic factors (e.g., age, sex and race) are not accounted for in crude rates. Age, sex and race-adjusted rates can offer a more refined measurement to compare experiences over geographic areas or time periods. However, there are limitations to their use, and one should be familiar with these types of rates before using them.

Beginning with the 2006 edition of this publication, age-adjusted rates based on less than 20 events were considered statistically unreliable and were not displayed. Likewise, crude rates (e.g., percentages and age-specific rates) based on less than 10 events were not displayed.

3. Variability of Rates:

Standard Errors and Confidence Intervals

As mentioned in the definition, age-adjusted rates are only to be used for comparison purposes and only if the same standard population was used in the calculation. Age-adjusted rates are point estimates. The standard error (S.E.) for an age-adjusted rate defines the variability in this point estimate. Therefore, appropriate consideration should be given to standard errors when comparing age-adjusted rates. With a standard error for a rate, a confidence interval (C.I.) can be computed, i.e., a range for an observed rate which should include the actual or real rate 95 percent of the time. Age-adjusted rates for two different populations are significantly different when 95% confidence intervals for their age-adjusted rates do not overlap.

The S.E. for a rate per 100,000 population, as presented in this report, can be **estimated** by dividing that rate by the square root of the number of cases (N) upon which the rate was based:

$$\text{RATE} / \sqrt{N}$$

The standard formula for determining the 95% C.I. of a rate (based on the estimated S.E.) is:

$$\text{RATE} \pm (1.96 \times \text{S.E.})$$

This estimate assumes the rate to be a binomial proportion. As an example, let's use the state's 2015 age-adjusted incidence rate for all cancer sites of 474.6 per 100,000 in the calculation of this estimated S.E. and 95% C.I. The rate was based on 77,993 invasive cancers. The square root of 77,993 is about 279.3. By dividing the rate of 474.6 by the square root of 77,993, one obtains the estimated S.E. of about 1.70.

This formula produces an equation of $474.6 \pm (1.96 \times 1.70)$. Then, by subtracting and adding 3.3 against the original rate of 474.6, a range can be calculated and considered the estimated 95% confidence interval for the rate, i.e., 471.3 - 477.9. One could then state, with 95 percent certainty, that the actual 2015 age-adjusted cancer incidence rate for the state was between 471.3 and 477.9.

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APPENDICES

APPENDIX A

REPORTABLE CONDITIONS

Pennsylvania Cancer Registry

The Pennsylvania Cancer Registry collects data on: 1) each form of invasive cancer with the exception of basal cell and squamous cell carcinoma of the skin; 2) each form of in situ cancer except carcinoma in situ of the cervix uteri; and 3) malignant, benign and borderline primary tumors of the intracranial and central nervous system tumors diagnosed on or after Jan. 1, 2004.

The International Classification of Diseases for Oncology (ICD-O) is used to determine reportability of solid tumors; the 2012 “Hematopoietic and Lymphoid Neoplasm Case Reportability and Coding Manual, Case Reportability Instructions” is used to determine reportability of hematopoietic and lymphoid neoplasms.

Solid Tumors

All histologic diagnoses with a behavior code of /2 (in situ) or /3 (malignant) in the International Classification of Diseases for Oncology, Second Edition (ICD-O-2) or Third Edition (ICD-O-3) are reportable.

Exceptions:

Cancers primary to the skin (C44.0-C44.9) with the following histologies are not reportable:

- Neoplasms, malignant, NOS of the skin (8000-8005);
- Epithelial carcinomas of the skin (8010-8046);
- Squamous cell carcinoma of the skin (8050-8084); and
- Basal cell carcinoma of the skin (8090-8110).

Note: The above lesions are reportable for squamous and basal cell cancers originating in mucoepidermoid sites: lip, anus, vulva, vagina, penis or scrotum (ICD-O codes C00.0-C00.9, C21.0, C51.0-C51.9, C52.9, C60.0-C60.9 and C63.2).

Cervical intraepithelial neoplasia, grade III, (CIN III) is not reportable (8077/2).

Prostatic intraepithelial neoplasia, grade III, (PIN III) is not reportable (8148/2).

Pilocytic/juvenile astrocytoma is reportable and is coded with a behavior of /3 (9421/3 in [ICD-O-2] and 9421/1 in [ICD-O-3]).

All histologic diagnoses with a behavior code of /0 (benign) or /1 (borderline or uncertain) when primary to the intracranial and central nervous system (CNS) sites listed below are reportable when diagnosed **on or after Jan. 1, 2004**.

- Meninges (C70.0 - C70.9)
- Brain (C71.0 - C71.9)
- Spinal cord (C72.0)
- Cauda equina (C72.1)
- Cranial nerves (C72.2 - C72.5)
- Other CNS (C72.8, C72.9)
- Pituitary gland (C75.1)
- Craniopharyngeal duct (C75.2)
- Pineal gland (C75.3)

Cystadenomas or tumors primary to the ovary or peritoneum qualified by the phrases borderline malignancy or low malignant potential are reportable only if **diagnosed prior to Jan. 1, 2001**.

Hematopoietic and Lymphoid Neoplasms

The 2012 “Hematopoietic and Lymphoid Neoplasm Case Reportability and Coding Manual, Case Reportability Instructions” must be used to determine reportability of hematopoietic and lymphoid neoplasms because not all reportable terms are indexed in ICD-O-3.

The behavior code for hematopoietic neoplasms listed below changed from /1 (borderline or uncertain) to /3 (malignant) and are reportable when diagnosed on or after **Jan. 1, 2010**.

- Chronic lymphoproliferative disorder of NK-cells (9831/3)
- T-cell large granular lymphocytic leukemia (9831/3)
- Langerhans cell histiocytosis, NOS (9751/3)
- Langerhans cell histiocytosis, unifocal (9751/3)

Langerhans cell histiocytosis, multifocal (9751/3)
Myelodysplastic/Myeloproliferative neoplasm, unclassifiable (9975/3)
Myeloproliferative disease, NOS (9975/3)
Myeloproliferative neoplasm, unclassifiable (9975/3)

APPENDIX B

Table 1. 2015 Estimated Pennsylvania Population by Age, Sex and Race

	Total	Male	Female	White Male	White Female	Black Male	Black Female
All ages	12,802,503	6,264,374	6,538,129	5,188,180	5,385,356	721,634	775,842
Under 1	143,731	73,473	70,258	56,551	54,214	9,967	9,489
1-4	571,188	292,098	279,090	215,184	203,885	47,962	46,285
5-9	736,160	376,846	359,314	286,213	271,067	55,487	54,021
10-14	759,962	388,303	371,659	302,695	287,821	54,500	52,356
15-19	830,291	422,662	407,629	331,439	318,674	60,887	57,753
20-24	853,475	433,927	419,548	335,076	324,481	68,393	64,274
25-29	862,946	438,574	424,372	346,646	330,694	61,638	61,717
30-34	800,121	403,334	396,787	326,413	315,963	49,166	50,514
35-39	740,416	369,482	370,934	300,270	295,421	44,564	48,177
40-44	758,892	377,279	381,613	311,789	310,500	42,954	46,249
45-49	841,603	416,908	424,695	352,260	354,056	45,082	49,069
50-54	932,050	457,980	474,070	394,986	404,190	45,842	50,965
55-59	951,583	464,549	487,034	407,874	421,233	42,122	48,948
60-64	840,297	406,453	433,844	361,857	380,125	32,676	39,903
65-69	696,912	330,374	366,538	297,877	324,514	23,419	31,430
70-74	499,716	228,547	271,169	207,473	242,109	14,867	21,939
75-79	366,703	159,726	206,977	145,664	186,066	10,042	16,230
80-84	282,629	113,769	168,860	105,096	153,568	6,444	12,331
85+	333,828	110,090	223,738	102,817	206,775	5,622	14,192

Source: State Data Center, Pennsylvania State University at Harrisburg

APPENDIX C

Table 2. Comparability Table of ICD-O-2, ICD-O-3, ICD-9 and ICD-10 Codes For 23 Primary Sites

PRIMARY SITE	ICD-O-2	ICD-O-3	ICD-9	ICD-10
Oral cavity and pharynx	C00.0-C14.8	C00.0-C14.8	140.0-149.9	C00.0-C14.8
Esophagus	C15.0-C15.9	C15.0-C15.9	150.0-150.9	C15.0-C15.9
Stomach	C16.0-C16.9	C16.0-C16.9	151.0-151.9	C16.0-C16.9
Colon and rectum	C18.0-C20.9, C26.0	C18.0-C20.9, C26.0	153.0-154.1, 159.0	C18.0-C20.9, C26.0
Liver/intrahepatic bile duct	C22.0-C22.1	C22.0-C22.1	155.0-155.2	C22.0-C22.9
Pancreas	C25.0-C25.9	C25.0-C25.9	157.0-157.9	C25.0-C25.9
Larynx	C32.0-C32.9	C32.0-C32.9	161.0-161.9	C32.0-C32.9
Lung and bronchus	C34.0-C34.9	C34.0-C34.9	162.2-162.9	C34.0-C34.9
Melanoma of the skin	C44.0-C44.9 & M8720-M8790	C44.0-C44.9 & M8720-M8790	172.0-172.9	C43.0-C43.9
Female breast	C50.0-C50.9	C50.0-C50.9	174.0-174.9	C50.0-C50.9
Cervix uteri	C53.0-C53.9	C53.0-C53.9	180.0-180.9	C53.0-C53.9
Corpus/uterus, NOS	C54.0-C55.9	C54.0-C55.9	182.0-182.8, 179	C54.0-C54.9, C55
Ovary	C56.9	C56.9	183.0	C56
Prostate	C61.9	C61.9	185	C61
Testis	C62.0-C62.9	C62.0-C62.9	186.0-186.9	C62.0-C62.9
Urinary bladder	C67.0-C67.9 *	C67.0-C67.9 *	188.0-188.9	C67.0-C67.9
Kidney and renal pelvis	C64.9, C65.9	C64.9, C65.9	189.0-189.1	C64, C65
Brain/other nervous system	C70.0-C72.9	C70.0-C72.9	191.0-192.9	C70.0-C72.9
Thyroid	C73.9	C73.9	193	C73
Non-Hodgkin lymphoma	M9590-M9595, M9670-M9717	M9590-M9597, M9670-M9671, M9673, M9675, M9678-M9680, M9684, M9687, M9688, M9689-M9691, M9695, M9698-M9702, M9705, M9708-M9709, M9712, M9714-M9719, M9724-M9729, M9735, M9737, M9738, M9811-M9818†, M9823†, M9827†, M9837†	200.0-200.8, 202.0-202.2, 202.8-202.9	C82.0-C85.9, C96.3
Hodgkin lymphoma	M9650-M9667	M9650-M9667	201.0-201.9	C81.0-C81.9
Myeloma	M9731-M9732	M9731-M9732, M9734	203.0, 203.2-203.8	C90.0, C90.2
Leukemia	M9800-M9941	M9733, M9742, M9800, M9801, M9805, M9806-M9809, M9811-M9818§, M9820, M9823§, M9826, M9827§, M9831, M9832-M9834, M9835-M9836, M9837§, M9840, M9860, M9861, M9863, M9865, M9866, M9867, M9869, M9870, M9871-M9874, M9875, M9876, M9891, M9895-M9897, M9898, M9910, M9911, M9920, M9930, M9931, M9940, M9945, M9946, M9948, M9963, M9964	202.4, 203.1, 204.0-208.9	C90.1, C91.0-C95.9

*Includes in situ cases.

† Excludes topography codes C42.0, C42.1, and C42.4.

§ Includes only topography codes C42.0, C42.1, and C42.4.

NOTES: Sites Oral Cavity to Thyroid, as listed above, exclude histologies M9050 to M9055, M9140 and M9590 to M9992 of the ICD-O-2 and ICD-O-3. See “Comparability of Codes” in the Technical Notes section for more information. Unless otherwise noted, only invasive and in situ urinary bladder cancers are included in the counts of incidence cases and in the calculation of all rates in this report. The abbreviation “NOS” means “Not Otherwise Specified.”

APPENDIX D

Additional Cancer Incidence and Mortality Data Available

The cancer incidence and mortality data presented in this report are only a part of the information collected by the Pennsylvania Cancer Registry and via the death certificate. The Division of Health Informatics maintains current and historical tabulations in different formats not contained in this report (most notably, data at the minor civil division level). Copies of these tabulations can be obtained by contacting the division. All of the 1985 through 2015 annual tabulations and multiple-year tabulations are available in .PDF file format (requires free Adobe Acrobat Reader software) and text (.TXT) file formats. The division can also produce, for a fee, special computer-generated output to the user's specifications. The following is a list of the cross-tabulations readily available by type of record. Annual tabulations of cancer mortality data are available for every year back to 1960, except for data at the minor civil division level, which are available only back to 1961. Statewide cancer incidence data are available back to 1985. Some regional cancer incidence data are available for 1983 and 1984. Please contact the division regarding the limited availability of incidence data for those years. Both annual and multiple-year tabulations are available at the county and minor civil division levels (as indicated below). NOTE: Starting with the availability of 1999 data, the cancer primary site groupings were changed to match the definitions used by the National Cancer Institute's SEER program. Unless otherwise noted, only invasive (and in situ urinary bladder) cancers are included in the counts of cancer incidence cases. Historical data, back to 1985, have also been re-tabulated using these new primary site groupings.

IMPORTANT NOTE: Most of the cancer incidence and mortality tabulations shown here, back to 1990, can be accessed on the Health Statistics web pages of the department's website at www.statistics.health.pa.gov/ (select Cancer Statistics under Health Statistics). The Pennsylvania Department of Health has also developed an interactive web tool for health data users to create customized data tables of birth, teen pregnancies, death, infant death, cancer, behavioral risk, sexually transmitted diseases, other communicable diseases and population statistics. This online web tool is called Enterprise Data Dissemination Informatics Exchange (EDDIE) and contains historical data back to 1990 for most datasets. EDDIE can be accessed from the Health Statistics Web pages at www.statistics.health.pa.gov/ (select EDDIE under Statistical Resources).

ANNUAL TABULATIONS

Mortality

Resident Cancer Deaths by Age, Sex and Race, by County, 23 Primary Sites, Pa., 1960-2015

Resident Cancer Deaths by Minor Civil Division, 23 Primary Sites, Pa., 1961-2015

Resident Cancer Deaths by 4-digit ICD Cause of Death Code, by Age, Sex and Race, by County, Pa., 1960-2015

Resident Cancer Deaths by Age, Sex, Race and Hispanic Origin, 23 Primary Sites, Pa., 1989-2015

Incidence

Number of Cancer Cases by Age, Sex and Race, by County, 75 Primary Sites, Pa. Residents, 1985-2015

Number of Cancer Cases by Minor Civil Division, 23 Primary Sites, Pa. Residents, 1985-2015

Number of Cancer Cases by Stage of Disease, by Sex and Race, by County, Selected Primary Sites, Pa. Residents, 1985-2015

Number of Cancer Cases by Stage of Disease, by Age, by County, Selected Primary Sites, Pa. Residents, 1985-2015

MULTIPLE-YEAR TABULATIONS

Mortality (1985-2015)

Resident Cancer Deaths by Age, Sex and Race, by Minor Civil Division, 23 Primary Sites, Pa.

Resident Cancer Deaths by Primary Site, Sex and Year, by County, Pa.

Number of Cancer Cases by Age, Sex and Race, by County, 75 Primary Sites, Pa. Residents,

Number of Cancer Cases by Age, Sex and Race, by Minor Civil Division, 23 Primary Sites, Pa. Residents

Number of Cancer Cases by Primary Site, Sex and Year, by County, Pa. Residents

Incidence (1985-2015)

NOTES: Ages are listed by five-year age groupings (0-4, 5-9, 10-14, etc.).
Racial breakdowns for annual tabulations are for whites and blacks.

APPENDIX E

LIST OF CONSOLIDATED DATA ITEMS Pennsylvania Cancer Registry

This list includes various data items found in the consolidated cancer file as reported to or derived by the Pennsylvania Cancer Registry. The consolidated items serve as an abridgement to the items found in the cancer abstract file, which follows the requirements and recommendations for collection of each item by standard-setting groups, such as the National Program of Cancer Registries, the Commission on Cancer, and the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program. The consolidated list replaces the Pennsylvania Cancer Registry Report Form (Figure 1) appearing in previous editions (2003 and earlier) of the "Pennsylvania Cancer Incidence and Mortality" Report. It provides cancer data users with an overview of the various data items collected or derived and is not considered to be comprehensive. Contact the Division of Health Informatics for additional information on the data items.

Patient ID number	Date of diagnosis
Sequence number -- central	Type of reporting source
Tumor record number	Physician -- follow-up
Name -- alias	Primary site*
Name -- last	Laterality
Name -- first	Histology type*
Name -- middle	(1992-2000 ICD-O-2, 2001+ ICD-O-3)
Name -- suffix	Behavior code*
Name -- maiden	(1992-2000 ICD-O-2, 2001+ ICD-O-3)
Address at diagnosis -- no. and street	ICD-O-3 conversion flag
Address at diagnosis -- city	Grade*
Address at diagnosis -- state	Diagnostic confirmation
Address at diagnosis -- postal zip	Primary payer at diagnosis
County at diagnosis	Collaborative staging (2004+)
Geocoded items	-- Derived SEER Summary Stage 1977
-- Municipality	-- Derived SEER Summary Stage 2000
-- Census tract	-- Derived AJCC Stage Group
-- Census tract block group	Treatment provided/planned
-- Census tract certainty	Date of first course of treatment
-- Latitude	Date of last contact
-- Longitude	Vital status
Age at diagnosis	Follow-up source central
Date of birth	Cause of death
Birth place	Place of death
Social Security number	County of death
Sex	Date case last changed
Spanish/Hispanic origin	Unusual follow-up method
Race (single designation race)	Date patient updated
Race (multiple race designation)	Date tumor record updated
Usual occupation (only text collected)	Date tumor record available
Usual industry (only text collected)	

*Reported from registry hospitals only. These data items are coded by the PCR when reported from other (non-registry) facilities.

FIGURE I
PENNSYLVANIA COUNTY OUTLINE MAP

