DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

SECONDARY ANALYSIS OF DELAWARE'S CENSUS TRACTS WITH ELEVATED ALL-SITE CANCER INCIDENCE RATES IN 2009-2013

(July 2017)

In July 2017, Delaware Health and Social Services, Division of Public Health (DPH) released its annual *Cancer Incidence and Mortality in Delaware (I&M) Report, 2009-2013.* In accordance with Delaware legislation, DPH calculated 2009-2013 all-site cancer incidence rates for each of Delaware's census tracts and these results are included in the 2009-2013 I&M Report. This report summarizes the secondary analyses for the 30 census tracts with a significantly elevated all-site cancer incidence rate for 2009-2013 (New Castle County: 19.02, 23, 29, 136.14, 139.03, 139.04, 141.00, 148.08, 148.09, 148.10, 149.03, 159.00, 164.01, 166.01, 166.04, 166.08; Kent County: 401.00, 402.03, 409.00, 417.01, 417.02, 418.01, 428, 430, 432.02; and Sussex County: 501.03, 503.01, 504.05, 507.04, 508.02).

In Delaware, all-site cancer incidence rates measure the total cancer burden for an area over a five-year time period. Cancer incidence rates are calculated by dividing the total number of cancer cases in an area by the total number of people living in that area. Incidence rates are age-adjusted to the 2000 U.S. standard population and expressed as the average annual number of new cases diagnosed per year per 100,000 people. Census 2000 and Census 2010 data were used to interpolate census tract population totals for intervening years 2001-2009. U.S. Census Bureau data was used for 2011-2013. Beginning with the 2010 census, Delaware was divided into 214 census tracts (previously, Census 2000 had divided Delaware into 197 census tracts).

The 2009-2013 all-site cancer incidence rates for each of Delaware's 214 census tracts was compared to the all-site cancer incidence rate for the entire state. DPH used standard statistical procedures to determine if the difference between each census's tract all-site cancer incidence rate and the state all-site cancer incidence rate reached the threshold of statistical significance. If a census tract's all-site cancer incidence rate is significantly higher than the state all-site cancer incidence rate, the difference between the rates is interpreted as "larger than would be expected by chance alone." If a census tract's all-site cancer incidence rate is significantly lower from the state all-site cancer incidence rate, the difference is interpreted as "smaller than would be expected by chance alone." If a census tract's all-site cancer incidence rate is not significantly different from the state all-site cancer incidence rate, the difference between the rates is interpreted as "not meaningfully different." Please refer to the 2009-2013 I&M Report for additional details pertaining to rate calculation methodology and testing for statistical significance.

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

When assessing cancer incidence data by census tract, it should be kept in mind that the occurrence of cancer may differ across census tracts for a variety of reasons. For example, lifestyle behaviors may cluster in a homogeneous community. In addition, the presence or absence of exposure to environmental or occupational carcinogen(s) is often limited to a defined geographic area. In addition, residents in certain geographic areas may be more impoverished than other residents, affecting access to health care, including cancer screening services. Population changes, such as residents moving into or out of a census tract, can also affect the cancer rates. Finally, chance or random variation can also influence whether a census tract's

all-site cancer incidence rate is significantly different from the overall state all-site cancer incidence rate. Statistically-speaking, 5 percent of all numerical comparisons are significantly different due to chance alone.

Results for 2009-2013 show that:

- In 30 of Delaware's 214 census tracts, the 2009-2013 all-site cancer incidence rates were statistically significantly higher than Delaware's 2009-2013 all-site cancer incidence rate (507.3 per 100,000).
- In 20 census tracts, the 2009-2013 all-site cancer incidence rates were significantly lower than Delaware's 2009-2013 all-site cancer incidence rate (507.3 per 100,000).

Secondary Analysis of Elevated Census Tracts for 2009-2013

DPH analyzed cancer data within each of the 30 elevated census tracts to determine unique patterns which could suggest an environmental, occupational, or other unusual cause. DPH conducted the following analyses on census tracts with an elevated overall cancer incidence:

- Sex distribution
- Age at diagnosis
- Types of cancers elevated
- Cancer sites with substantiated environmental risk factors

Sex Distribution of Cases for 2009-2013

To determine if the all-site cancer incidence rate in a census tract affected males and females differently, age-adjusted all-site cancer incidence rates were calculated separately by sex for each of the 30 elevated census tracts. Male- and female-specific rates for each census tract were compared to those at the state level. The 30 census tracts fell into one of the following four categories compared to the state of Delaware:

- 30 census tracts (100 percent) had significantly elevated all-site cancer incidence rates for both males and females combined.
- 20 census tracts (67 percent) had a significantly elevated all-site cancer incidence rate for males.
- 13 census tracts (43 percent) had a significantly elevated all-site cancer incidence rate for females.
- Three census tracts (10 percent) did not have a significantly elevated all-site cancer incidence rate for either males or females. Rather, minor (i.e. not statistically significant) elevations in male and female all-site cancer incidence rates produced a significantly elevated all-site cancer incidence rate for both sexes combined.

Age at Diagnosis of Cases for 2009-2013

The median age of diagnosis for all cancer cases diagnosed during 2009-2013 in Delaware was 66. Therefore, half of all Delawareans diagnosed with cancer during this time period were younger than 66 years; the other half were older than 66 years. The median age of cancer cases in each census tract was compared to the median age of cancer cases at the state level for the same time period. A younger median age at diagnosis in the census tract could suggest a unique exposure, such as from the environment or an occupation. Of the 30 census tracts analyzed:

- 19 census tracts (63 percent) had a lower median age of diagnosis (range: 59-65 years) compared to the state's median age at diagnosis (66 years).
- Two census tracts (7 percent) had a median age at diagnosis identical to the state's median age at diagnosis (66 years).
- Nine census tracts (30 percent) had a higher median age at diagnosis (67-75 years) compared to the state's median age at diagnosis (66 years).

Significantly-Elevated Site-Specific Cancer Types for 2009-2013

Cancer is a generic term used to describe more than 100 different diseases. Thirty of Delaware's 214 census tracts had a significantly elevated all-site cancer incidence rate for 2009-2013. It is important to note that these census tracts were not elevated for every individual cancer type. To investigate specific patterns of cancer diagnoses within the 30 census tracts with elevated all-site cancer incidence rates, DPH calculated site-specific incidence rates for the 24 most commonly-diagnosed cancers. These analyses helped to determine which cancers, if any, contributed to the higher-than-expected all-site cancer incidence rate. Results for the 30 census tracts are as follows:

- Two census tracts (7 percent) did not have any cancer type that was significantly elevated.
- Ten census tracts (33 percent) had one cancer type that was significantly elevated.
- Nine census tracts (30 percent) had two cancer types that were significantly elevated.
- Six census tracts (20 percent) had three cancer types that were significantly elevated.
- Three census tracts (10 percent) had four cancer types that were significantly elevated.

The higher-than-expected all-site cancer incidence rates among the 30 elevated census tracts were confined to 19 cancer types (Table 1). Note that the frequencies in Table 1 total 58 because 18 of the 30 census tracts under review were significantly elevated for more than one cancer type.

TABLE 1: NUMBER OF OCCURRENCES OF SIGNIFICANTLY-ELEVATED SITE-SPECIFIC CANCER TYPES WITHIN THE CENSUS TRACTS WITH ELEVATED ALL-SITE CANCER INCIDENCE RATES, DELAWARE, 2009-2013

Site-Specific Cancer Type	Number of Occurrences of Significantly Elevated Site-Specific Cancer Type
Prostate	11
Lung	8
Colorectal	5
Bladder	4
Melanoma	4
Non-Hodgkin Lymphoma	4
Liver	3
Stomach	3
Thyroid	3
Kidney and Renal Pelvis	2
Oral Cavity and Pharynx	2
Pancreas	2
Brain and Central Nervous System	1
Breast	1
Larynx	1
Leukemia	1
Myeloma	1
Ovary	1
Uterus	1
TOTAL	58

SOURCE: Delaware Cancer Registry, Delaware Health and Social Services, Division of Public Health, 2017.

When a census tract has an elevated rate for a cancer type with many risk factors, it is difficult to pinpoint any single causal factor. Rather, the elevated cancer rate is likely due to a mix of non-modifiable, modifiable, and/or unidentified risk factors. For example, the American Cancer Society cites 19 substantiated risk factors for breast cancer alone: 12 of these risk factors are non-modifiable (e.g., age, family history), and the remaining seven are modifiable (e.g., lack of exercise, being overweight/obese). The impact of other potential breast cancer risk factors is still under scientific review. Adding to the complexity is that the interaction of several risk factors may increase a person's cancer risk more than the sum of the individual risk factors acting separately. For example, research shows that while alcohol use and tobacco use are both individual risk factors for laryngeal cancer, their joint effect is greater than the sum of the two risk factors acting separately (i.e., when they occur together, the two risk factors exert a multiplicative, rather than additive, effect).[1]

Site-Specific Cancer Types with Environmentally-Based Risk Factors

The Delaware Cancer Consortium has identified seven cancer types with substantiated environmental risk factors:

a. Brain/Central Nervous System (CNS) cancer
b. Hodgkin lymphoma
c. Leukemia
d. Liver cancer
e. Non-Hodgkin lymphoma
f. Thyroid cancer
g. Urinary bladder cancer

It is important to note that while these seven malignancies have been known to be associated with environmental risk factors, they may also be related to modifiable risk factors. For example, in addition to chemical exposures in the manufacturing of dyes, rubber, and leather, tobacco use is the primary risk factor for bladder cancer.

Among the 30 census tracts, results related to these seven cancer types are as follows:

- Three census tracts (10 percent) had significantly elevated rates for **two** of the seven cancer types with substantiated environmental risk factors.
- Ten census tracts (33 percent) had a significantly elevated rate for **one** of the seven cancer types with substantiated environmental risk factors.
- Seventeen census tracts (57 percent) did not have a significantly elevated rate for any of the seven cancer types with substantiated environmental risk factors.

Of the seven cancers with environmentally-suspected causes:

- Brain cancer was significantly elevated among males in census tract 417.01.
- Leukemia was significantly elevated in females in census tract 166.08.
- Liver cancer was significantly elevated in females in census tracts 29, 139.03, and 409.00.
- Non-Hodgkin lymphoma was significantly elevated in the overall population in census tract 503.01, in males in census tract 428.00, and in females in census tracts 164.01 and 430.00.
- Thyroid cancer was significantly elevated in the overall population in census tract 504.05, in males in census tract 139.03, and in females in census tracts 401.00 and 504.05.

[1] Pelucchi, C., Gallus, S., Garavello, W., Bosettie, C., & La Vecchia, C. (2008). Alcohol and tobacco use, and cancer risk for upper aerodigestive tract and liver. *European Journal of Cancer Prevention, 17*(4), 340-4.

- Urinary bladder cancer was significantly elevated in the overall population in census tracts 401.00, 417.01, and 507.04, and in males in census tract 139.04.

While some of the elevated cancer types in these census tracts were those with environmental risk factors, some other cancer types without these risk factors were also significantly higher compared to the state average. These may simply be statistical aberrations resulting from the very small number of cancer cases in these communities, or, especially when combined with unusual sex and age distributions, there may be underlying occupational or environmental causes. Further investigation of these concerns cannot be conducted with data routinely collected by DPH.

Tables 2-4 summarize results of the secondary analyses for the census tracts that were significantly elevated for all-site cancer in 2009-2013 for each of the three counties in Delaware. Table 5 summarizes substantiated risk factors for the 19 different site-specific cancers with significantly-elevated all-site cancer incidence rates among the census tracts under review. Table 6 displays census tracts that are consistently elevated over two or more of the nine five-year time periods from 2001-2005 through 2009-2013.

TABLE 2: CHARACTERISTICS OF NEW CASTLE COUNTY, DELAWARE CENSUS TRACTS WITH STATISTICALLY SIGNIFICANTLY ELEVATED 2009-2013 ALL-SITE CANCER INCIDENCE RATES

Census Tract	Avg. Cases/ year	Overall Age-Adjusted All-Site Cancer Incidence Rates per 100,000, 2009-2013**			Significantly Elevated Cancer Site(s) by Sex	Median Age at Diagnosis		Area(s) of Concern
						DE	CT	
		All	Male	Female				
DELAWARE	**5,439**	**507.5**	**582.8**	**451.8**				
19.02	8	**731.8**	**1,347.7**	360.3	• Oral cavity (overall, male)	66	59	• Prevention • Screening • Sex distribution
23	14	**671.3**	**1,339.5**	466.2	• Prostate	66	66	• Prevention • Screening
29	22	**693.6**	**980.2**	**643.2**	• Liver (female) • Lung (overall, male, female) • Prostate	66	65	• Prevention • Screening • Sex distribution • Cancer type
136.14	17	**647.4**	**866.1**	548.5	• Pancreas (female)	66	67	• Prevention • Sex distribution
139.03	20	**667.3**	**1,096.6**	596.2	• Liver (female) • Prostate • Thyroid (male)	66	59	• Prevention • Screening • Sex distribution • Cancer type
139.04	32	**615.1**	**768.4**	461.1	• Prostate • Urinary bladder (female)	66	63	• Prevention • Screening • Sex distribution • Cancer type
141.00	28	**671.7**	722.9	**630.7**	• Colorectal (female) • Larynx (overall, male)	66	64	• Prevention • Screening • Sex distribution • Cancer type
148.08	29	**621.1**	**850.5**	557.5	• Colorectal (overall, female) • Prostate	66	61	• Prevention • Screening • Sex distribution • Cancer type
148.09	41	**620.2**	729.0	**635.6**	• Melanoma (overall, male)	66	62.5	• Prevention • Screening • Sex distribution
148.10	37	**605.6**	623.4	**620.5**	• Breast	66	60	• Prevention • Screening
149.03	25	**752.0**	**1,001.8**	**699.7**	• Breast • Prostate • Uterus	66	61	• Prevention • Screening • Cancer type
159.00	25	**653.5**	736.0	579.2	• Breast • Kidney and renal pelvis (overall, male)	66	64	• Prevention • Screening • Sex distribution • Cancer type
164.01	28	**630.0**	740.5	528.7	• Myeloma (male) • Non-Hodgkin lymphoma (female) • Stomach (overall, female)	66	64	• Prevention • Screening • Sex distribution • Cancer type

TABLE 2 (continued): CHARACTERISTICS OF NEW CASTLE COUNTY, DELAWARE CENSUS TRACTS WITH STATISTICALLY SIGNIFICANTLY ELEVATED 2009-2013 ALL-SITE CANCER INCIDENCE RATES

Census Tract	Avg. Cases / year	Overall Age-Adjusted All-Site Cancer Incidence Rates per 100,000, 2009-2013**			Significantly Elevated Cancer Site(s) by Sex	Median Age at Diagnosis		Area(s) of Concern
						DE	CT	
		All	Male	Female				
DELAWARE	**5,439**	**507.5**	**582.8**	**451.8**				
166.01	65	**585.8**	646.3	**558.7**	• Breast • Melanoma (overall, male)	66	67	• Prevention • Screening • Sex distribution • Cancer type
166.04	48	**596.8**	**905.7**	491.2	• Colorectal (male) • Lung (overall, male) • Prostate • Stomach (overall, male)	66	61	• Prevention • Screening • Sex distribution • Cancer type
166.08	26	**690.2**	**1,153.1**	571.3	• Leukemia (female) • Oral cavity (overall) • Prostate	66	65	• Prevention • Screening • Sex distribution • Cancer type

** Age-adjusted incidence rate in bold indicates that the census tract rate is significantly elevated compared to the state rate.
CT=Census Tract
Rates are per 100,000 and age-adjusted to 2000 U.S. standard population
SOURCE: Delaware Cancer Registry, Delaware Health and Social Services, Division of Public Health, 2017.

TABLE 3: CHARACTERISTICS OF KENT COUNTY, DELAWARE CENSUS TRACTS WITH STATISTICALLY SIGNIFICANTLY ELEVATED 2009-2013 ALL-SITE CANCER INCIDENCE RATES

Census Tract	Avg. Cases / year	Overall Age-Adjusted All-Site Cancer Incidence Rates per 100,000, 2009-2013**			Significantly Elevated Cancer Site(s) by Sex	Median Age at Diagnosis		Area(s) of Concern
						DE	CT	
		All	Male	Female				
DELAWARE	**5,439**	**507.5**	**582.8**	**451.8**				
401.00	49	**704.4**	**865.5**	**619.8**	• Breast • Lung (overall, male) • Melanoma (overall) • Thyroid (female) • Urinary bladder (overall)	66	65	• Prevention • Screening • Sex distribution • Cancer type
402.03	31	**671.1**	**868.4**	567.8	• Colorectal (male) • Pancreas (overall) • Prostate	66	67	• Prevention • Screening • Sex distribution • Cancer type
409.00	21	**665.6**	715.0	**622.7**	• Liver (female) • Lung (overall, female)	66	75	• Prevention • Screening • Sex distribution • Cancer type
417.01	47	**649.9**	**731.3**	**584.2**	• Brain (male) • Prostate • Urinary bladder (overall)	66	68	• Prevention • Screening • Sex distribution • Cancer type
417.02	31	**658.0**	**808.7**	**591.8**	• Colorectal (overall, female) • Lung (female)	66	63	• Prevention • Screening • Sex distribution • Cancer type
418.01	64	**610.2**	**708.4**	542.4	• Prostate	66	64.5	• Prevention • Screening
428.00	51	**621.0**	**759.2**	530.3	• Non-Hodgkin lymphoma (male)	66	66	• Prevention • Sex distribution
430.00	37	**635.0**	696.7	**602.8**	• Cervix • Kidney and renal pelvis (female) • Lung (overall, male) • Myeloma (overall) • Non-Hodgkin lymphoma (female)	66	65	• Prevention • Screening • Sex distribution • Cancer type
432.02	30	**703.1**	**837.6**	**640.7**	• Lung (overall) • Stomach (overall, female)	66	65	• Prevention • Screening • Sex distribution • Cancer type

** Age-adjusted incidence rate in bold indicates that the census tract rate is significantly elevated compared to the state rate.
CT=Census Tract
Rates are per 100,000 and age-adjusted to 2000 U.S. standard population
SOURCE: Delaware Cancer Registry, Delaware Health and Social Services, Division of Public Health, 2017.

TABLE 4: CHARACTERISTICS OF SUSSEX COUNTY, DELAWARE CENSUS TRACTS WITH STATISTICALLY SIGNIFICANTLY ELEVATED 2009-2013 ALL-SITE CANCER INCIDENCE RATES

Census Tract	Avg. Cases / year	Overall Age-Adjusted All-Site Cancer Incidence Rates per 100,000, 2009-2013**			Significantly Elevated Cancer Site(s) by Sex	Median Age at Diagnosis		Area(s) of Concern
						DE	CT	
		All	Male	Female				
DELAWARE	**5,439**	**507.5**	**582.8**	**451.8**				
501.03	39	**616.5**	**745.2**	525.4	• None	66	67	• Prevention • Screening
503.01	54	**585.4**	664.8	534.9	• Non-Hodgkin lymphoma (overall) • Prostate	66	67	• Prevention • Screening • Cancer type
504.05	31	**642.2**	**1,019.7**	517.4	• Lung (overall, male) • Prostate • Thyroid (overall, female)	66	70	• Prevention • Screening • Sex distribution • Cancer type
507.04	45	**656.8**	716.1	**588.7**	• Colorectal (female) • Urinary bladder (overall)	66	71	• Prevention • Screening • Sex distribution • Cancer type
508.02	37	**619.5**	**752.1**	569.5	• Melanoma (overall, male) • Ovary	66	65	• Prevention • Screening • Sex distribution • Cancer type

** Age-adjusted incidence rate in bold indicates that the census tract rate is significantly elevated compared to the state rate.
CT=Census Tract
Rates are per 100,000 and age-adjusted to 2000 U.S. standard population
SOURCE: Delaware Cancer Registry, Delaware Health and Social Services, Division of Public Health, 2017.

TABLE 5: KNOWN RISK FACTORS OF ELEVATED CANCER TYPES AMONG THE 30 DELAWARE CENSUS TRACTS WITH SIGNIFICANTLY ELEVATED ALL-SITE CANCER INCIDENCE RATES, 2009-2013**

CANCER TYPE	KNOWN RISK FACTORS
BLADDER	Age (risk increases with age), arsenic in drinking water, bladder birth defects, chronic bladder irritation and infections, gender (more common in males), not drinking enough fluids, personal history of bladder or other urothelial cancer, prior chemotherapy, race and ethnicity, smoking
BRAIN	Family history (rare), genetic disorders (Neurofibromatosis type 1, Neurofibromatosis type 2), immune system disorders, radiation exposure
BREAST	Age (risk increases with age), alcohol abuse, benign breast conditions, birth to children (giving birth after age 30 or not at all increases risk), breastfeeding (not breastfeeding increases risk), dense breast tissue, exposure to diethylstilbestrol, family history, genes, hormone therapy after menopause, menopause after age 55, menstruation before age 12, overweight or obesity, personal history, physical inactivity, oral contraceptive use, race (African American), radiation to the chest, tobacco use
COLORECTAL	Age (50 and older), alcohol abuse, diabetes (type 2), family history, high-fat diet, history of bowel disease, overweight or obesity, physical inactivity, smoking (cigarettes, cigars, or pipes)
KIDNEY	Advanced kidney disease with long-term dialysis, cigar or cigarette smoking, family history, gender (male), hypertension, certain medications, overweight or obesity, workplace exposures
LARYNX	Alcohol abuse, diet, gastroesophageal reflux disease, gender (male), genetic syndromes, human papilloma virus, poor nutrition, secondhand smoke, smoking (cigarettes, cigars, or pipes), workplace exposure
LEUKEMIA	Acute Lymphocytic Leukemia (ALL): chemical exposure (certain chemotherapy drugs, benzene), gender (male), identical twin with ALL, inherited syndromes (Down syndrome, Klinefelter syndrome, Fanconi anemia, Bloom syndrome, Ataxia-telangiectasia, Neurofibromatosis), radiation exposure, race (Caucasian), viral infections (human T-cell lymphoma/leukemia virus-1 (HTLV-1), Epstein-Barr virus (EBV)) Acute Myeloid Leukemia (AML): age (older age), blood disorders, chemotherapy drugs, family history, gender (male), genetic syndromes (Fanconi anemia, Bloom syndrome, Ataxia-telangiectasia, Diamond-Blackfan anemia, Schwachman-Diamond syndrome, Li-Fraumeni syndrome, Neurofibromatosis type 1, Severe congenital neutropenia (also called Kostmann syndrome, Down syndrome, Trisomy 8) , radiation exposure, tobacco use Chronic Lymphocytic Leukemia (CLL): chemical exposure (Agent Orange, pesticides), family history, gender (male), race/ethnicity (North America, Europe) Chronic Myeloid Leukemia (CML): age (older age), gender (male), radiation exposure Chronic Myelomonocytic Leukemia (CMML): age (60 and older), chemotherapy, gender (male)
LIVER	Alcohol use, anabolic steroid use, diabetes (type 2) gender (male), hepatitis B or C (chronic infection), liver cirrhosis, obesity, previous exposure to certain chemicals (including arsenic and vinyl chloride), race (especially Asian Americans and Pacific Islanders), tobacco use
LUNG	Asbestos, diet low in fruits and vegetables, family history, radiation therapy, radon exposure, secondhand smoke, smoking (cigarettes, cigars, or pipes), tuberculosis, workplace exposures
MELANOMA	Age (risk increases with age), fair skin, freckling and light hair, family history of melanoma, gender (males are more at risk), moles on the skin, personal history of melanoma, UV exposure, weakened immune system, Xeroderma pigmentosum (rare inherited condition that affects skin cells' ability to repair damage to their DNA

TABLE 5 (continued): KNOWN RISK FACTORS OF ELEVATED CANCER TYPES AMONG THE 30 DELAWARE CENSUS TRACTS WITH SIGNIFICANTLY ELEVATED ALL-SITE CANCER INCIDENCE RATES, 2009-2013**

CANCER TYPE	KNOWN RISK FACTORS
MYELOMA	Age (65 and older), family history, gender (male), overweight or obesity, plasma cell diseases, race (African American), radiation exposure
NON-HODGKIN LYMPHOMA	Age (60 and older), certain autoimmune disorders (e.g., rheumatoid arthritis, lupus), chronic immune stimulation (e.g., *H. pylori*, hepatitis C), gender (male), immune system deficiency, overweight or obesity, previous exposure to radiation and certain chemicals (including benzene and certain herbicides and insecticides), race (Caucasian)
ORAL CAVITY AND PHARYNX	Age (55 and older), alcohol use, diet low in fruits and vegetables, gender (male), genetic syndromes (Fanconi anemia, Dyskeratosis congenital), Graft-vs-Host disease (GVHD), Lichen planus (disease that affects the skin mainly in middle aged people), weakened immune system, HPV infection, tobacco use, UV exposure
OVARY	Age (40 and older), age at first pregnancy (26 and older), estrogen use after menopause, family cancer syndromes, diet (high fat, low in fruits and vegetables), family history, fertility drug use for more than a year, obesity, oral contraceptive use, personal history of breast cancer
PANCREAS	Age (45 and older), chronic pancreatitis, diabetes, family history, gender (male), *Heliobacter pylori* infection, inherited genetic syndromes (hereditary breast and ovarian cancer syndrome, familial atypical multiple mole melanoma (FAMMM) syndrome, familial pancreatitis, Lynch syndrome, Peutz-Jeghers syndrome, Von Hippel-Lindau syndrome, Neurofibromatosis type 1, multiple endocrine neoplasia type I (MEN1)), liver cirrhosis, overweight and obesity, race (African American), tobacco use, workplace exposure to chemicals
PROSTATE	Age (50 and older), diet high in red meat and high-fat dairy, ethnicity (non-Hispanic), family history, gene mutations, inherited DNA changes, obesity, race (African American)
STOMACH	Age (risk increases with age), Common variable immune deficiency, diet (consumption of smoked foods), Epstein-Barr virus infection, ethnicity (Hispanics, African Americans, Asian/Pacific Islanders are at higher risk), family history of stomach cancer, gender (males at higher risk), geography (more common in Japan, China, and Southern and Eastern Europe), *H. pylori* infection, Menetrier disease (excess growth of stomach lining), inherited cancer syndromes, overweight or obese, pernicious anemia, previous stomach surgery, some types of stomach polyps, tobacco, Type A blood, work in the coal, metal, and rubber industries
THYROID	Age (younger females and older males at increased risk), diet low in iodine, family history, hereditary conditions, radiation
UTERUS	Pelvic radiation therapy, race (African American), RB gene changes, treatment with Tamoxifen

****Cancer-specific risk factors are listed in descending alphabetical order and do not necessarily represent descending order of relative risk factor strength.

SOURCES: American Cancer Society (www.cancer.org) and National Cancer Institute (www.cancer.gov).

TABLE 6: CONSISTENTLY-ELEVATED ALL-SITE CANCER INCIDENCE RATES BY DELAWARE CENSUS TRACTS, BY COUNTY AND TIME PERIOD, DELAWARE: 2001-2005 TO 2009-2013**

COUNTY	CENSUS TRACT	2001-2005	2002-2006	2003-2007	2004-2008	2005-2009	2006-2010	2007-2011	2008-2012	2009-2013
NEW CASTLE	6.02	X	X	X	X					
	29								X	X
	139.01	X	X	X	X					
	148.10							X	X	X
	149.03								X	X
	149.06	X	X							
	156.00			X	X	X				
	159.00					X	X			X
	160.00	X	X	X						
	163.01					X	X	X	X	
	166.01								X	X
	169.01	X	X	X						
	169.04	X	X	X						
KENT	401.00							X	X	X
	417.01					X	X		X	X
	417.02							X	X	X
	418.01							X	X	X
	421.00				X	X	X			
	428.00		X		X	X	X	X	X	X
	430.00							X	X	X
	432.02							X	X	X
SUSSEX	501.03							X	X	X
	501.05			X	X	X				
	504.01							X	X	
	504.05								X	X
	506.02	X	X							
	507.04								X	X
	513.02	X	X	X	X					
	513.05	X	X							
	517.01			X	X		X			

**Two or more adjacent time periods with a significantly elevated overall cancer incidence rate.
SOURCE: Delaware Cancer Registry, Delaware Health and Social Services, Delaware Division of Public Health, 2017.

For questions or comments related to any information found in this report, call the Delaware Comprehensive Cancer Control Program at 302-744-1020.

This report and the full *Cancer Incidence and Mortality in Delaware (I&M) Report, 2009-2013* can be found on the Division of Public Health's website: http://www.dhss.delaware.gov/dhss/dph/dpc/cancer.html.