Health Consultation

Birth Outcomes, Cancer Incidence and Mortality among the Ramapough Lenape Nation Turtle Clan Communities in Ringwood and Mahwah, New Jersey

July 17, 2015

Prepared by:

Environmental and Occupational Health Surveillance Program
Consumer, Environmental and Occupational Health Service
New Jersey Department of Health

Table of Contents

Summary

Introduction

In July 2013, the Ramapough Lenape Nation Turtle Clan (RLNTC) communities in Ringwood and Mahwah, New Jersey, met with representatives of the New Jersey Department of Health (NJDOH) and the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) to express concerns about several health issues. The health agencies developed a proposal to analyze and provide the RLNTC with health statistics for the two communities, including data on birth outcomes, cancer incidence and mortality.

This Health Consultation describes the populations and geographic areas that are considered part of the RLNTC community for the purpose of these health outcome analyses. Separate sections discuss adverse birth outcomes (low birth weight and prematurity), the incidence of several types of cancer, and mortality from major causes of death. Each section includes a description of the methods used to obtain and analyze the data, and the findings of the analyses. Analyses also included the same statistics for the surrounding municipalities (Ringwood Borough and Mahwah Township) and counties (Passaic and Bergen).

NJDOH has reached the following conclusions based on the information presented in this Health Consultation:

Conclusions

- Low birth weight and prematurity were more prevalent among births in the Ringwood RLNTC than in the surrounding municipality, county and the State in the period 1989-2011, though the differences were not statistically significant (that is, chance cannot be excluded as a reason for the differences).

- Adverse birth outcomes were not elevated in the Mahwah RLNTC.

- Lung cancer incidence among males and cervical cancer incidence among females were statistically significantly elevated in the Ringwood RLNTC population in the period 1979-2011. These cancer types were not elevated in Ringwood Borough, while cervical cancer was elevated in Passaic County.

- There were no cancer types that were statistically significantly elevated in the Mahwah RLNTC community, but several types were significantly high or low in Mahwah Township and Bergen County.

- Overall mortality (all causes) was statistically significantly elevated among males in the Ringwood RLNTC during the period 2004-2010. The number of deaths due to malignant neoplasms (cancers) in the Ringwood RLNTC population, among males and females combined, was elevated compared to the State of New Jersey, but the difference was not statistically significant. Overall mortality and mortality due to malignant neoplasms were not elevated in Ringwood Borough or Passaic County, but there were a variety of other causes of death that were statistically significantly high or low in the county.

- Mortality rates were not elevated in the Mahwah RLNTC. Rates of overall mortality and several specific causes of death were lower in Mahwah Township and Bergen County in comparison to the State.

Basis for Conclusions

These conclusions are based on analyses of three health-related data sets of the NJDOH. Cancer incidence and mortality rates in the Ringwood and Mahwah RLNTC communities, and in surrounding municipalities and counties, were compared to rates in the State of New Jersey, and were adjusted to take into account any differences in age distributions among the populations. Proportions of adverse birth outcomes were compared directly among the populations.

Next Steps

In any community, it is important to focus efforts on reducing preventable chronic diseases that are responsible for a substantial burden of illness, injury and death, including heart disease, cancers, diabetes, and respiratory diseases. There are positive steps that any community can take to address important risk factors for these diseases: reducing tobacco smoking, controlling high blood pressure, lowering obesity/overweight, increasing physical inactivity, and improving diets. This Health Consultation provides web links to many local, state and federal public health resources that work to promote communities' and individuals' health.

For More Information

Copies of this Health Consultation will be provided to the Ramapough Lenape Nation Turtle Clan leadership and will be posted on the NJDOH website.

Questions about this Health Consultation should be directed to the NJDOH:

Environmental and Occupational Health Surveillance Program
New Jersey Department of Health
P.O. Box 369
Trenton, New Jersey 08625-0369
(609) 826-4984

1. Background and Statement of Issues

In July of 2013, representatives of the New Jersey Department of Health (NJDOH) and the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) met with Chief Vincent Mann and about 35 members of the Ramapough Lenape Nation Turtle Clan (RLNTC) from Ringwood and Mahwah, New Jersey. Chief Mann called the meeting to initiate actions to address health concerns of the community, many of which arose in relation to the Ringwood Mines/Landfill Superfund site.

At the meeting, community members expressed concerns about several health issues, described below. As a result, the NJDOH committed to working with representatives of the community to develop a proposal to address these issues of mutual concern. The proposal included analyses of cancer incidence, mortality from major causes of death, and adverse birth outcomes (specifically low birth weight and prematurity). The purpose of these analyses is to provide the RLNTC with health statistics for two of its communities, one in Ringwood Borough and one in Mahwah Township. This Health Consultation presents the results of the analyses of birth outcomes, cancer incidence and mortality.

Summary of Health Concerns

At the July 2013 meeting, members of the RLNTC raised several health concerns. Some of these concerns had been raised over several years by RLNTC members during community meetings and Community Advisory Group meetings related to the Ringwood Mines/Landfill Superfund site, to which NJDOH and ATSDR had responded during previous public health activities related to the site. However, community members felt that health statistics had inadequately described their community's experience with diseases and death.

Cancers As part of a draft Public Health Assessment prepared by NJDOH and ATSDR in 2006, NJDOH examined available data on cancer incidence for the population of Upper Ringwood living on or near the Ringwood Mines/Landfill site (NJDOH and ATSDR, 2006). (The definition of this population is the same as is used in this report for the Ringwood community of the RLNTC.) NJDOH found that overall cancer incidence in this Upper Ringwood community populated by the RLNTC was not elevated over the period 1979 to 2002, in comparison to the State of New Jersey, but that lung cancer incidence in males was elevated over this time. NJDOH updated this analysis in 2011 to include incidence data through 2008; this analysis showed similar results (NJDOH and ATSDR 2011a).[1]

In the July 2013 meeting, members of the RLNTC community asked that NJDOH also examine cancer incidence among the RLNTC population in Mahwah Township. They also suggested that cancer

[1] NJDOH reports related to the Ringwood Mines/Landfill are located on the web at: http://nj.gov/health/eohs/passaic.shtml#ringwood.

incidence statistics be developed for other populations as an alternative comparison to Upper Ringwood.

Lead Exposure NJDOH evaluated available childhood blood lead data from July 1999 through October 2005 in the draft PHA of 2006. There was evidence that at least one child had been exposed to lead from exposure to paint sludge during that time, resulting in an elevated blood lead level. NJDOH and ATSDR updated the analysis with data through 2010. Blood lead testing since the end of 2005 did not indicate that there was ongoing exposure to lead in soils to children in the community (NJDOH and ATSDR 2011b).

Mortality Members of the RLNTC also expressed concern that community members have been dying prematurely. Mortality data for the Upper Ringwood community had not been examined for the draft PHA in 2006.

Birth Outcomes Similarly, RLNTC members expressed general concerns related to infant health during the July 2013 meeting. Data on birth outcomes had not been evaluated in the draft PHA in 2006.

Access to Health Care In October and November 2005, the NJDOH sponsored three day-long health screening events for residents of the Ringwood Mines area, in response to concerns about access to health care in the population. These concerns remain, however, as noted by the RLNTC, particularly for the less mobile, elderly members of the population.

* * *

This Health Consultation is divided into the following sections. First, the populations and geographic areas that are considered part of the RLNTC community are defined in detail, for the purpose of these health outcome analyses. Next, separate sections discuss birth outcomes, cancer incidence, and mortality data. Each of these sections includes a description of the methods used to obtain and analyze the data, and the findings of the analyses. Finally, the Health Consultation discusses the results, draws conclusions, and makes recommendations. An Appendix is added for supplemental, detailed tables not included in the main report sections.

2. Population Definitions and Demographic Profile

Geographic Boundaries to Define Populations

For an analysis of health outcomes, it is important to define clearly the population to be evaluated. The starting point for defining the RLNTC population for this analysis was the U.S. Census Bureau's 2010 definition of the "Ramapough Lenape Nation (Ramapough Mountain)" in Ringwood Borough and Mahwah Township, New Jersey. (This population had not been defined in censuses prior to 2010.)[2] The U.S. Census Bureau provided geographic shape files for the Ramapough Lenape Nation in each municipality. Using Geographic Information System software (ArcGIS), NJDOH matched the RLNTC area map with U.S. Census Blocks for the census years 2000 and 2010.

NJDOH shared this preliminary population definition with the RLNTC leadership. At the request of the RLNTC, the NJDOH added the Ramapo Brae Lane neighborhood located off Cloverbrook Road in Mahwah Township to the analysis area to complete the population definitions (Figures 2-1 and 2-2). From this point forward in this Health Consultation, these populations will be referred to as the "Ringwood RLNTC" and "Mahwah RLNTC."

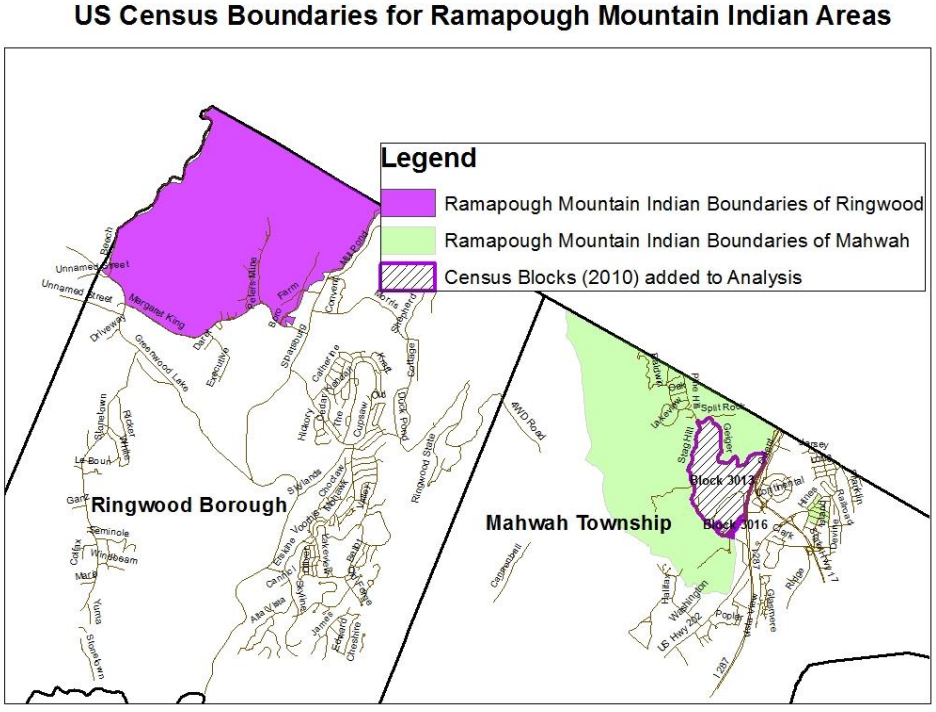


Figure 2-1. U.S. Census boundaries for "Ramapough Lenape Nation (Ramapough Mountain)" as modified after consultation with tribal leadership for the purpose of this Health Consultation.

[2] The U.S. Census Bureau defines geographic boundaries for numerous American Indian and Alaska Native populations (see Appendix F of the U.S. Census document found at http://www.census.gov/prod/cen2010/doc/pl94-171.pdf).

A complete listing of the U.S. Census blocks included in the RLNTC of Mahwah and Ringwood can be found in Table A-1 in the Appendix.

Additional Blocks by 2000 Census Boundaries

Additional Blocks by 2010 Census Boundaries

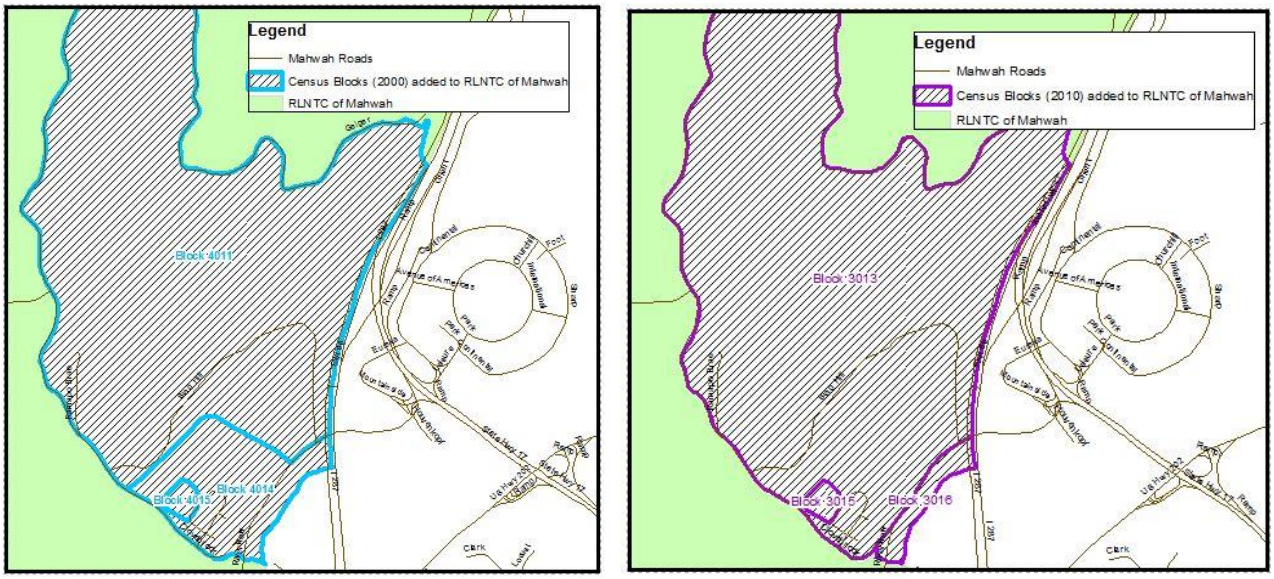


Figure 2-2. U.S. Census 2000 (top left) and 2010 (top right) added to the definition of the Mahwah RLNTC after consultation with tribal leadership. Recent aerial photograph of Ramapough Brae Lane neighborhood (bottom).

Demographic Characteristics of the Defined RLNTC Populations

Population numbers by five-year age group and sex for the included Census Blocks were obtained from Summary File 1 from both the 2000 and 2010 U.S. Censuses (Table 2-1). The Ringwood RLNTC, as defined for this Health Consultation, comprised 330 individuals in 2000. The population fell 10% to 297 individuals in 2010. The Mahwah RLNTC was larger with a nearly constant population size of 920 individuals in 2000 and 926 in 2010.

Table 2-1. Populations of the RLNTC communities in Ringwood and Mahwah, according to U.S. Censuses in 2000 and 2010, by sex and age group.

Population	2000 U.S. Census		2010 U.S. Census	
	Ringwood RLNTC	Mahwah RLNTC	Ringwood RLNTC	Mahwah RLNTC
Total	330	920	297	926
Sex				
Male	168 (51%)	455 (49%)	150 (51%)	466 (50%)
Female	162 (49%)	465 (51%)	147 (49%)	460 (50%)
Age Group				
0-19	116 (35%)	324 (35%)	81 (27%)	301 (33%)
20-44	128 (39%)	356 (39%)	108 (36%)	297 (32%)
45-64	68 (21%)	187 (20%)	86 (29%)	252 (27%)
65+	18 (5%)	53 (6%)	22 (7%)	76 (8%)

Data source: U.S. Census Bureau, Summary File 1 for censuses in years 2000 and 2010.

The proportions of males and females in both RLNTCs of Ringwood and Mahwah were evenly divided in both census years 2000 and 2010. The age distributions for the Ringwood and Mahwah RLNTCs were similar at the time of the 2000 U.S. Census. Both RLNTC populations showed a shift toward older age groups in 2010, with the percentage of individuals age 45 years and older increasing from 26% to 36% for the Ringwood RLNTC and from 26% to 35% for the Mahwah RLNTC.

Race Distributions

Respondents to the 2000 and 2010 U.S. Censuses were asked to identify themselves as belonging to one, two, or more race groups: American Indian and Alaska Native (AIAN); Black or African American; White; Asian; Native Hawaiian and Other Pacific Islander; or Some Other Race.

In 2010, 45% of the Ringwood RLNTC population self-identified as AIAN alone, with another 19% identifying as AIAN and another race group; 13% identified as Black or African American alone, and 17% identified as White alone. The Mahwah RLNTC population had a different distribution of self-identified race than Ringwood's RLNTC, with 9% identifying as AIAN alone and another 5% as AIAN and another

race. More than half (53%) self-identified as White alone, while 16% identified as Black or African American alone, and 8% identified as Asian alone. These percentages are shown in Figure 2-3.

Between 2000 to 2010, the Ringwood RLNTC saw an increase (from 53% to 64%) in self-identification as AIAN or AIAN plus another race, a decrease (from 20% to 13%) in self-identification as Black or African American alone. Self-identified race distributions for the RLNTC of Mahwah changed only slightly from 2000 to 2010. Changes between censuses may be due to in- and out-migration of individuals who self-identify differently, or changes in self-identification among individuals who stay put. Detailed tables of the self-reported race identification of populations in the RLNTCs of Mahwah and Ringwood, Mahwah Township and Ringwood Borough, and Bergen and Passaic Counties are presented in Tables A-2, A-3 and A-4, respectively.

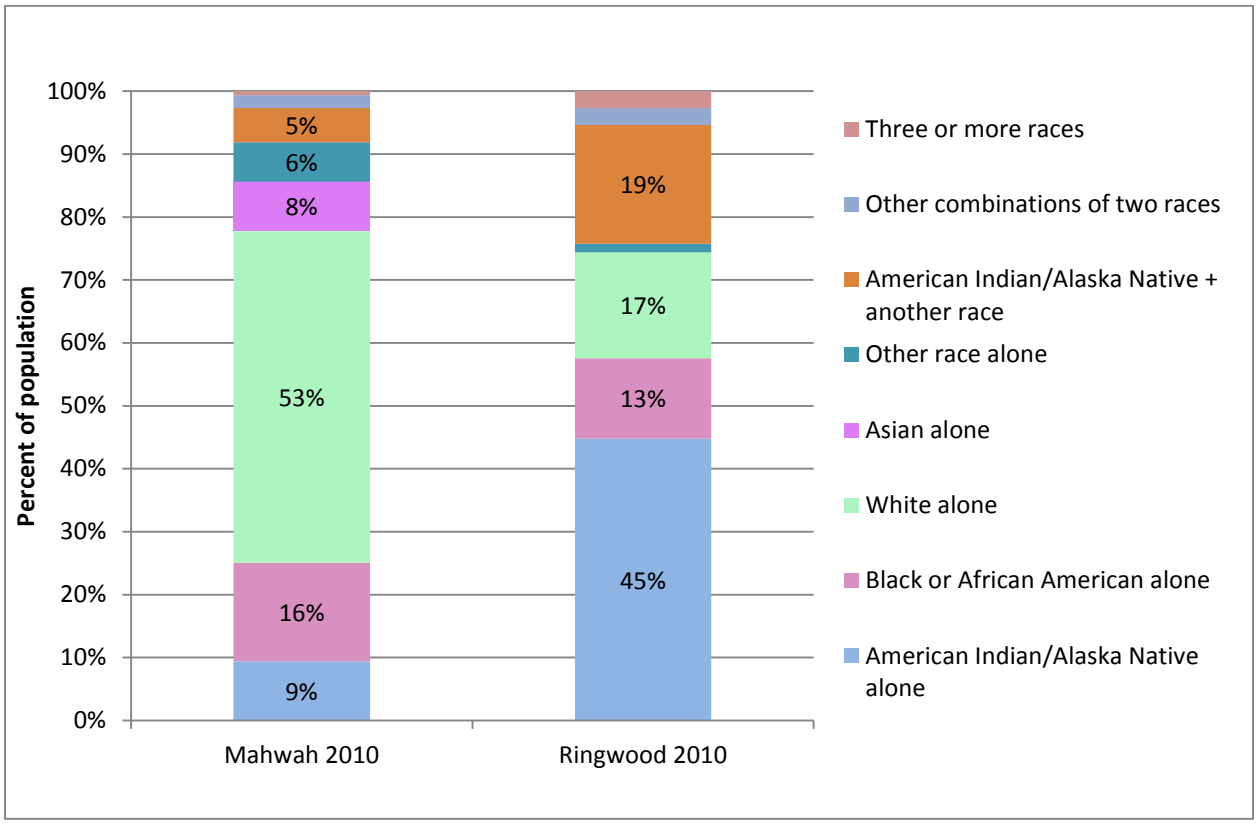


Figure 2-3. Self-reported race identity, RLNTC populations in Mahwah and Ringwood, U.S. Census 2010.

Numbers of Births and Demographic Characteristics of Birth Mothers in the RLNTC Populations

There were 141 live births in the period 1989 through 2011 to mothers among the RLNTC population, which is an average of approximately 6 births per year. In the larger Mahwah RLNTC, there were 348 live births during the same time period, or an average of about 15 births per year. Table 2-2

shows the distribution of mother's age and race identification on the birth certificate in the two RLNTC communities.

The proportion of births among mothers age 35 and older was higher in the Mahwah RLNTC (14%) compared to the Ringwood RLNTC (4%) over the period 1989 to 2011. In the Ringwood RLNTC, 90% of birth mothers were between the ages of 18 and 34 at delivery and 4% were less than 18 years of age at delivery. In the Mahwah RLNTC, 80% of birth mothers were between the ages of 18 and 34 at delivery and 2% were less than 18 years of age at delivery.

The distribution of maternal race among births occurring between 1989 and 2011 differed between the Ringwood RLNTC and the Mahwah RLNTC. In the Ringwood RLNTC, 32% of birth mothers were White, 35% were Black or African American, and 30% were American Indian or Alaska Native. In the Mahwah RLNTC, 65% of birth mothers were White, 14% were Black or African American, and 11% were American Indian or Alaska Native.

Table 2-2. Demographic characteristics of births in the RLNTC communities in Ringwood and Mahwah, over the period 1989 through 2011.

Births	**Ringwood RLNTC**	**Mahwah RLNTC**
Total	141	348
Mother's Race Identification on the Birth Certificate		
White	45 (32%)	225 (65%)
Black or African American	50 (35%)	49 (14%)
American Indian or Alaska Native	42 (30%)	37 (11%)
Asian or Pacific islander	0 (0%)	10 (3%)
Other or Unknown	4 (3%)	27 (8%)
Mother's Age at Time of Birth, (years)		
<18	6 (4%)	8 (2%)
18-34	127 (90%)	279 (80%)
35+	5 (4%)	48 (14%)
Unknown	3 (2%)	13 (4%)

Data source: New Jersey Department of Health, New Jersey Birth Certificate Database

3. Birth Outcomes (Low Birth Weight and Prematurity)

Low birth weight (LBW) is defined as a baby's weight at birth of less than 2,500 grams (about 5.5 pounds). In New Jersey, the average birth weight among full-term infants born singly (singletons) is around 3,400 grams (about 7.5 pounds).

An infant's birth is considered premature when the birth occurs before 37 weeks of pregnancy. Most pregnancies last around 40 weeks, but an infant is considered to have been brought to full term at 37 weeks or more of gestation (Behrman et al 2007).

LBW and premature infants are at greater risk of dying in the first month of life, are at higher risk of developmental disabilities and chronic illnesses throughout life, and are more likely to require special education services. LBW and premature infants may require intensive care at birth, resulting in longer hospital stays and higher health care costs (Behrman et al 2007).

The overall proportion of LBW and premature babies is slowly increasing because the number of twins and other multiple births is increasing (Martin et al 2012). Infants born as part of a multiple birth (twins, triplets, etc.) are more likely to be born with LBW and prematurely. Half of twins and virtually all triplet infants are born with LBW. The percentage of full-term, singleton infants with LBW has been steady at about 2% among New Jersey residents, while the proportion of prematurity among singleton infants has been steady at about 8%.

Methods

The objective of this analysis is to compare the occurrence of adverse birth outcomes, specifically LBW and prematurity, among the RLNTC of Ringwood, the RLNTC of Mahwah, the Borough of Ringwood, the Township of Mahwah, Bergen and Passaic Counties, and the State of New Jersey.

The NJDOH compiles birth certificate records that are filed electronically by hospitals. The birth certificate is the source document for this data. The birth certificate data set, maintained by the NJDOH Center for Health Statistics, includes all births to New Jersey resident mothers that occurred in New Jersey or out of state.

In order to obtain birth outcome data for the geographic areas occupied by the RLNTC, the record level data set for all births which occurred in Bergen and Passaic Counties between 1989 and 2011 were imported into Geographic Information System software based on geographic variables in each birth record. The boundaries of the Ringwood RLNTC and Mahwah RLNTC were based on the U.S. Census boundaries for this community with modifications based on input from the community, as described in the previous section.

The birth records were selected for the Mahwah and Ringwood RLNTC communities separately by identifying births that occurred within the respective boundaries. NJDOH also obtained birth outcome statistics of interest for Ringwood Borough, Mahwah Township, Bergen County, Passaic County, and State of New Jersey.[3]

The birth outcome statistics obtained were:

1) Proportion of LBW, among all births, and among singleton births brought to full term only (gestation of 37 weeks or more). This measure is the proportion of births who were LBW. To remove the effect of multiple births and prematurity on LBW comparisons, LBW proportion is often computed only among full-term, singleton births brought to full term.

2) Proportion of prematurity, among all births and among singleton births only. This measure is the proportion of births born prematurely, that is, before 37 weeks of gestation. To remove the effect of multiple births on prematurity proportion, this measure is often computed only among singleton births.

For all proportions, 95% confidence intervals were calculated to indicate whether there were statistically significant differences between the proportions among the seven geographic areas.

Results for LBW

LBW among All Births, 1989 through 2011

Over the 23-year period from 1989 through 2011, the LBW proportion in the RLNTC of Ringwood was 10.6%, with a 95% confidence interval of 6.1% to 16.9%. This proportion was slightly higher than in the RLNTC of Mahwah (6.0%, 95% CI 3.8%, 9.1%), Ringwood Borough, Mahwah Township, Bergen County, Passaic County, and the State of New Jersey, although the differences were not statistically significant.

LBW among Singleton Births Brought to Term, 1989 through 2011

From 1989 through 2011, the LBW proportion in the RLNTC of Ringwood among singleton, full-term babies was 4.9%, which was higher than the proportion in the other geographic areas (including RLNTC of Mahwah and the State of NJ), although the differences are not statistically significant. During this same time period, the LBW proportion in the RLNTC of Mahwah among singleton, full-term babies

[3] NJDOH makes non-confidential birth record data available to the public through the NJ State Health Assessment Data (NJ SHAD) web-based query system down to the municipal level for 1990 on. For this analysis, NJDOH searched the source birth certificate data set since we needed to compute sub-municipality rates. Since the dataset used to search for births among residents living in the RLNTC included data since 1989, municipal and county-level data were obtained from the source data set rather than NJ SHAD. Using NJ SHAD, NJDOH calculated birth outcome statistics among all live births for the State of New Jersey, in the period 1990 to 2011.

was 2.7%. Figure 3-1 shows the LBW proportion and 95% confidence intervals among singleton, full-term births in RLNTC of Ringwood in comparison to each of the other six geographic areas.

Results for Prematurity

Prematurity among All Births, 1989 through 2011

Over the 23-year period from 1989 through 2011, the prematurity proportion in the RLNTC of Ringwood was 12.1% (95% CI 7.2% to 18.6%) among all births. This proportion was almost two times higher than the RLNTC of Mahwah (6.0%, 95% CI 3.8%, 9.1%), although the results were not statistically significant. Also, this proportion was higher compared to Ringwood Borough, Mahwah Township, Bergen County, Passaic County, and the State of New Jersey.

Prematurity among Singleton Births, 1989 through 2011

The prematurity proportion in the RLNTC of Ringwood was 12.1% (95% CI 7.2% to 18.6%) from 1989 through 2011 among singleton live births (this is the same as among all births, since there were no multiple births). This proportion was more than two times higher than the RLNTC of Mahwah (5.4%, 95% CI 3.2%, 8.4%) and was higher than the proportion in Ringwood Borough, Mahwah Township, Bergen County, Passaic County, and the State of New Jersey , although the results are not statistically significant. Figure 3-2 shows the prematurity proportion and 95% confidence intervals among singleton births in the RLNTC of Ringwood in comparison to each of the six geographic areas.

Table 3-1. Low birth weight proportions among all live births in RLNTC of Ringwood, RLNTC of Mahwah, Ringwood, Mahwah, Bergen County, Passaic County, 1989-2011, and the State of New Jersey, 1990-2011.

Population	Number Low Birth Weight Babies	Number of Live Births	Percent Low Birth Weight Babies	95% Confidence Interval	Statistically Significantly Different from the State?
RLNTC – Ringwood	15	141	10.6%	6.1%, 16.9%	No
RLNTC – Mahwah	21	348	6.0%	3.8%, 9.1%	No
Ringwood Borough	218	3,694	5.9%	5.2%, 6.7%	**Yes, low**
Mahwah Township	414	6,704	6.2%	5.6%, 6.8%	**Yes, low**
Passaic County	14,739	180,251	8.2%	8.1%, 8.3%	**Yes, high**
Bergen County	14,829	238,170	6.2%	6.1%, 6.3%	**Yes, low**
State of New Jersey	195,529	2,526,889	7.7%	7.7%, 7.8%	--

Table 3-2. Low birth weight proportions among singleton, full-term (gestation 37 weeks or more) live births in RLNTC of Ringwood, RLNTC of Mahwah, Ringwood, Mahwah, Bergen County, Passaic County, 1989-2011, and the State of New Jersey, 1990-2011.

Population	Number Low Birth Weight Babies	Number of Live Births	Percent Low Birth Weight Babies	95% Confidence Interval	Statistically Significantly Different from the State?
RLNTC – Ringwood	6	123	4.9%	1.8%, 10.0%	No
RLNTC – Mahwah	8	297	2.7%	1.2%, 5.2%	No
Ringwood Borough	43	3,137	1.4%	1.0%, 1.8%	**Yes, low**
Mahwah Township	73	5,247	1.4%	1.1%, 1.8%	**Yes, low**
Passaic County	3,483	153,734	2.3%	2.2%, 2.3%	**Yes, high**
Bergen County	3,171	194,278	1.6%	1.6%, 1.7%	**Yes, low**
State of New Jersey	42,324	2,096,691	2.0%	2.0%, 2.0%	--

Data sources for Tables 3-1 and 3-2: The New Jersey Birth Certificate Database and NJ SHAD, the New Jersey Department of Health 's public web-based data query system (www.nj.gov/health/shad).

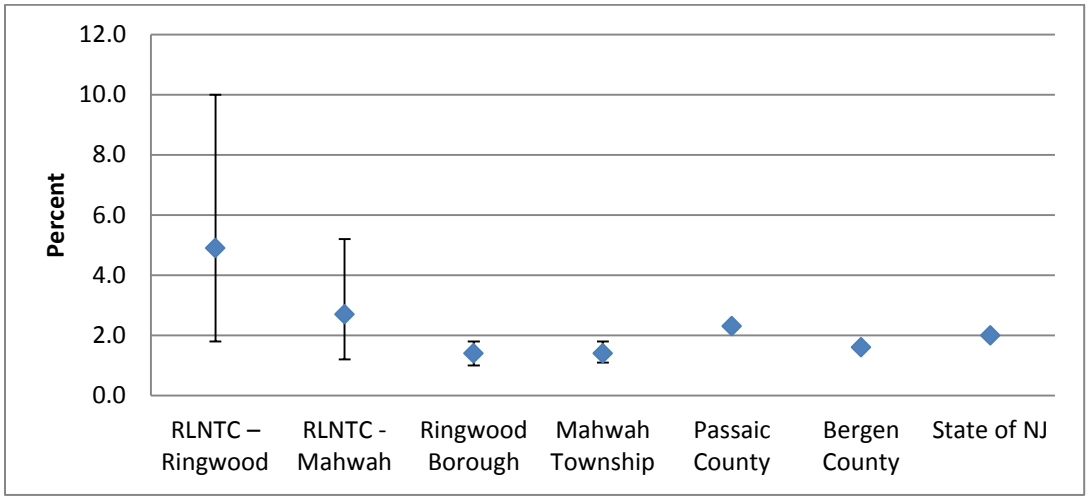
Table 3-3. Premature birth proportions among all live births in RLNTC of Ringwood, RLNTC of Mahwah, Ringwood, Mahwah, Bergen County, Passaic County, 1989-2011, and the State of New Jersey, 1990-2011.

Population	Number of Premature Babies	Number of Live Births	Percent Premature Babies	95% Confidence Interval	Statistically Significantly Different from the State?
RLNTC – Ringwood	17	141	12.1%	7.2%, 18.6%	No
RLNTC – Mahwah	21	348	6.0%	3.8%, 9.1%	No
Ringwood Borough	321	3,694	8.7%	7.8%, 9.6%	No
Mahwah Township	516	6,704	7.7%	7.7%, 8.4%	**Yes, low**
Passaic County	17,723	180,251	9.8%	9.7%, 10.0%	**Yes, high**
Bergen County	18,490	238,170	7.8%	7.7%, 7.9%	**Yes, low**
State of New Jersey	231,289	2,526,889	9.2%	9.1%, 9.2%	--

Table 3-4. Premature birth proportions among singleton live births in RLNTC of Ringwood, RLNTC of Mahwah, Ringwood, Mahwah, Bergen County, Passaic County, 1989-2011, and the State of New Jersey, 1990-2011.

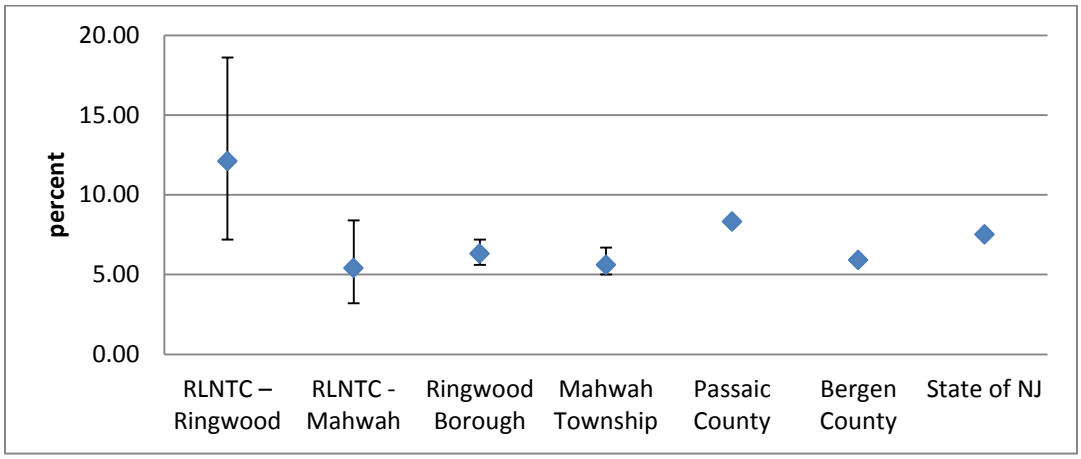
Population	Number of Premature Babies	Number of Live Births	Percent Premature Babies	95% Confidence Interval	Statistically Significantly Different from the State?
RLNTC – Ringwood	17	141	12.1%	7.2%, 18.6%	No
RLNTC – Mahwah	18	333	5.4%	3.2%, 8.4%	No
Ringwood Borough	224	3,540	6.3%	5.6%, 7.2%	**Yes, low**
Mahwah Township	355	6,360	5.6%	5.0%, 6.7%	**Yes, low**
Passaic County	14,482	174,324	8.3%	8.2%, 8.4%	**Yes, high**
Bergen County	13,505	227,543	5.9%	5.8%, 6.0%	**Yes, low**
State of New Jersey	181,070	2,427,574	7.5%	7.4%, 7.5%	--

Data sources for Tables 3-3 and 3-4: The New Jersey Birth Certificate Database and NJ SHAD, the New Jersey Department of Health 's public web-based data query system (www.nj.gov/health/shad).



Data source: The New Jersey Birth Certificate Database and NJ SHAD, the New Jersey Department of Health's public web-based data query system (www.nj.gov/health/shad).

Figure 3-1. Low birth weight proportions and 95% confidence intervals among singleton, full-term (gestation 37 weeks or more) live births in RLNTC of Ringwood, RLNTC of Mahwah, Ringwood, Mahwah, Bergen County, Passaic County 1989-2011 and the State of New Jersey, 1990-2011.



Data source: The New Jersey Birth Certificate Database and NJ SHAD, the New Jersey Department of Health's public web-based data query system (www.nj.gov/health/shad).

Figure 3-2. Premature birth proportions among singleton live births in RLNTC of Ringwood, RLNTC of Mahwah, Ringwood, Mahwah, Bergen County, Passaic County, 1989-2011, and the State of New Jersey, 1990-2011.

4. Cancer Incidence

According to the American Cancer Society, about 43% of men and 38% of women in the United States will develop cancer over the course of their lifetimes (American Cancer Society, 2015a). As a result, over the years, cancer will affect most households. Because many infectious diseases have been either stabilized or conquered due to advancements in medical science, cancer has become the second leading cause of death in the United States, following heart disease.

Cancer is a group of over 100 different diseases, each with a different set of risk factors. Scientists estimate most cancers are related to a combination of heredity, lifestyle factors such as smoking or secondhand smoke, diet, alcohol consumption, sun exposure, reproductive factors, certain occupational exposures, and certain infections. For adults, there is often a long period, 10 to 30 years or even more, between the exposure(s) and the diagnosis of cancer. While cancers occur in people of all ages, incidence rates (the number of newly diagnosed cases of cancer in a specific population during a specific time period) for most types of cancers rise sharply among people who are over 45 years of age with an even greater increase over the age of 60 years.

As noted in the Background and Statement of Purpose section, NJDOH has prepared two previous cancer incidence analyses for the RLNTC of Ringwood, for the years 1979-2002 and 1979-2008 (NJDOH and ATSDR 2006; NJDOH and ATSDR 2011). (The RLNTC of Ringwood was referred to as the "Focus Area" within Ringwood Borough in these earlier reports.) The previous analyses both indicated that overall cancer incidence was not elevated in the RLNTC of Ringwood with the exception of lung cancer in males, which was statistically significantly elevated.

Methods

The objective of this analysis is to compare the incidence of cancer in the RLNTC of Ringwood, the RLNTC of Mahwah, the Borough of Ringwood, the Township of Mahwah, and Bergen and Passaic Counties, to incidence in the State of New Jersey. The State of New Jersey is used as the comparison population for each of the analysis areas since age-specific incidence rates for specific types of cancer are stable.

Population Definition

The geographic definition of the population for this cancer incidence analysis is described in the section, Population Definition and Demographic Profile. This cancer analysis was completed for RLNTC of Ringwood, RLNTC of Mahwah, Township of Mahwah, Ringwood Borough as well as Passaic and Bergen Counties. Cancer incidence was examined for this population during the period 1979-2011, adding three years of incidence data to the most recent analysis. At the time this analysis was conducted, 2011 was the most recent year with complete cancer incidence data for New Jersey.

Cancer Case Ascertainment

The New Jersey State Cancer Registry (NJSCR) was used for the ascertainment of cancer cases. The NJSCR is a population-based cancer incidence registry covering the entire state of New Jersey. By law, all cases of newly diagnosed cancer are reportable to the NJSCR except certain carcinomas of the skin. In addition, the NJSCR has reporting agreements with the states of New York, Pennsylvania, Maryland, North Carolina, Delaware, and Florida. Information on New Jersey residents who are diagnosed in those states is supplied to the NJSCR. The NJSCR has been in operation since October 1, 1978.

A "case" of cancer was defined as an individual who was diagnosed with a new primary malignant cancer during the time period January 1, 1979, through December 31, 2011, while residing in one of the analysis areas analyzed in this report. Cases identified only through search of death records were excluded from this evaluation. Information in the NJSCR includes the case's identifying information, demographic characteristics such as age, sex and race, residence at time of diagnosis, and specific cancer diagnosis, among other data. Information on some important cancer risk factors, such as genetics, personal behaviors (e.g., diet and smoking history), and occupational history are not available from the NJSCR.

Data Analysis

An incidence rate is the number of new cases of a disease in a defined population over a specific interval of time (for example, 3 cases of the disease per 100,000 people per year). When comparing cancer incidence rate data among communities, it is important to "age-adjust" the rates, since the risk of developing most cancer types increases strongly with age. Age-adjustment allows for the comparison of incidence rates across populations by removing the effect that the age distribution has on the rates (Breslow and Day 1987, Checkoway et al. 1989, Kelsey et al. 1986). One way of adjusting for age differences is by computing a Standardized Incidence Ratio (SIR).

The SIR is calculated by dividing the observed number of cancer cases by an expected number of cases for a target population over a specific time period. The expected number is the number of cases that would occur in that population if the incidence rates were the same as in the comparison population. The expected number is derived by multiplying the comparison population's age-sex-specific incidence rates and the target area's age-sex-specific population numbers. The comparison rates used to derive the expected number of cases were the New Jersey average annual age-specific incidence rates for 1979-2011.

The observed and expected numbers are evaluated by interpreting the ratio of these numbers. If the observed number of cases equals the expected number, the SIR will be equal to 1.0. An SIR less than 1.0 indicates that fewer cases were observed than expected, while an SIR greater than 1.0 indicates that more cases than expected were observed. Random fluctuations may account for some SIRs being

higher or lower than 1.0. The statistical significance of deviations from "SIR equal to 1.0" was evaluated using a 95% confidence interval (CI). The 95% CI was used to evaluate the probability that the SIR may be greater or less than 1.0 due to chance alone. If the confidence interval includes 1.0, then the estimated SIR is not considered to be statistically significantly different than 1.0; that is, the observed number of cases is not statistically different from the expected number of cases.

This approach has limitations when the observed number of cases is small, because there may be a lack of statistical power to detect a difference if indeed one exists. In situations where there were fewer than five observed cases across all age groups for a particular cancer type, SIRs and confidence intervals were not reported. Reporting SIRs and confidence intervals when there are fewer than five observed cases may give the false impression of statistical reliability of these comparisons. Interpreting the confidence interval and whether 1.0 is included when based on small numbers is uninformative, as it is likely that there was a lack of statistical power to detect a difference if one truly existed. However, if the comparison was statistically significantly different it is noted in the tables because we did not want to suppress any significantly high findings.

Populations for the each sex and 18 age-specific groups used in the calculation of the expected counts were obtained from the U.S. Census (U.S. Census Bureau 2013). The age-sex-specific population for the RLNTCs of Ringwood and Mahwah were determined from the 2000 and 2010 Census data. Because the age-specific populations for both RLNTC areas were comprised of census blocks and age-specific population data was not available at the block level for the 1980 and 1990 census, population data for the year 2000 were used as sex- and age-specific populations over the period 1979 through 2000. For years 2001 through 2011, age-specific intercensal populations were determined by linear interpolation between the 2000 and 2010 U.S. Census figures. The age-sex-specific intercensal populations for the municipal and county SIR analysis were determined by linear interpolation between the 1980, 1990, 2000 and 2010 U.S. Census figures.

SIR analyses were conducted separately for males and females. Analyses were completed for all malignant cancer types combined and for select cancer types. In addition to all cancers combined, the following cancer types were examined in this analysis:

- Lung
- Prostate (male)
- Breast (female)
- Colorectal
- Bladder
- Hodgkin lymphoma
- Non-Hodgkin lymphoma
- Melanoma
- Leukemia
- Kidney and renal pelvis

- Pancreas
- Oral cavity and pharynx
- Stomach
- Cervix (female)
- Ovary (female)
- Thyroid
- Brain and central nervous system (CNS)
- Myeloma
- Esophagus
- Liver and intrahepatic bile duct
- Soft tissues
- Mesothelioma
- Gallbladder
- Bones and joints

For cancer incidence data, non-zero case counts under five are not reported, following the policy of the NJSCR, to protect the privacy of confidential medical information. In this situation, case counts under five are presented as "<5". (It should be noted that "All Sites" combined includes cases that may have been suppressed due to case counts being less than five, as well as cancer types not included in the list above.)

Results: Standardized Incidence Ratios

SIR analysis results are presented for the RLNTC of Ringwood (Table 4-1), RLNTC of Mahwah (Table 4-2), Ringwood Borough (Table 4-3) and Mahwah Township (Table 4-4). SIR tables for Bergen County (Table A-5) and Passaic County (Table A-6) are shown in the Appendix. For the Ringwood RLNTC, the incidence of lung cancer in males over the period 1979-2011 was statistically significantly elevated, based on 11 observed cases. This increase is the same that has been observed in the previous cancer incidence analyses. In addition, there was a statistically significant elevation in cervical cancer among females in the Ringwood RLNTC over this same period. Because this SIR is based on fewer than five cases, the actual number of observed and the SIR is not presented in the Table due to statistical unreliability.

For the RLNTC of Mahwah, the incidence of all cancer sites combined in females was statistically significantly *lower* than expected. No statistically significant SIR elevations were seen in the RLNTC of Mahwah. Ringwood Borough showed a statistically significant elevation in male bladder cancer and female melanoma. Mahwah Township showed statistically significantly elevated SIRs among males for prostate cancer, kidney cancer, thyroid cancer, leukemias and melanoma, while SIRs were statistically significantly low for lung cancer and esophagus cancer in males and colorectal cancer and cervical cancer in females.

Table 4-1. Standardized Incidence Ratios: ***RLNTC of Ringwood*** *compared to the State of New Jersey, 1979-2011.*

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
All Sites Combined	Male	21	18.0	1.16	0.72-1.78	No
	Female	15	16.3	0.92	0.51-1.51	No
Prostate	Male	<5	4.6	--	--	No
Breast	Female	5	5.3	0.9	0.3-2.2	No
Lung and Bronchus	Male	9	2.7	3.4	1.5-6.4	**Yes, high**
	Female	<5	1.7	--	--	No
Colon and Rectum	Male	<5	2.1	--	--	No
	Female	0	1.7	--	--	No
Urinary Bladder	Male	<5	1.2	--	--	No
	Female	0	0.4	--	--	No
Hodgkin Lymphoma	Male	0	0.2	--	--	No
	Female	<5	0.2	--	--	No
Non-Hodgkin Lymphoma	Male	<5	0.8	--	--	No
	Female	<5	0.6	--	--	No
Melanoma	Male	0	0.7	--	--	No
	Female	0	0.5	--	--	No
Leukemia	Male	0	0.6	--	--	No
	Female	0	0.4	--	--	No
Kidney and Renal Pelvis	Male	0	0.6	--	--	No
	Female	0	0.3	--	--	No
Pancreas	Male	0	0.4	--	--	No
	Female	0	0.3	--	--	No
Oral Cavity and Pharynx	Male	0	0.6	--	--	No
	Female	0	0.2	--	--	No
Stomach	Male	0	0.4	--	--	No
	Female	<5	0.2	--	--	No
Cervix	Female	<5	0.5	--	--	**Yes, high**
Ovary	Female	0	0.6	--	--	No
Thyroid	Male	<5	0.2	--	--	No
	Female	<5	0.6	--	--	No
Brain and Other Nervous System	Male	0	0.3	--	--	No
	Female	0	0.2	--	--	No
Myeloma	Male	0	0.2	--	--	No
	Female	0	0.2	--	--	No
Esophagus	Male	0	0.3	--	--	No
	Female	0	0.1	--	--	No
Liver and Intrahepatic Bile Duct	Male	0	0.2	--	--	No
	Female	0	0.1	--	--	No

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
Soft Tissue	Male	0	0.1	--	--	No
	Female	0	0.1	--	--	No
Mesothelioma	Male	0	0.1	--	--	No
	Female	0	0.0	--	--	No
Gallbladder	Male	0	0.0	--	--	No
	Female	<5	0.1	--	--	No
Bones and Joints	Male	<5	0.1	--	--	No
	Female	0	0.0	--	--	No

<5 cases suppressed to ensure confidentiality

-- SIR and Confidence Interval suppressed when count <5 to ensure statistical reliability

Source: New Jersey State Cancer Registry

Table 4-2. Standardized Incidence Ratios: ***RLNTC of Mahwah*** *compared to the State of New Jersey, 1979-2011.*

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
All Sites Combined	Male	55	48.5	1.13	0.85-1.48	No
	Female	41	54.3	0.75	0.54-1.02	No
Prostate	Male	14	12.1	1.16	0.63-1.94	No
Breast	Female	13	17.2	0.76	0.40-1.29	No
Lung and Bronchus	Male	10	7.1	1.42	0.68-2.61	No
	Female	5	5.7	0.9	0.3-2.0	No
Colon and Rectum	Male	5	5.7	0.9	0.3-2.1	No
	Female	5	6.0	0.8	0.3-1.9	No
Urinary Bladder	Male	5	3.3	1.5	0.5-3.6	No
	Female	0	1.3	--	--	No
Hodgkin Lymphoma	Male	0	0.5	--	--	No
	Female	0	0.4	--	--	No
Non-Hodgkin Lymphoma	Male	0	2.2	--	--	No
	Female	0	1.9	--	--	No
Melanoma	Male	<5	1.9	--	--	No
	Female	0	1.7	--	--	No
Leukemia	Male	0	1.5	--	--	No
	Female	0	1.2	--	--	No
Kidney and Renal Pelvis	Male	5	1.6	3.1	1.0-7.2	No
	Female	0	1.0	--	--	No
Pancreas	Male	<5	1.1	--	--	No
	Female	<5	1.1	--	--	No
Oral Cavity and Pharynx	Male	<5	1.6	--	--	No
	Female	0	0.8	--	--	No
Stomach	Male	<5	1.1	--	--	No
	Female	<5	0.8	--	--	No
Cervix	Female	<5	1.7	--	--	No
Ovary	Female	<5	2.1	--	--	No
Thyroid	Male	0	0.6	--	--	No
	Female	<5	1.9	--	--	No
Brain and Other Nervous System	Male	0	0.9	--	--	No
	Female	<5	0.8	--	--	No
Myeloma	Male	0	0.6	--	--	No
	Female	<5	0.6	--	--	No
Esophagus	Male	0	0.7	--	--	No
	Female	0	0.3	--	--	No
Liver and Intrahepatic Bile Duct	Male	<5	0.6	--	--	No
	Female	0	0.3	--	--	No

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
Soft Tissue	Male	<5	0.4	--	--	No
	Female	0	0.4	--	--	No
Mesothelioma	Male	0	0.2	--	--	No
	Female	0	0.1	--	--	No
Gallbladder	Male	0	0.1	--	--	No
	Female	0	0.0	--	--	No
Bones and Joints	Male	0	0.2	--	--	No
	Female	0	0.1	--	--	No

<5 cases suppressed to ensure confidentiality

-- SIR and Confidence Interval suppressed when count <5 to ensure statistical reliability

Source: New Jersey State Cancer Registry

Table 4-3. Standardized Incidence Ratios: ***Ringwood Borough*** *compared to the State of New Jersey, 1979-2011.*

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
All Sites Combined	Male	835	842.4	0.99	0.93-1.06	No
	Female	771	757.5	1.02	0.95-1.09	No
Prostate	Male	236	217.4	1.09	0.95-1.23	No
Breast	Female	254	242.2	1.05	0.92-1.19	No
Lung and Bronchus	Male	116	125.2	0.93	0.77-1.11	No
	Female	73	80.5	0.91	0.71-1.14	No
Colon and Rectum	Male	88	101.1	0.87	0.70-1.07	No
	Female	78	82.4	0.95	0.75-1.18	No
Urinary Bladder	Male	76	58.0	1.31	1.03-1.64	**Yes, high**
	Female	14	18.1	0.77	0.42-1.29	No
Hodgkin Lymphoma	Male	8	7.7	1.0	0.4-2.0	No
	Female	7	6.1	1.1	0.5-2.4	No
Non-Hodgkin Lymphoma	Male	34	35.8	0.95	0.66-1.33	No
	Female	25	26.9	0.93	0.60-1.37	No
Melanoma	Male	43	32.0	1.34	0.97-1.81	No
	Female	35	23.8	1.47	1.02-2.04	**Yes, high**
Leukemia	Male	26	24.9	1.04	0.68-1.53	No
	Female	15	16.5	0.91	0.51-1.50	No
Kidney and Renal Pelvis	Male	25	28.1	0.89	0.58-1.32	No
	Female	21	14.4	1.46	0.90-2.23	No
Pancreas	Male	14	18.7	0.75	0.41-1.25	No
	Female	14	15.7	0.89	0.49-1.50	No
Oral Cavity and Pharynx	Male	21	27.9	0.75	0.47-1.15	No
	Female	9	11.3	0.80	0.36-1.51	No
Stomach	Male	19	19.7	0.96	0.58-1.50	No
	Female	9	10.5	0.85	0.39-1.62	No
Cervix	Female	15	23.1	0.65	0.36-1.07	No
Ovary	Female	34	29.1	1.17	0.81-1.63	No
Thyroid	Male	11	9.0	1.22	0.61-2.19	No
	Female	24	26.4	0.91	0.58-1.35	No
Brain and Other Nervous System	Male	10	14.5	0.69	0.33-1.27	No
	Female	15	10.5	1.43	0.80-2.36	No
Myeloma	Male	10	9.9	1.01	0.48-1.85	No
	Female	<5	7.8	--	--	No
Esophagus	Male	0	13.0	--	--	No
	Female	0	3.7	--	--	No
Liver and Intrahepatic Bile Duct	Male	8	11.1	0.72	0.31-1.41	No
	Female	6	3.9	1.5	0.6-3.3	No

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
Soft Tissue	Male	<5	6.2	--	--	No
	Female	7	4.9	1.4	0.6-3.0	No
Mesothelioma	Male	6	3.8	1.6	0.6-3.4	No
	Female	0	0.9	--	--	No
Gallbladder	Male	<5	1.3	--	--	No
	Female	<5	2.8	--	--	No
Bones and Joints	Male	<5	2.3	--	--	No
	Female	<5	1.7	--	--	No

<5 cases suppressed to ensure confidentiality

-- SIR and Confidence Interval suppressed when count <5 to ensure statistical reliability

Source: New Jersey State Cancer Registry

Table 4-4. Standardized Incidence Ratios: ***Mahwah Township*** *compared to the State of New Jersey, 1979-2011.*

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
All Sites Combined	Male	1,631	1,587.2	1.03	0.98-1.08	No
	Female	1,478	1,519.7	0.97	0.92-1.02	No
Prostate	Male	478	426.4	1.12	1.02-1.23	**Yes, high**
Breast	Female	506	465.1	1.09	1.00-1.19	No
Lung and Bronchus	Male	189	239.4	0.79	0.68-0.91	**Yes, low**
	Female	167	172.4	0.97	0.83-1.13	No
Colon and Rectum	Male	179	195.0	0.92	0.79-1.06	No
	Female	151	179.3	0.84	0.71-0.99	**Yes, low**
Urinary Bladder	Male	118	114.2	1.03	0.86-1.24	No
	Female	30	39.7	0.76	0.51-1.08	No
Hodgkin Lymphoma	Male	18	12.9	1.40	0.83-2.21	No
	Female	14	11.4	1.23	0.67-2.07	No
Non-Hodgkin Lymphoma	Male	65	64.0	1.02	0.78-1.30	No
	Female	51	55.1	0.93	0.69-1.22	No
Melanoma	Male	90	56.7	1.59	1.28-1.95	**Yes, high**
	Female	50	44.7	1.12	0.83-1.48	No
Leukemia	Male	59	44.7	1.32	1.01-1.70	**Yes, high**
	Female	33	32.9	1.00	0.69-1.41	No
Kidney and Renal Pelvis	Male	70	50.3	1.39	1.08-1.76	**Yes, high**
	Female	35	29.5	1.19	0.83-1.65	No
Pancreas	Male	31	35.7	0.87	0.59-1.23	No
	Female	39	34.7	1.13	0.80-1.54	No
Oral Cavity and Pharynx	Male	52	48.5	1.07	0.80-1.41	No
	Female	17	22.8	0.75	0.43-1.20	No
Stomach	Male	37	37.6	0.98	0.69-1.36	No
	Female	21	22.8	0.92	0.57-1.41	No
Cervix	Female	23	40.4	0.57	0.36-0.85	**Yes, low**
Ovary	Female	48	57.1	0.84	0.62-1.12	No
Thyroid	Male	26	14.8	1.76	1.15-2.58	**Yes, high**
	Female	53	46.0	1.15	0.86-1.65	No
Brain and Other Nervous System	Male	25	24.2	1.03	0.67-1.53	No
	Female	24	19.5	1.23	0.79-1.83	No
Myeloma	Male	13	18.7	0.69	0.37-1.19	No
	Female	13	16.6	0.78	0.42-1.34	No
Esophagus	Male	12	24.0	0.50	0.26-0.87	**Yes, low**
	Female	<5	7.9	--	--	No
Liver and Intrahepatic Bile Duct	Male	15	20.1	0.75	0.42-1.23	No
	Female	8	8.4	1.0	0.4-1.9	No

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
Soft Tissue	Male	8	10.6	0.75	0.32-1.48	No
	Female	7	9.0	0.8	0.3-1.6	No
Mesothelioma	Male	10	7.6	1.32	0.63-2.42	No
	Female	<5	1.9	--	--	No
Gallbladder	Male	<5	2.7	--	--	No
	Female	6	6.2	1.0	0.4-2.1	No
Bones and Joints	Male	<5	3.7	--	--	No
	Female	<5	3.1	--	--	No

<5 cases suppressed to ensure confidentiality

-- SIR and Confidence Interval suppressed when count <5 to ensure statistical reliability

Source: New Jersey State Cancer Registry

5. Mortality

New Jersey law requires death certificates to be filed by proper authorities such as hospitals, physicians, medical examiners, and funeral directors, in the event of a death occurring in the state. Death certificates are submitted to the office of the State Registrar. Statistics on deaths of New Jersey residents that occurred in other states are obtained through participation in the national Vital Statistics Cooperative Program.

Causes of deaths included in the mortality analysis are underlying causes, and were coded using National Center for Health Statistics software in accordance with the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10).

Methods

The NJDOH makes non-confidential death record data available to the public through the NJ SHAD web-based query system. NJ SHAD was used to generate counts of death by cause in the period 2004-2010, in Ringwood, Mahwah, Bergen County, Passaic County and the State of New Jersey. The mortality data presented in the query system are for New Jersey residents, regardless of where the death occurred. In order to obtain death rates for the geographic areas occupied by the RLNTC, record level data for all deaths which occurred in Bergen and Passaic Counties between 2004 and 2010 were imported into Geographic Information System software based on geographic variables in each death record. The boundaries of the Ringwood RLNTC and Mahwah RLNTC were based on the U.S. Census boundaries for this community with modifications based on input from the community, as described in section 2.

A mortality rate is the number of deaths in a defined population over a specific interval of time. When comparing mortality data among communities, it is important to “age-adjust” the rates, since the risk of death increases strongly with age. Age-adjustment allows for the comparison of mortality rates across populations by removing the effect that the age distribution has on the rates (Breslow and Day 1987, Checkoway et al. 1989, Kelsey et al. 1986). One way of adjusting for age differences is by computing a Standardized Mortality Rate (SMR).

The SMR is calculated by dividing the observed number of deaths by an expected number of deaths for a target population over a specific time period. The expected number is the number of deaths that would occur in that population if the mortality rates were the same as the comparison population. The expected number is derived by multiplying the comparison population's age-sex-specific mortality rates and the target area’s age-sex-specific population numbers. The comparison rates used to derive the expected number of cases were the New Jersey average annual mortality rates for 2004-2010.

The observed and expected numbers are evaluated by interpreting the ratio of these numbers. If the observed number of deaths equals the expected number of deaths, the SMR will equal 1.0. An SMR less than 1.0 indicates that fewer deaths were observed than expected, while an SMR greater than 1.0 indicates that more deaths than expected were observed. Random fluctuations may account for some SMRs being higher or lower than 1.0. The statistical significance of deviations from "SMR equal to 1.0" was evaluated using a 95% confidence interval (CI). The 95% CI was used to evaluate the probability that the SMR may be greater or less than 1.0 due to chance alone. If the confidence interval includes 1.0, then the estimated SMR is not considered to be statistically significantly different than 1.0; that is, the observed number of deaths is not statistically different from the expected number of deaths.

This approach has limitations when the observed number of deaths is too small, because there may be a lack of statistical power to detect a difference if indeed one exists. In situations where there were fewer than five observed deaths across all age groups for a particular cause of death, SMRs and confidence intervals were not reported. Reporting SMRs and confidence intervals when there are fewer than five observed deaths may give the false impression of statistical reliability of these comparisons. Interpreting the confidence interval and whether 1.0 is included when based on small numbers is uninformative as it is likely that there was a lack of statistical power to detect a difference if one truly existed. However, if the comparison was statistically significantly different it is noted in the tables because we did not want to suppress any significantly high or low findings.

Populations for the each sex and 18 age-specific groups used in the calculation of the expected counts were obtained from the U.S. Census (U.S. Census Bureau 2013). The age-sex-specific population for the RLNTCs of Ringwood and Mahwah were determined from the 2000 and 2010 Census data. Because the age-specific populations for both RLNTC areas were comprised of census blocks and age-specific population data was not available at the block level for the 1980 and 1990 census, population data for the year 2000 were used as sex- and age-specific populations over the period 1979 through 2000. For years 2001 through 2011, age-specific intercensal populations were determined by linear interpolation between the 2000 and 2010 U.S. Census figures. The age-sex-specific intercensal populations for the municipal and county SIR analysis were determined by linear interpolation between the 1980, 1990, 2000 and 2010 U.S. Census figures.

Causes of death are grouped and classified according to the NJDOH's Center for Health Statistics' "List of 33 Major Causes of Death." This list is derived from the National Center for Health Statistics (NCHS) "List of 50 Rankable Causes of Death" by grouping rare causes of deaths. Results are tabulated for males and females separately. Rates were calculated using population estimates obtained for the six geographic areas through the U.S. Census.

NJDOH compared age-adjusted mortality rates for all causes of death combined and for the 15 most frequent causes of deaths in New Jersey:

- Diseases of the heart
- Malignant neoplasms (cancers)

- Cerebrovascular diseases
- Chronic lower respiratory diseases
- Diabetes mellitus
- Unintentional injuries
- Septicemia
- Alzheimer's disease
- Nephritis, nephritic syndrome and nephrosis (kidney diseases)
- Influenza and pneumonia
- Chronic liver disease and cirrhosis
- Intentional self-harm (suicide)
- Hypertension and hypertensive renal disease
- Parkinson's disease
- Pneumonitis due to solids and liquids

Age-adjusted SMRs were calculated for the RLNTC of Ringwood, the RLNTC of Mahwah, Ringwood Borough, Mahwah Township, Bergen County, and Passaic County—each in comparison to the State of New Jersey—for the years 2004-2010. Mortality among males and females was evaluated separately, since the background risks of these causes of death may vary by sex.

Results: Standardized Mortality Ratio Analyses

As shown in Table 5-1, the SMR for all causes of death combined was statistically significantly elevated among males living in the RLNTC of Ringwood, compared to the State of New Jersey in the period 2004-2010. All causes of death among females living in the RLNTC of Ringwood was not statistically significantly elevated compared to the State of New Jersey.

There were a higher number of deaths from malignant neoplasms than expected among males and females in the RLNTC of Ringwood, as shown in Table 5-1. However, SMRs are not presented because fewer than five deaths occurred in each sex. Since the number of deaths from malignant neoplasms in both sexes combined did exceed five, NJDOH calculated the SMR for this combined grouping. Death from malignant neoplasms was not statistically significantly elevated (SMR=2.4, 95% confidence interval 0.9, 5.3). Among females, there were two deaths due to breast cancer and one death due to lung cancer. Among males, there were two deaths due to lung cancer and one death due to colon cancer. In the State of New Jersey during 2004 to 2010, the most common cause of cancer deaths among males was lung cancer and the third most common cause of cancer deaths was colon cancer. Among females in the state of NJ during this time period, the most common cause of cancer deaths was lung cancer, followed by breast cancer.

As shown in Tables 5-2, 5-3, and 5-4, there were no statistically significant elevated SMRs for any cause of death in the RLNTC of Mahwah, Ringwood Township or Borough of Mahwah compared to the

State of New Jersey. SMR tables for Bergen County (Table A-7) and Passaic County (Table A-8) are shown in the Appendix.

*Table 5-1. Standardized Mortality Ratios: **RLNTC of Ringwood** compared to the State of New Jersey, 2004-2010.*

Cause of Death	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Mortality Ratio (SMR)	95% Confidence Interval of SMR	Statistically Significant Difference?
All Causes	Male	10	4.5	2.2	1.1, 4.1	**Yes, high**
	Female	7	4.3	1.6	0.6, 3.3	No
Diseases of heart	Male	2	1.0	--	--	--
	Female	1	1.0	--	--	--
Malignant neoplasms (cancer)	Male	3	1.2	--	--	--
	Female	3	1.2	--	--	--
Cerebrovascular diseases (stroke)	Male	1	0.2	--	--	--
	Female	0	0.2	--	--	--
Chronic lower respiratory diseases	Male	1	0.2	--	--	--
	Female	1	0.2	--	--	--
Kidney disease	Male	1	0.1	--	--	--
	Female	1	0.1	--	--	--

Only the 15 leading causes of death are shown; of these, only those causes with one or more deaths in males or females are shown.

Data sources: 1. The NJ Death Certificate Database. 2. The U.S. Census Bureau website (American FactFinder) (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

*Table 5-2. Standardized Mortality Ratios: **RLNTC of Mahwah** compared to the State of New Jersey, 2004-2010.*

Cause of Death	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Mortality Ratio (SMR)	95% Confidence Interval of SMR	Statistically Significant Difference?
All Causes	Male	16	15.1	1.06	0.61, 1.73	No
	Female	10	14.5	0.69	0.33, 1.27	No
Diseases of heart	Male	7	3.8	1.84	0.74, 3.79	No
	Female	0	3.5	--	--	--
Malignant neoplasms (cancer)	Male	4	3.9	--	--	--
	Female	4	4.3	--	--	--
Cerebrovascular diseases (stroke)	Male	0	0.6	--	--	--
	Female	1	0.7	--	--	--
Chronic lower respiratory diseases	Male	2	0.5	--	--	--
	Female	0	0.7	--	--	--
Diabetes mellitus	Male	1	0.5	--	--	--
	Female	0	0.5	--	--	--
Septicemia	Male	1	0.3	--	--	--
	Female	2	0.4	--	--	--
Kidney disease	Male	0	0.3	--	--	--
	Female	1	0.3	--	--	--
Chronic liver disease and cirrhosis	Male	1	0.3	--	--	--
	Female	0	0.2	--	--	--

Only the 15 leading causes of death are shown; of these, only those causes with one or more deaths in males or females are shown.

Data sources: 1. The NJ Death Certificate Database. 2. The U.S. Census Bureau website (American FactFinder) (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

*Table 5-3. Standardized Mortality Ratios: **Ringwood Borough** compared to the State of New Jersey, 2004-2010.*

Cause of Death	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Mortality Ratio (SMR)	95% Confidence Interval of SMR	Statistically Significant Difference?
All Causes	Male	281	286	0.98	0.87, 1.10	No
	Female	210	237	0.89	0.77, 1.01	No
Diseases of heart	Male	73	75.2	0.97	0.76, 1.22	No
	Female	54	58.4	0.92	0.69, 1.21	No
Malignant neoplasms (cancer)	Male	82	75.0	1.09	0.87, 1.36	No
	Female	69	65.4	1.05	0.82, 1.34	No
Cerebrovascular diseases (stroke)	Male	18	11.2	1.61	0.95, 2.54	No
	Female	6	12.1	0.5	0.2, 1.1	No
Chronic lower respiratory diseases	Male	10	10.8	0.93	0.44, 1.71	No
	Female	11	10.7	1.03	0.51, 1.84	No
Unintentional injuries	Male	15	14.6	1.03	0.58, 1.70	No
	Female	4	6.7	--	--	--
Diabetes mellitus	Male	4	10.4	--	--	**Yes, low**
	Female	3	7.9	--	--	--
Septicemia	Male	5	6.6	0.8	0.2, 1.8	No
	Female	1	6.4	--	--	**Yes, low**
Alzheimer's disease	Male	3	3.4	--	--	--
	Female	6	6.4	0.9	0.3, 2.0	No
Kidney disease	Male	8	6.5	1.2	0.5, 2.4	No
	Female	6	5.1	1.2	0.4, 2.6	No
Influenza and pneumonia	Male	6	4.8	1.2	0.5, 2.7	No
	Female	5	4.3	1.2	0.4, 2.7	No
Chronic liver disease and cirrhosis	Male	2	5.0	--	--	--
	Female	2	2.2	--	--	--
Intentional self-harm (suicide)	Male	6	4.9	1.2	0.4, 2.7	No
	Female	1	1.2	--	--	--
Hypertension and hypertensive renal disease	Male	2	2.0	--	--	--
	Female	1	2.3	--	--	--
Pneumonitis due to solids and liquids	Male	2	2.0	--	--	--
	Female	0	1.4	--	--	--

Only the 15 leading causes of death are shown; of these, only those causes with one or more deaths in males or females are shown.

Data sources: 1. The NJ Death Certificate Database through NJ SHAD, the NJDOH's public web-based data query system (www.nj.gov/health/shad). 2. The U.S. Census Bureau website (American FactFinder) (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

*Table 5-4. Standardized Mortality Ratios: **Mahwah Township** compared to the State of New Jersey, 2004-2010.*

Cause of Death	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Mortality Ratio (SMR)	95% Confidence Interval of SMR	Statistically Significant Difference?
All causes	Male	425	651	0.65	0.59, 0.72	**Yes, low**
	Female	468	640	0.73	0.67, 0.80	**Yes, low**
Diseases of heart	Male	110	178	0.62	0.51, 0.75	**Yes, low**
	Female	106	164	0.65	0.53, 0.78	**Yes, low**
Malignant neoplasms (cancer)	Male	123	166	0.74	0.61, 0.88	**Yes, low**
	Female	150	171	0.88	0.74, 1.03	No
Cerebrovascular diseases (stroke)	Male	11	26.8	0.41	0.20, 0.74	**Yes, low**
	Female	30	34.2	0.88	0.59, 1.25	No
Chronic lower respiratory diseases	Male	17	26.4	0.64	0.37, 1.03	No
	Female	21	30.9	0.68	0.42, 1.04	No
Unintentional injuries	Male	21	30.5	0.69	0.43, 1.05	No
	Female	8	16.6	0.5	0.2, 1.0	No
Diabetes mellitus	Male	14	23.0	0.61	0.33, 1.02	No
	Female	14	21.6	0.65	0.35, 1.09	No
Septicemia	Male	10	15.4	0.65	0.31, 1.19	No
	Female	11	17.7	0.62	0.31, 1.11	No
Alzheimer's disease	Male	6	9.5	0.6	0.2, 1.4	No
	Female	13	18.6	0.70	0.37, 1.19	No
Kidney disease	Male	6	15.8	0.4	0.14, 0.82	**Yes, low**
	Female	9	14.2	0.6	0.3, 1.2	No
Influenza and pneumonia	Male	12	12.0	1.00	0.52, 1.75	No
	Female	7	12.1	0.6	0.2, 1.2	No
Chronic liver disease and cirrhosis	Male	7	9.3	0.8	0.3, 1.6	No
	Female	2	5.2	--	--	--
Intentional self-harm (suicide)	Male	8	9.7	0.8	0.4, 1.6	No
	Female	0	2.6	--	--	--
Hypertension and hypertensive renal disease	Male	3	4.7	--	--	--
	Female	5	6.2	0.8	0.3, 1.9	No
Parkinson's disease	Male	11	6.5	1.7	0.8, 3.0	No
	Female	4	4.1	--	--	--
Pneumonitis due to solids and liquids	Male	6	5.2	1.2	0.4, 2.5	No
	Female	2	3.9	--	--	--

Only the 15 leading causes of death are shown; of these, only those causes with one or more deaths in males or females are shown.

Data sources: 1. The NJ Death Certificate Database through NJ SHAD, the NJDOH's public web-based data query system (www.nj.gov/health/shad). 2. The U.S. Census Bureau website (American FactFinder) (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

6. Discussion, Conclusions and Recommendations

This Health Consultation provides health statistics on birth outcomes, cancer incidence and mortality for two communities that include members of the Ramapough Lenape Nation Turtle Clan, one in Ringwood Borough and one in Mahwah Township. In addition, heath statistics are provided for Ringwood Borough and Mahwah Township in their entireties, as well as for Bergen County and Passaic County, to provide regional contexts.

Birth outcome data are presented as prevalence rates for low birth weight (LBW) and prematurity, for the six analysis areas and for the State of New Jersey. Cancer incidence and mortality data are presented as standardized ratios, in comparison to the State of New Jersey, to adjust for (that is, remove the effect of) differences in age distributions between populations. This is important since cancer incidence rates and mortality rates increase dramatically with age.

Conclusions on Health Outcomes in the Ringwood RLNTC

Several health outcomes were elevated in the Ringwood population of the RLNTC. Prevalence of LBW and prematurity in the Ringwood RLNTC were both higher than in the surrounding municipality, county and the State in the period 1989-2011, though the differences were not statistically significant (that is, chance cannot be excluded as a reason for the differences).

Lung cancer incidence among males and cervical cancer incidence among females were statistically significantly elevated in the Ringwood RLNTC population in the period 1979-2011. Lung cancer incidence was not elevated in Ringwood Borough or in Passaic County. Cervical cancer was not elevated in Ringwood Borough, but was elevated in Passaic County. There were other types of cancer that were elevated in Ringwood Borough or in Passaic County, but these were not also elevated in the Ringwood RLNTC.

Overall mortality (all causes) was statistically significantly elevated among males in the Ringwood RLNTC during the period 2004-2010. The number of deaths due to malignant neoplasms (cancers) in the Ringwood RLNTC population, among males and females combined, was elevated compared to the State of New Jersey, but the difference was not statistically significant. Mortality rates in Ringwood Borough were not elevated. Overall mortality and mortality due to malignant neoplasms were not elevated in Passaic County, but there were a variety of other causes of death that were statistically significantly high or low.

Conclusions on Health Outcomes in the Mahwah RLNTC

The prevalence of adverse birth outcomes, cancer incidence rates, and mortality rates were not elevated in the Mahwah RLNTC. The incidences of several types of cancer were statistically significantly high or low in Mahwah Township or in Bergen County, but these differences were not seen in the

Mahwah RLNTC. Rates of overall mortality and several specific causes of death were lower in Mahwah Township and Bergen County in comparison to the State.

Discussion of Risk Factors

LBW and Prematurity There are several demographic, behavioral, and environmental factors known to increase the risk of LBW and prematurity (Behrman et al 2007). In New Jersey, rates of LBW and prematurity vary widely across the state and by several maternal and infant characteristics. The rates of both LBW and prematurity are higher for infants born to the youngest and the oldest mothers. LBW and prematurity prevalence rates among Blacks are more than double the rates among Whites. Infants whose mothers used tobacco during pregnancy are more likely to have LBW and to be born prematurely. Mothers who receive no prenatal care are much more likely to have a premature and/or LBW baby than those who receive prenatal care. Exposures to certain chemicals in the work place or environment may affect fetal development and increase the risk of LBW and prematurity.

Lung Cancer Tobacco smoking is by far the biggest risk factor for lung cancer, accounting for about 90% of all lung cancer cases (NCI 2015). Other known or suspected risk factors for lung cancer include environmental tobacco smoke (secondhand smoke), high doses of ionizing radiation, residential radon exposure, and occupational exposure to asbestos, mustard gas, chloromethyl ethers, inorganic arsenic, hexavalent chromium, nickel, vinyl chloride, radon, or byproducts of fossil fuel combustion (NCI 2015). Since the prevalence of tobacco smoking is not available for RLNTC and municipal analysis areas, it is unknown what influence this important risk factor may have played. Recent statistics for the percentage of adults who are current smokers in Passaic County and Bergen County are similar to the State of New Jersey as a whole (NJSHAD 2015).

Cervical Cancer The primary risk factor for cervical cancer is infection with the human papilloma virus (HPV). According to the American Cancer Society about two thirds of all cervical cancers are caused by two of the more common HPV strains (ACS 2015b). Other risk factors include smoking, immunosuppression due to human immunodeficiency virus (HIV), *Chlamydia* infection, poor diet, being overweight, use of oral contraceptives (birth control pills), intrauterine device use, and family history of cervical cancer. The Centers for Disease Control and Prevention currently recommends HPV vaccination for individuals in certain age groups to prevent HPV infection and associated cancers (CDC 2015a).

Discussion of Limitations

This Health Consultation describes the health experience for selected outcomes (LBW and prematurity, cancer incidence, and mortality) for the two populations of the RLNTC in New Jersey. Known risk factors for outcomes that have been elevated are discussed in general; it is not known whether these risk factors are responsible for observed differences.

There are limitations to the health outcome analyses in this Health Consultation, especially for the relatively small populations of the two RLNTC communities. Proportions of adverse birth outcomes,

incidence rates for specific cancers, and mortality rates for specific causes of death in the RLNTC communities are based on small numbers of cases or deaths. Consequently, rates and standardized ratios are statistically unstable. Another important limitation is that health statistics are based on residential location at birth, at diagnosis of cancer, or at the time of death. Population mobility cannot be accounted for in these analyses.

Recommendations to Promoting Improvements in Community Health

In any community, it is important to focus efforts on reducing preventable chronic diseases that are responsible for a substantial burden of illness, injury and death, including heart disease, cancers, diabetes, and respiratory diseases. There are positive steps that any community can take to address important risk factors for these diseases: reducing tobacco smoking, controlling high blood pressure, lowering obesity/overweight, increasing physical inactivity, and improving diets (Danaei et al. 2009).

The U.S. Centers for Disease Control and Prevention's (CDC) program, *Communities Putting Prevention to Work*, promotes community efforts that reduce tobacco use, lower obesity /overweight, and lead to environmental changes that increase physical activity and access to healthy foods. Improvements in these areas would prevent or lower the burden of important chronic diseases including heart disease, stroke, diabetes, and cancer (CDC 2015b). The website for the CDC program is found at: http://www.cdc.gov/nccdphp/dch/programs/communitiesputtingpreventiontowork/index.htm.

Tobacco smoking plays an important role in any community's health outcomes. The American Cancer Society states that smoking cigarettes is the leading cause of cancers of the lung, bladder, esophagus, kidney, oral cavity, pancreas and stomach as well as acute myelogenous leukemia, and that tobacco smoking causes about 30% of all cancer deaths in the United States (ACS 2015c). According to the report of the U.S. Surgeon General, *The Health Consequences of Smoking—50 Years of Progress* (USDHSS 2014), "The burden of death and disease from tobacco use in the United States is overwhelmingly caused by cigarettes and other combusted tobacco products; rapid elimination of their use will dramatically reduce this burden."

New Jersey residents seeking assistance in quitting smoking should visit the New Jersey Quitline on the web at http://www.njquitline.org, or by telephone at (866) NJSTOPS. The American Cancer Society's *Guide to Quitting Smoking* is available on the web at: http://www.cancer.org/acs/groups/cid/documents/webcontent/002971-pdf.pdf.

There are many local, state and federal public health resources that work to promote communities' and individuals' health. The following is a list of some of these resources and links to them on the web:

Local Health Departments

- Bergen County Department of Health Services
  - http://www.co.bergen.nj.us/Index.aspx?NID=280
- Northwest Bergen Regional Health Commission
  - http://www.nwbrhc.org/
- Passaic County Health Department
  - http://www.passaiccountynj.org/Index.aspx?NID=136
- Ringwood Health Department
  - http://www.ringwoodnj.net/content/2347/2357/default.aspx

New Jersey Department of Health Resources

- NJDOH Family Health Services: http://www.nj.gov/health/fhs/
  - New Jersey HealthLink Directory of Programs and Resources. New Jersey HealthLink is a comprehensive health care consumer information website.
    - http://www.nj.gov/njhealthlink/
  - New Jersey Cancer Education and Early Detection Screening Program (NJCEED), which provides comprehensive screening services for breast, cervical, prostate, and colorectal cancer for uninsured or underinsured individuals at or below 250% of the Federal Poverty Level.
    - http://web.doh.state.nj.us/apps2/cancerfacilities/njceed.aspx
  - NJDOH Family Health Services sponsors many other health service programs for families, adults, mothers, and children:
    - http://www.nj.gov/health/fhs/primarycare/index.shtml
    - http://www.nj.gov/health/fhs/adult/health.shtml
    - http://www.nj.gov/health/fhs/children/index.shtml
    - http://www.nj.gov/health/fhs/newborn/index.shtml
    - http://www.nj.gov/health/fhs/prenatal/index.shtml

- NJDOH Office of Minority and Multicultural Health assists people in diverse New Jersey communities live longer, healthier lives, and leads the effort to reduce health disparities.
  - http://www.nj.gov/health/omh/index.shtml

Federal Health Resources

The Health Resources Services Administration (HRSA) of the U.S. Department of Health and Human Services aims to improve health and achieve health equity by improving access to quality care and services. The HRSA Region II Office provides oversight for New Jersey and New York (212-264-4498). For general information about HRSA and its programs that improve access to health care for underserved people, contact HRSA by telephone (1-888-ASK-HRSA or 888-275-4772) or online at http://www.hrsa.gov/about/contact/hrsahelp.aspx.

HRSA health centers provide certain health care services for the insured and uninsured. To find the nearest health center, use the HRSA 'Find a Health Center' application at http://findahealthcenter.hrsa.gov/Search_HCC.aspx.

The Administration for Community Living (ACL) of the U.S. Department of Health and Human Services is responsible for increasing access to community supports, while focusing attention and resources on the unique needs of older Americans and people with disabilities across the lifespan. For general questions, call 1-202-619-0724. The ACL Region II Office provides oversight for New Jersey and New York (1-212-264-2976). To find local resources for eldercare, use the ACL 'Eldercare Locator' (http://www.eldercare.gov/eldercare.net/Public/Search_Results.aspx) or call 1-800-677-1116.

References

[ACS] American Cancer Society, 2015a. Cancer Facts and Figures, 2015a. Retrieved from: http://www.cancer.org/acs/groups/content/@editorial/documents/document/acspc-044552.pdf

[ACS] American Cancer Society, 2015b. What Are the Risk Factors for Cervical Cancer. Retrieved from: http://www.cancer.org/cancer/cervicalcancer/detailedguide/cervical-cancer-risk-factors

[ACS] American Cancer Society, 2015c. Tobacco-related Cancers Fact Sheet. Retrieved from: http://www.cancer.org/cancer/cancercauses/tobaccocancer/tobacco-related-cancer-fact-sheet

Behrman RE, Butler AS, Committee on Understanding Premature Birth and Assuring Healthy Outcomes 2007. Preterm Birth: Causes, Consequences, and Prevention. Washington, DC: National Academies Press (US).

Breslow NE, Day NE 1987. Statistical Methods in Cancer Research: Vol II-The Design and Analysis of Cohort Studies, E. Heseltine, ed. In IARC Scientific Publication No. 82. Lyon:International Agency for Research on Cancer.

[CDC] Centers for Disease Control and Prevention 2015a. What Can I Do to Reduce My Risk of Cervical Cancer? Retrieved from: http://www.cdc.gov/cancer/cervical/basic_info/prevention.htm; and, What Are the Risk Factors for Cervical Cancer? Retrieved from: http://www.cdc.gov/cancer/cervical/basic_info/risk_factors.htm

[CDC] Centers for Disease Control and Prevention 2015b. Communities Putting Prevention to Work web page. Retrieved from: http://www.cdc.gov/nccdphp/dch/programs/communitiesputtingpreventiontowork/index.htm.

Checkoway H, Pearce NE, Crawford-Brown DJ 1989. Research Methods in Occupational Epidemiology, B. MacMahon, ed. In Monographs in Epidemiology and Biostatistics Vol. 13. Oxford: Oxford University Press.

Danaei G, Ding EL, Mozaffarian D, Taylor B, Rehm J, Murray CJL, Ezzati M 2009. The preventable causes of death in the United States: Comparativerisk assessment of dietary, lifestyle, and metabolic risk factors. PLoS Med 6(4): e1000058. doi:10.1371/journal.pmed.1000058.

Kelsey JL, Whittemore AS, Evans AS, Thompson WD 1996. Methods in Observational Epidemiology, 2nd Ed. Monographs in Epidemiology and Biostatistics, Vol. 26. Oxford: Oxford University Press.

Martin JA, Hamilton BE, Osterman MJK 2012. Three Decades of Twin Births in the United States, 1980–2009. NCHS Data Brief No. 80. U.S. Department of Health and Human Service: Centers for Disease Control and Prevention: National Center for Health Statistics. Retrieved from: http://www.cdc.gov/nchs/data/databriefs/db80.pdf

[NCI] National Cancer Institute 2015. Lung Cancer Prevention. Retrieved from: http://www.cancer.gov/cancertopics/pdq/prevention/lung; and, Smoking- Tobacco Facts. Retrieved from: http://www.cancer.gov/cancertopics/tobacco/smoking

[NJDOH and ATSDR] New Jersey Department of Health, and U.S. Agency for Toxic Substances and Disease Registry 2006. Public Health Assessment for the Ringwood Mines/Landfill Site, Borough of Ringwood, Passaic County, New Jersey. Draft for Public Comment. U.S. Department of Health and Human Services, Atlanta, GA. Retrieved at: http://www.state.nj.us/health/eoh/cehsweb/documents/ringwood_pha.pdf.

[NJDOH and ATSDR] New Jersey Department of Health, and U.S. Agency for Toxic Substances and Disease Registry 2011a. Cancer Incidence in the Population Living near the Ringwood Mines/Landfill Site, 1979-2008. Retrieved from: http://www.state.nj.us/health/eohs/passaic/ringwood/ringwood_mines_landfill/ringwood_cancer_incidence_hc_dec2011.pdf

[NJDOH and ATSDR] New Jersey Department of Health, and U.S. Agency for Toxic Substances and Disease Registry 2011b. Childhood Blood Lead Data in the Population Living near the Ringwood Mines/Landfill Site, July 1999 to December 2010. Retrieved from: http://nj.gov/health/eohs/passaic/ringwood/ringwood_mines_landfill/ringwood_childpb_hc_12_11.pdf

[NJSHAD] New Jersey State Health Assessment Data 2015. Percentage of Adults who Reported Current Cigarette Smoking by County of Residence, New Jersey, 2007-2009. New Jersey Department of Health, Center for Health Statistics, New Jersey State Health Assessment Data website. Retrieved from: http://nj.gov/health/shad.

[USDHSS] U.S. Department of Health and Human Services 2014. *The Health Consequences of Smoking—50 Years of Progress. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Atlanta, GA.

Report Preparation

This Health Consultation, "Birth Outcomes, Cancer Incidence and Mortality among the Ramapough Lenape Nation Turtle Clan Communities in Ringwood and Mahwah, New Jersey," was prepared by the New Jersey Department of Health (NJDOH) and was supported in part by funds provided through a cooperative agreement with the Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services. The findings and conclusions in these reports are those of the author(s) and do not necessarily represent the views of the Agency for Toxic Substances and Disease Registry or the U.S. Department of Health and Human Services.

Principal Authors

Jerald Fagliano, M.P.H., Ph.D.
Katharine McGreevy, M.P.A., Ph.D.
Pamela Agovino, M.P.H.
Environmental and Occupational Health Surveillance Program
Consumer, Environmental and Occupational Health Service
New Jersey Department of Health

State Reviewer

Joseph Eldridge, M.P.H., Director
Consumer, Environmental and Occupational Health Service
Division of Epidemiology, Environmental and Occupational Health
New Jersey Department of Health

Appendix

Table A-1. Complete list of U.S. Census Blocks in census years 2000 and 2010 that comprise the Ramapough Lenape Nation Turtle Clan (RLNTC) communities for the purpose of this Health Consultation.

Ringwood RLNTC 2000	Ringwood RLNTC 2010	Mahwah RLNTC 2000	Mahwah RLNTC 2010
2167004006	2167012000	0321011026	0321041029
2167004009	2167012002	0321011027	0321041031
2167004011	2167012003	0321014000	0321043000
2167004012	2167012004	0321014001	0321043001
2167004014	2167012017	0321014002	0321043002
2167004046	2167012072	0321014003	0321043003
2167004999	2167012074	0321014004	0321043004
		0321014005	0321043006
		0321014006	0321043007
		0321014007	0321043008
		0321014008	0321043009
		0321014009	0321043010
		0321014010	0321043011
		0321014011*	0321043012
		0321014014*	0321043013*
		0321014015*	0321043015*
		0321014999	0321043016*
		0322002001	0321043019
		0322002003	0321043027
		0322002004	0321043028
		0322002005	0322024002
			0322024003
			0322024004
			0322024005

* Census blocks added to the U.S. Census Bureau's definition at the request of the RLNTC leadership.

Table A-2. Populations of Ramapough Lenape Nation Turtle Clan (RLNTC) areas of Mahwah and Ringwood, by self-reported race identity. Source: U.S. Census, 2000 and 2010.

Self-Reported Race Identity	2000				2010			
	Mahwah RLNTC		Ringwood RLNTC		Mahwah RLNTC		Ringwood RLNTC	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total population	920	100.0	330	100.0	926	100.0	297	100.0
One race	860	93.5	283	85.8	851	91.9	225	75.8
White	505	54.9	43	13.0	488	52.7	50	16.8
Black or African American	118	12.8	67	20.3	145	15.7	38	12.8
American Indian and Alaska Native	131	14.2	154	46.7	87	9.4	133	44.8
Asian	56	6.1	4	1.2	73	7.9	0	0
Native Hawaiian and Other Pacific Islander	5	0.8	0	0	1	0.1	0	0
Some other race	45	4.9	15	4.5	57	6.2	4	1.3
Two or more races	60	6.5	47	14.2	75	8.1	72	24.2
Two races	53	5.8	34	10.3	69	7.5	64	21.5
White; Black or African American	1	0.1	8	2.4	0	0	6	2.0
White; American Indian and Alaska Native	14	1.5	3	0.9	30	3.2	24	8.1
White; Asian	4	0.4	0	0	7	0.8	2	0.7
White; Native Hawaiian and Other Pacific Islander	0	0	0	0	0	0	0	0
White; Some other race	20	2.2	0	0	1	0.1	0	0
Black or African American; American Indian and Alaska Native	10	1.1	18	5.5	19	2.1	32	10.8
Black or African American; Asian	0	0	0	0	5	0.5	0	0
Black or African American; Native Hawaiian and Other Pacific Islander	0	0	0	0	0	0	0	0
Black or African American; Some other race	0	0	3	0.9	0	0	0	0
American Indian and Alaska Native; Asian	0	0	0	0	0	0	0	0
American Indian and Alaska Native; Native Hawaiian and Other Pacific Islander	4	0.4	0	0	0	0	0	0
American Indian and Alaska Native; Some other race	0	0	2	0.6	1	0.1	0	0
Asian; Native Hawaiian and Other Pacific Islander	0	0	0	0	0	0	0	0
Asian; Some other race	0	0	0	0	3	0.3	0	0
Native Hawaiian and Other Pacific Islander; Some other race	0	0	0	0	3	0.3	0	0
Three or more races	7	0.8	13	3.9	6	0.6	8	2.7

Table A-3. Populations of Mahwah Township and Ringwood Borough, by self-reported race identity. Source: U.S. Census, 2000 and 2010.

Self-Reported Race Identity	2000				2010			
	Mahwah Township		Ringwood Borough		Mahwah Township		Ringwood Borough	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total population	24,062	100.0	12,396	100.0	25,890	100.0	12,228	100.0
One race	23,731	98.6	12,246	98.8	25,390	98.1	11,998	98.1
White	21,157	87.9	11,636	93.9	22,180	85.7	11,321	92.6
Black or African American	519	2.2	199	1.6	678	2.6	166	1.4
American Indian and Alaska Native	169	0.7	179	1.4	146	0.6	152	1.2
Asian	1,518	6.3	148	1.2	2,021	7.8	213	1.7
Native Hawaiian and Other Pacific Islander	7	<0.1	1	<0.1	2	<0.1	2	<0.1
Some other race	361	1.5	83	0.7	363	1.4	144	1.2
Two or more races	331	1.4	150	1.2	500	1.9	230	1.9
Two races	317	1.3	126	1.0	483	1.9	211	1.7
White; Black or African American	18	0.1	20	0.2	42	0.2	37	0.3
White; American Indian and Alaska Native	33	0.1	16	0.1	54	0.2	69	0.6
White; Asian	76	0.3	30	0.2	139	0.5	31	0.3
White; Native Hawaiian and Other Pacific Islander	6	<0.1	0	0	3	<0.1	1	<0.1
White; Some other race	110	0.5	26	0.2	35	0.1	15	0.1
Black or African American; American Indian and Alaska Native	16	0.1	19	0.2	29	0.1	37	0.3
Black or African American; Asian	7	<0.1	3	<0.1	7	<0.1	6	<0.1
Black or African American; Native Hawaiian and Other Pacific Islander	1	<0.1	0	0	0	0	0	0
Black or African American; Some other race	7	<0.1	5	<0.1	11	<0.1	4	<0.1
American Indian and Alaska Native; Asian	7	<0.1	1	<0.1	2	<0.1	1	<0.1
American Indian and Alaska Native; Native Hawaiian and Other Pacific Islander	4	<0.1	0	0	0	0	0	0
American Indian and Alaska Native; Some other race	1	<0.1	3	<0.1	2	<0.1	1	<0.1
Asian; Native Hawaiian and Other Pacific Islander	2	<0.1	1	<0.1	131	0.5	1	<0.1
Asian; Some other race	28	0.1	2	<0.1	24	0.1	7	0.1
Native Hawaiian and Other Pacific Islander; Some other race	1	<0.1	0	0	4	<0.1	1	<0.1
Three or more races	14	0.1	24	0.2	17	0.1	19	0.2

Table A-4. Populations of Bergen and Passaic Counties, New Jersey, by self-reported race identity. Source: U.S. Census, 2000 and 2010.

Self-Reported Race Identity	2000 Census				2010 Census			
	Bergen County		Passaic County		Bergen County		Passaic County	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total population	884,118	100.0	489,049	100.0	905,116	100.0	501,226	100.0
One race	864,160	97.7	469,261	96.0	882,406	97.5	482,627	96.3
White	693,236	78.4	304,786	62.3	650,703	71.9	314,001	62.6
Black or African American	46,568	5.3	64,647	13.2	52,473	5.8	64,295	12.8
American Indian and Alaska Native	1,336	0.2	2,166	0.4	2,061	0.2	3,348	0.7
Asian	94,324	10.7	18,064	3.7	131,329	14.5	25,092	5.0
Native Hawaiian and Other Pacific Islander	193	<0.1	175	<0.1	229	<0.1	156	<0.1
Some other race	28,503	3.2	79,423	16.2	45,611	5.0	75,735	15.1
Two or more races	19,958	2.3	19,788	4.0	22,710	2.5	18,599	3.7
Two races	18,973	2.1	19,177	3.9	21,359	2.4	17,526	3.5
White; Black or African American	1,768	0.2	1,093	0.2	3,440	0.4	3,184	0.6
White; American Indian and Alaska Native	801	0.1	500	0.1	1,019	0.1	888	0.2
White; Asian	3,292	0.4	1,334	0.3	5,914	0.7	2,388	0.5
White; Native Hawaiian and Other Pacific Islander	111	<0.1	116	<0.1	180	<0.1	111	<0.1
White; Some other race	8,755	1.0	11,435	2.3	5,912	0.7	6,590	1.3
Black or African American; American Indian and Alaska Native	463	0.1	345	0.1	509	0.1	455	0.1
Black or African American; Asian	378	<0.1	156	<0.1	573	0.1	200	<0.1
Black or African American; Native Hawaiian and Other Pacific Islander	95	<0.1	107	<0.1	95	<0.1	97	<0.1
Black or African American; Some other race	1,454	0.2	2,399	0.5	1,083	0.1	1,536	0.3
American Indian and Alaska Native; Asian	333	<0.1	137	<0.1	300	<0.1	168	<0.1
American Indian and Alaska Native; Native Hawaiian and Other Pacific Islander	6	<0.1	7	<0.1	6	<0.1	14	<0.1
American Indian and Alaska Native; Some other race	179	<0.1	370	0.1	350	<0.1	679	0.1
Asian; Native Hawaiian and Other Pacific Islander	124	<0.1	36	<0.1	409	<0.1	78	<0.1
Asian; Some other race	1,167	0.1	869	0.2	1,375	0.2	774	0.2
Native Hawaiian and Other Pacific Islander; Some other race	47	<0.1	273	0.1	194	<0.1	364	0.1
Three or more races	985	0.1	611	0.1	1,351	0.1	1,073	0.2

Table A-5. Standardized Incidence Ratios: ***Bergen County*** *compared to the State of New Jersey, 1979-2011.*

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
All Sites Combined	Male	81,357	82,378.0	0.99	0.98-0.99	**Yes, low**
	Female	79,267	78,106.5	1.01	1.01-1.02	**Yes, high**
Prostate	Male	22,637	22,719.0	1.00	0.98-1.01	No
Breast	Female	24,535	22,922.0	1.07	1.06-1.08	**Yes, high**
Lung and Bronchus	Male	10,937	12,553.4	0.87	0.85-0.89	**Yes, low**
	Female	8,548	9,181.0	0.93	0.91-0.95	**Yes, low**
Colon and Rectum	Male	10,157	10,366.1	0.98	0.96-1.00	No
	Female	10,005	10,116.5	0.99	0.97-1.01	No
Urinary Bladder	Male	6,468	6,158.7	1.05	1.02-1.08	**Yes, high**
	Female	2,337	2,223.2	1.05	1.01-1.09	**Yes, high**
Hodgkin Lymphoma	Male	604	549.8	1.10	1.01-1.19	**Yes, high**
	Female	524	472.1	1.11	1.02-1.21	**Yes, high**
Non-Hodgkin Lymphoma	Male	3,372	3,189.6	1.06	1.02-1.09	**Yes, high**
	Female	3,001	2,896.6	1.04	1.00-1.07	No
Melanoma	Male	2,982	2,811.1	1.06	1.02-1.10	**Yes, high**
	Female	2,200	2,141.2	1.03	0.98-1.07	No
Leukemia	Male	2,405	2,253.0	1.07	1.03-1.11	**Yes, high**
	Female	1,773	1,719.7	1.03	0.98-1.08	No
Kidney and Renal Pelvis	Male	2,739	2,525.2	1.08	1.04-1.13	**Yes, high**
	Female	1,557	1,531.0	1.02	0.97-1.07	No
Pancreas	Male	1,925	1,876.2	1.03	0.98-1.07	No
	Female	1,979	1,963.2	1.01	0.96-1.05	No
Oral Cavity and Pharynx	Male	1,979	2,366.3	0.84	0.80-0.87	**Yes, low**
	Female	1,112	1,160.8	0.96	0.90-1.02	No
Stomach	Male	2,029	1,984.4	1.02	0.98-1.07	No
	Female	1,334	1,295.7	1.03	0.98-1.09	No
Cervix	Female	1,433	1,826.1	0.78	0.74-0.83	**Yes, low**
Ovary	Female	3,085	2,824.7	1.09	1.05-1.13	**Yes, high**
Thyroid	Male	794	674.0	1.18	1.10-1.26	**Yes, high**
	Female	2,164	2,004.6	1.08	1.03-1.13	**Yes, high**
Brain and Other Nervous System	Male	1,229	1,140.2	1.08	1.02-1.14	**Yes, high**
	Female	1,049	930.1	1.13	1.06-1.20	**Yes, high**
Myeloma	Male	1,008	978.0	1.03	0.97-1.10	No
	Female	920	900.1	1.02	0.96-1.09	No
Esophagus	Male	942	1,226.7	0.77	0.72-0.82	**Yes, low**
	Female	399	435.7	0.92	0.83-1.01	No
Liver and Intrahepatic Bile Duct	Male	1,044	1,007.9	1.04	0.97-1.10	No
	Female	477	454.6	1.05	0.96-1.15	No

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
Soft Tissue	Male	530	509.9	1.04	0.95-1.13	No
	Female	420	433.9	0.97	0.88-1.07	No
Mesothelioma	Male	323	413.7	0.78	0.70-0.87	**Yes, low**
	Female	82	102.2	0.80	0.64-1.00	No
Gallbladder	Male	174	146.9	1.18	1.02-1.37	**Yes, high**
	Female	393	355.9	1.10	1.00-1.22	No
Bones and Joints	Male	161	161.8	0.99	0.85-1.16	No
	Female	141	134.5	1.05	0.88-1.24	No

<5 cases suppressed to ensure confidentiality

-- SIR and Confidence Interval suppressed when count <5 to ensure statistical reliability

Source: New Jersey State Cancer Registry

*Table A-6. Standardized Incidence Ratios: **Passaic County** compared to the State of New Jersey, 1979-2011.*

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
All Sites Combined	Male	36,197	37,610.7	0.96	0.95-0.97	**Yes, low**
	Female	35,362	37,322.5	0.95	0.94-0.96	**Yes, low**
Prostate	Male	9,702	10,190.9	0.95	0.93-0.97	**Yes, low**
Breast	Female	10,043	10,933.8	0.92	0.90-0.94	**Yes, low**
Lung and Bronchus	Male	5,533	5,661.8	0.98	0.95-1.00	No
	Female	3,675	4,308.8	0.85	0.83-0.88	**Yes, low**
Colon and Rectum	Male	4,576	4,682.2	0.98	0.95-1.01	No
	Female	4,661	4,772.6	0.98	0.95-1.01	No
Urinary Bladder	Male	2,614	2,772.2	0.94	0.91-0.98	**Yes, low**
	Female	993	1,047.7	0.95	0.89-1.01	No
Hodgkin Lymphoma	Male	279	294.8	0.95	0.84-1.06	No
	Female	273	260.6	1.05	0.93-1.18	No
Non-Hodgkin Lymphoma	Male	1,347	1,495.9	0.90	0.85-0.95	**Yes, low**
	Female	1,318	1,386.4	0.95	0.90-1.00	No
Melanoma	Male	936	1,309.2	0.71	0.67-0.76	**Yes, low**
	Female	809	1,050.8	0.77	0.72-0.82	**Yes, low**
Leukemia	Male	1,099	1,070.9	1.03	0.97-1.09	No
	Female	854	849.0	1.01	0.94-1.08	No
Kidney and Renal Pelvis	Male	1,112	1,160.2	0.96	0.90-1.02	No
	Female	739	730.3	1.01	0.94-1.09	No
Pancreas	Male	900	847.5	1.06	0.99-1.13	No
	Female	982	923.5	1.06	1.00-1.13	No
Oral Cavity and Pharynx	Male	1,169	1,092.0	1.07	1.01-1.13	**Yes, high**
	Female	558	553.7	1.01	0.93-1.09	No
Stomach	Male	1,061	899.0	1.18	1.11-1.25	**Yes, high**
	Female	691	613.6	1.13	1.04-1.21	**Yes, high**
Cervix	Female	1,033	911.2	1.13	1.07-1.21	**Yes, high**
Ovary	Female	1,337	1,354.7	0.99	0.93-1.04	No
Thyroid	Male	276	329.1	0.84	0.74-0.94	**Yes, low**
	Female	839	1,018.7	0.82	0.77-0.88	**Yes, low**
Brain and Other Nervous System	Male	563	562.9	1.00	0.92-1.09	No
	Female	522	470.0	1.11	1.02-1.21	**Yes, high**
Myeloma	Male	446	443.2	1.01	0.92-1.10	No
	Female	431	423.9	1.02	0.92-1.12	No
Esophagus	Male	573	556.6	1.03	0.95-1.12	No
	Female	199	204.7	0.97	0.84-1.12	No
Liver and Intrahepatic Bile Duct	Male	491	461.7	1.06	0.97-1.16	No
	Female	244	216.5	1.13	0.99-1.28	No

Cancer Type	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Incidence Ratio (SIR)	95% Confidence Interval of SIR	Statistically Significant Difference?
Soft Tissue	Male	219	249.6	0.88	0.77-1.00	No
	Female	215	219.3	0.98	0.85-1.12	No
Mesothelioma	Male	149	185.5	0.80	0.68-0.94	**Yes, low**
	Female	43	48.2	0.89	0.65-1.20	No
Gallbladder	Male	75	65.9	1.14	0.90-1.43	No
	Female	231	167.5	1.38	1.21-1.57	**Yes, high**
Bones and Joints	Male	87	86.0	1.01	0.81-1.25	No
	Female	74	72.0	1.03	0.81-1.29	No

<5 cases suppressed to ensure confidentiality

-- SIR and Confidence Interval suppressed when count <5 to ensure statistical reliability

Source: New Jersey State Cancer Registry

*Table A-7. Standardized Mortality Ratios: **Bergen County** compared to the State of New Jersey, 2004-2010.*

Cause of Death	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Mortality Ratio (SMR)	95% Confidence Interval of SMR	Statistically Significant Difference?
All causes	Male	22,535	27,591	0.82	0.81, 0.83	**Yes, low**
	Female	25,852	30,220	0.86	0.85, 0.87	**Yes, low**
Diseases of the heart	Male	6,591	7,810	0.84	0.82, 0.86	**Yes, low**
	Female	7,328	8,504	0.86	0.84, 0.88	**Yes, low**
Malignant neoplasms (cancer)	Male	5,959	6,844	0.87	0.85, 0.89	**Yes, low**
	Female	6,441	7,030	0.92	0.89, 0.94	**Yes, low**
Cerebrovascular diseases (stroke)	Male	964	1,174	0.82	0.77, 0.87	**Yes, low**
	Female	1,504	1,728	0.87	0.83, 0.92	**Yes, low**
Chronic lower respiratory diseases	Male	830	1,153	0.72	0.67, 0.77	**Yes, low**
	Female	1,087	1,429	0.76	0.72, 0.81	**Yes, low**
Unintentional injuries	Male	780	1,150	0.68	0.63, 0.73	**Yes, low**
	Female	527	679	0.78	0.71, 0.84	**Yes, low**
Diabetes mellitus	Male	680	954	0.71	0.66, 0.77	**Yes, low**
	Female	689	962	0.72	0.66, 0.77	**Yes, low**
Septicemia	Male	458	662	0.69	0.63, 0.76	**Yes, low**
	Female	597	838	0.71	0.66, 0.77	**Yes, low**
Alzheimer's disease	Male	395	466	0.85	0.77, 0.94	**Yes, low**
	Female	1,004	1,088	0.92	0.87, 0.98	**Yes, low**
Kidney disease	Male	519	702	0.74	0.68, 0.81	**Yes, low**
	Female	452	686	0.66	0.60, 0.72	**Yes, low**
Influenza and pneumonia	Male	447	543	0.82	0.75, 0.90	**Yes, low**
	Female	570	634	0.90	0.83, 0.98	**Yes, low**
Chronic liver disease and cirrhosis	Male	247	354	0.70	0.61, 0.79	**Yes, low**
	Female	147	196	0.75	0.63, 0.88	**Yes, low**
Intentional self-harm (suicide)	Male	331	354	0.93	0.84, 1.04	No
	Female	88	90.0	0.98	0.79, 1.21	No
Hypertension and hypertensive renal disease	Male	158	203	0.78	0.66, 0.91	**Yes, low**
	Female	255	319	0.80	0.70, 0.90	**Yes, low**
Parkinson's disease	Male	308	300	1.03	0.92, 1.15	No
	Female	205	206	0.99	0.86, 1.14	No
Pneumonitis due to solids and liquids	Male	259	241	1.07	0.95, 1.21	No
	Female	250	208	1.20	1.06, 1.36	**Yes, high**

Only the 15 leading causes of death are shown; of these, only those causes with one or more deaths in males or females are shown.

Data sources: 1. The NJ Death Certificate Database through NJ SHAD, the NJDOH's public web-based data query system (www.nj.gov/health/shad). 2. The U.S. Census Bureau website (American FactFinder) (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

*Table A-8. Standardized Mortality Ratios: **Passaic County** compared to the State of New Jersey, 2004-2010.*

Cause of Death	Gender	Number of Cases Observed	Number of Cases Expected	Standardized Mortality Ratio (SMR)	95% Confidence Interval of SMR	Statistically Significant Difference?
All Causes	Male	12,257	12,150	1.01	0.99, 1.03	No
	Female	13,331	13,436	0.99	0.98, 1.01	No
Diseases of heart	Male	3,413	3,323	1.03	0.99, 1.06	No
	Female	3,748	3,698	1.01	0.98, 1.05	No
Malignant neoplasms (cancer)	Male	2,918	2,998	0.97	0.94, 1.01	No
	Female	3,074	3,180	0.97	0.93, 1.00	No
Cerebrovascular diseases (stroke)	Male	513	499	1.03	0.94, 1.12	No
	Female	791	754	1.05	0.98, 1.13	No
Chronic lower respiratory diseases	Male	446	486	0.92	0.83, 1.01	No
	Female	587	627	0.94	0.86, 1.01	No
Unintentional injuries	Male	527	601	0.88	0.80, 0.96	**Yes, low**
	Female	297	331	0.90	0.80, 1.01	No
Diabetes mellitus	Male	475	418	1.14	1.04, 1.24	**Yes, high**
	Female	516	427	1.21	1.11, 1.32	**Yes, high**
Septicemia	Male	353	285	1.24	1.11, 1.37	**Yes, high**
	Female	424	370	1.15	1.04, 1.26	**Yes, high**
Alzheimer's disease	Male	166	187	0.89	0.76, 1.03	No
	Female	445	465	0.96	0.87, 1.05	No
Kidney disease	Male	290	296	0.98	0.87, 1.10	No
	Female	258	302	0.86	0.75, 0.97	**Yes, low**
Influenza and pneumonia	Male	265	228	1.16	1.03, 1.31	**Yes, high**
	Female	296	278	1.07	0.95, 1.20	No
Chronic liver disease and cirrhosis	Male	217	168	1.29	1.13, 1.48	**Yes, high**
	Female	102	91.6	1.11	0.91, 1.35	No
Intentional self-harm (suicide)	Male	173	187	0.92	0.79, 1.07	No
	Female	32	47.4	0.67	0.46, 0.95	**Yes, low**
Hypertension and hypertensive renal disease	Male	88	87.0	1.01	0.81, 1.25	No
	Female	139	139	1.00	0.84, 1.18	No
Parkinson's disease	Male	87	122	0.71	0.57, 0.88	**Yes, low**
	Female	90	88.8	1.01	0.82, 1.25	No
Pneumonitis due to solids and liquids	Male	53	99.4	0.53	0.40, 0.70	**Yes, low**
	Female	49	90.2	0.54	0.40, 0.72	**Yes, low**

Only the 15 leading causes of death are shown; of these, only those causes with one or more deaths in males or females are shown.

Data sources: 1. The NJ Death Certificate Database through NJ SHAD, the NJDOH's public web-based data query system (www.nj.gov/health/shad). 2. The U.S. Census Bureau website (American FactFinder) (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).