DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Average Annual Age-Adjusted Cancer Incidence Rates, 2000-2004, at the Delaware Sub-County Level

Delaware Health and Social Services
Division of Public Health
Health Promotion and Disease Prevention,
Bureau of Chronic Diseases
Phone: 302-744-1040
Fax: 302-739-2545

April, 2008

Average Annual Age-Adjusted Cancer Incidence Rates, 2000-2004, at the Delaware Sub-County Level

Summary

This report was published by the Delaware Division of Public Health (DPH) to supplement cancer incidence data previously published at the state and county level. Incidence rates describe the extent to which new cancer cases are diagnosed in a population over a period of time; they are typically presented as the number of new cancer cases diagnosed per year per 100,000 individuals. This report focused on incidence rates for all cancers combined, as well as for the four most frequently occurring cancers (breast, colorectal, lung, and prostate cancers).

Incidence rates were calculated from the most recently available five-year period of data (2000-2004). Additionally, rates were age-adjusted to reflect the unique age breakdown of residents in different areas of Delaware. Incidence rates presented in this report should be interpreted as the average number of new cancer cases diagnosed per 100,000 residents each year from 2000-2004.

The report focuses on the sub-county, or Census County Division (CCD), level. CCDs are county subdivisions established cooperatively by the United State Census Bureau and state and local authorities. In general, CCDs are defined in such a way that boundaries follow visible features and census tracts. Delaware is divided into 27 CCDs, ranging in size from 6,093 to 83,884 people.

DPH chose the CCD level of analysis because it provided cancer rate information for more distinct geographical areas than whole counties. Additionally, CCD was selected as the level of analysis because of the difficulty of drawing conclusions from analyses of cancer rates in areas with smaller populations.

Analyses determined if incidence rates at the CCD level were significantly higher or lower than the incidence rate at the state level. Statistical significance was evaluated by comparing the upper and lower 95% confidence intervals of the rates. A confidence interval is sometimes called the “margin of error.” A 95% confidence interval means that we are 95% sure that the incidence rate is between the lower confidence interval and upper confidence interval.

If the confidence intervals from two incidence rates do *not* overlap, we call the rates significantly different. When incidence rates are significantly different, it means that the difference between these two rates is larger than would be expected by chance alone. On the other hand, if incidence rates from two populations have confidence intervals that overlap, we cannot say that the rates are significantly different. Even at the CCD level, the confidence intervals for rates are so large that, in many instances, they overlap. A non-significant difference between incidence rates is commonly interpreted as “no meaningful difference” between rates.

Determining if two incidence rates are significantly different from one another is an important step in investigating suspected cancer clusters. The Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI) define a cancer cluster as a greater-than-expected number of cancers diagnosed among a population in a particular geographic area, over a given period of time.

Some cancer clusters occur simply by chance. In these situations, clusters are not the result of a single, external cause; instead, the cluster simply reflects coincidental spatial clustering among individuals who have been diagnosed with cancer.

Other cancer clusters may be due to environmental exposure. Health officials are more easily able to trace the origin of a cancer cluster to an environmental exposure if the cluster involves one or more of the following three traits: (1) the cluster contains a large number of *one* type of cancer, as opposed to several cancer types; (2) the cluster involves a *rare* cancer type, as opposed to more commonly diagnosed cancers; and (3) the cluster involves a large number of cases of a type of cancer in an age group that is usually not affected by that cancer type.

Cancer clusters may also reflect better access to health care. Residents from one geographic area may be more likely to have cancer screening services compared to residents from another area. In these situations, cancer clusters exist because more cases of cancer are being diagnosed than in other areas. As such, these cancer clusters do not reflect a truly elevated cancer risk in a geographic area.

Finally, cancer clusters may be due to clustering of lifestyle behaviors. Tobacco use, regular physical activity, diet, and other behaviors strongly impact cancer risk. If residents in one geographic area are more likely to engage in unhealthy lifestyle behaviors, the cancer incidence rate for that area may be elevated compared to other areas.

Based on 2000-2004 data, eight of the 27 CCDs in Delaware had statistically significant elevated incidence rates for one or more cancer types compared to the state. DPH will be arranging meetings with the communities in each of the eight areas with statistically higher rates, working with the respective legislators, seeking input from the Delaware Cancer Consortium, and, if appropriate, conducting formal epidemiologic studies to further investigate elevated cancer incidence rates.

CCD	Statistically Elevated CCD Incidence Rate Compared to State Incidence Rate[1]
1. Central Pencader	• All Cancer Combined (23)
2. Kenton	• All Cancer Combined (6)
3. Lower Christiana	• All Cancer Combined (21) • Lung Cancer (9)
4. Middletown-Odessa	• Colorectal Cancer (8)
5. Millsboro	• Lung Cancer (5)
6. New Castle	• All Cancer Combined (65) • Lung Cancer (16) • Prostate Cancer (21)
7. Upper Christiana	• Prostate Cancer (9)
8. Wilmington	• All Cancer Combined (36) • Lung Cancer (10) • Prostate Cancer (13)

[1] Numbers in parentheses should be interpreted as the "extra" number of cases per year that are expected to occur in the CCD as a result of the CCD having a higher incidence rate compared to the state.

Introduction

Purpose

This report was published by the Delaware Division of Public Health (DPH) to supplement cancer incidence data previously published at the state and county level. The current report focused on the sub-county, or Census County Division (CCD), level. CCDs are county subdivisions established cooperatively by the United State Census Bureau and state and local authorities. In general, CCDs are defined in such a way that boundaries follow visible features and census tracts.

Census County Divisions

Delaware is divided into 27 CCDs, ranging in size from 6,093 to 83,884 people. Figure 1 is a map of Delaware showing the CCDs used in this report. Incidence rates for all cancers combined, as well as for the four most frequently occurring cancers (breast, colorectal, lung, and prostate cancers) are presented in this report.

DPH chose the CCD level of analysis because it provided cancer rate information for more distinct geographical areas than whole counties. Additionally, CCD was selected as the level of analysis because of the difficulty of drawing conclusions from analyses of cancer rates in areas with smaller populations (such as neighborhoods).

Calculation of Rates

A cancer incidence rate is defined as the number of new cancer cases diagnosed in a population over a period of time. Incidence rates are typically presented as the number of new cancer cases diagnosed per year per 100,000 individuals. This report calculated annual average incidence rates using five years of data (2000-2004). Because Delaware is a small state, five years of data are combined and then averaged to reduce the likelihood of statistical "flukes" that might occur if only one year of data was used. The period 2000-2004 is the most recent for which a complete set of 5-year data is available.

The cancer incidence rates are age-adjusted, which is a statistical procedure that allows a rate to be compared to other populations that may be younger or older. Because the most significant influence on the risk of cancer is a person's age, age-adjustment is necessary to make sure that we "control" the effect of age when comparing a population's risk of cancer.

Statistical Significance

The 95% confidence interval for each cancer rate is also presented. A confidence interval is sometimes called the "margin of error." A 95% confidence interval means that we are 95% sure that the incidence rate is between the lower confidence interval (LCI) and upper confidence interval (UCI). When confidence intervals are *small*, we are *more* certain that the incidence rate is a good estimate. When confidence intervals are *large*, we are *less* certain that the incidence rate is a good estimate. One factor that determines the width of the confidence interval is the size of the population from which the rate is calculated. Rates calculated from small populations have larger confidence intervals than rates calculated from big populations. This means that we are less certain of the incidence rate when the rate is calculated for smaller populations.

If the confidence intervals from two incidence rates do *not* overlap, we call the rates significantly different. When the difference between two incidence rates is statistically significant, it means that the difference between these two rates is larger than would be expected by chance alone. On the other hand, if rates from

two populations have confidence intervals that overlap, we cannot say that the rates are significantly different. A non-significant difference between incidence rates is commonly interpreted as "no meaningful difference" between rates.

Sometimes the incidence rate for a CCD is highly elevated compared to the incidence rate for the state of Delaware; but, if the CCD incidence rate has a very wide confidence interval, it still may not be significantly different from the state incidence rate. When incidence rates are computed for an entire geographic area based on a very small number of cases, rates are estimated with a larger degree of uncertainty. This uncertainty is represented by a very wide confidence interval.

When confidence intervals are wide, they are more likely to overlap with the confidence intervals of incidence rates from other areas; this means that it is more difficult to establish a significant difference between incidence rates. For this reason, incidence rates are not calculated at smaller levels (such as neighborhoods). Incidence rates for small geographic levels are estimated with such a high degree of uncertainty that few, if any, conclusions can be drawn from the data.

In addition to all cancer sites combined, this report focused on calculating incidence rates for breast, colorectal, lung and prostate cancers because they are the four most commonly occurring cancers in Delaware and the United States. Incidence rates for rare cancers were not calculated at the CCD level because of the high degree of uncertainty associated with rates calculated from a very small number of cases.

Determining if two incidence rates are significantly different from one another is an important step in investigating suspected cancer clusters. The Centers for Disease Control and Prevention (CDC) and that National Cancer Institute (NCI) define a cancer cluster as a greater-than-expected number of cancers diagnosed among a population in a particular geographic area, over a given period of time.

Reasons Why Cancer Clusters Occur

Some cancer clusters occur simply by chance. In these situations, clusters are not the result of a single, external cause; rather, the cluster reflects coincidental spatial clustering among individuals who have been diagnosed with cancer.

Other cancer clusters may be due to environmental exposure. Health officials are more easily able to trace the origin of a cancer cluster to an environmental exposure if the cluster involves one or more of the following three traits: (1) the cluster contains a large number of *one* type of cancer, as opposed to several cancer types; (2) the cluster involves a *rare* cancer type, as opposed to more commonly diagnosed cancers; and (3) the cluster involves a large number of cases of a type of cancer in an age group that is usually not affected by that cancer type.

Cancer clusters may also reflect better access to health care. Residents from one geographic area may be more likely to have cancer screening services compared to residents from another area. In these situations, cancer clusters exist because more cases of cancer are being diagnosed *earlier* than in other areas. As such, these cancer clusters do not reflect a truly elevated cancer risk in a geographic area.

Finally, cancer clusters may be due to clustering of lifestyle behaviors. Tobacco use, regular physical activity, diet, and other behaviors strongly impact cancer risk. If residents in one geographic area are more

likely to engage in unhealthy lifestyle behaviors, the cancer incidence rate for that area may be elevated compared to other areas.

Differences in Terms of Number of Cases

For those CCDs with significantly higher rates of cancer than all of Delaware, we calculated the difference in terms of the number of cases. To do this, the age-adjusted rate for the state was multiplied by the CCD's population. Next, the age-adjusted rate for the CCD was multiplied by the CCD's population. The first value was subtracted from the second value to yield the difference between the CCD and the state, in terms of additional cancer cases. These differences should be interpreted as the "extra" number of cases per year that are expected to occur in the CCD as a result of the CCD having a higher incidence rate compared to the state.

For example, the 2000-2004 average annual age-adjusted lung cancer incidence rate for Delaware was 75.2 per 100,000. If this rate is applied to the New Castle CCD population, the resulting number of expected lung cancer cases is 62. The lung cancer incidence rate for the New Castle CCD is 94.0 per 100,000. When this second rate is applied to the New Castle CCD population, the resulting number of expected lung cancer cases is 78. Subtracting the expected number of lung cancer cases in the New Castle CCD based on the state incidence rate (62) from the number of expected lung cancer cases based on the New Castle CCD incidence rate (78) yields 16. This means that the New Castle CCD experienced an average of 16 *more* lung cancer cases per year compared to the state as a whole.

Appendix A of this report provides details about how the populations, CCDs, rates, and confidence intervals were calculated.

Appendix B of this report provides the population for the CCDs.

Figure 1: New Castle County Delaware Census County Divisions

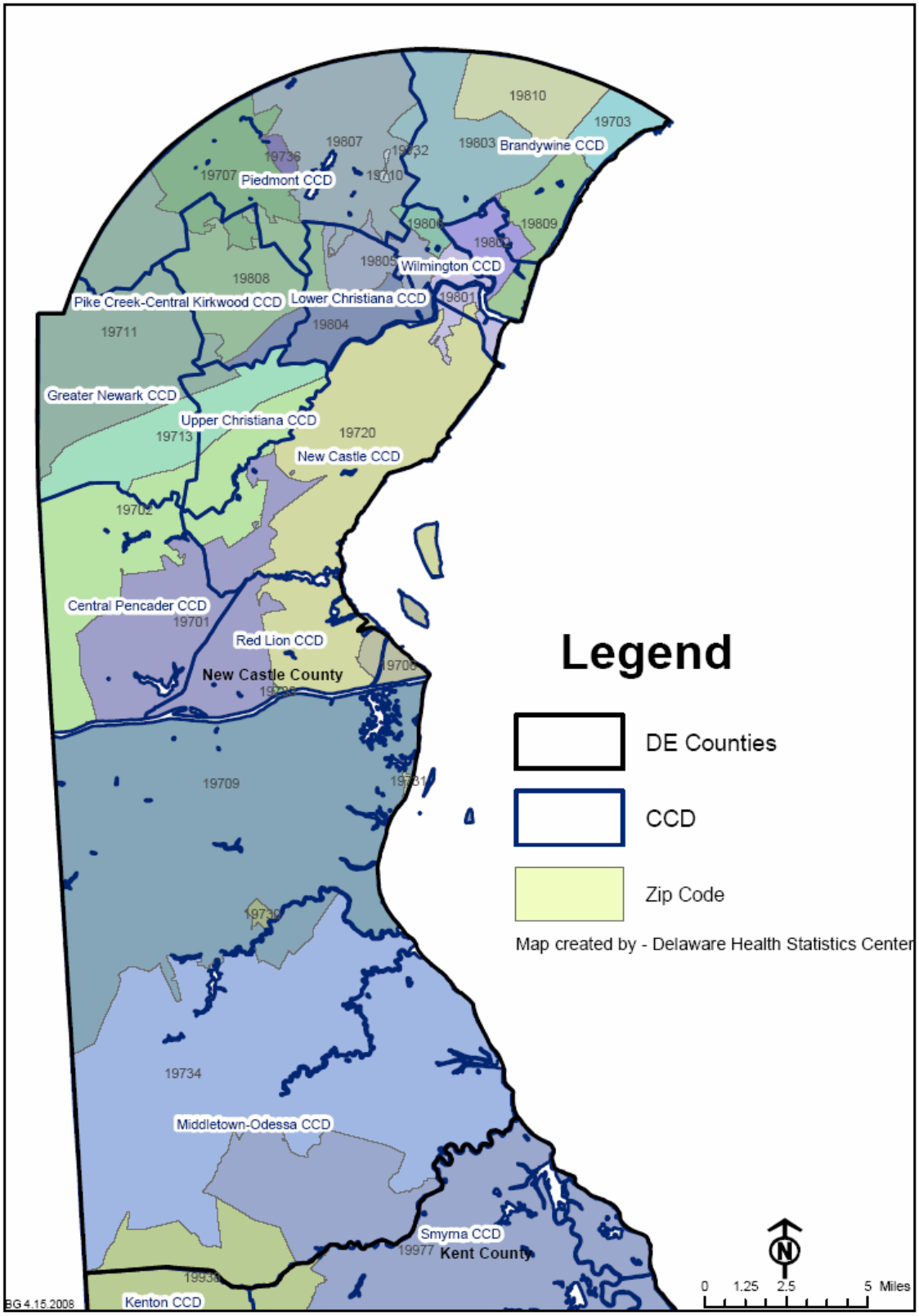
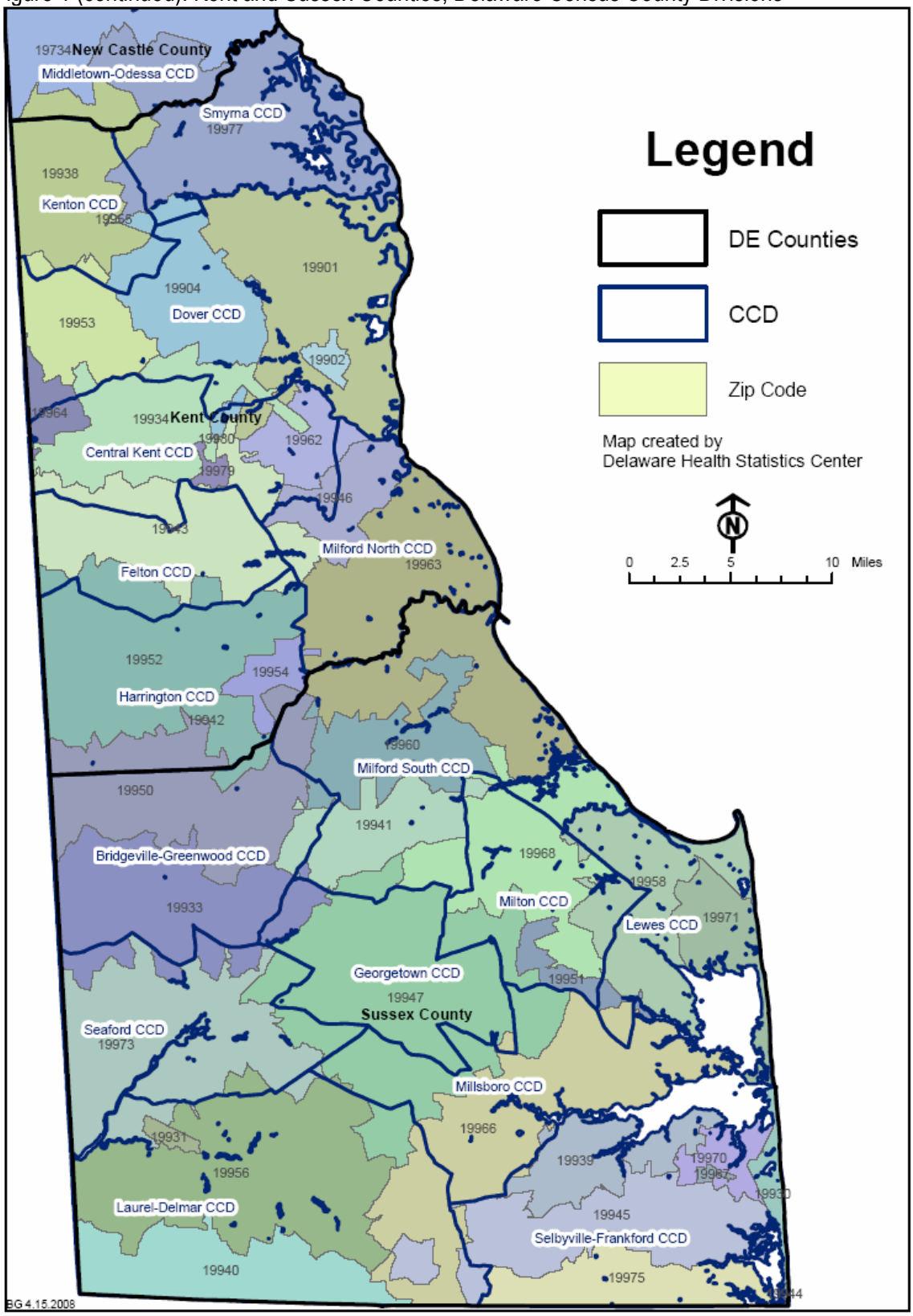


Figure 1 (continued): Kent and Sussex Counties, Delaware Census County Divisions



Limitations

As mentioned above, we have less confidence in rates calculated for small geographic areas. CCDs are larger than other geographic units (such as neighborhoods or census tracts); however, even at the CCD level, the confidence intervals for rates are so large that, in many instances, they overlap.

Rates for different race/ethnic groups, for males and for females, and for infrequently-occurring cancers were not computed. Calculating rates for these subgroups would result in incidence rates with very wide confidence intervals, making it impossible to determine with certainty if one incidence rate is different from another.

Many factors contribute to cancer risk, including age, heredity, tobacco use, nutrition, and exposures to cancer-causing agents. Because of this, these analyses cannot determine the reason why CCD incidence rates are higher or lower in certain geographic areas.

Cancers resulting from exposure develop slowly in people, usually appearing 5 – 40 years after exposure to a cancer-causing agent. Migration within the state further complicates the issue; people are constantly moving in and out CCDs, making it hard to link exposure to a cancer causing agent to where a person lives. Therefore, a map, alone, cannot prove that something in the environment is responsible for elevated cancer rates.

It is also important to note that just because a person lives in an area where there is a statistically higher rate of cancer does not mean that he or she, personally, is more likely to get cancer than someone who lives in an area with a lower rate. A person's risk depends on many things including lifestyle (smoking, diet), family history, and contact with cancer causing substances (sunlight, x-rays, tobacco smoke, and chemicals).

Results

For each of the five cancer types considered here ((a) all cancer sites combined; (b) breast cancer; (c) colorectal cancer; (d) lung cancer; and (e) prostate cancer), average annual age-adjusted incidence rates for CCDs are presented in both table and graph format. For comparison purposes, tables and graphs also include respective incidence rates for the state of Delaware. Incidence rates are arranged in descending order.

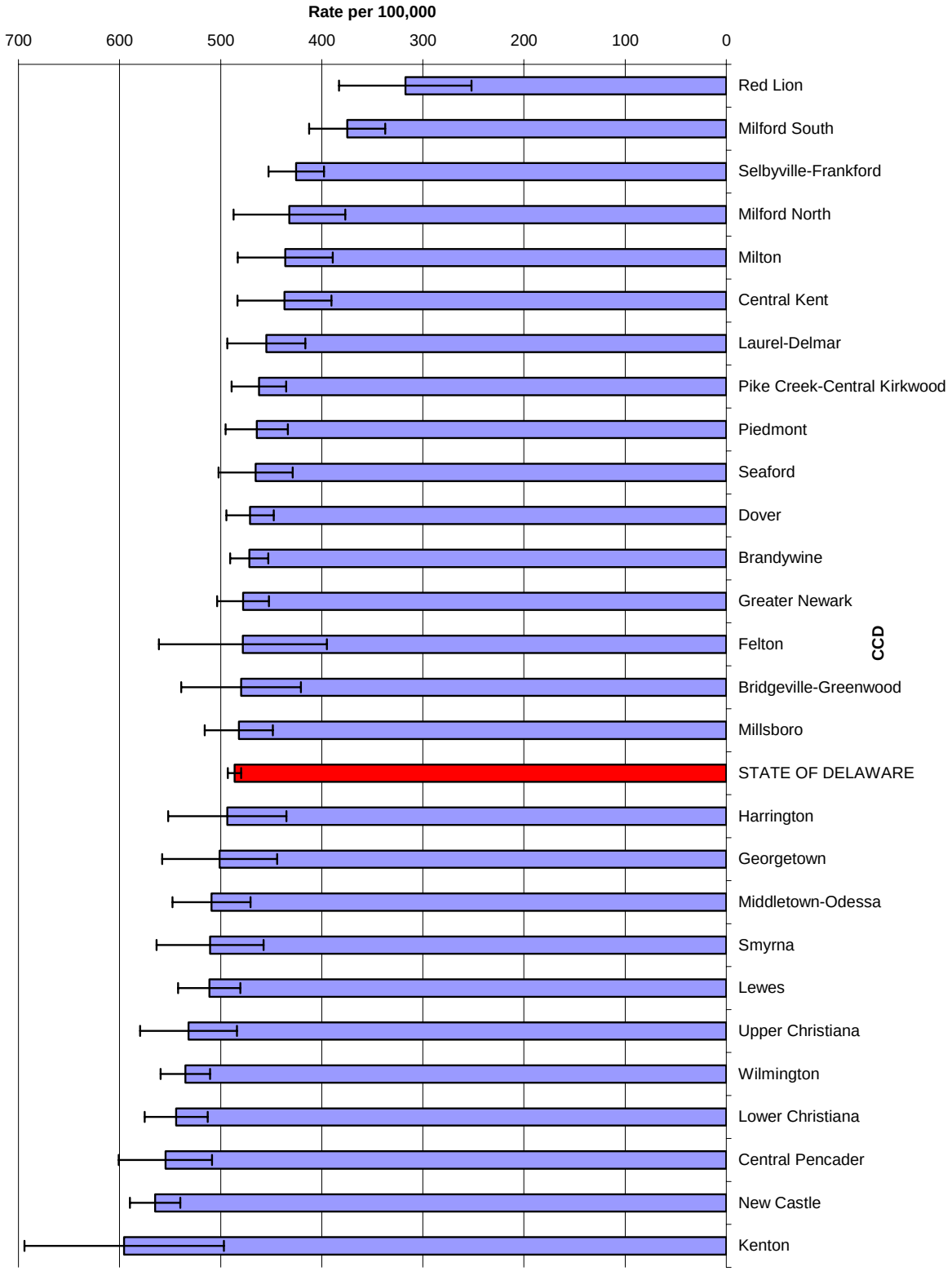
In graphical format, incidence rates for CCDs are represented by blue bars. State incidence rates are represented by red bars. The black lines that accompany each bar represent the lower and upper confidence interval for that particular incidence rate.

Table 1: Average Annual Age-Adjusted Cancer Incidence Rate, All Cancer Sites Combined, Delaware, 2000-2004, by Census County Division

	Rate	Lower Confidence Interval	Upper Confidence Interval	Statistical Significance*	Difference in Terms of "Extra" Cases†
Kenton	*595.44*	*496.81*	*694.08*	*Greater than State Rate*	*6*
New Castle	*564.76*	*539.83*	*589.69*	*Greater than State Rate*	*65*
Central Pencader	*554.60*	*508.42*	*600.78*	*Greater than State Rate*	*23*
Lower Christiana	*543.99*	*512.82*	*575.16*	*Greater than State Rate*	*21*
Wilmington	*534.94*	*510.53*	*559.36*	*Greater than State Rate*	*36*
Upper Christiana	531.79	483.76	579.81		
Lewes	511.19	480.40	541.98		
Smyrna	510.41	457.39	563.43		
Middletown-Odessa	508.98	470.47	547.49		
Georgetown	500.99	444.11	557.88		
Harrington	493.38	434.85	551.91		
STATE OF DELAWARE	486.34	479.72	492.96		
Millsboro	481.98	448.31	515.66		
Bridgeville-Greenwood	479.79	420.67	538.92		
Felton	477.99	394.85	561.12		
Greater Newark	477.91	452.24	503.57		
Brandywine	471.69	452.89	490.49		
Dover	470.84	447.37	494.31		
Seaford	465.43	428.80	502.07		
Piedmont	464.22	433.40	495.03		
Pike Creek-Central Kirkwood	462.11	435.13	489.09		
Laurel-Delmar	454.83	416.18	493.48		
Central Kent	436.89	390.45	483.33		
Milton	436.06	389.08	483.04		
Milford North	432.06	376.81	487.30		
Selbyville-Frankford	*425.29*	*397.84*	*452.74*	*Less than State Rate*	
Milford South	*374.78*	*337.20*	*412.37*	*Less than State Rate*	
Red Lion	*317.34*	*251.78*	*382.90*	*Less than State Rate*	

All rates are per 100,000 and age-adjusted to the 2000 U.S. standard population
± "*Greater than State Rate*" indicates CCD rate is statistically significantly greater than the state rate
± "*Less than State Rate*" indicates CCD rate is statistically significantly lower than the state rate
† Numbers should be interpreted as the "extra" number of cases per year that are expected to occur in the CCD as a result of the CCD having a higher incidence rate compared to the state
Rates statistically different from the state rate are shown *in italics*
Source: Delaware Division of Public Health, Cancer Registry

Figure 2: Average Annual Age-Adjusted Cancer Incidence Rate, All Sites Combined, Delaware, 2000-2004, by Census County Division



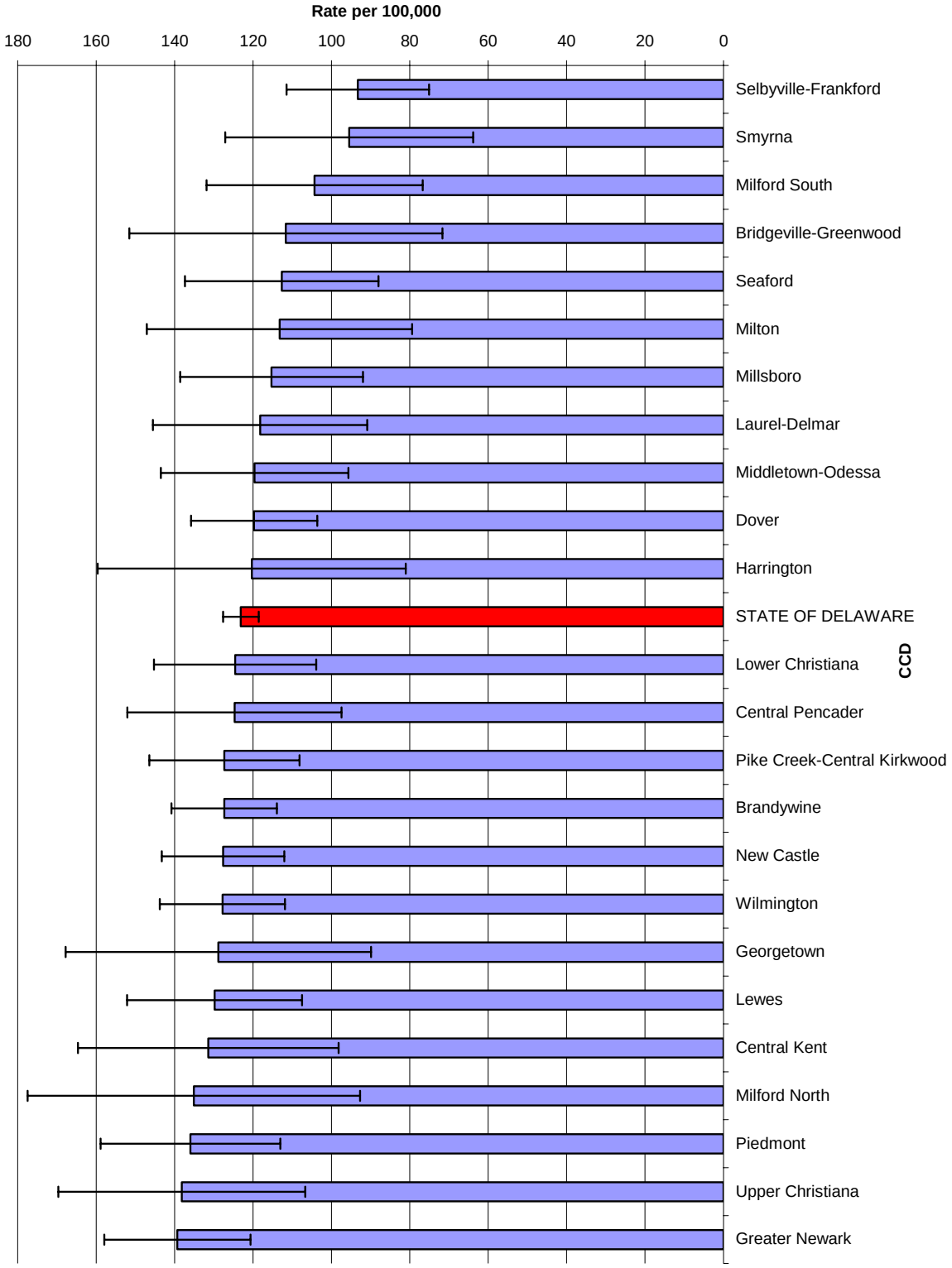
Note: Lower and upper confidence intervals indicated by black lines
Source: Delaware Division of Public Health, Cancer Registry

Table 2: Average Annual Age-Adjusted Incidence Rate, Breast Cancer, Delaware, 2000-2004, by Census County Division

	Rate	Lower Confidence Interval	Upper Confidence Interval	Statistical Significance±	Difference in Terms of "Extra" Cases†
Greater Newark	139.27	120.61	157.93		
Upper Christiana	138.17	106.69	169.65		
Piedmont	135.95	113.01	158.88		
Milford North	135.09	92.69	177.49		
Central Kent	131.38	98.14	164.62		
Lewes	129.79	107.48	152.10		
Georgetown	128.83	89.87	167.80		
Wilmington	127.77	111.81	143.74		
New Castle	127.63	112.03	143.24		
Brandywine	127.34	113.89	140.80		
Pike Creek-Central Kirkwood	127.29	108.15	146.42		
Central Pencader	124.70	97.37	152.03		
Lower Christiana	124.55	103.85	145.26		
STATE OF DELAWARE	123.10	118.56	127.64		
Harrington	120.32	81.01	159.62		
Dover	119.71	103.63	135.78		
Middletown-Odessa	119.58	95.66	143.50		
Laurel-Delmar	118.18	90.88	145.48		
Millsboro	115.25	91.95	138.54		
Milton	113.21	79.37	147.04		
Seaford	112.67	87.98	137.35		
Bridgeville-Greenwood	111.61	71.67	151.55		
Milford South	104.27	76.71	131.83		
Smyrna	95.45	63.83	127.08		
Selbyville-Frankford	*93.24*	*75.06*	*111.43*	*Less than State Rate*	
Felton	*	*	*		
Kenton	*	*	*		
Red Lion	*	*	*		

All rates are per 100,000 and age-adjusted to the 2000 U.S. standard population
** Rates are omitted because they are based on fewer than 25 cases*
± "*Greater than State Rate*" indicates CCD rate is statistically significantly greater than the state rate
± "*Less than State Rate*" indicates CCD rate is statistically significantly lower than the state rate
† Numbers should be interpreted as the "extra" number of cases per year that are expected to occur in the CCD as a result of the CCD having a higher incidence rate compared to the state
Rates statistically different from the state rate are shown *in italics*
Source: Delaware Division of Public Health, Cancer Registry

Figure 3: Average Annual Age-Adjusted Incidence Rate, Breast Cancer, Delaware, 2000-2004, by Census County Division



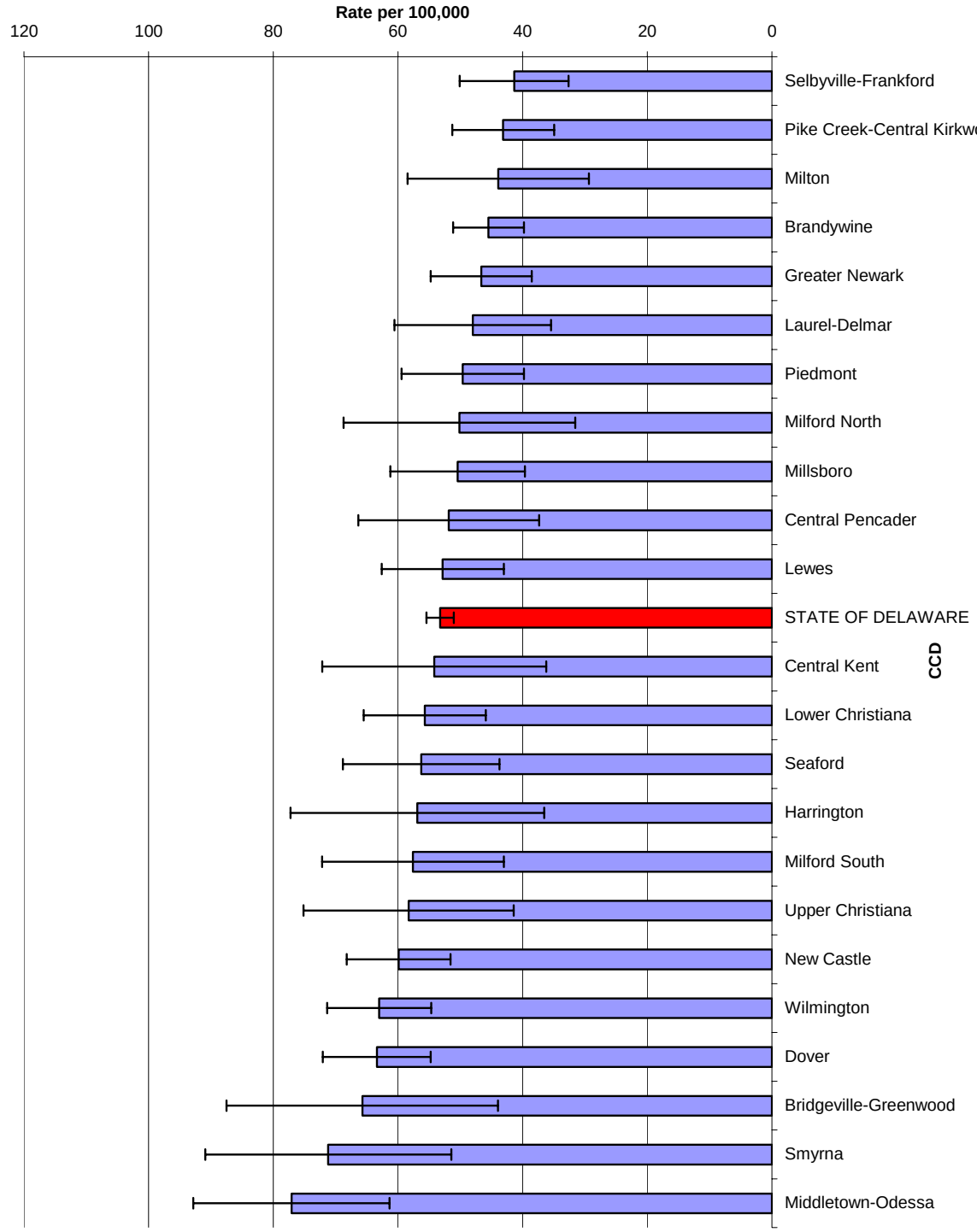
Note: Lower and upper confidence intervals indicated by black lines.
Source: Delaware Division of Public Health, Cancer Registry

Table 3: Average Annual Age-Adjusted Incidence Rate, Colorectal Cancer, Delaware 2000-2004, by Census County Division

	Rate	Lower Confidence Interval	Upper Confidence Interval	Statistical Significance±	Difference in Terms of "Extra" Cases†
Middletown-Odessa	*77.08*	*61.33*	*92.84*	*Greater than State Rate*	*8*
Smyrna	71.20	51.46	90.93		
Bridgeville-Greenwood	65.71	43.94	87.48		
Dover	63.39	54.73	72.04		
Wilmington	63.01	54.65	71.37		
New Castle	59.90	51.55	68.24		
Upper Christiana	58.29	41.45	75.14		
Milford South	57.59	43.02	72.17		
Harrington	56.88	36.53	77.24		
Seaford	56.27	43.70	68.83		
Lower Christiana	55.70	45.89	65.50		
Central Kent	54.18	36.23	72.13		
STATE OF DELAWARE	53.23	51.03	55.42		
Lewes	52.81	43.03	62.59		
Central Pencader	51.85	37.33	66.37		
Millsboro	50.43	39.64	61.21		
Milford North	50.14	31.57	68.71		
Piedmont	49.61	39.79	59.44		
Laurel-Delmar	47.99	35.42	60.55		
Greater Newark	46.64	38.53	54.75		
Brandywine	45.48	39.79	51.18		
Milton	43.90	29.35	58.44		
Pike Creek-Central Kirkwood	43.12	34.95	51.29		
Selbyville-Frankford	*41.36*	*32.62*	*50.11*	*Less than State Rate*	
Felton	*	*	*		
Georgetown	*	*	*		
Kenton	*	*	*		
Red Lion	*	*	*		

All rates are per 100,000 and age-adjusted to the 2000 U.S. standard population
** Rates are omitted because they are based on fewer than 25 cases*
± "*Greater than State Rate*" indicates CCD rate is statistically significantly greater than the state rate
± "*Less than State Rate*" indicates CCD rate is statistically significantly lower than the state rate
† Numbers should be interpreted as the "extra" number of cases per year that are expected to occur in the CCD as a result of the CCD having a higher incidence rate compared to the state
Rates statistically different from the state rate are shown *in italics*
Source: Delaware Division of Public Health, Cancer Registry

Figure 4: Average Annual Age-Adjusted Incidence Rate, Colorectal Cancer, Delaware, 2000-2004, by Census County Division



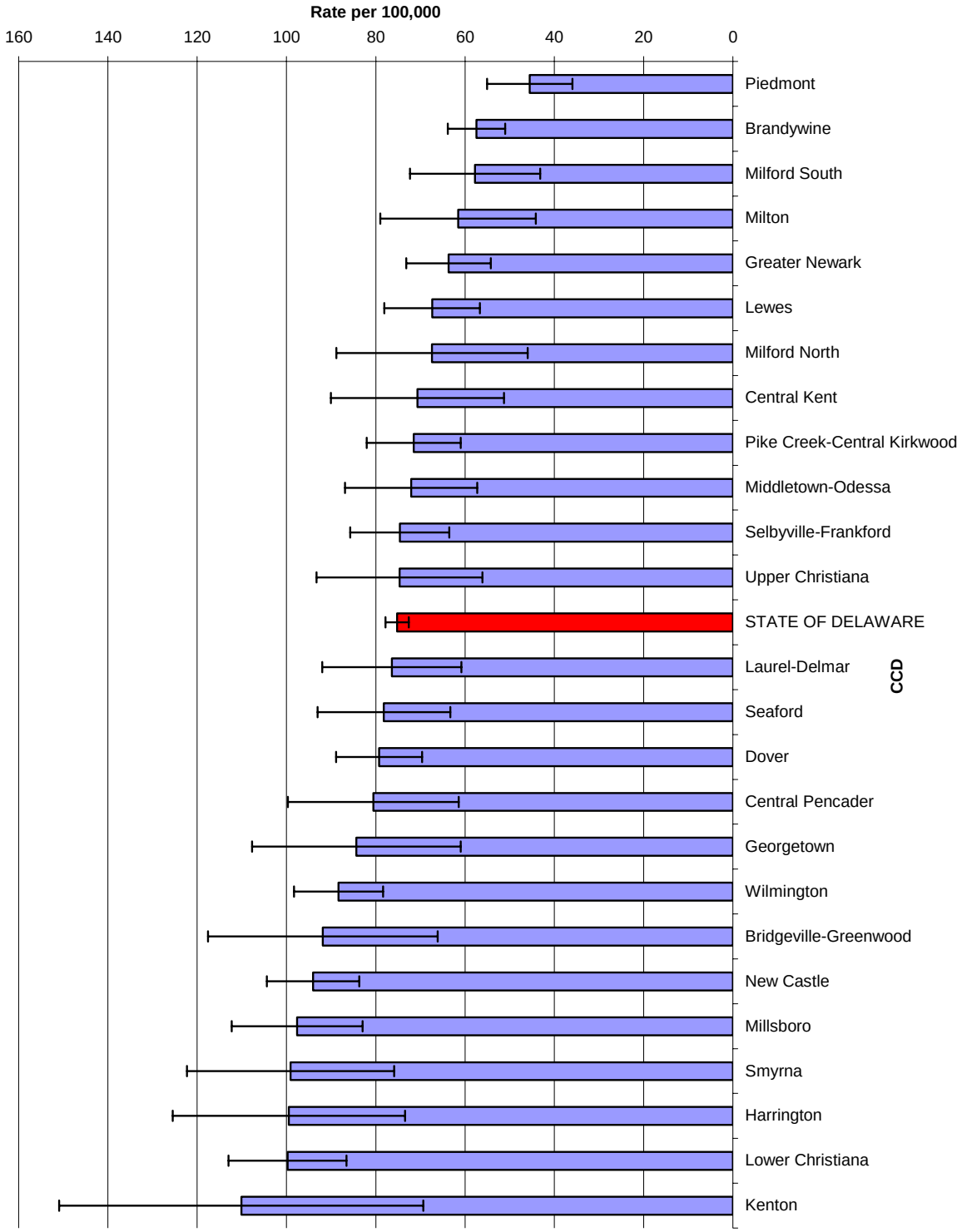
Note: Lower and upper confidence intervals indicated by black lines.
Source: Delaware Division of Public Health, Cancer Registry

Table 4: Average Annual Age-Adjusted Incidence Rate, Lung Cancer, Delaware, 2000-2004, by Census County Division

	Rate	Lower Confidence Interval	Upper Confidence Interval	Statistical Significance±	Difference in Terms of "Extra" Cases†
Kenton	110.13	69.34	150.92		
Lower Christiana	*99.76*	*86.55*	*112.97*	*Greater than State Rate*	*9*
Harrington	99.47	73.42	125.52		
Smyrna	99.06	75.85	122.26		
Millsboro	*97.61*	*82.98*	*112.24*	*Greater than State Rate*	*5*
New Castle	*94.04*	*83.68*	*104.41*	*Greater than State Rate*	*16*
Bridgeville-Greenwood	91.87	66.15	117.59		
Wilmington	*88.35*	*78.39*	*98.32*	*Greater than State Rate*	*10*
Georgetown	84.34	60.96	107.72		
Central Pencader	80.55	61.40	99.69		
Dover	79.28	69.64	88.91		
Seaford	78.18	63.30	93.06		
Laurel-Delmar	76.39	60.78	92.00		
STATE OF DELAWARE	75.22	72.63	77.81		
Upper Christiana	74.67	56.08	93.26		
Selbyville-Frankford	74.63	63.54	85.72		
Middletown-Odessa	72.08	57.27	86.89		
Pike Creek-Central Kirkwood	71.48	60.95	82.01		
Central Kent	70.68	51.28	90.07		
Milford North	67.42	45.98	88.86		
Lewes	67.36	56.65	78.07		
Greater Newark	63.70	54.24	73.17		
Milton	61.55	44.14	78.96		
Milford South	*57.74*	*43.13*	*72.35*	*Less than State Rate*	
Brandywine	*57.42*	*50.99*	*63.86*	*Less than State Rate*	
Piedmont	*45.51*	*35.95*	*55.07*	*Less than State Rate*	
Felton	*	*	*		
Red Lion	*	*	*		

All rates are per 100,000 and age-adjusted to the 2000 U.S. standard population
** Rates are omitted because they are based on fewer than 25 cases*
± "*Greater than State Rate*" indicates CCD rate is statistically significantly greater than the state rate
± "*Less than State Rate*" indicates CCD rate is statistically significantly lower than the state rate
† Numbers should be interpreted as the "extra" number of cases per year that are expected to occur in the CCD as a result of the CCD having a higher incidence rate compared to the state
Rates statistically different from the state rate are shown *in italics*
Source: Delaware Division of Public Health, Cancer Registry

Figure 5: Average Annual Age-Adjusted Incidence Rates, Lung Cancer, Delaware, 2000-2004, by Census County Division



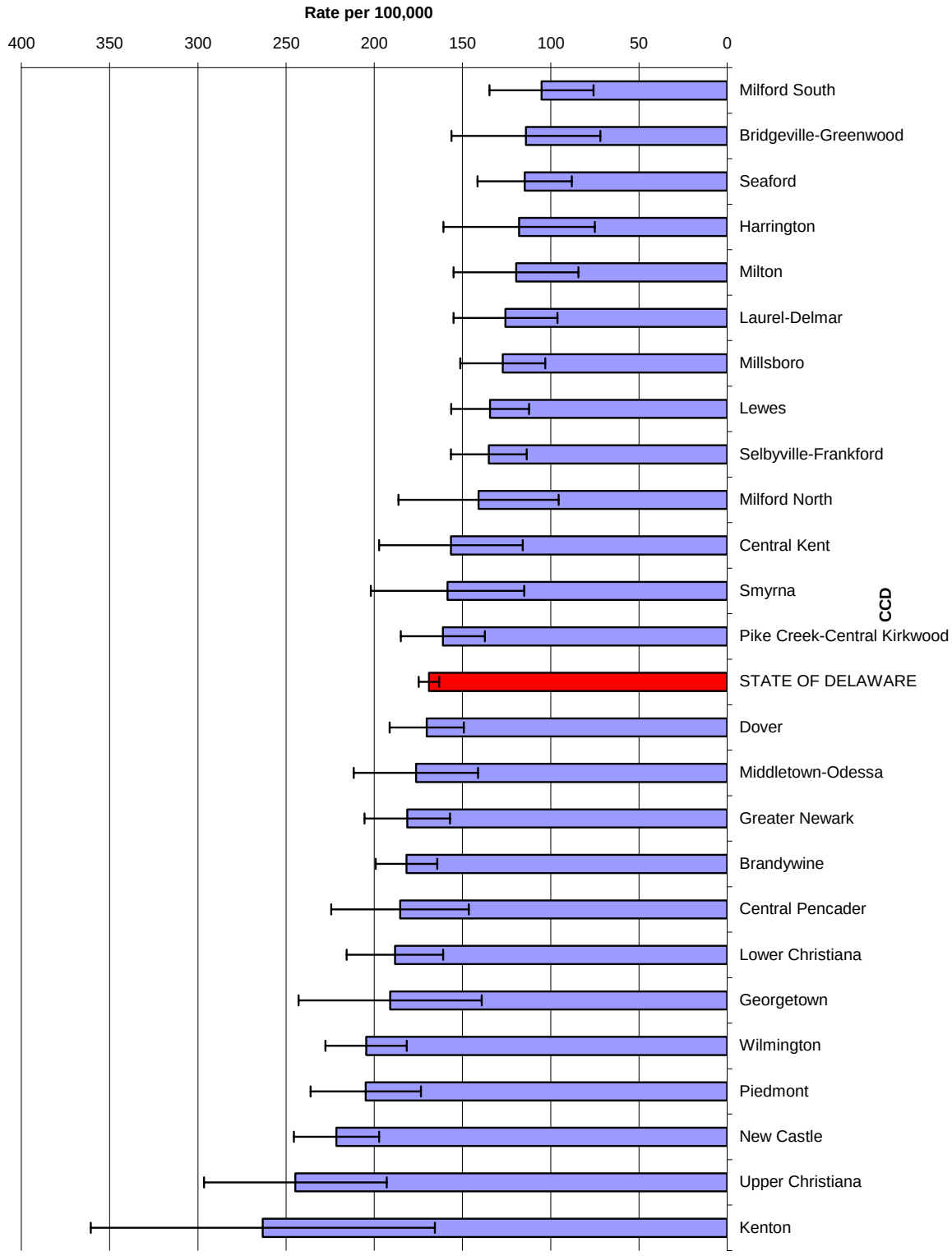
Note: Lower and upper confidence intervals indicated by black lines.
Source: Delaware Division of Public Health, Cancer Registry

Table 5: Average Annual Age-Adjusted Incidence Rates, Prostate Cancer, Delaware, 2000-2004, by Census County Division

	Rate	Lower Confidence Interval	Upper Confidence Interval	Statistical Significance±	Difference in Terms of "Extra" Cases†
Kenton	263.23	165.73	360.73		
Upper Christiana	*244.70*	*192.98*	*296.42*	*Greater than State Rate*	*9*
New Castle	*221.40*	*197.30*	*245.51*	*Greater than State Rate*	*21*
Piedmont	204.82	173.56	236.07		
Wilmington	*204.61*	*181.57*	*227.65*	*Greater than State Rate*	*13*
Georgetown	190.94	139.04	242.84		
Lower Christiana	188.28	160.92	215.63		
Central Pencader	185.40	146.44	224.35		
Brandywine	181.71	164.29	199.13		
Greater Newark	181.28	157.04	205.51		
Middletown-Odessa	176.40	141.11	211.68		
Dover	170.26	149.24	191.28		
STATE OF DELAWARE	169.01	163.20	174.82		
Pike Creek-Central Kirkwood	161.08	137.28	184.88		
Smyrna	158.43	114.95	201.92		
Central Kent	156.56	115.92	197.20		
Milford North	140.91	95.50	186.31		
Selbyville-Frankford	*135.11*	*113.63*	*156.59*	*Less than State Rate*	
Lewes	*134.36*	*112.26*	*156.46*	*Less than State Rate*	
Millsboro	*127.22*	*103.11*	*151.32*	*Less than State Rate*	
Laurel-Delmar	*125.62*	*96.19*	*155.05*	*Less than State Rate*	
Milton	*119.64*	*84.29*	*155.00*	*Less than State Rate*	
Harrington	*117.96*	*75.03*	*160.90*	*Less than State Rate*	
Seaford	*114.76*	*88.07*	*141.45*	*Less than State Rate*	
Bridgeville-Greenwood	*114.04*	*71.80*	*156.28*	*Less than State Rate*	
Milford South	*105.21*	*75.75*	*134.67*	*Less than State Rate*	
Felton	*	*	*		
Red Lion	*	*	*		

All rates are per 100,000 and age-adjusted to the 2000 U.S. standard population
** Rates are omitted because they are based on fewer than 25 cases*
± "*Greater than State Rate*" indicates CCD rate is statistically significantly greater than the state rate
± "*Less than State Rate*" indicates CCD rate is statistically significantly lower than the state rate
† Numbers should be interpreted as the "extra" number of cases per year that are expected to occur in the CCD as a result of the CCD having a higher incidence rate compared to the state
Rates statistically different from the state rate are shown *in italics*
Source: Delaware Division of Public Health, Cancer Registry

Figure 6: Average Annual Age-Adjusted Incidence Rates, Prostate Cancer, Delaware, 2000-2004, by Census County Division



Note: Lower and upper confidence intervals indicated by black lines.
Source: Delaware Division of Public Health, Cancer Registry

A Need for Future Research

As discussed under the "Limitations" section, this analysis cannot determine why some areas of the state have higher cancer rates than others. Possible reasons could include coincidental spatial clustering, environmental exposure, migration of people into or out of the area, differences in lifestyle risk factors, and improved access to health care. Additional study of the areas where there are higher rates will be necessary to gain further insight into the possible reasons. Questions that could be asked are:

- Are unusual cancers occurring that have known environmental causes?
- Are the people who are getting cancer younger than we normally would expect?
- Do these people have similar occupations?
- Are people in the area more or less likely to be screened for cancer than in areas with lower rates?
- Do areas with elevated rates contain disproportionate numbers of those at higher risk for cancer, including individuals in low income groups or in racial and ethnic groups known to be at high risk?
- Do a disproportionate number of residents in areas with elevated rates engage in lifestyle risk factors that place them at higher risk for developing cancer (e.g., tobacco use, sedentary lifestyle)?

To explore these questions and others, DPH will be arranging meetings with the communities in each of the areas with statistically higher rates, working with the respective legislators, seeking input from the Delaware Cancer Consortium, and, if appropriate, conducting formal epidemiologic studies to answer specific questions.

Appendix A: Review of Methodology

Preliminary Data Analyses

Preliminary analyses were performed on five raw data files created for the Division of Public Health (DPH) by the Delaware Cancer Registry One file included records of all cancer cases diagnosed in Delaware between 2000 and 2004 (all cancer sites combined). The remaining four data files included all cancer cases, diagnosed in Delaware during the same time period, for the following four primary sites: (a) female breast; (b) colorectal; (c) lung / bronchus; and (d) prostate.

Raw data files were sorted by tumor behavior code[2]. Behavior codes are assigned using the following coding scheme[3]:

- 0 = benign (tumor is growing in an isolated location and will not spread to surrounding tissue)
- 1 = uncertain (tumor displays borderline malignancy or uncertain malignancy potential)
- 2 = in situ (tumor has the potential to spread to surrounding tissue, but is currently contained in an isolated location)
- 3 = malignant (tumor has invaded surrounding tissue)

Per reporting guidelines mandated by the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute, cancer incidence rates *exclude* benign tumors, non-urinary bladder in situ tumors, and basal and squamous cell cancers. However, state cancer registries may still collect data on these tumors for tracking purposes. Therefore, raw data files were analyzed to determine the proportion of cases involving benign, non-urinary bladder in situ tumors, and basal and squamous cell cancers; all cases involving benign tumors, non-bladder in situ tumors, and basal and squamous cell cancer were eliminated from files; all malignant tumors, as well as any tumors with an unknown behavior code, were retained for further analyses. Table A1 displays the distribution of tumor behaviors across the five raw cancer files.

[2] Behavior code describes a tumor's pattern of growth within the body
[3] As defined by the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute and printed in the International Classification of Diseases for Oncology, Third Edition (ICD-O-3).

Table A1: Distribution of Tumor Behavior by Primary Site

	All Site	Breast	Colorectal	Lung	Prostate
Total Cases	22,791	3,681	2,439	3,328	3,340
Benign	58	0	1	0	0
Unknown	24	0	0	0	0
In Situ	2,035	795	127	1	4
Urinary Bladder[4]	*493*	*0*	*0*	*0*	*0*
Non-Urinary Bladder	*1,542*	*795*	*127*	*1*	*4*
Malignant	20,774	2,886	2,311	3,327	3,336
Total Cases Retained	21,191	2,886	2,311	3,327	3,336

Source: Delaware Division of Public Health, Cancer Registry

After retaining all appropriate cancer cases, raw data files were truncated to include the following 12 variables: (1) patient ID number; (2) gender; (3) age at diagnosis; (4) race; (5) Spanish / Hispanic origin; (6) census tract at diagnosis; (7) county of residence at diagnosis; (8) zipcode at diagnosis; (9) year of diagnosis; (10) primary tumor site; (11) tumor behavior code; (12) tumor histology code. Raw data files were converted into comma separated data files and imported into SAS for further analysis.

Secondary Data Analyses

Secondary analyses focused on creation of the Census County Division (CCD) variable. CCDs represent county subdivisions and are established, cooperatively, by the United State Census Bureau and state and local authorities. CCDs have been established in 21 states and represent a useful method of presenting statistics in areas where minor civil divisions (i.e., primary governmental or administrative sectors within counties) do not exist. In general, CCDs are defined in such a way that boundaries follow visible features and census tracts (where available). In Delaware, 27 CCDs are defined using census tracts. While the Delaware Cancer Registry collects census tract data, it is not mandated to record the CCD in which each new diagnosed cancer case exists; therefore, prior to any analyses involving CCDs, the CCD variable must be manually created using existing census tract data.

As of the 2000 Census, Delaware is subdivided into 197 census tracts (please note that census tracts *do not* follow a consecutive numbering scheme). New Castle County includes tracts 1 through 169.02. Kent County is comprised of census tracts 401 through 431, and Sussex County includes census tracts 501.01 through 519. The Delaware Cancer Registry codes census tracts using a 5-digit coding scheme; the 5-digit coding system accounts for census tracts with values carried out to the tenths and hundredths positions following a decimal point (e.g., 169.02). Census tracts *without* digits following a decimal point are coded with trailing zeroes that serve as "place holder" values. For example, within the raw data, census tract 519 is coded as 51900. For census tracts lower than 100 (i.e., tracts 1 through 27), leading zeroes serve as "place holder" values in the 5-digit numbering scheme. For example, census tracts 1 and 6.01 are coded as

[4] In situ bladder tumors indicated by primary site codes C670 – C679.

00100 and 00601, respectively, within the registry data. Importation of the raw data files from Excel into SAS results in the deletion of leading zeroes from the census tract variable. Therefore, the first step in creating CCDs was to manually recode all census tract values back to their original 5-digit values. The CCD variable was created using operational CCD definitions provided by the Delaware Health Statistics Center. Table A2 shows the operational definitions (based on census tracts) for all 27 CCDs. For cancer cases which missing or invalid census tract data, CCD was labeled "Unknown".

Table A2: Census County Divisions: Operational Definitions by Census Tract

	CCD Name	Census Tracts Included
1	Central Kent	42000, 42100, 42201, 42202
2	Dover	40400 (if zip = 19901 or 19961), 40500, 40600, 40700, 40800, 40900, 41000, 41100, 41200, 41300, 41400, 41500, 41600, 41701, 41702, 41801, 41802, 41900
3	Felton	42800
4	Harrington	42900, 43000, 43100
5	Kenton	40100
6	Milford North	42400, 42500, 42600, 42700
7	Smyrna	40400 (if zip = 19977), 40201, 40202, 40203
8	Brandywine	10101, 10102, 10200, 10300, 10400, 10500, 10700, 10800, 10900, 11000, 11100, 11201, 11202, 11203, 11204, 11205, 11206, 11300, 11400, 11500, 11600, 11700
9	Central Pencader	14805, 14806, 14807, 14808
10	Greater Newark	13610, 13611, 13700, 14803, 14100, 14200, 14300, 14402, 11403, 14404, 14501, 14502, 14702, 14703, 14705, 14706
11	Lower Christiana	12000, 12100, 12200, 12300, 12400, 12500, 12600, 12700, 12900
12	Middletown-Odessa	16601, 16602, 16603, 16604, 16801, 16802, 16901, 16902
13	New Castle	14902, 14903, 14904, 14905, 15000, 15100, 15200, 15400, 15500, 15600, 15800, 15900, 16000, 16100, 16200, 16301, 16302, 16303
14	Peidmont	11800, 11900, 13501, 13503, 13504
15	Pike Creek-Central Kirkwood	13000, 13100, 13200, 13300, 13400, 13604, 13607, 13608, 13609, 13612, 13613
16	Red Lion	16401, 16402
17	Upper Christiana	13800, 13901, 13902, 14000
18	Wilmington	00100, 00200, 00300, 00400, 00500, 00601, 00602, 00700, 00800, 00900, 01000, 01100, 01200, 01300, 01400, 01500, 01600, 01700, 01800, 01900, 02000, 02100, 02200, 02300, 02400, 02500, 02600, 02700
19	Bridgeville-Greenwood	50301, 50302
20	Georgetown	50501, 50502
21	Laurel-Delmar	51701, 51702, 51801, 51802, 51900
22	Lewes	50900, 51001, 51002, 51003, 51100
23	Milford South	50101, 50102, 50103, 50200
24	Millsboro	50601, 50602, 50701, 50702
25	Milton	50801, 50802, 50803
26	Seaford	50401, 50402, 50403, 50404
27	Selbyville-Frankford	51200, 51301, 51302, 51303, 51304, 51400, 51500

Source: Delaware Division of Public Health, Delaware Health Statistics Center

To evaluate the accuracy of geographic variables, follow-up analyses involved cross-tabulations using three geographic variables. The Delaware Cancer Registry collects several variables related to location of residence at the time of cancer diagnosis. Hospital registries report patients' street address, zip code, and county of residence, all at the time of diagnosis, to the Central Registry. Geocoding software is used at the Central Registry level to assign census tract codes to each new record; census tract assignment is based on street address and zip code. Data analysts are increasingly confident of the accuracy of the data when record-level zip code, census tract, and county code data indicate the same county of residence at the time of diagnosis.

As mentioned previously, Delaware is comprised of 197 census tracts. Based on census tracts data, a new variable "ccode" was created to represent the county in which the cancer case would have been diagnosed assuming the census tract of residence at time of diagnosis was coded accurately. That is, the variable "ccode" answered the question, "If a person was diagnosed in this census tract, in what county would they have been diagnosed?" Table A3 shows the breakdown of counties by census tract.

Table A3: Delaware Counties by Census Tract

County	Census Tracts Included
New Castle County	00100, 00200, 00300, 00400, 00500, 00601, 00602, 00700, 00800, 00900, 01000, 01100, 01200, 01300, 01400, 01500, 01600, 01700, 01800, 01900, 02000, 02100, 02200, 02300, 02400, 02500, 02600, 02700, 10101, 10102, 10200, 10300, 10400, 10500, 10700, 10800, 10900, 11000, 11100, 11201, 11202, 11203, 11204, 11205, 11206, 11300, 11400, 11500, 11600, 11700, 11800, 11900, 12000, 12100, 12200, 12300, 12400, 12500, 12600, 12700, 12900, 13000, 13100, 13200, 13300, 13400, 13501, 13503, 13504, 13604, 13607, 13608, 13609, 13610, 13611, 13612, 13613, 13700, 13800, 13901, 13902, 14000, 14100, 14200, 14300, 14402, 14403, 14404, 14501, 14502, 14702, 14703, 14705, 14706, 14803, 14805, 14806, 14807, 14808, 14902, 14903, 14904, 14905, 15000, 15100, 15200, 15400, 15500, 15600, 15800, 15900, 16000, 16100, 16200, 16301, 16302, 16303, 16401, ,16402, 16601, 16602, 16603, 16604, 16801, 16802, 16901, 16902
Kent County	40100, 40201, 40202, 40203, 40400, 40500, 40600, 40700, 40800, 40900, 41000, 41100, 41200, 41300, 41400, 41500, 41600, 41701, 41702, 41801, 41802, 41900, 42000, 42100, 42201, 42202, 42400, 42500, 42600, 42700, 42800, 42900, 43000, 43100
Sussex County	50101, 50102, 50103, 50200, 50301, 50302, 50401, 50402, 50403, 50404, 50501, 50502, 50601, 50602, 50701, 50702, 50801, 50802, 50803, 50900, 51001, 51002, 51003, 51100, 51200, 51301, 51302, 51303, 51304, 51400, 51500, 51701, 51702, 51801, 51802, 51900

Source: Delaware Division of Public Health

Delaware is comprised of 93 zip codes. As with census tract data, new variable "zcode" was created to represent the county in which a cancer case would have been diagnosed assuming the zip code of residence at time of diagnosis was coded accurately. Thus, the variable "zcode" answered the question, "If a person was diagnosed in this zip code, in what county would they have been diagnosed?" Table A4 shows the breakdown of counties by zip code.

Table A4: Delaware Counties by Zip Code

County	Zip Codes Included
New Castle County	19701, 19702, 19703, 19706, 19707, 19709, 19710, 19711, 19713, 19720, 19730, 19731, 19732, 19733, 19734, 19736, 19801, 19802, 19803, 19804, 19805, 19806, 19807, 19808, 19809, 19810 and 19938 if census tract = 16901 19977 if census tract = 16901 or 16902
Kent County	19901, 19902, 19903, 19904, 19905, 19934, 19936, 19943, 19946, 19952, 19953, 19954, 19955, 19961, 19962, 19964, 19979, 19980, and 19938 if census tract = 40100 or 40201 19963 if census tract = 42600 19977 if census tract = 40100, 40201, 40202, 40203, or 40404
Sussex County	19930, 19931, 19933, 19939, 19940, 19941, 19944, 19945, 19947, 19950, 19951, 19956, 19958, 19960, 19966, 19967, 19968, 19969, 19970, 19971, 19973, 19975, and 19963 if census tract = 50101, 50102, or 50103

Source: Delaware Division of Public Health

Cross-tabulations ("ccode" x "zcode" x county) were performed within each dataset. Consistent results (i.e., "ccode" = "zcode" = county code) were assumed to be indicative of accurately coded geographic data. For example, consider a hypothetical record for Individual A, diagnosed with breast cancer. If the data indicated that Individual A resided in census tract 02700 (New Castle County), within zip code 19801 (New Castle County), and the county of residence for Individual A was coded as New Castle County, geographic data were assumed accurate.

Conversely, geographic data were considered inconsistent if one of the following three scenarios existed: (a) "ccode"≠ "zcode"; (b) "ccode" ≠ county; (c) "zcode" ≠ county). For example, if the data indicated that Individual B, a hypothetical prostate cancer patient, resided in census tract 50102 (Sussex County), within zip code 19901 (Kent County), and the county of residence for Individual B was coded as Sussex County, geographic data were inconsistent.

Records with inconsistent geographic data were subsetted for further analyses; analyses revealed that geographic inconsistencies belonged to one of 12 categories. These categories are outlined in Table A5.

Table A5: 12 Categories of Inconsistent Geographic Data

1	Zip code and census tract point to the same county of diagnosis; county code is non-matching
2	Zip code and county code point to the same county of diagnosis; census tract is non-matching
3	Census tract and county code point to the same county of diagnosis; zip code is non-matching
4	Zip code and census tract point to the same county of diagnosis; county code is missing
5	Zip code and county code point to the same county of diagnosis; census tract is missing
6	Census tract and county code point to the same county of diagnosis; zip code is missing
7	Zip code and census tract are non-matching; county code is missing
8	Census tract and county code are non-matching; zip code is missing
9	Zip code and county code are non-matching; census tract is missing
10	Zip code data available; census tract and county code data are both missing
11	Census tract data available; zip code and county code data are both missing
12	County code data available; zip code and census tract data are both missing

Source: Delaware Division of Public Health

Three categories of inconsistency among geographic variables warranted record elimination. First, records were eliminated if census tract data were missing. Second, records were eliminated if census tract pointed to a different county of diagnosis than did zip code and county code. For example, if the record for Individual C indicated that that the person was diagnosed in census tract 02700 (New Castle County), but zip code and county code data both indicated that the county of residence at time of diagnosis was Sussex County, the record was eliminated. Third, records were eliminated if census tract, zip code, and county code were completely non-matching (i.e., census tract indicated New Castle County as the county of residence at time of diagnosis, while zip code and county code indicated Kent and Sussex Counties, respectively, as the county of residence at the time of diagnosis). Provided they did not meet any of the above three scenarios, records were retained for incidence rate analyses.

Table A6 shows the total number of records, the number of records with inconsistent geographic data, and the number of records ultimately eliminated from further analyses among the five cancer data sets.

Table A6: Breakdown of Geographically Inconsistent Records, by Data Set

	Total No. Cases (from DCR)	No. Cases with Inconsistent Geographic Data	No. Cases Ultimately Eliminated	No. Cases Retained for Incidence Rate Analysis
All Site, 2000-04	21,191	860	570	20,721
Breast, 2000-04	2,886	98	59	2,827
Colorectal, 2000-04	2,312	88	49	2,263
Lung, 2000-04	3,327	126	86	3,241
Prostate, 2000-04	3,336	123	83	3,253

Source: Delaware Division of Public Health

Calculating Age-Adjusted Incidence Rates

CCD population denominators were calculated by the Delaware Health Statistics Center using estimates from the Delaware Population Consortium and the 2000 Census. CCD population denominators were stratified by gender (male, female) and age group (0-4 yrs, 5-14 yrs, 15-24 yrs, 25-34 yrs, 35-44 yrs, 45-54 yrs, 55-64 yrs, 65-74 yrs, 75-84 yrs, and 85+ years). Population denominators were available for the 6-year time period encompassing 2000-2005. Denominators for years 2000 through 2004 were summed to obtain

the 2000-2004 population for each CCD. Five-year (2000-2004) population estimates ranged in size from 27,924 for Kenton to 414,251 for New Castle. Please refer to Appendix B for total and gender-specific populations by CCD. Within these tables, CCDs are arranged in order of descending size by 2000-2004 population; below each 5-year population estimate is a one-year population estimate (2005 only) for that CCD.

Within each of the five cancer data files, cross-tabulations (age group x CCD) were performed to determine the number of cancer cases by CCD and the age groups in which they were diagnosed. These frequencies were used to calculate crude and age-adjusted incidence rates. Crude incidence rates represent the total number of new cancer diagnoses over the total population at risk, without consideration of any demographic characteristics of the population. Age-adjusted incidence rates take into account the age distribution of the population at risk; age-adjusted incidence rates are useful for comparing rates between two populations that differ in age composition.

To calculate crude incidence rates, the number of cancer cases diagnosed in a particular age group in a particular CCD was divided by the population size for that specific cohort; these values were then multiplied by 100,000 (see Equation A1). To determine the 2000-2004 crude incidence rate for an entire CCD, the number of cancer cases diagnosed in a CCD over the 5-year period was divided by the total population of the CCD for the same 5-year period, and this value was multiplied by 100,000.

Equation A1: 2000-2004 Crude All Site Incidence Rate, 25-34 year olds, Milford South

$$\frac{(\text{No. cancer cases (2000}-\text{2004) among 25}-\text{34 year olds in Milford South})}{(\text{2000}-\text{2004 population, 25}-\text{34 year olds in Milford South})} = \frac{(3)}{(8983)} \times 100{,}000 = \quad 33.4 \text{ per } 100{,}000$$

To calculate age-adjusted incidence rates, crude incidence rates for each age group were multiplied by the appropriate 2000 U.S. Standard Million Population weight[5]. Table A7 displays the U.S. Standard Million population weights, by age group. Age-adjusted incidence rates for each of the 10 age groups were summed to yield the age-adjusted incidence rate for an entire population.

Table A7: U.S. Standard Million Population Weights, by Age Group

Age Group	U.S. Standard Million Population Weight
0-4 yrs	0.069135
5-14 yrs	0.145565
15-24 yrs	0.138646
25-34 yrs	0.135573
35-44 yrs	0.162613
45-54 yrs	0.134834
55-64 yrs	0.087247
65-74 yrs	0.066037
75-84 yrs	0.044842
85+ yrs	0.015508

Source: Centers for Disease Control and Prevention, National Center for Health Statistics

5 Published by the Centers of Disease Control and Prevention and the National Center for Health Statistics.

Upper and lower (95%) confidence intervals were calculated around age-adjusted incidence rates for each CCD. The following formulas were used to generate upper and lower confidence limits:

$$\text{Lower Confidence Interval} = \text{AA Rate} - 1.96\left(\frac{(\text{AA Rate})}{\sqrt{\#\text{ Cases}}}\right)$$

$$\text{Upper Confidence Interval} = \text{AA Rate} + 1.96\left(\frac{(\text{AA Rate})}{\sqrt{\#\text{ Cases}}}\right),$$

where AA Rate represents the age-adjusted incidence rate for a particular CCD.

Appendix B: CCD Populations, 2000-2004 and 2005 Only

	2000-2004	New Castle	Brandywine	Wilmington	Dover	Greater Newark	Pike Creek-Central Kirkwood
	Total (M + F):	414,251	395,859	362,555	343,445	338,391	212,900
	Total Male:	202,317	189,394	175,718	165,541	164,883	102,745
	Total Female:	211,934	206,465	186,837	177,904	173,508	110,155
Male, 2000-2004	0-4 years	15,468	11,900	13,196	12,335	9,431	6,739
	5-14 years	33,119	25,986	26,800	25,312	19,121	13,812
	15-24 years	27,219	19,354	25,533	28,460	47,629	12,052
	25-34 years	32,768	22,996	29,134	21,649	21,294	13,657
	35-44 years	34,266	30,377	27,176	25,014	21,583	17,739
	45-54 years	26,775	29,378	22,267	20,982	19,583	15,133
	55-64 years	16,962	20,691	13,897	14,651	12,763	10,569
	65-74 years	9,528	15,551	9,552	10,456	7,909	7,834
	75-84 years	5,319	10,599	6,319	5,369	4,508	4,452
	85+ years	893	2,562	1,844	1,313	1,062	758
Female, 2000-2004	0-4 years	15,070	11,596	12,864	12,240	9,188	6,566
	5-14 years	31,388	24,627	25,396	24,193	18,120	13,089
	15-24 years	27,452	19,522	25,752	29,220	48,040	12,156
	25-34 years	33,186	23,290	29,506	23,342	21,566	13,833
	35-44 years	35,505	31,475	28,157	26,722	22,361	18,379
	45-54 years	28,636	31,418	23,817	22,786	20,942	16,184
	55-64 years	18,598	22,685	15,234	15,964	13,991	11,588
	65-74 years	11,608	18,946	11,639	11,924	9,635	9,545
	75-84 years	8,231	16,404	9,788	8,101	6,974	6,893
	85+ years	2,260	6,502	4,684	3,413	2,691	1,922

	2005 Only	New Castle	Brandywine	Wilmington	Dover	Greater Newark	Pike Creek-Central Kirkwood
	Total (M + F):	83,884	79,395	72,213	73,457	68,069	42,700
	Total Male:	40,922	37,973	35,058	35,407	33,218	20,596
	Total Female:	42,962	41,422	37,155	38,050	34,851	22,104
Male, 2005	0-4 years	3,104	2,372	2,840	2,606	1,896	1,343
	5-14 years	6,487	5,000	5,002	5,143	3,683	2,659
	15-24 years	5,453	3,813	5,308	6,239	9,557	2,383
	25-34 years	6,440	4,396	5,602	4,541	4,115	2,628
	35-44 years	6,554	5,720	5,251	5,028	4,050	3,356
	45-54 years	5,697	6,136	4,582	4,735	4,167	3,170
	55-64 years	3,874	4,556	3,080	3,397	2,925	2,341
	65-74 years	1,935	3,162	1,834	2,224	1,598	1,593
	75-84 years	1,137	2,217	1,169	1,179	958	935
	85+ years	241	601	390	315	269	188
Female, 2005	0-4 years	3,124	2,387	2,859	2,615	1,908	1,351
	5-14 years	6,162	4,749	4,752	4,934	3,498	2,526
	15-24 years	5,350	3,742	5,209	6,285	9,377	2,338
	25-34 years	6,571	4,484	5,715	4,908	4,199	2,681
	35-44 years	6,808	5,944	5,455	5,352	4,208	3,488
	45-54 years	6,069	6,537	4,881	5,172	4,438	3,378
	55-64 years	4,279	5,033	3,403	3,692	3,232	2,586
	65-74 years	2,307	3,770	2,186	2,553	1,905	1,898
	75-84 years	1,712	3,336	1,759	1,766	1,441	1,407
	85+ years	578	1,440	936	773	645	451

Source: Delaware Health Statistics Center

Appendix B: CCD Populations, 2000-2004 and 2005 Only

	2000-2004	Lower Christiana	Middletown-Odessa	Central Pencader	Piedmont	Selbyville-Frankford	Upper Christiana
	Total (M + F):	182,273	171,130	168,743	150,656	130,052	123,765
	Total Male:	87,741	83,744	83,163	72,160	63,081	60,667
	Total Female:	94,532	87,386	85,580	78,496	66,971	63,098
Male, 2000-2004	0-4 years	6,005	6,188	7,619	4,642	2,810	4,523
	5-14 years	12,483	14,525	14,361	11,293	6,573	9,025
	15-24 years	11,250	9,689	10,392	7,047	5,785	9,259
	25-34 years	11,848	11,230	14,851	5,180	5,393	11,230
	35-44 years	14,501	17,229	16,057	12,205	8,036	10,607
	45-54 years	11,276	12,261	11,479	13,698	9,261	8,077
	55-64 years	7,963	7,395	5,290	8,830	10,700	4,659
	65-74 years	7,065	3,278	2,134	4,773	9,945	2,011
	75-84 years	4,536	1,580	781	3,305	4,023	1,002
	85+ years	814	369	199	1,187	555	274
Female, 2000-2004	0-4 years	5,851	6,035	7,425	4,522	2,732	4,407
	5-14 years	11,827	13,767	13,613	10,703	6,259	8,552
	15-24 years	11,349	9,763	10,476	7,106	5,432	9,339
	25-34 years	11,998	11,374	15,041	5,248	5,408	11,372
	35-44 years	15,022	17,857	16,639	12,644	8,240	10,988
	45-54 years	12,060	13,111	12,276	14,650	9,683	8,639
	55-64 years	8,731	8,109	5,796	9,680	11,807	5,106
	65-74 years	8,608	3,994	2,598	5,815	10,869	2,452
	75-84 years	7,022	2,443	1,209	5,117	5,272	1,549
	85+ years	2,064	935	506	3,011	1,269	694

	2005 Only	Lower Christiana	Middletown-Odessa	Central Pencader	Piedmont	Selbyville-Frankford	Upper Christiana
	Total (M + F):	36,509	41,049	36,259	30,919	28,653	25,055
	Total Male:	17,568	20,059	17,835	14,802	13,906	12,267
	Total Female:	18,941	20,990	18,424	16,117	14,747	12,788
Male, 2005	0-4 years	1,193	1,474	1,619	947	618	908
	5-14 years	2,403	3,382	2,995	2,236	1,333	1,763
	15-24 years	2,224	2,296	2,210	1,421	1,329	1,858
	25-34 years	2,277	2,601	3,117	974	1,082	2,219
	35-44 years	2,733	3,946	3,284	2,362	1,605	2,032
	45-54 years	2,374	3,074	2,588	2,908	2,118	1,718
	55-64 years	1,783	1,981	1,325	1,972	2,527	1,075
	65-74 years	1,435	786	448	990	2,152	403
	75-84 years	949	402	183	710	978	217
	85+ years	197	117	66	282	164	74
Female, 2005	0-4 years	1,201	1,483	1,629	954	615	914
	5-14 years	2,283	3,212	2,844	2,123	1,260	1,675
	15-24 years	2,182	2,254	2,168	1,395	1,266	1,823
	25-34 years	2,324	2,655	3,181	993	1,062	2,265
	35-44 years	2,840	4,100	3,413	2,453	1,659	2,111
	45-54 years	2,529	3,274	2,757	3,098	2,207	1,831
	55-64 years	1,970	2,189	1,463	2,178	2,709	1,186
	65-74 years	1,712	936	535	1,181	2,400	481
	75-84 years	1,428	606	277	1,068	1,232	326
	85+ years	471	281	157	674	337	176

Source: Delaware Health Statistics Center

Appendix B: CCD Populations, 2000-2004 and 2005 Only

	2000-2004	Seaford	Lewes	Laurel-Delmar	Millsboro	Central Kent	Milford South
	Total (M + F):	114,389	114,118	104,414	102,485	95,594	86,956
	Total Male:	55,949	54,878	51,266	49,750	46,408	42,564
	Total Female:	58,440	59,240	53,148	52,735	49,186	44,392
Male, 2000-2004	0-4 years	3,796	2,326	3,736	2,457	3,679	2,567
	5-14 years	8,793	4,762	7,562	5,676	8,335	6,586
	15-24 years	7,574	4,496	6,817	4,993	6,554	5,483
	25-34 years	6,272	4,434	6,177	4,674	5,880	4,484
	35-44 years	8,385	7,171	8,008	6,904	8,281	6,990
	45-54 years	7,986	8,667	7,051	6,951	5,913	6,259
	55-64 years	5,327	8,916	5,155	7,225	4,062	4,297
	65-74 years	3,998	8,409	3,969	7,102	2,591	3,330
	75-84 years	3,037	4,818	2,335	3,223	950	2,038
	85+ years	781	879	456	545	163	530
Female, 2000-2004	0-4 years	3,694	2,264	3,634	2,392	3,650	2,498
	5-14 years	8,374	4,534	7,200	5,406	7,966	6,270
	15-24 years	7,112	4,223	6,403	4,690	6,730	5,150
	25-34 years	6,291	4,447	6,197	4,690	6,340	4,499
	35-44 years	8,596	7,352	8,212	7,082	8,843	7,168
	45-54 years	8,351	9,060	7,371	7,267	6,423	6,543
	55-64 years	5,878	9,840	5,688	7,975	4,427	4,740
	65-74 years	4,370	9,191	4,339	7,760	2,952	3,638
	75-84 years	3,980	6,311	3,060	4,224	1,433	2,669
	85+ years	1,794	2,018	1,044	1,248	422	1,217

	2005 Only	Seaford	Lewes	Laurel-Delmar	Millsboro	Central Kent	Milford South
	Total (M + F):	23,433	24,722	21,602	21,871	20,869	18,731
	Total Male:	11,464	11,906	10,603	10,623	10,125	9,169
	Total Female:	11,969	12,816	10,999	11,248	10,744	9,562
Male, 2005	0-4 years	776	503	772	523	794	552
	5-14 years	1,710	930	1,479	1,124	1,743	1,346
	15-24 years	1,589	1,023	1,445	1,106	1,474	1,212
	25-34 years	1,201	867	1,203	917	1,258	899
	35-44 years	1,577	1,410	1,526	1,345	1,715	1,393
	45-54 years	1,700	1,943	1,518	1,543	1,361	1,398
	55-64 years	1,215	2,077	1,182	1,668	961	1,025
	65-74 years	799	1,789	802	1,487	562	701
	75-84 years	696	1,128	550	759	215	497
	85+ years	201	236	126	151	42	146
Female, 2005	0-4 years	774	501	768	522	796	550
	5-14 years	1,615	879	1,398	1,061	1,672	1,272
	15-24 years	1,514	975	1,377	1,054	1,485	1,154
	25-34 years	1,180	852	1,181	901	1,360	883
	35-44 years	1,628	1,457	1,577	1,390	1,825	1,439
	45-54 years	1,772	2,027	1,582	1,609	1,487	1,459
	55-64 years	1,303	2,225	1,267	1,787	1,045	1,099
	65-74 years	892	1,995	895	1,659	646	781
	75-84 years	877	1,420	693	955	323	625
	85+ years	414	486	260	310	104	299

Source: Delaware Health Statistics Center

Appendix B: CCD Populations, 2000-2004 and 2005 Only

	2000-2004	Smyrna	Georgetown	Milton	Harrington	Bridgeville-Greenwood	Milford North
	Total (M + F):	64,364	63,449	57,258	54,416	49,606	47,322
	Total Male:	30,819	31,283	27,965	26,247	24,379	22,686
	Total Female:	33,545	32,166	29,293	28,169	25,227	24,636
Male, 2000-2004	0-4 years	2,252	1,998	1,732	2,060	1,878	1,562
	5-14 years	4,850	3,749	3,564	4,325	4,021	3,562
	15-24 years	3,964	5,762	3,174	3,311	3,272	3,059
	25-34 years	4,039	5,299	2,989	3,350	3,083	2,712
	35-44 years	4,998	4,938	4,178	4,146	3,646	3,427
	45-54 years	3,985	3,798	4,135	3,599	3,196	2,950
	55-64 years	2,715	2,432	3,360	2,507	2,273	2,314
	65-74 years	2,324	1,808	3,059	1,855	1,746	1,842
	75-84 years	1,310	1,220	1,519	963	1,012	1,046
	85+ years	382	279	255	131	252	212
Female, 2000-2004	0-4 years	2,236	1,944	1,682	2,045	1,827	1,547
	5-14 years	4,634	3,571	3,395	4,133	3,830	3,405
	15-24 years	4,069	5,413	2,984	3,399	3,073	3,139
	25-34 years	4,356	5,312	2,998	3,611	3,091	2,925
	35-44 years	5,338	5,063	4,284	4,430	3,739	3,662
	45-54 years	4,329	3,970	4,322	3,910	3,342	3,205
	55-64 years	2,958	2,684	3,706	2,733	2,510	2,519
	65-74 years	2,652	1,975	3,343	2,116	1,912	2,101
	75-84 years	1,979	1,598	1,989	1,454	1,326	1,577
	85+ years	992	637	590	337	578	555

	2005 Only	Smyrna	Georgetown	Milton	Harrington	Bridgeville-Greenwood	Milford North
	Total (M + F):	14,710	14,124	12,759	11,962	10,660	10,755
	Total Male:	7,042	6,962	6,231	5,769	5,239	5,154
	Total Female:	7,668	7,162	6,528	6,193	5,421	5,601
Male, 2005	0-4 years	508	444	385	448	403	350
	5-14 years	1,054	779	744	907	823	770
	15-24 years	935	1,300	730	752	720	717
	25-34 years	906	1,138	621	722	626	603
	35-44 years	1,078	1,015	856	859	720	732
	45-54 years	959	884	955	831	716	706
	55-64 years	672	613	818	594	544	564
	65-74 years	528	392	668	406	366	416
	75-84 years	306	314	378	217	250	242
	85+ years	96	83	76	33	71	54
Female, 2005	0-4 years	510	442	384	449	401	351
	5-14 years	1,012	735	703	869	778	739
	15-24 years	942	1,238	695	758	685	722
	25-34 years	978	1,117	610	779	615	651
	35-44 years	1,147	1,048	884	914	743	780
	45-54 years	1,048	922	996	908	746	771
	55-64 years	730	657	877	645	584	613
	65-74 years	606	437	745	465	409	478
	75-84 years	458	395	476	325	314	363
	85+ years	236	170	156	81	145	132

Source: Delaware Health Statistics Center

Appendix B: CCD Populations, 2000-2004 and 2005 Only

	2000-2004	Red Lion	Felton	Kenton
	Total (M + F):	30,764	28,448	27,924
	Total Male:	14,987	13,761	13,540
	Total Female:	15,777	14,687	14,384
Male, 2000-2004	0-4 years	1,133	895	939
	5-14 years	2,459	2,289	2,344
	15-24 years	1,856	1,643	1,925
	25-34 years	2,141	1,931	1,632
	35-44 years	2,690	2,350	2,260
	45-54 years	2,093	2,016	1,891
	55-64 years	1,455	1,377	1,444
	65-74 years	702	880	738
	75-84 years	350	324	331
	85+ years	108	56	36
Female, 2000-2004	0-4 years	1,106	890	931
	5-14 years	2,330	2,189	2,239
	15-24 years	1,872	1,686	1,979
	25-34 years	2,168	2,083	1,757
	35-44 years	2,788	2,509	2,413
	45-54 years	2,240	2,191	2,054
	55-64 years	1,596	1,502	1,574
	65-74 years	856	1,001	841
	75-84 years	543	488	499
	85+ years	277	147	97

	2005 Only	Red Lion	Felton	Kenton
	Total (M + F):	6,965	6,123	6,093
	Total Male:	3,389	2,959	2,953
	Total Female:	3,576	3,164	3,140
Male, 2005	0-4 years	254	190	202
	5-14 years	539	470	489
	15-24 years	415	366	433
	25-34 years	468	409	348
	35-44 years	578	478	466
	45-54 years	496	454	433
	55-64 years	365	318	337
	65-74 years	160	188	160
	75-84 years	84	72	75
	85+ years	30	14	10
Female, 2005	0-4 years	257	191	203
	5-14 years	512	451	469
	15-24 years	408	369	436
	25-34 years	478	441	376
	35-44 years	600	510	496
	45-54 years	529	496	473
	55-64 years	403	347	367
	65-74 years	190	216	184
	75-84 years	126	108	111
	85+ years	73	35	24

Source: Delaware Health Statistics Center

For questions or comments related to this report, please contact the Division of Public Health at the following address:

Delaware Health and Social Services
Division of Public Health
540 S. DuPont Highway
Dover, DE 19901
Phone: 302-744-1040
Fax: 302-739-2545
http://www.dhss.delaware.gov/dhss/dph/index.html