

Health Consultation

Community Health Profile

DuPont Pompton Lakes Works Site
Pompton Lakes, Passaic County, New Jersey

EPA FACILITY ID: NJD980771604

Prepared by:
New Jersey Department of Health

MARCH 21, 2014

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR Toll Free at
1-800-CDC-INFO

or

Visit our Home Page at: <http://www.atsdr.cdc.gov>

HEALTH CONSULTATION

Community Health Profile

DuPont Pompton Lakes Works Site
Pompton Lakes, Passaic County, New Jersey

EPA FACILITY ID: NJD980771604

Prepared By:

Environmental and Occupational Health Surveillance Program
New Jersey Department of Health

Under Cooperative Agreement with the
U. S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

Table of Contents

Summary	iii
1. Statement of Purpose	1
2. Background	1
3. Birth Outcomes (Birth Weight and Prematurity)	5
4. Birth Defects	9
5. Cancer Incidence	13
6. Mortality	21
7. Hospitalization and Emergency Department Use	31
8. Childhood Lead Exposure	41
9. Discussion	46
10. Conclusions and Recommendations	51
11. Public Health Action Plan	52
References	54
Report Preparation	55
Appendix: Population Demographic Profile	57

Summary

Introduction

Operations of the former DuPont Pompton Lakes Works plant in Pompton Lakes, Passaic County, New Jersey resulted in environmental contamination of soils, sediments and groundwater, both on and off the plant's site. Contaminants include heavy metals such as lead and mercury in soils and sediments, and chlorinated solvents in groundwater. The New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (USEPA) are overseeing investigations to characterize the extent and magnitude of contamination and are responsible for ensuring that remedial actions are taken to protect public health and the environment. The New Jersey Department of Health (NJDOH) and the federal Agency for Toxic Substances and Disease Registry (ATSDR) are working with the community to understand and respond to public health concerns related to environmental contaminants.

NJDOH and ATSDR established a Community Advisory Group for Health (Health CAG) to serve as a forum to discuss community health concerns and to provide advice to the health agencies. The Health CAG identified a need to understand whether there are health outcomes that are occurring more frequently in the Pompton Lakes population than would be expected.

In response, NJDOH and ATSDR have developed this Community Health Profile based on existing public health and demographic data sets, including births, deaths, hospitalizations and emergency department usage, cancer registry, birth defects registry, and childhood lead exposure.

NJDOH and ATSDR have reached the following conclusions based on the information presented in this Community Health Profile:

Conclusions

- Adverse birth-related health outcomes, including low birth weight, prematurity and a variety of birth defects, have not occurred with unusual frequency in Pompton Lakes.
 - The leading causes of death in Pompton Lakes were similar to the leading causes of death in the comparison populations.
 - The mortality rate among adults under 80 years of age was similar among the geographic areas, but Pompton Lakes showed a higher mortality rate among those 80 years of age
-

and over, for all causes and for the two most frequent causes of death, heart disease and malignant neoplasms. Mortality rates among younger residents of Pompton Lakes were similar to those in the surrounding communities and the State.

- Overall cancer incidence in Pompton Lakes was 8% higher in females during 1990-2008 compared to the State of New Jersey, but specific cancer sites analyzed were not statistically significantly elevated (that is, differences in rates may be explained by chance).
 - In the groundwater contamination plume area of Pompton Lakes, there were no statistically significant elevated rates of cancer incidence compared to the State in the period 1990-2008.
 - The incidence of kidney cancer in females and non-Hodgkin lymphoma in males had been found to be statistically significantly elevated in a previous analysis over different time frames; these cancers were elevated to a similar degree in this analysis, but the rates were not statistically different from the State.
 - Mortality rates for all cancers combined in male and female Pompton Lakes residents age 80 years and above was higher than in the State and the six surrounding towns; mortality rates in those less than age 80 years were similar to those in the comparison populations, indicating that younger residents of Pompton Lakes were not dying from cancer at a higher rate than residents in the other areas.
 - Emergency department visits for diseases of the nervous system and sense organs (2006-2010) were higher in Pompton Lakes males and females than in the State. The most frequent types of emergency department visits among this group of diseases were generally consistent across the three geographic areas, with the exception of migraine headaches accounting for a higher proportion among Pompton Lakes females.
 - Analyses of health data sets for respiratory and kidney diseases did not show that these outcomes are occurring with a pattern of increased frequency in Pompton Lakes.
 - Children aged 6 to 29 months in Pompton Lakes are not exhibiting increased frequency of exposure to high levels of lead from the environment.
-

-
- Overall, the rates of some health outcomes in Pompton Lakes were lower than expected, many were similar to what was expected, and some were higher than expected. The NJDOH and ATSDR will continue to consider the findings from this Community Health Profile in light of the findings of the NJDOH's Household Health Survey. Together, these complementary investigations will be used by NJDOH and ATSDR to guide decision-making about the need for further health investigations, in consultation with the Health CAG.
-

Basis for
Conclusion

These conclusions are based on analyses of several health-related data sets of the NJDOH. Rates of health outcomes in Pompton Lakes have been compared to rates in the State of Jersey and in the six surrounding municipalities combined.

Next Steps

The NJDOH and ATSDR will consider the findings from this Community Health Profile in light of the findings of the NJDOH's Household Health Survey. Together, these complementary investigations will be used by NJDOH and ATSDR to guide decision-making about the need for further health investigations, in consultation with the Health CAG.

**For More
Information**

Copies of this Community Health Profile will be provided to interested residents through the borough library, the local information repository related to the DuPont Pompton Lakes Works site, and the NJDOH and municipal web sites. NJDOH will notify area residents that this report is available.

Questions about this Community Health Profile should be directed to the NJDOH at:

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

1. Statement of Purpose

Over many decades, operations of the former DuPont Pompton Lakes Works plant resulted in environmental contamination of soils, sediments and groundwater, both on and off the plant's site. Contaminants include heavy metals such as lead and mercury in soils and sediments, and chlorinated solvents in groundwater. The New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (USEPA) are overseeing investigations to characterize the extent and magnitude of contamination and are responsible for ensuring that remedial actions are taken to protect public health and the environment. The New Jersey Department of Health (NJDOH) and the federal Agency for Toxic Substances and Disease Registry (ATSDR) are working with the community to understand and respond to public health concerns related to environmental contaminants.

In March 2010, NJDOH and ATSDR established a Community Advisory Group for Health (Health CAG). Several participants in the Health CAG expressed concern that the community was experiencing higher than normal rates of multiple adverse health outcomes. Therefore, NJDOH and ATSDR determined that there was a need to provide the community with an understanding of whether there are health outcomes that are occurring more frequently in the Pompton Lakes population than would be expected. In response, the NJDOH and ATSDR have pursued two complementary approaches: 1) development of this Community Health Profile based on existing public health and demographic data sets, including births, deaths, hospitalizations and emergency department usage, cancer registry, birth defects registry, and childhood lead exposure; and 2) a Household Health Survey of current and former residents of current households above the groundwater contamination plume.

2. Background

Previous Health Investigations

In 1994, ATSDR completed a Public Health Assessment (PHA) for the DuPont Pompton Lakes Works site (ATSDR 1994). This document evaluated possible pathways of human exposure to contaminants from the site. (A pathway is the means by which a contaminant at a site enters an environmental medium such as soil or air, is transported through the environment, and enters into the human body through the lungs, gastrointestinal tract, or skin.) In response to the PHA's recommendations, NJDOH and ATSDR conducted an investigation of exposure to lead and mercury among children, with a particular focus on those children living near the Acid Brook. The investigation did not show evidence of exposure to lead and mercury in the children at that time (ATSDR and NJDHSS 1998).

In 2008, NJDEP asked NJDOH and ATSDR to evaluate the potential health impacts to Pompton Lakes residents exposed to volatile organic compounds in indoor residential air. Volatile organic compounds that are present in the groundwater contamination plume beneath residences can enter indoor air via a process known as vapor intrusion. With oversight from NJDEP, DuPont began installing vapor intrusion mitigation systems at residences above the groundwater plume, and collected sub-slab and indoor air data.

NJDOH and ATSDR evaluated indoor air data collected by DuPont in 337 residences in the latter half of 2008, and concluded that current and future exposures to plume-related contaminants in indoor air at residences where mitigation systems have not been installed may harm people's health. Where properly functioning mitigation systems have been installed, the NJDOH and ATSDR concluded that exposure to plume-related contaminants will not occur, and therefore will not harm people's health. In December 2009, the agencies recommended that residences impacted by the groundwater plume should get the mitigation system installed, and that, to the extent feasible, the groundwater plume should be remediated to eliminate vapor intrusion (ATSDR and NJDHSS 2009a).

The Mayor of Pompton Lakes and members of the community requested the NJDOH to examine cancer incidence in the neighborhood above the contaminated groundwater plume. In response, the NJDOH and ATSDR compared cancer rates in the portion of Pompton Lakes above the groundwater plume to cancer rates in New Jersey, for the period 1979 through 2006. In December 2009, the agencies reported that cancer incidence was evaluated for all cancer types combined and for 13 specific cancer types. NJDOH and ATSDR found that the rates of all cancer types combined was not elevated in the Pompton Lakes groundwater plume area, nor were the rates of eleven other types of cancer (ATSDR and NJDHSS 2009b). However, kidney cancer incidence, based on seven observed cases, was statistically significantly higher than expected in females (but not in males). Non-Hodgkin lymphoma (NHL), also based on seven cases, was statistically significantly higher in males (but not in females) during the most recent 13-year period. This descriptive analysis of cancer incidence did not provide evidence of a specific cause-effect relationship between the incidence of cancer and environmental contamination. Two of the chemicals found in the groundwater contamination plume (trichloroethylene or TCE, and perchloroethylene or PCE) have been found to increase the risk of kidney cancer or NHL (and other cancers) in experimental animals and/or workers exposed to very high amounts of these chemicals. However, important risk factors for kidney cancer and NHL (for example, cigarette smoking or occupational exposures) could not be accounted for in the analysis.

In April 2010, NJDOH also completed and released an analysis of cancer incidence for the entire borough of Pompton Lakes, over the period 1979 through 2007 (NJDHSS 2010). This analysis found that the incidence of all cancer types combined over that 29-year period was statistically significantly elevated among females, but overall cancer incidence was not elevated in males. Among specific cancer types, lung cancer incidence was statistically significantly elevated in females. Lung cancer in females was particularly elevated in an earlier part of the period (1979-1989), and was not significantly elevated from 1990-2007. Colorectal cancer was significantly elevated among males, but only in the latter portion of the time period, 1990-2007. Town-wide, kidney cancer and NHL were not statistically significantly elevated in males or females.

Community Advisory Group for Health (Health CAG)

At a public forum with Pompton Lakes residents in December 2009, community members expressed concerns about numerous health and environmental issues. As a result, NJDOH and ATSDR convened the Health CAG, which began meeting in March 2010. The

purpose of the Health CAG is to provide a forum for community representatives to express concerns about health and environmental exposures in relation to the DuPont Pompton Lakes Works site, define specific questions regarding exposure and health, discuss solutions to answering the defined questions, and advise ATSDR and NJDOH on priorities for health investigation.

The Health CAG met twelve times from March 2010 through September 2011. Initial meetings in March through May 2010 focused on understanding the various exposure and health concerns of community members and discussing principles of toxicology and epidemiology. ATSDR made a presentation to the Health CAG in May 2010 about a series of health investigations in Endicott, New York, a community with a similar problem of exposure to PCE and TCE through vapor intrusion. At the June 2010 CAG meeting, the NJDOH presented a draft Public Health Response Plan (PHRP) which included a proposal for health investigations related to environmental concerns. Members of the Health CAG expressed concerns about illnesses and deaths occurring at what they perceived to be at higher rates than in other communities. The PHRP would include the review and analysis of health outcome data currently available to the NJDOH (which are assembled as this Community Health Profile), as well as health care provider and community education efforts. The Health CAG also discussed the purposes and need for a community health survey during this time. Meetings in the latter half of 2010 focused on possible survey designs and resources.

The NJDOH conducted a physician survey in January 2011 to determine whether local physicians had patients express concerns regarding exposures to contaminants from the DuPont site and possible health effects. The NJDOH and ATSDR brought in a medical officer from ATSDR in March 2011 to provide education to local physicians regarding exposures to site contaminants and potential health effects. The NJDOH also held an availability session in April 2011 for the residents to speak with expert physicians and scientists from the University of Medicine and Dentistry of New Jersey and the Mt. Sinai School of Medicine, who specialize in studying the impacts of environmental exposures on adults and children. Health CAG meetings between May and September 2011 focused on discussing preliminary presentations of health outcome data analyses that are part of this Community Health Profile.

Community Health Profile

In framing health-related questions with the Health CAG, it became apparent that a wide variety of health issues were of concern to the community, and that there was a need to develop an understanding of whether there are specific health outcomes that are occurring more frequently in the Pompton Lakes population than would be expected. In response, the NJDOH and ATSDR developed two complementary approaches to address this need.

First, NJDOH and ATSDR would develop this Community Health Profile based on available public health and demographic data sets, including births, deaths, hospitalizations and emergency department usage, cancer registry, birth defects registry, childhood lead exposure, and census information. Second, NJDOH would conduct a targeted Household Health Survey of current and former residents of current households above the groundwater contamination plume.

The goal of these approaches is to provide basic information about the health status of the community.

This Community Health Profile compares the rates of health outcomes in Pompton Lakes with those of the State of New Jersey. To provide additional perspective, based on a recommendation from the Health CAG participants, health outcome rates are also presented for the six municipalities surrounding Pompton Lakes. For cancers and birth defects -- outcomes which had been investigated in Endicott, NY, where there were similar exposure concerns -- disease rates for the groundwater plume area are also presented.

For the Community Health Profile, all years of data available through the NJDOH Health Assessment Data System (NJ SHAD, a public, web-based data query system) were used for birth outcomes provided on the birth certificate (2000-2007), and for deaths (2004-2007). For data sets not yet available on NJ SHAD, the Community Health Profile includes time intervals representative of recent experiences of the community.

The data presented in this Community Health Profile are not intended to be used to evaluate whether any environmental or other factor is responsible for a high or low disease rate. This Community Health Profile, in conjunction with the Household Health Survey, will be used by NJDOH and ATSDR to generate hypotheses and guide decision-making about the need for further health investigations in the community in relation to environmental and other factors. If health outcomes of concern are identified, the need and feasibility of conducting a study to evaluate the role of specific exposures on the outcomes will be explored.

A population profile of the Pompton Lakes community may be found in Tables A-1 and A-2 in the Appendix.

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; an infant is considered to have been brought to full term at 37 weeks or more of gestation. 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.

The overall proportion of LBW and premature babies is slowly increasing because the number of twins and other multiple births is increasing. Infants born as part of a multiple birth (twins, triplets, etc.) are more likely to be born with LBW and prematurely. Virtually all triplet infants are born with LBW as are half of twins. 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%.

Risk Factors

There are many health, behavioral, and environmental factors known to increase the risk of LBW and prematurity. In New Jersey, rates of these conditions vary widely across the state and by several maternal and infant characteristics. The rates of both LBW and prematurity among Blacks are more than double the rate among Whites. Also, these rates are highest for infants born to the youngest and the oldest mothers. 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 LBW and/or premature 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.

Methods

The NJDOH compiles birth certificate records that are filed electronically by hospitals. NJDOH makes non-confidential birth record data available to the public through the NJ State Health Assessment Data (NJ SHAD) web-based query system. The birth certificate is the source document for data included in the birth query. The data included in the query are for births to New Jersey resident mothers that occurred in New Jersey or out of state.

Using NJ SHAD, NJDOH calculated LBW proportions (rates of LBW prevalence at birth and 95% confidence intervals) among all live births for the town of Pompton Lakes, the six surrounding municipalities combined (Oakland Borough, Pequannock Township, Riverdale Borough, Bloomingdale Borough, Wanaque Borough, and Wayne Township), and the State of New Jersey, in the period 2000-2007. Similarly, NJDOH calculated prematurity proportions

(and 95% confidence intervals) among all live births for Pompton Lakes, the six surrounding towns combined, and the State of New Jersey. NJDOH also computed LBW and prematurity rate ratios comparing proportions relative to the State.

To remove the effect of multiple births and prematurity on LBW comparisons, these analyses were repeated with a data set restricted to singleton births brought to full term (gestation of 37 weeks or more). Since prematurity is strongly affected by multiple births (twins, triplets, etc.), analyses of prematurity were repeated with a data set restricted only to singleton births.

Results for LBW

All Births, 2000 through 2007

Over the 8-year period from 2000 through 2007, the LBW proportion in Pompton Lakes was 7.3%, with a 95% confidence interval of 5.9% to 8.9%. This prevalence rate was similar to the six surrounding towns (7.4%, 95% CI 6.8% to 8.0%), and was lower than in the State (7.9%) over the same time period (see Table 3-1). In Pompton Lakes during this time period, the proportion of LBW babies was 4.6% among singletons, and 58% among twins. Similarly the LBW proportion among term births was 2.0%, and 56% among premature births.

Singleton Births Brought to Term, 2000 through 2007

From 2000 through 2007, the LBW proportion in Pompton Lakes among singleton, full term babies was 1.3%, which was similar to the prevalence rate in the six surrounding towns (1.5%). Both rates were lower than in the State (2.1%) over the same time period (see Table 3-2). Figure 3-1 shows the LBW proportion and 95% confidence intervals among singleton, term births in Pompton Lakes in comparison to each of the six surrounding municipalities.

Results for Prematurity

All Births, 2000 through 2007

Over the 8-year period from 2000 through 2007, the prematurity proportion in Pompton Lakes was 10.0% (95% CI 8.4% to 11.9%). This prevalence rate was similar to the six surrounding towns (9.7%, 95% CI 9.0% to 10.3%) and the State (9.9%) over the same time period (see Table 3-3).

Singleton Births, 2000 through 2007

From 2000 through 2007, the prematurity proportion in Pompton Lakes among singleton babies was 7.5%, which was higher than the prevalence rate in the six surrounding towns (6.6%), and a little lower than in the State (7.9%) over the same time period (see Table 3-4). Figure 3-2 shows the prematurity proportion and 95% confidence intervals among singleton births in Pompton Lakes in comparison to each of the six surrounding municipalities.

Table 3-1. Low birth weight proportions among all live births in Pompton Lakes, the six surrounding municipalities, and the State of New Jersey, 2000-2007.

Population	Number Low Birth Weight Babies	Number of Live Births	Percent Low Birth Weight Babies	95% Confidence Interval	LBW Rate Ratio vs. State
Pompton Lakes Borough	86	1,183	7.3%	5.9%, 8.9%	0.92
Six Surrounding Towns	658	8,924	7.4%	6.8%, 8.0%	0.94
State of New Jersey	72,995	921,456	7.9%	7.9%, 8.0%	--

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

Table 3-2. Low birth weight proportions among singleton, full term (gestation 37 weeks or more) live births in Pompton Lakes, the six surrounding municipalities, and the State of New Jersey, 2000-2007.

Population	Number Low Birth Weight Babies	Number of Live Births	Percent Low Birth Weight Babies	95% Confidence Interval	LBW Rate Ratio vs. State
Pompton Lakes Borough	13	1,011	1.3%	0.7%, 2.2%	0.62
Six Surrounding Towns	118	7,626	1.5%	1.3%, 1.9%	0.71
State of New Jersey	16,010	767,595	2.1%	2.0%, 2.1%	--

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

Table 3-3. Premature birth proportions among all live births in Pompton Lakes, the six surrounding municipalities, and the State of New Jersey, 2000-2007.

Population	Number of Premature Babies	Number of Live Births	Percent Premature Babies	95% Confidence Interval	Prematurity Rate Ratio vs. State
Pompton Lakes Borough	118	1,183	10.0%	8.4%, 11.9%	1.01
Six Surrounding Towns	864	8,924	9.7%	9.0%, 10.3%	0.98
State of New Jersey	91,243	921,426	9.9%	9.8%, 10.0%	--

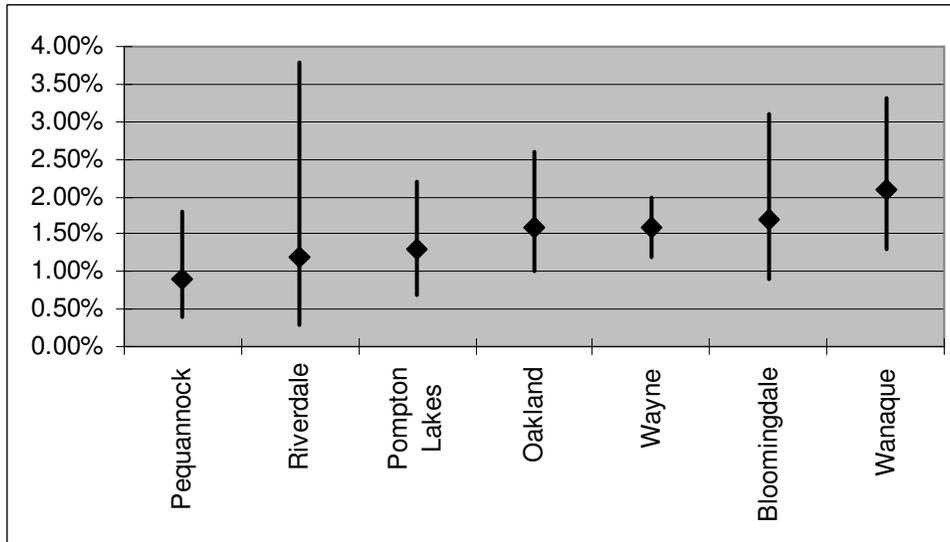
Data source: The New Jersey Birth Certificate Database through NJ SHAD, the New Jersey Department of Health and Senior Service's public web-based data query system (www.nj.gov/health/shad).

Table 3-4. Premature birth proportions among singleton live births in Pompton Lakes, the six surrounding municipalities, and the State of New Jersey, 2000-2007.

Population	Number Premature Babies	Number of Live Births	Percent Premature Babies	95% Confidence Interval	Prematurity Rate Ratio vs. State
Pompton Lakes Borough	84	1,121	7.5%	6.0%, 9.2%	0.95
Six Surrounding Towns	550	8,380	6.6%	6.0%, 7.1%	0.84
State of New Jersey	69,463	881,484	7.9%	7.8%, 7.9%	--

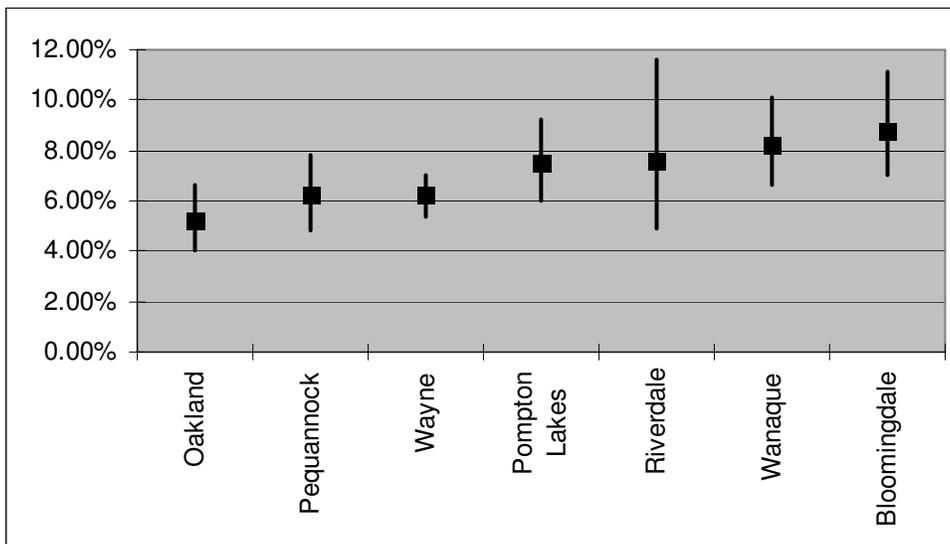
Data source: The New Jersey Birth Certificate Database through NJ SHAD, the New Jersey Department of Health and Senior Service's public web-based data query system (www.nj.gov/health/shad).

Figure 3-1. Low birth weight proportions and 95% confidence intervals among singleton, full term (gestation 37 weeks or more) live births in Pompton Lakes and the six surrounding municipalities, 2000-2007.



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

Figure 3-2. Premature birth proportions and 95% confidence intervals among singleton live births in Pompton Lakes and the six surrounding municipalities, 2000-2007.



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

4. Birth Defects

Nationally, about 1 in every 33 babies is born with a birth defect. Birth defects range from mild to severe. Major birth defects are present at birth and cause structural changes in one or more parts of the body. Most birth defects occur in the first three months of pregnancy when the organs are developing. Though the specific cause of most birth defects is unknown, birth defects are thought to be the result of a complex interaction between genes, our behaviors, and the environment. A birth defect may have serious adverse effects on the health and development of the baby. Birth defects are normally found at the time of birth. However, they may be diagnosed before birth and any time after birth. Most birth defects are diagnosed by the baby's first birthday. Some birth defects, for example, cleft lip, are easy to observe, while others, for example, heart defects, may require special tests.

A large number of medical and other resources are available for children, and their families, who are affected by birth defects. In New Jersey, the NJDOH Early Identification and Monitoring Program administers the Birth Defects Registry, which conducts surveillance and connects families with necessary services. New Jersey's program to assist families with birth defect and development-related services is the oldest in the nation.

Research is being conducted to determine how environmental exposures of the mother during specific periods of fetal development may contribute to birth defects. It is known that alcohol consumption during pregnancy, smoking cigarettes, drug use, certain chemical exposures, as well as metabolic imbalances and other exposure conditions can adversely affect a developing fetus. However, much more research is still needed to more fully understand how and when these exposures are related to birth defects.

Methods

The NJDOH Early Identification and Monitoring Program operates under rules based upon the law establishing the Birth Defects Registry. The rules specify the conditions that must be reported to NJDOH, and sets strict controls on access to this confidential information. Information on all births that occur within New Jersey or to New Jersey residents are electronically compiled by the NJDOH. Non-confidential birth record information is made available to the public through the NJ SHAD web-based query system. The Early Identification and Monitoring Program also has access to complete birth record information under the terms of a confidentiality agreement which restricts the access and use of the data. Information from the Birth Defects Registry, NJ SHAD, and complete birth records were used for the analyses, which was conducted by the Early Identification and Monitoring Program.

Birth defect data were compiled for births occurring in the time period 1995 through 2007. Analyses were completed for the town of Pompton Lakes, the six surrounding municipalities combined (Oakland Borough, Pequannock Township, Riverdale Borough, Bloomingdale Borough, Wanaque Borough, and Wayne Township) and the State of New Jersey. In addition, data were examined for the groundwater contamination area within Pompton Lakes. Geographic group assignment was based upon the mother's address at the time of the child's birth.

The specific birth defects included in the analyses were based upon a similar investigation conducted in Endicott, New York by the New York State Department of Health and ATSDR. These birth defects are categorized and listed in Table 4-1. Major cardiac defects are also analyzed as a separate group because of their possible association with exposure to TCE.

Counts of the occurrence of the specific birth defects within each geographic group were obtained from the Birth Defects Registry. Data on the number of live births used to calculate rates were obtained from NJ SHAD. Prevalence rates are expressed as the number of birth defects at the time of birth per 10,000 live births.

Results

Table 4-2 and Figure 4-1 show the prevalence rates, along with the 95% confidence intervals, for the aggregated set of birth defects listed in Table 4-1, for Pompton Lakes, the six surrounding towns, and the State of New Jersey, for children born in the 13-year period 1995 through 2007.

There were a total of 18 of the selected birth defects reported for Pompton Lakes during this period, resulting in a prevalence rate of 92 per 10,000 live births. Three of these 18 children resided within the groundwater contamination area of Pompton Lakes. There were 162 cases in the six surrounding towns during this same period, resulting in a prevalence rate of 108 per 10,000 live births. In the State of New Jersey, there were 14,989 cases, resulting in a prevalence rate of these birth defects of 100.5 per 10,000 live births. Based on comparisons of the confidence intervals, there were no statistically significant differences in birth defect prevalence rates among these population groups.

Table 4-2 and Figure 4-2 show prevalence rates for the major cardiac defects listed in Table 4-1. There was a prevalence rate of 26 cases per 10,000 live births in Pompton Lakes, based on five reported cases. In comparison, the prevalence rate was 29.3 per 10,000 live births (based on 44 cases) in the six surrounding municipalities, and 34.4 cases per 10,000 live births (based on 5,125 cases) in the State of New Jersey. None of the differences in rates were statistically significant.

Table 4-1. Birth defects and groupings selected for analysis, with International Classification of Diseases (ICD) codes.

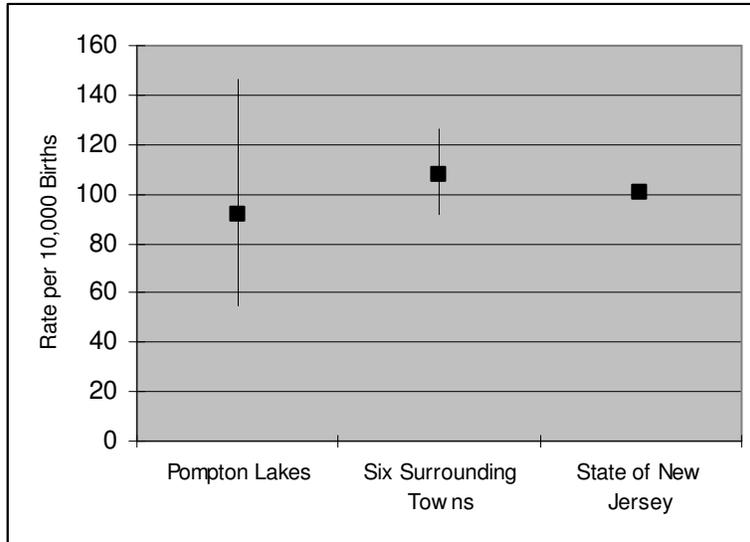
Birth Defect Type	ICD-9 Codes
Major Cardiac Defects	
Common Truncus	745.00
Transposition of Great Vessels	745.10
Tetralogy of Fallot	745.20
Anomalies of Pulmonary Valve	746.00
Tricuspid Atresia and Stenosis	746.10
Congenital Stenosis of Aortic Arch	746.30
Congenital Insufficiency of Aortic Valve	746.40
Hypoplastic Left Heart Syndrome	746.70
Coarctation of Aorta	747.10
Anomalies of Pulmonary Artery	747.30
Neural Tube Defects	
Anencephalus	740.X
Spina Bifida	741.X
Encephalocele	742.0X
Oral Clefts	
Cleft Palate	749.00-749.04
Cleft Lip	749.10-749.14
Cleft Palate with Cleft Lip	749.20-749.25
Choanal Atresia	
Choanal Atresia	748.00
Hypospadias	
Hypospadias	752.61
Chromosomal Defects	
Down Syndrome/ Trisomy 21	758.00
Patau Syndrome/Trisomy 13	758.10
Edwards Syndrome/Trisomy 18	758.20
Klinefelter's Syndrome/XXY	758.70
Fragile X Syndrome	759.83

Table 4-2. Prevalence rates of selected set of birth defects for birth years 1995 through 2007, showing 95% confidence intervals, for Pompton Lakes, six surrounding towns, and the State of New Jersey. "All selected birth defects" includes all those listed in Table 4-1.

Birth Defects Grouping	Population	Number of Cases	Prevalence Rate per 10,000 Births	95% Confidence Interval
All selected birth defects	Pompton Lakes	18	92	55, 146
	Six Surrounding Towns	162	108	92.0, 126
	State of New Jersey	14,989	100.5	98.9, 102.9
Major cardiac defects	Pompton Lakes	5	26	8, 60
	Six Surrounding Towns	44	29.3	21, 39
	State of New Jersey	5,125	34.4	33.4, 35.3

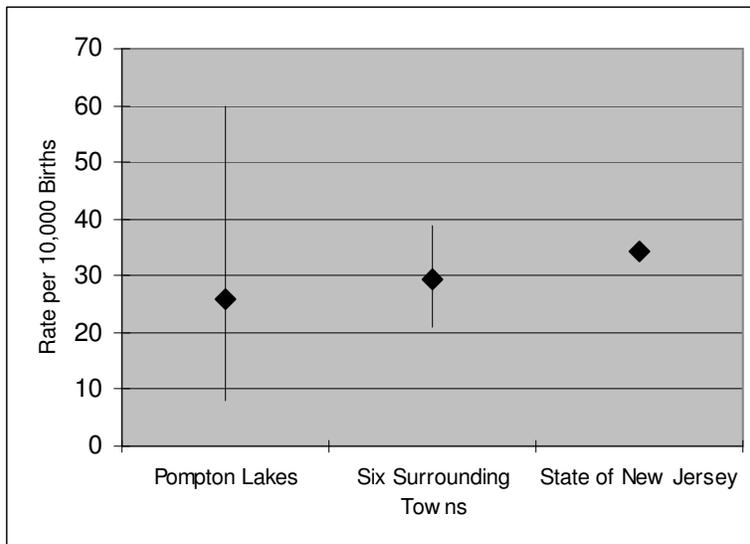
Data sources: New Jersey Birth Defects Registry and NJ SHAD.

Figure 4-1. Prevalence rates of selected set of birth defects for birth years 1995 through 2007, showing 95% confidence intervals, for Pompton Lakes, six surrounding towns, and the State of New Jersey. Birth defect types included all those listed in Table 4-1.



Data sources: New Jersey Birth Defects Registry and NJ SHAD.

Figure 4-2. Prevalence of major cardiac birth defects for birth years 1995 through 2007, showing 95% confidence intervals, for Pompton Lakes, six surrounding towns, and the State of New Jersey. See Table 4-1 for a list of the specific major cardiac defects included.



Data sources: New Jersey Birth Defects Registry and NJ SHAD.

5. Cancer Incidence

Cancers are a group of more than a hundred diseases that all start with the uncontrolled growth and spread of abnormal cells. According to the American Cancer Society, about one out of two men and one out of three women in the U.S. will develop cancer over their lifetime. Cancers are the second leading cause of death in the U.S., following heart disease. Different types of cancers have different rates of occurrence. The most common types are cancers of the prostate (males), breast (females), lung and bronchus, and colorectum. While cancers may occur in people of all ages, cancer is generally a disease of aging. Incidence rates for most types of cancers rise sharply among people who are over 45 years of age.

Different cancer types have different set of causes. Cancers may be caused by a variety of factors acting alone or together, usually over a period of many years. Lifestyle factors are thought to account for most cancers, including cigarette smoking, heavy alcohol use, a diet high in fat and low in fiber, physical inactivity, and overweight or obesity. Other risk factors for some cancers include sunlight exposure, reproductive hormone exposure, sexual behaviors, some infectious diseases, and some occupational exposures. A family history of cancer may also increase a person's chances of getting a cancer. For adults, there is often a long period, 10 to 30 years or even more, between causal exposures and the diagnosis of cancer.

Methods

This analysis presents cancer distributions by gender for the State of New Jersey, Pompton Lakes and the six surrounding municipalities combined (Oakland Borough, Pequannock Township, Riverdale Borough, Bloomingdale Borough, Wanaque Borough, and Wayne Township). Additionally, this report presents Standardized Incidence Ratio (SIR) analyses for Pompton Lakes, the part of Pompton Lakes above the DuPont-related groundwater contamination area, and the six surrounding municipalities combined. Both analyses present total cancer incidence and selected specific cancer types for the time period from 1990-2008. These analyses update cancer incidence statistics which had previously been reported to the Pompton Lakes community (NJDHSS and ATSDR 2009b; NJDHSS 2010).

Case Ascertainment

The New Jersey State Cancer Registry (NJSCR) was used to ascertain cancer cases. The NJSCR is a population-based cancer incidence registry that has been in operation since October 1, 1978 and maintains complete years of data from 1979 to 2008. Data for 2009 to 2011 are currently being collected but are not yet complete. By law, all cases of newly diagnosed cancer are reportable to the NJSCR. All primary invasive and *in situ* neoplasms are reportable to the NJSCR, except cervical cancer *in situ* diagnosed after 1995 and certain carcinomas of the skin. Benign and borderline intracranial and central nervous system tumors are also collected, beginning January 1, 2004. In addition, the NJSCR has reporting agreements with the states of New York, Pennsylvania, Delaware, Maryland, North Carolina, and Florida. The NJSCR has consistently been awarded the North American Association of Central Cancer Registries (NAACCR) Gold Standard for data quality. Additional information on the NJSCR may be found at <http://www.state.nj.us/health/ces/njscr.shtml>.

A "case" was defined as an individual who was diagnosed with a new primary malignant cancer during the period 1990 through 2008, while residing in a specified geographic area. NJSCR cases identified only through search of death or autopsy records were excluded from this evaluation, since the majority of these cases do not include accurate address information. It should be noted that information on important cancer risk factors, such as genetics, personal behaviors (e.g., diet and smoking), and occupational history, is not available from the NJSCR.

Data Analysis: Cancer Count Distributions

Cancer count distributions for the State of New Jersey, Pompton Lakes and the six surrounding towns combined are presented separately for males and females. The select cancer types analyzed include prostate, female breast, ovarian, cervix, lung, colorectal, bladder, non-Hodgkin lymphoma (NHL), melanoma of the skin, leukemia, kidney, pancreas, thyroid, brain and central nervous system (CNS) and liver. These cancer types account for over 80% of all cancer diagnoses in New Jersey and the U.S.

Data Analysis: Standardized Incidence Ratios

Population counts were obtained from the 1990, 2000 and 2010 censuses (U.S. Census Bureau). At the time of this report, 2010 census population by 5 year age groups were not available at the census tract/block group level and therefore could not be used for the groundwater contamination area; instead, populations for this area were estimated based on 1990 and 2000 census data only.

When comparing cancer incidence data in two communities, it is important to "age-adjust" the rates. Because increased age is by far the biggest risk factor for cancer, communities with higher distributions of older individuals will have a higher cancer incidence. Age-adjustment allows the reviewer to compare cancer incidence rates for geographic regions by removing the affect that the age distribution has on the rates. One way to adjust rates for age differences is to compute standardized incidence ratios (SIRs). SIRs were used for the quantitative comparison of cancer incidence between the survey areas (Pompton Lakes, the groundwater contamination area, and the six surrounding towns) in comparison to the State of New Jersey. The SIR is calculated by dividing the observed number of cases (from the NJSCR) by an expected number for the surveyed population separately for 1990 to 2008. The expected number was derived by multiplying the comparison population's age-sex specific cancer incidence rates and the survey area age-sex-specific population numbers. The comparison rates used to derive the expected number of cases were the New Jersey average annual incidence rates for the total survey period (1990 to 2008).

The observed and expected numbers are evaluated by interpreting the ratio of these numbers. If the observed number of cases equals the expected number of cases, the SIR will equal 1.0. An SIR less than 1.0 indicates that fewer cases are observed than expected. An SIR greater than 1.0 indicates that more cases are observed than expected. 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.

Males and females were evaluated separately for all races combined. The select cancer types analyzed include prostate, female breast, lung, colorectal, bladder, non-Hodgkin lymphoma (NHL), melanoma of the skin, leukemia, kidney, pancreas, thyroid, brain and central nervous system (CNS) and liver. Following standard practice in the presentation of cancer types, liver cancer includes cancers of the intrahepatic bile duct and brain cancer includes cancers of the central nervous system.

Results for Cancer Count Distributions

Within each sex, the distributions of cancer counts are similar for the State of New Jersey, Pompton Lakes and the six surrounding towns combined (see Figure 5-1).

Results of Standardized Incidence Ratio Analyses

Tables 5-1 through 5-3 present the standardized incidence ratio (SIRs) results for Pompton Lakes, the groundwater contamination area, and the six surrounding municipalities combined, by sex, for the nineteen-year survey period from 1990-2008. For Pompton Lakes, overall cancer incidence was borderline statistically significantly elevated for females (SIR=1.08; 95% CI=1.00, 1.17). With the addition of 2008 data and the new population estimates, the SIR for females for all cancer sites combined has decreased slightly from the previous analysis from 1990-2007 (SIR=1.12; 95% CI=1.03, 1.22). Additionally, the colorectal cancer rate in males is no longer statistically significantly elevated (Table 5-1).

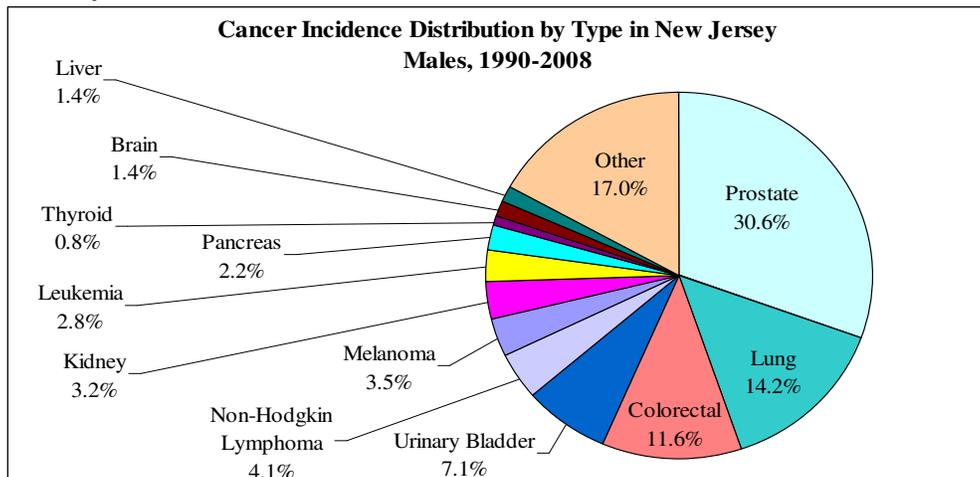
For the groundwater contamination area of Pompton Lakes, none of the cancer sites analyzed was found to be statistically significantly elevated in this analysis. Although both kidney cancer in females and non-Hodgkin lymphoma in males were elevated to a similar degree as reported in previous analyses (ATSDR and NJDHSS 2009b), the rates are not significantly different in comparison to the State of New Jersey in the time period 1990-2008 (Table 5-2).

For the six surrounding municipalities, the incidence of all cancers combined among females was statistically significantly elevated (SIR=1.05; 95% CI=1.02, 1.07). Additionally, the analysis showed a statistically significant elevation for melanoma in females (SIR=1.21; 95% CI=1.04, 1.40), and thyroid cancer in males (SIR=1.56; 95% CI=1.22, 1.98). Lung cancer in males was found to be statistically significantly low (SIR=0.83; 95% CI=0.77, 0.90) (Table 5-3).

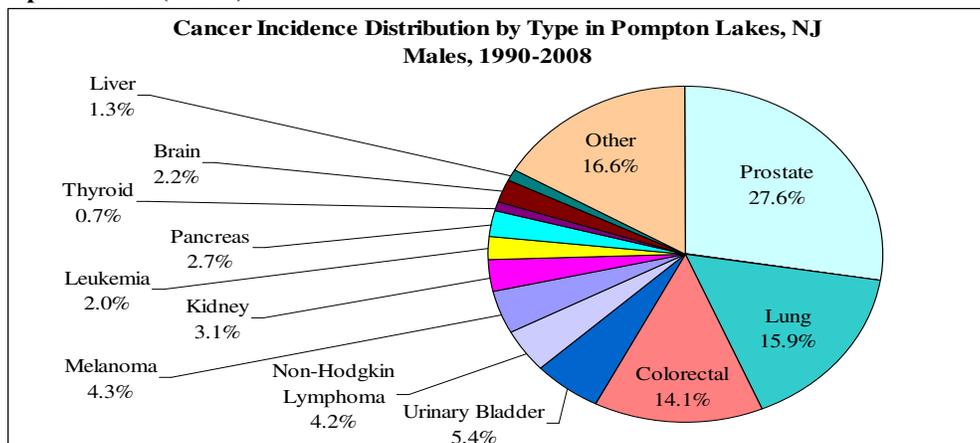
Benign brain cancer cases from 2004-2008 were reviewed for Pompton Lakes. For this five-year period, there were fewer than five benign brain cancer cases diagnosed among both men and women combined. Based on New Jersey State rates for benign brain cancer for the same time period and the population of Pompton Lakes, the expected number of benign brain cancer cases in Pompton Lakes would be 4.6. There were no cases of benign brain cancer reported for the plume area for this five-year period.

Figure 5-1. Distributions of cancer incidence by cancer type, by geographic area and sex.

New Jersey (Males)



Pompton Lakes (Males)



Six Surrounding Towns (Males)

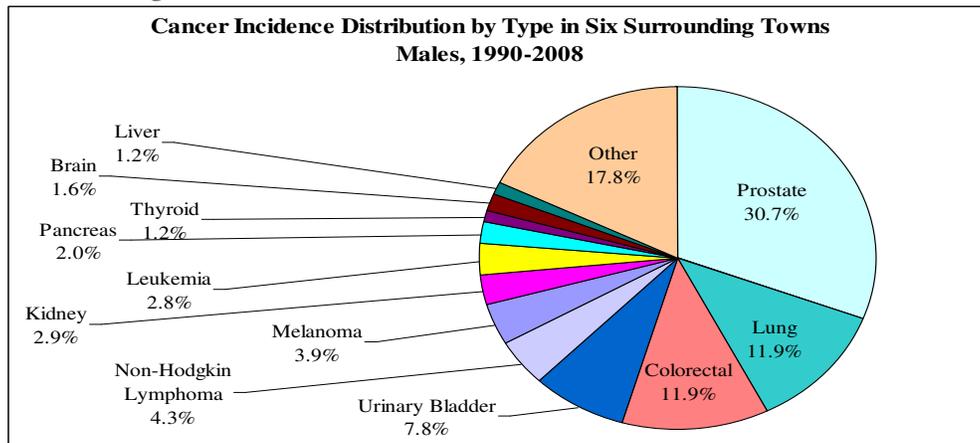
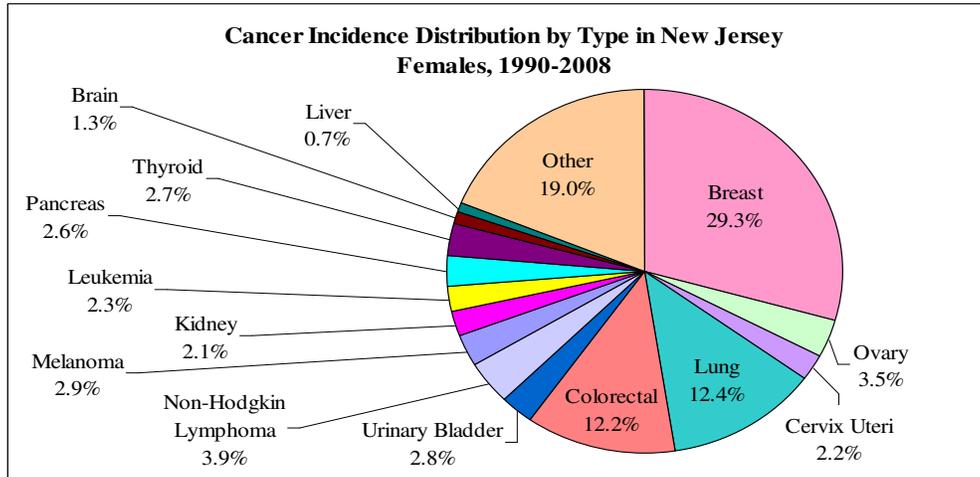
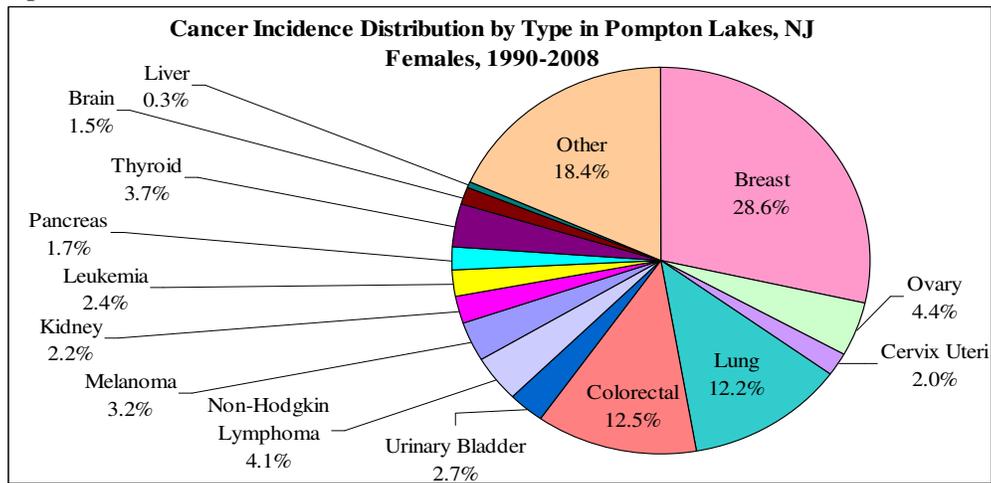


Figure 5-1, continued. Distributions of cancer incidence by cancer type, by geographic area and sex.

New Jersey (Females)



Pompton Lakes (Females)



Six Surrounding Towns (Females)

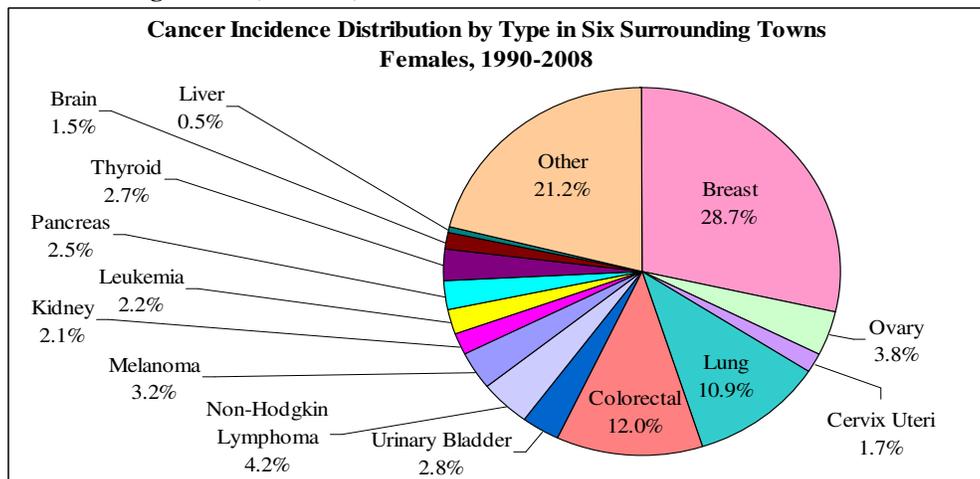


Table 5-1. Standardized Incidence Ratios (SIRs) for all cancers combined and selected cancer types, Pompton Lakes compared to the State of New Jersey, 1990-2008, by sex.

Pompton Lakes

Cancer Type	Sex	Observed	Expected	SIR	95% Confidence Interval	Statistically Significant Difference?
All Cancers	Male	554	554.6	1.00	0.92, 1.09	No
	Female	591	546.6	1.08	1.00, 1.17	Yes, high
Prostate	Male	153	172.0	0.89	0.75, 1.04	No
Breast	Female	169	163.1	1.04	0.89, 1.20	No
Lung	Male	88	78.0	1.13	0.90, 1.39	No
	Female	72	67.1	1.07	0.84, 1.35	No
Colorectal	Male	78	64.7	1.21	0.95, 1.50	No
	Female	74	67.0	1.10	0.87, 1.39	No
Bladder	Male	30	39.4	0.76	0.51, 1.09	No
	Female	16	15.2	1.05	0.60, 1.70	No
Non-Hodgkin Lymphoma	Male	23	22.8	1.01	0.64, 1.51	No
	Female	24	21.4	1.12	0.72, 1.67	No
Melanoma	Male	24	19.5	1.23	0.79, 1.83	No
	Female	19	15.7	1.21	0.73, 1.89	No
Leukemia	Male	11	15.0	0.74	0.37, 1.32	No
	Female	14	12.2	1.15	0.63, 1.93	No
Kidney	Male	17	17.4	0.97	0.57, 1.56	No
	Female	13	11.4	1.14	0.61, 1.95	No
Pancreas	Male	15	11.8	1.27	0.71, 2.10	No
	Female	10	13.5	0.74	0.36, 1.37	No
Thyroid	Male	<5	NR	0.87	0.23, 2.22	No
	Female	22	14.5	1.52	0.95, 2.30	No
Brain	Male	12	7.9	1.52	0.78, 2.65	No
	Female	9	6.9	1.30	0.59, 2.47	No
Liver	Male	7	7.2	0.98	0.39, 2.01	No
	Female	<5	NR	0.58	0.07, 2.11	No

Data source: New Jersey State Cancer Registry

Observed counts are suppressed when there are fewer than 5 cases to ensure confidentiality; when counts are suppressed, expected values are not reported (NR) so that the SIR can be shown.

Table 5-2. Standardized Incidence Ratios (SIRs) for all cancers combined and selected cancer types, Pompton Lakes Groundwater Plume Area compared to the State of New Jersey, 1990-2008, by sex.

Pompton Lakes Groundwater Plume Area

Cancer Type	Sex	Observed	Expected	SIR	95% Confidence Interval	Statistically Significant Difference?
All Cancers	Male	75	90.2	0.83	0.65, 1.04	No
	Female	94	83.1	1.13	0.91, 1.38	No
Prostate	Male	20	27.3	0.73	0.45, 1.13	No
Breast	Female	19	24.41	0.78	0.47, 1.22	No
Lung	Male	11	12.67	0.87	0.43, 1.55	No
	Female	9	10.19	0.88	0.40, 1.68	No
Colorectal	Male	11	11.03	1.00	0.50, 1.79	No
	Female	14	10.60	1.32	0.72, 2.22	No
Bladder	Male	<5	NR	0.44	0.09, 1.28	No
	Female	<5	NR	1.68	0.45, 4.30	No
Non-Hodgkin Lymphoma	Male	7	3.74	1.87	0.75, 3.86	No
	Female	<5	NR	1.21	0.33, 3.10	No
Melanoma	Male	7	3.1	2.24	0.90, 4.61	No
	Female	5	2.4	2.11	0.68, 4.91	No
Leukemia	Male	<5	NR	0.80	0.09, 2.88	No
	Female	0	1.90	0.00	--	No
Kidney	Male	<5	NR	0.73	0.08, 2.63	No
	Female	5	1.74	2.88	0.93, 6.72	No
Pancreas	Male	<5	NR	0.51	0.01, 2.86	No
	Female	<5	NR	1.44	0.29, 4.22	No
Thyroid	Male	0	0.7	0.00	--	No
	Female	<5	NR	1.40	0.28, 4.10	No
Brain	Male	<5	NR	1.63	0.18, 5.88	No
	Female	0	1.05	0.00	--	No
Liver	Male	<5	NR	1.76	0.20, 6.35	No
	Female	<5	NR	1.87	0.02, 10.39	No

Data source: New Jersey State Cancer Registry

Observed counts are suppressed when there are fewer than 5 cases to ensure confidentiality; when counts are suppressed, expected values are not reported (NR) so that the SIR can be shown.

Table 5-3. Standardized Incidence Ratios (SIRs) for all cancers combined and selected cancer types, Six Surrounding Municipalities compared to the State of New Jersey, 1990-2008, by sex.

Six Surrounding Municipalities

Cancer Type	Sex	Observed	Expected	SIR	95% Confidence Interval	Statistically Significant Difference?
All Cancers	Male	5674	5,732.7	0.99	0.96, 1.02	No
	Female	5580	5,331.1	1.05	1.02, 1.07	Yes, high
Prostate	Male	1743	1,792.5	0.97	0.93, 1.02	No
Breast	Female	1601	1,575.6	1.02	0.97, 1.07	No
Lung	Male	676	812.2	0.83	0.77, 0.90	Yes, low
	Female	611	649.7	0.94	0.87, 1.02	No
Colorectal	Male	677	676.9	1.00	0.93, 1.08	No
	Female	669	676.9	0.99	0.91, 1.07	No
Bladder	Male	442	414.1	1.07	0.97, 1.17	No
	Female	158	152.4	1.04	0.88, 1.21	No
Non-Hodgkin Lymphoma	Male	242	231.2	1.05	0.92, 1.19	No
	Female	237	209.6	1.13	0.99, 1.28	No
Melanoma	Male	224	198.4	1.13	0.99, 1.29	No
	Female	181	149.9	1.21	1.04, 1.40	Yes, high
Leukemia	Male	161	152.3	1.06	0.90, 1.23	No
	Female	125	120.0	1.04	0.87, 1.24	No
Kidney	Male	162	179.1	0.90	0.77, 1.06	No
	Female	116	110.6	1.05	0.87, 1.26	No
Pancreas	Male	113	123.2	0.92	0.76, 1.10	No
	Female	137	135.3	1.01	0.85, 1.20	No
Thyroid	Male	70	44.7	1.56	1.22, 1.98	Yes, high
	Female	151	133.1	1.13	0.96, 1.33	No
Brain	Male	89	77.8	1.14	0.92, 1.41	No
	Female	81	65.5	1.24	0.98, 1.54	No
Liver	Male	67	74.0	0.91	0.70, 1.15	No
	Female	28	34.0	0.82	0.55, 1.19	No

Data source: New Jersey State Cancer Registry

6. 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 2004-2007, in Pompton Lakes, the six surrounding municipalities combined (Oakland Borough, Pequannock Township, Riverdale Borough, Bloomingdale Borough, Wanaque Borough, and Wayne Township), 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.

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 affect that the age distribution has on the rates. The “age-adjusted mortality rate” shows what the level of mortality would be if the age composition was the same between two geographic areas or in two different time periods. 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 2004-2007.

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.

Causes of death are grouped and classified according to the National Center for Health Statistics' "50 Rankable Causes of Death." Results are tabulated for males, females, and combined sexes. The percentage of all deaths in the period due to each specific cause is also presented. NJDOH compared age-adjusted mortality rates for all causes of death combined and for the ten 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); and influenza and pneumonia). Age-adjusted rates were calculated for Pompton Lakes and for the six surrounding municipalities combined, in comparison to the State of New Jersey, for the years 2004-2007. Mortality among males and females was evaluated separately since the background risks of these causes of death may vary by sex.

In addition to comparisons of age-adjusted rates, which reflect the mortality experience across all ages, it is sometimes useful to compare age-specific mortality rates to see if there are differences between populations among specific age segments of the population. NJDOH computed age-specific mortality rates by sex in ten-year age intervals in Pompton Lakes, the six surrounding municipalities combined, and the State of New Jersey.

Results: Counts of Deaths

Table 6-1 displays the counts of death by cause, geographic area, and sex. Causes of death are listed in order of the percentage of total deaths by cause in the state. Counts for each of the top 20 causes of death are shown in the table, as are the combined counts of the other 30 rankable causes of death, and the total of all other causes. The two most frequent underlying causes of death in all three geographic areas were heart disease and cancers. Together these two causes account for 52% of deaths statewide, 59% of deaths in Pompton Lakes, and 52% of deaths in the six surrounding towns.

Other causes of death in the top 10 statewide are cerebrovascular diseases, chronic lower respiratory diseases, diabetes mellitus, unintentional injuries, septicemia, Alzheimer's disease, kidney diseases, and influenza and pneumonia. These causes of death each account for about 2% to 5% of all causes statewide. Overall, the relative proportion of counts is similar among the three geographic areas.

Results: Standardized Mortality Ratio Analyses

As shown in Table 6-2, there are no statistically significantly elevated SMRs in the comparison of all-cause and cause-specific mortality rates between Pompton Lakes and the State of New Jersey, in the period 2004-2007. Though SMRs for some conditions were higher or lower than expected in the period, chance is a reasonable explanation for the differences. In the six municipalities surrounding Pompton Lakes, SMRs for all-cause mortality in males, heart disease mortality in males, malignant neoplasm mortality in males, and nephritis, nephrotic

syndrome and nephrosis mortality in females were statistically significantly low, compared to the State of New Jersey. Deaths from septicemia in males and chronic lower respiratory diseases in females were statistically significantly elevated (Table 6-3).

As noted above, the most common causes of mortality are heart diseases and malignant neoplasms. Since mortality from malignant neoplasms in Pompton Lakes was higher than expected (though not statistically significant), and because this category includes a diverse set of diseases, frequencies of specific types of cancer were compared across the geographic areas (Table 6-4). The most frequent types of malignant neoplasm deaths in the State of New Jersey and the six municipalities surrounding Pompton Lakes were: lung, trachea and bronchus cancer, colon and rectal cancer, prostate cancer, and pancreatic cancer among males; and lung, trachea and bronchus cancer, breast cancer, colon and rectal cancer, and pancreatic cancer among females. The most common cancer causes of death showed similar distributions in Pompton Lakes.

Results: Age-Specific Mortality Rate Analyses

Age-specific mortality rates per 100,000 people in Pompton Lakes, the six surrounding towns, and the State of New Jersey are presented in charts below (Figures 6-1 to 6-3). Figure 6-1 compares age-specific mortality rates by sex for all causes combined; Figure 6-2 presents rates for deaths due to heart disease by sex, and Figure 6-3 shows rates for malignant neoplasms by sex. In comparison to the State of New Jersey and the six surrounding municipalities combined, age-specific mortality rates in the age interval above 80 years were higher in Pompton Lakes among both males and females, for both malignant neoplasms and heart disease. Age-specific mortality from malignant neoplasms in Pompton Lakes was not consistently different from the State or surrounding towns in younger age groups.

Table 6-1. Mortality counts by cause of death: Pompton Lakes, six surrounding towns, and the State of New Jersey, 2004-2007.

Rank in State	National Center for Health Statistics, 50 Rankable Causes of Death	Pompton Lakes				Six Surrounding Towns *				State of New Jersey			
		Male	Female	Total	% of All Causes	Male	Female	Total	% of All Causes	Male	Female	Total	% of All Causes
1	Diseases of heart	49	59	108	29.8%	519	695	1,214	30.1%	35,719	40,672	76,391	28.3%
2	Malignant neoplasms	49	57	106	29.2%	424	478	902	22.4%	31,737	33,456	65,193	24.2%
3	Cerebrovascular diseases	2	15	17	4.7%	78	127	205	5.1%	5,290	8,124	13,414	5.0%
4	Chronic lower respiratory diseases	8	13	21	5.8%	75	140	215	5.3%	5,087	6,592	11,679	4.3%
5	Diabetes mellitus	7	4	11	3.0%	56	82	138	3.4%	4,777	4,925	9,702	3.6%
6	Unintentional injuries	6	3	9	2.5%	68	37	105	2.6%	5,640	3,192	8,832	3.3%
7	Septicemia	8	4	12	3.3%	67	70	137	3.4%	3,036	4,035	7,071	2.6%
8	Alzheimer's disease	1	3	4	1.1%	41	77	118	2.9%	1,936	4,908	6,844	2.5%
9	Nephritis, nephrotic syndrome and nephrosis	6	2	8	2.2%	41	37	78	1.9%	3,085	3,191	6,276	2.3%
10	Influenza and pneumonia	0	3	3	0.8%	52	59	111	2.8%	2,547	3,085	5,632	2.1%
11	Chronic liver disease and cirrhosis	2	0	2	0.6%	19	11	30	0.7%	1,694	935	2,629	1.0%
12	Essential (primary) hypertension and hypertensive renal disease	0	1	1	0.3%	9	20	29	0.7%	854	1,385	2,239	0.8%
13	Parkinson's disease	0	3	3	0.8%	32	25	57	1.4%	1,296	935	2,231	0.8%
14	Human immunodeficiency virus (HIV) disease	0	0	0	0.0%	3	1	4	0.1%	1,415	808	2,223	0.8%
15	Intentional self-harm (suicide)	2	0	2	0.6%	16	3	19	0.5%	1,731	432	2,163	0.8%
16	Pneumonitis due to solids and liquids	1	2	3	0.8%	13	16	29	0.7%	1,078	983	2,061	0.8%
17	In situ and benign neoplasms, neoplasms of unknown behavior	0	1	1	0.3%	12	14	26	0.6%	885	937	1,822	0.7%
18	Assault (homicide)	2	0	2	0.6%	8		8	0.2%	1,285	281	1,566	0.6%
19	Aortic aneurysm and dissection	2	1	3	0.8%	8	4	12	0.3%	797	607	1,404	0.5%
20	Certain conditions originating in the perinatal period	1	0	1	0.3%	8	1	9	0.2%	696	570	1,266	0.5%
21-50	Other 30 Rankable Causes	3	4	7	1.9%	22	40	62	1.5%	2,234	2,560	4,794	1.8%
--	Other than 50 Rankable Causes	21	18	39	10.7%	205	321	526	13.0%	14,449	19,858	34,307	12.7%
	<i>Total</i>	170	193	363	100.0%	1,776	2,258	4,034	100.0%	127,268	142,471	269,739	100.0%

Results are from queries of the New Jersey Death Certificate Database through NJ SHAD, the New Jersey Department of Health and Senior Service's public web-based data query system (www.nj.gov/health/shad).

* Six surrounding municipalities are: Oakland, Pequannock, Riverdale, Bloomingdale, Wanaque, and Wayne.

Table 6-2. Standardized Mortality Ratio: Pompton Lakes compared to State of New Jersey, 2004-2007.

Cause of Death	Sex	Observed	Expected	SMR	95 % Confidence Interval	Statistically Significant Difference?
All causes	Male	170	161.0	1.06	0.90, 1.23	No
	Female	193	181.1	1.07	0.92, 1.23	No
Heart disease	Male	49	44.5	1.10	0.81, 1.46	No
	Female	59	50.1	1.18	0.90, 1.52	No
Malignant neoplasms	Male	49	40.3	1.21	0.90, 1.61	No
	Female	57	44.4	1.28	0.97, 1.66	No
Cerebrovascular diseases	Male	2	6.7	0.30	0.03, 1.08	No
	Female	15	10.3	1.46	0.82, 2.41	No
Chronic lower respiratory diseases	Male	8	6.2	1.30	0.56, 2.56	No
	Female	13	8.3	1.57	0.83, 2.68	No
Diabetes mellitus	Male	7	5.9	1.18	0.47, 2.44	No
	Female	4	6.2	0.64	0.17, 1.65	No
Unintentional injuries	Male	6	7.8	0.77	0.28, 1.68	No
	Female	3	4.3	0.70	0.14, 2.04	No
Septicemia	Male	8	3.8	2.11	0.91, 4.16	No
	Female	4	5.0	0.79	0.21, 2.03	No
Alzheimer's disease	Male	1	2.3	0.44	0.01, 2.45	No
	Female	3	5.8	0.52	0.10, 1.51	No
Nephritis, nephrotic syndrome & nephrosis	Male	6	3.8	1.58	0.58, 3.44	No
	Female	2	4.0	0.50	0.06, 1.82	No
Influenza and pneumonia	Male	0	3.0	0.00	--	No
	Female	3	3.7	0.80	0.16, 2.35	No

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 6-3. Standardized Mortality Ratio: Six municipalities surrounding Pompton Lakes compared to State of New Jersey, 2004-2007.

Cause of Death	Sex	Observed	Expected	SMR	95 % Confidence Interval	Statistically Significant Difference?
All causes	Male	1,776	1,963.2	0.90	0.86, 0.95	Yes, low
	Female	2,258	2,341.2	0.96	0.93, 1.01	No
Heart disease	Male	519	568.9	0.91	0.84, 0.99	Yes, low
	Female	695	696.7	1.00	0.92, 1.07	No
Malignant neoplasms	Male	424	487.1	0.87	0.79, 0.96	Yes, low
	Female	478	514.7	0.93	0.85, 1.02	No
Cerebrovascular diseases	Male	78	85.9	0.91	0.72, 1.13	No
	Female	127	140.5	0.90	0.75, 1.08	No
Chronic lower respiratory diseases	Female	140	105.7	1.32	1.11, 1.56	Yes, high
	Male	75	79.5	0.94	0.74, 1.18	No
Diabetes mellitus	Male	56	71.6	0.78	0.59, 1.02	No
	Female	82	77.2	1.06	0.85, 1.32	No
Unintentional injuries	Male	68	77.2	0.88	0.68, 1.12	No
	Female	37	49.2	0.75	0.53, 1.04	No
Septicemia	Male	67	47.9	1.40	1.08, 1.78	Yes, high
	Female	70	66.4	1.05	0.82, 1.33	No
Alzheimer's disease	Male	41	32.4	1.27	0.91, 1.72	No
	Female	77	87.5	0.88	0.69, 1.10	No
Nephritis, nephrotic syndrome & nephrosis	Male	41	49.2	0.83	0.60, 1.13	No
	Female	37	52.6	0.70	0.50, 0.97	Yes, low
Influenza and pneumonia	Male	52	40.9	1.27	0.95, 1.67	No
	Female	59	53.4	1.11	0.84, 1.43	No

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 6-4. Most frequent causes of mortality within the Malignant Neoplasms category (expressed as percent within category), in Pompton Lakes, the six surrounding municipalities, and the State of New Jersey, 2004-2007, by sex.

Cause of Death	Males			Cause of Death	Females		
	Pompton Lakes	Six Surrounding Towns	New Jersey		Pompton Lakes	Six Surrounding Towns	New Jersey
Lung, trachea and bronchus cancer	31%	27%	28%	Lung, trachea and bronchus cancer	26%	19%	24%
Colon and rectal cancer	8%	12%	10%	Breast cancer	12%	16%	16%
Prostate cancer	*	11%	10%	Colon and rectal cancer	11%	11%	11%
Pancreatic cancer	10%	5%	6%	Pancreatic cancer	*	4%	6%

* For Pompton Lakes, percentages are shown only for cancer types with 4 or more deaths in the four-year time period.

Figure 6-1. Age-specific mortality rates for all causes of death combined, by sex, for Pompton Lakes (PL), the six municipalities surrounding Pompton Lakes (Surr PL), and the State of New Jersey (NJ), 2004-2007. Rates are expressed as the number of deaths per 100,000 persons in the age interval.

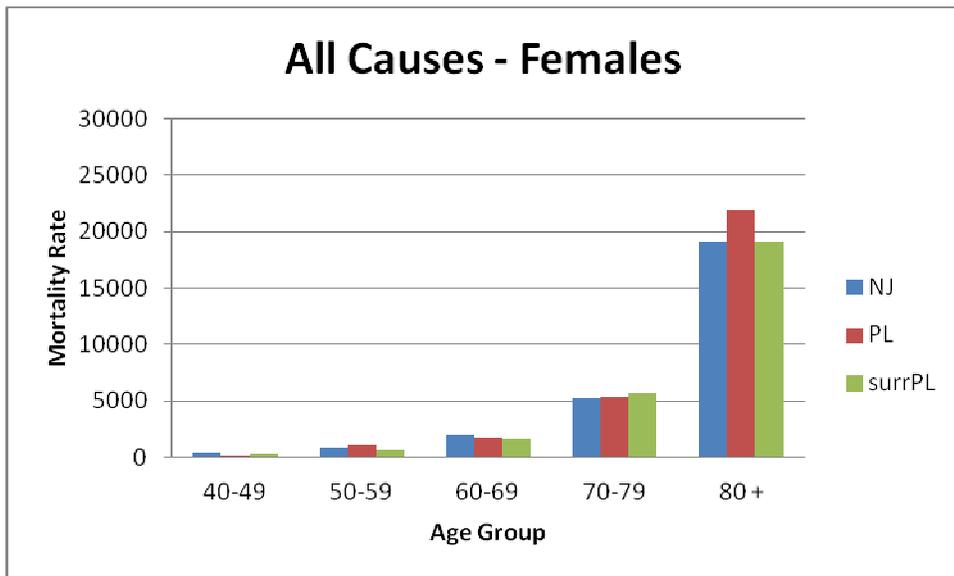
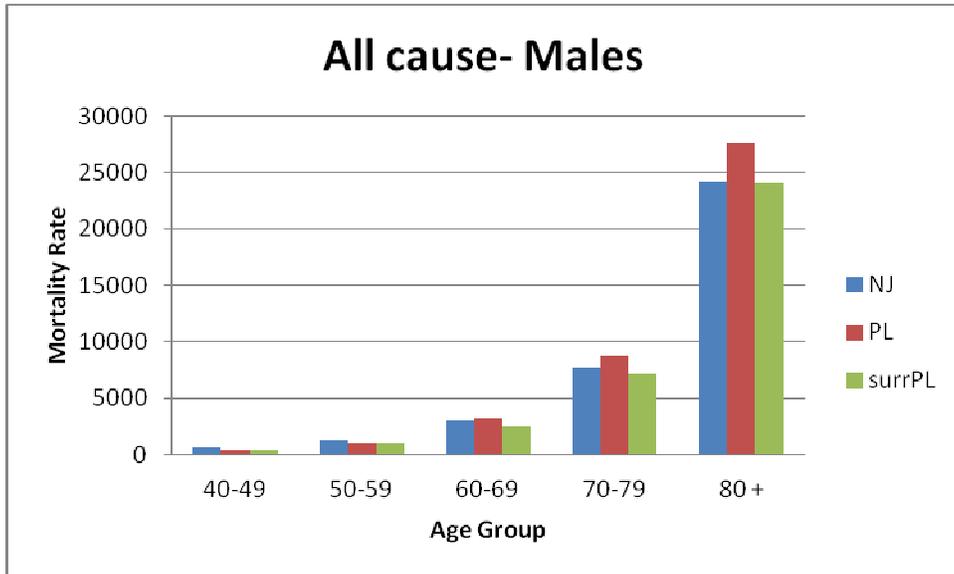


Figure 6-2. Age-specific mortality rates for deaths due to heart disease, by sex, for Pompton Lakes (PL), the six municipalities surrounding Pompton Lakes (Surr PL), and the State of New Jersey (NJ), 2004-2007. Rates are expressed as the number of deaths per 100,000 persons in the age interval.

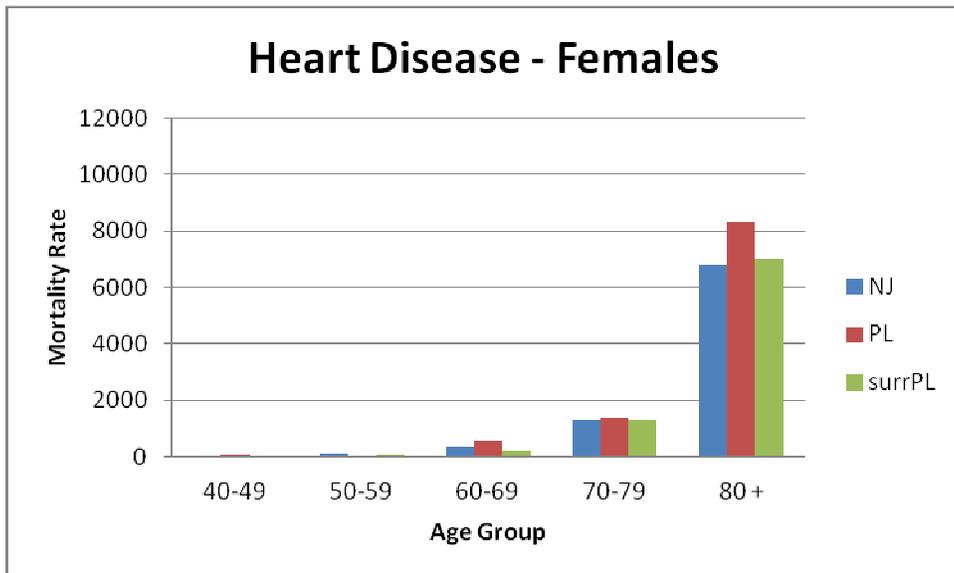
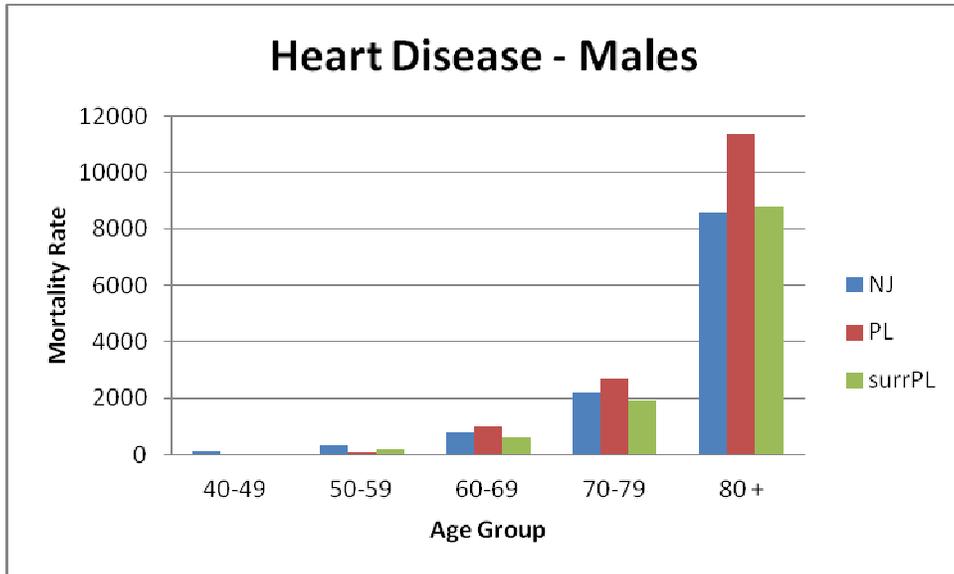
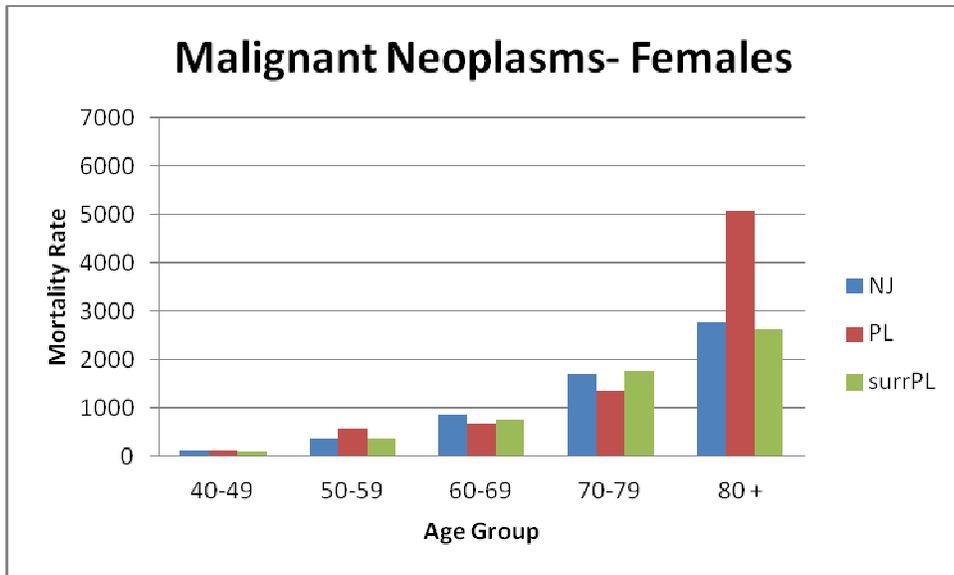
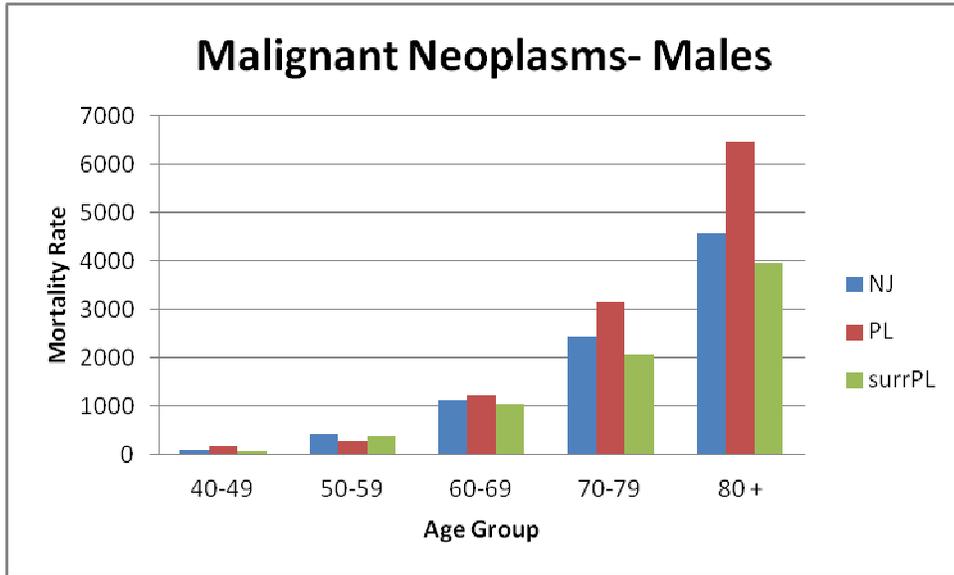


Figure 6-3. Age-specific mortality rates for deaths due to malignant neoplasms (cancers), by sex, for Pompton Lakes (PL), the six municipalities surrounding Pompton Lakes (Surr PL), and the State of New Jersey (NJ), 2004-2007. Rates are expressed as the number of deaths per 100,000 persons in the age interval.



7. Hospitalization and Emergency Department Use

New Jersey was one of the first states to collect data on in-patient hospitalization among residents, including information on patient demographics, admission and discharge dates, diagnoses recorded at discharge, clinical services rendered and charges. Data is collected through Uniform Bill-Patient Summaries (UB), which ensure consistency and comparability of data collection across states and over time. Originally, data only included in-patient hospitalization data but now also includes outpatient data from hospital emergency departments (ED), in accordance with New Jersey laws and NJDOH regulations.

UB data supports a variety of NJDOH public health surveillance programs and public policy research priorities in the State. Several UB-based public health indicators are displayed on the NJ SHAD system, and it is expected that non-confidential hospitalization data sets will be made available to the public through the NJ SHAD web-based data query system in the near future.

Methods

In-patient hospitalizations and ED datasets were searched to generate counts of visits based on the principal International Classification of Diseases, Clinical Modification Ninth Revision (ICD-9-CM) diagnosis code. *The counts reflect the number of ED visits and hospital discharges or “events” and not the number of unique individuals who visited the ED or who were hospitalized.* Thus, some of these counts may include individuals with repeat admissions or visits.

Diagnosis codes were grouped into standard categories as defined by ICD-9-CM and in National Center for Health Statistics reports. The specific categories and groupings selected for presentation and analysis in this report were based on outcomes of community concern and/or because they may be associated with environmental exposures (Table 7-1).

The residence code variable was used to determine whether the hospitalization or ED visit was by a resident of Pompton Lakes, one of the six surrounding municipalities combined (Oakland Borough, Pequannock Township, Riverdale Borough, Bloomingdale Borough, Wanaque Borough, and Wayne Township), or the State of New Jersey. Hospitalizations or ED visits by out-of-state patients were excluded from this analysis. This report covers in-patient hospital discharges and ED visits beginning January 1, 2006 through December 31, 2010.

A hospitalization rate is the number of visits in a defined population over a specific interval of time. Because the rate of hospitalization changes with the age of a population, rates should be “age-adjusted” when comparing among population groups to remove the effect of age alone on differences in the rates. Using a method analogous to those described for SIRs and SMRs in the two previous sections, NJDOH calculated Standardized Hospitalization Ratios (SHRs) and confident intervals. The SHR is the ratio of the observed number of hospital visits by an expected number of visits for the target population over a specific time period. The expected number is the number of visits we would expect to see in the target population if the hospitalization rates were the same as in the comparison population. In this analysis, the

expected number is derived by multiplying the age-sex-specific average annual hospitalization rates in New Jersey for 2006-2010 and the target population age-sex-specific population numbers. Population estimates were based on the U.S. Census Bureau's 2000 and 2010 estimates and were obtained from the U.S. Census Bureau web site (American FactFinder: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>).

NJDOH compared age-adjusted hospitalization rates for all visits combined and for the principal diagnosis groupings listed in Table 7-1. Age-adjusted rates were calculated for Pompton Lakes and for the six surrounding municipalities combined, in comparison to the State of New Jersey, for the five-year period 2006-2010. Hospitalization rates among males and females were evaluated separately since the background risks of health conditions may vary by sex.

Four separate analyses were completed. The rates of visits among residents of Pompton Lakes were compared to the overall rates of visits among New Jersey residents for both ED and in-patient hospitalization. Additionally, the rates of visits among residents of the six municipalities which surround Pompton Lakes were compared to the overall rates of visits among New Jersey residents for both ED and in-patient hospitalization.

Results

In-patient Hospitalizations

As shown in Table 7-2, the SHRs for in-patient hospitalization were statistically significantly elevated during the 2006-2010 time period, in comparison to the State of New Jersey for: malignant neoplasms (cancers) in both sexes; chronic renal failure and congenital anomalies in females; and benign neoplasms in males. The SHRs were statistically significantly low in Pompton Lakes for: diabetes mellitus and diseases of the circulatory system in both sexes; heart disease, disease of the respiratory system, and asthma in females; and all visits in males.

During the 2006-2010 time period the SHRs for in-patient hospitalization were statistically significantly low in the six towns surrounding Pompton Lakes for: diabetes mellitus, diseases of the blood and blood forming organs, diseases of the circulatory system, heart disease, asthma, acute renal failure, and all visits in both males and females; benign neoplasms and cerebrovascular disease in females; and diseases of the nervous system and sense organs in males (Table 7-3).

Since in-patient hospitalizations for malignant neoplasms in Pompton Lakes was statistically significantly higher than expected, and because this category includes a diverse set of diseases, frequencies of hospitalization for specific types of cancer were compared across the geographic areas (Table 7-4). The proportion of the four most frequent sites of malignant neoplasm hospitalizations among male New Jersey residents and residents of the six surrounding towns followed a consistent pattern. The most frequent sites of malignant neoplasm hospitalizations among male Pompton Lakes residents followed a slightly different pattern with secondary (metastatic) cancers and lung, trachea, and bronchus cancer accounting for a higher proportion of malignant neoplasm hospitalizations than in the State of New Jersey or six

surrounding municipalities. Among females, the most frequent sites of malignant neoplasm hospitalizations were fairly similar across the three geographic areas, with slight variations.

Emergency Department Visits

During the 2006-2010 time period the SHRs for ED visits were statistically significantly elevated in Pompton Lakes for: malignant neoplasms (cancers) and congenital anomalies in males; chronic renal failure in females; and diseases of the nervous system and sense organs in males and females (Table 7-5). The SHRs were statistically significantly low in Pompton Lakes for: all visits, diseases of the circulatory system, diseases of the respiratory system, asthma, and diseases of the digestive system in males and females; and heart disease and diabetes in males. As shown in Table 7-6, the SHRs were statistically significantly low in the six towns surrounding Pompton Lakes, for most of the categories of principal diagnoses in both sexes, except there were no statistically significant differences for chronic renal failure, acute renal failure, congenital anomalies, or malignant neoplasms in either sex, nor for benign neoplasms in males.

Since ED visits for diseases of the nervous system and sense organs among Pompton Lakes residents was statistically significantly higher than expected and was based on a relatively large number of visits, and because this category includes a diverse set of diseases, frequencies of ED visits for specific diagnoses within this category were compared across the geographic areas (Table 7-7). Among males, the most frequent types of ED visit for diseases of the nervous system and sense organs were consistent across the three geographic areas. The most frequent diagnoses of nervous system and sense organs ED visits among females were also fairly consistent across the three geographic areas, with the exception of migraines accounting for a higher proportion of ED visits due to diseases of the nervous system and sense organs among Pompton Lakes residents and the six surrounding towns, compared to New Jersey.

Table 7-1. Principal diagnosis categories used for the analyses in this report.

Principal Diagnosis Category	ICD-9-CM Diagnosis Code
Malignant Neoplasms	140-208; 230-234
Benign Neoplasms	210-229
Diabetes Mellitus	250
Diseases of the Blood and Blood Forming Organs	280-289
Diseases of the Nervous System and Sense Organs	320-389
Diseases of the Circulatory System	390-459
Heart Disease*	392.0; 391; 402; 404; 393-398; 410-416; 420-429
Cerebrovascular Disease*	430-438
Diseases of the Respiratory System	460-519
Asthma*	493
Diseases of the Digestive System	520-579
Chronic Renal Failure	581-583; 585-586
Acute Renal Failure	584
Congenital Anomalies	740-759
All visits	All codes

* Note: Cerebrovascular Disease and Heart Disease are subsets of Diseases of the Circulatory System; Asthma is a subset of Diseases of the Respiratory System.

Table 7-2. Standardized Hospitalization Ratios (SHRs) for in-patient hospitalization: Pompton Lakes compared to the State of New Jersey, 2006-2010, by sex.

Principal Diagnosis Category	Sex	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	Male	118	95.6	1.23	1.02 , 1.48	Yes, high
	Female	169	122.3	1.38	1.18 , 1.61	Yes, high
Benign Neoplasms	Male	9	3.9	2.30	1.1 , 4.4	Yes, high
	Female	62	57.7	1.07	0.82 , 1.38	No
Diabetes Mellitus	Male	30	49.0	0.61	0.41 , 0.87	Yes, low
	Female	25	37.2	0.67	0.43 , 0.99	Yes, low
Diseases of the Blood and Blood Forming Organs	Male	26	17.9	1.45	0.95 , 2.1	No
	Female	34	38.5	0.88	0.61 , 1.24	No
Diseases of the Nervous System and Sense Organs	Male	49	55.1	0.89	0.66 , 1.17	No
	Female	81	72.8	1.11	0.88 , 1.38	No
Diseases of the Circulatory System	Male	514	565.5	0.91	0.83 , 0.99	Yes, low
	Female	465	521.9	0.89	0.81 , 0.98	Yes, low
Heart Disease	Male	378	413.4	0.91	0.82 , 1.01	No
	Female	295	351.7	0.84	0.75 , 0.94	Yes, low
Cerebrovascular Disease	Male	67	72.5	0.92	0.72 , 1.17	No
	Female	82	90.0	0.91	0.72 , 1.13	No
Diseases of the Respiratory System	Male	207	237.2	0.87	0.76 , 1.0	No
	Female	236	296.8	0.80	0.70 , 0.90	Yes, low
Asthma	Male	31	23.2	1.34	0.91 , 1.9	No
	Female	35	50.8	0.69	0.48 , 0.96	Yes, low
Diseases of the Digestive System	Male	279	285.8	0.98	0.86 , 1.1	No
	Female	367	356.1	1.03	0.93 , 1.14	No
Chronic Renal Failure	Male	1	0.3	3.74	0.05 , 21	No
	Female	4	0.5	8.74	2.4 , 22	Yes, high
Acute Renal Failure	Male	21	28.8	0.73	0.45 , 1.12	No
	Female	20	27.0	0.72	0.44 , 1.12	No
Congenital Anomalies	Male	9	4.2	2.13	0.97 , 4.0	No
	Female	11	2.7	4.12	2.0 , 7.4	Yes, high
All In-patient Hospitalizations	Male	2,681	2,834	0.95	0.91 , 0.98	Yes, low
	Female	3,837	3,964	0.97	0.94 , 1.0	No

Table 7-3. Standardized Hospitalization Ratios (SHRs) for in-patient hospitalization:
Six municipalities surrounding Pompton Lakes compared to the State of New Jersey, 2006-2010, by sex.

Principal Diagnosis Category	Sex	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	Male	1,137	1,150	0.99	0.93 , 1.05	No
	Female	1,328	1,343	0.99	0.94 , 1.04	No
Benign Neoplasms	Male	88	89.0	0.99	0.79 , 1.22	No
	Female	474	572.3	0.83	0.76 , 0.91	Yes, low
Diabetes Mellitus	Male	349	605.8	0.58	0.52 , 0.64	Yes, low
	Female	285	515.4	0.55	0.49 , 0.62	Yes, low
Diseases of the Blood and Blood Forming Organs	Male	313	374.2	0.84	0.75 , 0.93	Yes, low
	Female	407	556.5	0.73	0.66 , 0.81	Yes, low
Diseases of the Nervous System and Sense Organs	Male	567	627.0	0.90	0.83 , 0.98	Yes, low
	Female	747	801.2	0.93	0.87 , 1.0	No
Diseases of the Circulatory System	Male	6,369	6,769	0.94	0.92 , 0.96	Yes, low
	Female	5,870	6,536	0.90	0.88 , 0.92	Yes, low
Heart Disease	Male	4,614	4,928	0.94	0.91 , 0.96	Yes, low
	Female	3,973	4,421	0.90	0.87 , 0.93	Yes, low
Cerebrovascular Disease	Male	905	913.2	0.99	0.93 , 1.06	No
	Female	1,053	1,126	0.93	0.88 , 0.99	Yes, low
Diseases of the Respiratory System	Male	2,954	2,925	1.01	0.97 , 1.05	No
	Female	3,410	3,536	0.96	0.93 , 1.0	No
Asthma	Male	217	351.0	0.62	0.54 , 0.71	Yes, low
	Female	356	608.3	0.59	0.53 , 0.65	Yes, low
Diseases of the Digestive System	Male	3,092	3,021	1.02	0.99 , 1.06	No
	Female	3,915	3,843	1.02	0.99 , 1.05	No
Chronic Renal Failure	Male	27	20.8	1.29	0.85 , 1.88	No
	Female	12	12.4	0.97	0.50 , 1.69	No
Acute Renal Failure	Male	309	407.4	0.76	0.68 , 0.85	Yes, low
	Female	315	411.5	0.77	0.68 , 0.85	Yes, low
Congenital Anomalies	Male	56	56.0	1.00	0.76 , 1.30	No
	Female	56	48.4	1.16	0.87 , 1.50	No
All In-patient Hospitalizations	Male	29,274	30,380	0.96	0.95 , 0.97	Yes, low
	Female	38,240	40,972	0.93	0.92 , 0.94	Yes, low

Table 7-4. Most frequent in-patient hospitalizations within the Malignant Neoplasms principal diagnosis category (expressed as percent within category), in Pompton Lakes, the six surrounding municipalities, and the State of New Jersey, 2006-2010, by sex.

Diagnosis	Males			Diagnosis	Females		
	Pompton Lakes	Six Surrounding Towns	New Jersey		Pompton Lakes	Six Surrounding Towns	New Jersey
Secondary (metastatic) cancers	21%	16%	16%	Secondary (metastatic) cancers	22%	18%	19%
Prostate cancer	13%	15%	14%	Breast cancer	10%	13%	14%
Lung, trachea and bronchus cancer	19%	12%	13%	Lung, trachea and bronchus cancer	11%	11%	11%
Colon cancer	6%	9%	8%	Uterine cancer	14%	13%	11%

Table 7-5. Standardized Hospitalization Ratios (SHRs) for emergency department (ED) visits: Pompton Lakes compared to the State of NJ, 2006-2010, by sex.

Principal Diagnosis Category	Sex	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	Male	7	1.7	4.08	1.64 , 8.41	Yes, high
	Female	3	1.1	2.7	0.5 , 7.8	No
Benign Neoplasms	Male	1	0.1	8.66	0.11 , 48.16	No
	Female	8	4.8	1.7	0.7 , 3.3	No
Diabetes Mellitus	Male	25	41.1	0.61	0.39 , 0.9	Yes, low
	Female	30	34.5	0.87	0.59 , 1.24	No
Diseases of the Blood and Blood Forming Organs	Male	16	13.5	1.19	0.68 , 1.93	No
	Female	11	10.1	1.08	0.54 , 1.94	No
Diseases of the Nervous System and Sense Organs	Male	418	375.0	1.11	1.01 , 1.23	Yes, high
	Female	562	468.7	1.20	1.10 , 1.30	Yes, high
Diseases of the Circulatory System	Male	95	128.3	0.74	0.6 , 0.91	Yes, low
	Female	119	146.3	0.81	0.67 , 0.97	Yes, low
Heart Disease	Male	31	47.4	0.65	0.44 , 0.93	Yes, low
	Female	34	38.8	0.88	0.61 , 1.23	No
Cerebrovascular Disease	Male	6	4.4	1.35	0.49 , 2.95	No
	Female	8	7.1	1.1	0.5 , 2.2	No
Diseases of the Respiratory System	Male	622	738.8	0.84	0.78 , 0.91	Yes, low
	Female	700	909.9	0.77	0.71 , 0.83	Yes, low
Asthma	Male	88	136.7	0.64	0.52 , 0.79	Yes, low
	Female	109	169.6	0.64	0.53 , 0.78	Yes, low
Diseases of the Digestive System	Male	399	443.8	0.90	0.81 , 0.99	Yes, low
	Female	430	534.4	0.80	0.73 , 0.88	Yes, low
Chronic Renal Failure	Male	0	0.1	0.0	--	No
	Female	2	0.2	11	1.2 , 39	Yes, high
Acute Renal Failure	Male	0	0.03	0.0	--	No
	Female	0	0.02	0.0	--	No
Congenital Anomalies	Male	3	0.3	10.72	2.15 , 31.31	Yes, high
	Female	1	0.5	2.2	0.03 , 12	No
All ED Visits	Male	7,178	7,672.5	0.94	0.91 , 0.96	Yes, low
	Female	7,560	9,016	0.84	0.82 , 0.86	Yes, low

Table 7-6. Standardized Hospitalization Ratios (SHRs) for emergency department (ED) visits: Six municipalities surrounding Pompton Lakes compared to the State of New Jersey, 2006-2010, by sex.

Principal Diagnosis Category	Sex	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	Male	36	35.2	1.02	0.72 , 1.42	No
	Female	36	37.9	0.95	0.67 , 1.32	No
Benign Neoplasms	Male	12	9.6	1.25	0.65 , 2.19	No
	Female	36	87.9	0.41	0.29 , 0.57	Yes, low
Diabetes Mellitus	Male	213	452.9	0.47	0.41 , 0.54	Yes, low
	Female	205	419.1	0.49	0.42 , 0.56	Yes, low
Diseases of the Blood and Blood Forming Organs	Male	117	231.4	0.51	0.42 , 0.61	Yes, low
	Female	151	320.0	0.47	0.4 , 0.55	Yes, low
Diseases of the Nervous System and Sense Organs	Male	2,510	3,380	0.74	0.71 , 0.77	Yes, low
	Female	3,227	4,235	0.76	0.74 , 0.79	Yes, low
Diseases of the Circulatory System	Male	1,020	1,507	0.68	0.64 , 0.72	Yes, low
	Female	1,167	1,683	0.69	0.65 , 0.73	Yes, low
Heart Disease	Male	447	576.5	0.78	0.71 , 0.85	Yes, low
	Female	406	516.2	0.79	0.71 , 0.87	Yes, low
Cerebrovascular Disease	Male	85	113.3	0.75	0.6 , 0.93	Yes, low
	Female	75	130.0	0.58	0.45 , 0.72	Yes, low
Diseases of the Respiratory System	Male	3,921	6,756	0.58	0.56 , 0.6	Yes, low
	Female	4,367	8,279	0.53	0.51 , 0.54	Yes, low
Asthma	Male	648	1,309	0.50	0.46 , 0.53	Yes, low
	Female	733	1,563	0.47	0.44 , 0.5	Yes, low
Diseases of the Digestive System	Male	2,832	3,998	0.71	0.68 , 0.74	Yes, low
	Female	3,250	4,935	0.66	0.64 , 0.68	Yes, low
Chronic Renal Failure	Male	16	15.8	1.01	0.58 , 1.64	No
	Female	11	12.4	0.89	0.44 , 1.59	No
Acute Renal Failure	Male	1	0.5	1.9	0.02 , 10	No
	Female	2	1.6	1.2	0.1 , 4.4	No
Congenital Anomalies	Male	14	12.7	1.11	0.6 , 1.85	No
	Female	13	10.6	1.23	0.65 , 2.1	No
All ED Visits	Male	53,757	70,879	0.76	0.75 , 0.76	Yes, low
	Female	59,071	84,790	0.70	0.69 , 0.7	Yes, low

Table 7-7. Most frequent emergency department visits within the Diseases of the Nervous System and Sense Organs principal diagnosis category (expressed as percent within category), in Pompton Lakes, the six surrounding municipalities, and the State of New Jersey, 2006-2010, by sex.

Diagnosis	Males			Females		
	Pompton Lakes	Six Surrounding Towns	New Jersey	Pompton Lakes	Six Surrounding Towns	New Jersey
Ear infections and related disorders	60%	51%	43%	47%	40%	45%
Eye infections and related disorders	19%	23%	22%	13%	16%	20%
Migraine	5%	6%	5% *	31%	26%	16%
Pain, not elsewhere classified	9%	8%	7%	4%	7%	7%

Note: Epilepsy also accounted for 5% of diagnoses among males in this category in the State of New Jersey, but occurred less frequently in Pompton Lakes and the six surrounding towns.

8. Childhood Lead Exposure

The NJDOH requires every physician, professional registered nurse, and health care facility to screen for lead exposure all children under six years of age who come to them for care (Public Law 1995, chapter 328). Lead is a toxic metal that has been used in paints, gasoline, ceramics, solder, batteries and many other consumer products; the main source of childhood lead exposure is dust and chips from lead-based paint in older homes.

All children in New Jersey are considered at risk for lead exposure and poisoning. Therefore, NJDOH recommends that all children should be screened for lead poisoning at 12 and 24 months of age, as well as any child between three and six years of age who has never previously been screened. In addition, NJDOH recommends that any child who is six months of age or older, and who may be exposed to a known or suspected lead hazard, should be screened.

Since July 1999, NJDOH has required clinical laboratories to report all blood lead test results to the State. The Childhood Lead Poisoning Prevention (CLPP) program in NJDOH maintains a central surveillance database and patient tracking system called LeadTrax. Using LeadTrax, CLPP coordinates with local health departments to document, share and track case management data and environmental intervention activities. The LeadTrax database includes the following information on each laboratory report: patient's identifying information, patient's address, patient's age at time of blood specimen collection, type of screening specimen (venous or capillary), and blood lead result in micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$).

Multiple lead test reports may be received on the same patient. For the purpose of this analysis, each child was counted only once per calendar year. For each child, the highest result among all venous specimens during a calendar year was selected. If no venous sample is available for a child in a calendar year, the lowest result among capillary specimens (finger sticks) was selected, since a blood lead test done on a capillary specimen is susceptible to falsely high results.

Until recently, the U.S. Centers for Disease Control and Prevention (CDC) identified children as having a blood lead level of concern if the test result was 10 micrograms per deciliter of blood ($\mu\text{g}/\text{dL}$) or higher (CDC 2012; CDC 2005). This triggered case management, a home visit, education and counseling about lead hazards, and re-testing by local health departments; higher levels triggered more aggressive interventions including full environmental inspection and medical evaluation and treatment. However, CDC has recognized that blood lead levels less than 10 $\mu\text{g}/\text{dL}$ can harm children, and has recommended control or elimination of any source of lead in the environment to which a child could be exposed. In January 2012, the CDC's Advisory Committee on Childhood Lead Poisoning Prevention recommended a reference value of 5 $\mu\text{g}/\text{dL}$, which CDC now uses to identify young children who have been exposed to lead (ACCLPP 2012; CDC 2012).

Methods

While the ideal is for all children to be tested at both one and two years of age, at a minimum all children should have at least one blood lead test done before their third birthday. CLPP in NJDOH uses the age span of 6 to 29 months to capture data on tests that are performed either earlier than the age of 12 months or later than the age of 24 months, as not all children are tested exactly at the age of one and two years.

Blood lead test results in the period January 1, 2000 through December 31, 2010 were extracted from LeadTrax for children between the ages of 6 and 29 months at the time that blood was collected for lead analysis. Results were summarized for Pompton Lakes, the six surrounding municipalities (Oakland Borough, Pequannock Township, Riverdale Borough, Bloomingdale Borough, Wanaque Borough, and Wayne Township), and the State of New Jersey. In each of these areas, the percent of children tested whose blood lead test reached or exceeded 5, 10 and 20 µg/dL was computed, for the entire 11 year period and for each year.

CLPP also examined childhood lead screening data for all children 72 months (6 years) of age and under for the same time period and geographic areas. Results showed similar patterns and trends to the data for children age 6 to 29 months only, so only the data for the 6 to 29 month old children are presented below.

Results

Table 8-1 presents the percent of tested children age 6 to 29 months with blood lead levels equal to or exceeding 5, 10 or 20 µg/dL, in Pompton Lakes, the six surrounding towns, and the State of New Jersey, during the 11-year period 2000-2010. Statewide, 1.45% of tested children in this age range had blood lead levels at or above 10 µg/dL, with much lower percentages in Pompton Lakes (0.2%) and the six surrounding municipalities (also 0.2% combined, ranging from 0.1% to 0.4%).

No tested children aged 6 to 29 months in Pompton Lakes had blood lead levels at 20 µg/dL or above. About 0.25% of tested children in this age group statewide had a blood lead level of 20 µg/dL or above. About 8.9% of tested children aged 6 to 29 months in Pompton Lakes had a blood lead level of 5 µg/dL or higher. The percent was smaller in the six surrounding towns (6.4% combined, ranging from 4.0% to 8.3%), and was larger statewide (12.9%).

Table 8-2 shows the number of children age 6 to 29 months whose blood lead test fell within certain concentration ranges, for Pompton Lakes, the six surrounding municipalities combined and separately, and the state of New Jersey. This Table shows the data for the entire 11-year period combined, 2000 through 2010.

Table 8-3 shows a breakdown by year of blood lead values among children 6 to 29 months of age, for Pompton Lakes, the six surrounding municipalities combined, and the State of New Jersey. Table 8-3 presents these annual data expressed as the percent of children tested whose blood lead value reached or exceeded 5, 10 or 20 µg/dL. In general for the State of New

Jersey, there has been a steadily improving trend in the percent of tested children whose blood lead result was at or above 5, 10 or 20 $\mu\text{g}/\text{dL}$. These trends are also apparent in the six surrounding towns combined. Trends are not as clear for Pompton Lakes, primarily because of the relatively small number of tested children whose test results were 10 $\mu\text{g}/\text{dL}$ or higher.

Table 8-1. Percent of blood lead concentrations greater than or equal to 5, 10 or 20 micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$), among children aged 6 to 29 months, 2000 through 2010.

Population	% ≥ 5 $\mu\text{g}/\text{dL}$	% ≥ 10 $\mu\text{g}/\text{dL}$	% ≥ 20 $\mu\text{g}/\text{dL}$
Pompton Lakes	8.9%	0.2%	0%
Six Surrounding Towns	6.4%	0.2%	0.03%
Bloomingtondale	8.3%	0.1%	0%
Oakland	4.0%	0.3%	0.1%
Pequannock	7.8%	0.2%	0%
Riverdale	5.0%	0.2%	0%
Wanaque	7.4%	0.4%	0%
Wayne	6.0%	0.2%	0.04%
State of New Jersey	12.9%	1.45%	0.25%

Table 8-2. Distribution of blood lead concentrations among children aged 6 to 29 months, 2000 through 2010, in micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$).

Population	<2.5 $\mu\text{g}/\text{dL}$	2.5-4.4 $\mu\text{g}/\text{dL}$	4.5-9.4 $\mu\text{g}/\text{dL}$	10-14 $\mu\text{g}/\text{dL}$	15-19 $\mu\text{g}/\text{dL}$	20-44 $\mu\text{g}/\text{dL}$	45-69 $\mu\text{g}/\text{dL}$	≥ 70 $\mu\text{g}/\text{dL}$	Total Screened
Pompton Lakes	577	629	115	3	0	0	0	0	1,324
Six Surrounding Towns	4,239	5,058	617	15	5	3	0	0	9,937
Bloomingtondale	363	452	73	0	1	0	0	0	889
Oakland	380	349	28	1	0	1	0	0	759
Pequannock	565	756	108	2	1	0	0	0	1,432
Riverdale	175	208	19	1	0	0	0	0	403
Wanaque	466	606	81	3	2	0	0	0	1,158
Wayne	2,290	2,687	308	8	1	2	0	0	5,296
State of New Jersey	431,271	490,796	120,749	9,691	3,038	2,503	133	28	1,058,209

Table 8-3. Percent of blood lead concentrations greater than or equal to 5, 10 or 20 micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$), by year, among children aged 6 to 29 months, 2000 through 2010.

Population and Year of Test	% \geq 5 $\mu\text{g}/\text{dL}$	% \geq 10 $\mu\text{g}/\text{dL}$	% \geq 20 $\mu\text{g}/\text{dL}$
Pompton Lakes			
2000-2010	8.9%	0.2%	0%
2000	18%	0%	0%
2001	11%	0.8%	0%
2002	7%	0%	0%
2003	14%	0%	0%
2004	10%	0%	0%
2005	7%	0.7%	0%
2006	9%	0%	0%
2007	12%	0%	0%
2008	7%	0%	0%
2009	0.8%	0%	0%
2010	3%	0.8%	0%
Six Surrounding Towns			
2000-2010	6.4%	0.2%	0.03%
2000	8.1%	0.5%	0.2%
2001	9.4%	0.4%	0%
2002	8.3%	0.2%	0.09%
2003	6.8%	0.3%	0%
2004	6.9%	0.2%	0%
2005	6.1%	0.1%	0%
2006	6.5%	0.1%	0%
2007	8.1%	0.1%	0%
2008	4.2%	0.1%	0%
2009	2.2%	0.1%	0%
2010	1.6%	0.1%	0%
State of New Jersey			
2000-2010	12.9%	1.4%	0.25%
2000	18.3%	2.6%	0.50%
2001	16.6%	2.0%	0.34%
2002	16.9%	2.0%	0.29%
2003	17.0%	2.1%	0.37%
2004	16.2%	1.9%	0.32%
2005	15.3%	1.6%	0.26%
2006	14.5%	1.3%	0.21%
2007	12.9%	1.1%	0.20%
2008	7.8%	0.78%	0.14%
2009	5.5%	0.61%	0.13%
2010	4.7%	0.65%	0.13%

9. Discussion

The preceding six sections presented health statistics for Pompton Lakes, with comparisons provided by statistics for the six surrounding municipalities and the State of New Jersey. The statistics are from public health data sources that are routinely collected and compiled by the NJDOH under specific statutes and regulations. Taken together, these sections comprise a Community Health Profile for Pompton Lakes, for the purpose of identifying whether there are health outcomes that are occurring, or have occurred, more frequently than expected. As discussed in the introduction, these analyses are hypothesis generating and are not intended to explore associations between environmental or other factors with health outcomes.

Before summarizing the findings of this Community Health Profile, it is important to note the limitations of the data sources and the need to interpret these analyses cautiously.

Hospitalization and emergency department data sets are collected for billing purposes, not for tracking disease incidence or morbidity. The analyses of these data sets were based on the number of in-patient hospitalizations or ED visits, not the number of individual patients. Furthermore, hospitalizations or ED visit rates may be influenced strongly by variations in access to health care and health care-seeking behaviors. In general, the registry datasets (that is, births, deaths, birth defects and cancer incidence) are much better measures of occurrence of disease in populations than the hospitalization and emergency department datasets.

For rare outcomes with relatively small case counts, it is difficult to draw meaningful conclusions. For these outcomes, the number of years of data analyzed may not have been sufficient to accumulate a statistically reliable number of observed cases to detect a difference from the expected, if one existed.

Also, it is possible that health outcome rates for some outcomes in Pompton Lakes may have been different from the State of New Jersey during time intervals outside of those analyzed in this Community Health Profile. Conversely, when making comparisons between populations of multiple health outcomes at once, it is likely that some statistically significant differences will be detected by chance alone.

There is an overlap of health conditions among some of the health data sources. This Discussion section attempts to synthesize the data presented in the Profile sections, by examining the findings for patterns and trends by these health outcome groups:

- Birth Outcomes
- Causes of Death
- Heart and Cerebrovascular Diseases
- Cancers
- Respiratory Diseases
- Nervous System Diseases
- Kidney Diseases
- Children's Exposure to Lead

Birth Outcomes (Low Birth Weight, Prematurity and Birth Defects)

Based on eight years of birth certificate information (2000-2007), infants born to Pompton Lakes mothers had similar rates of adverse birth outcomes compared to the six surrounding municipalities and the State of New Jersey as a whole. About 7.3% of the 1,183 births to Pompton Lakes mothers had low birth weight (LBW), and 10.0% were born prematurely.

When the analysis of LBW was restricted to singleton births born at full term, to remove the strong effect of multiple births and prematurity on the rate, about 1.3% of the remaining 1,011 Pompton Lakes births had LBW. This compares to a LBW rate of 1.5% in the six towns taken together, and 2.1% for the State. In comparison to the six surrounding towns taken individually, the rate of LBW among full-term, singleton births in Pompton Lakes was ranked around the middle.

Similarly, when the analysis of prematurity was restricted to singleton births, about 7.5% of these infants were born prematurely. This compares to a LBW rate of 6.6% in the six towns taken together, and 7.9% for the State. In comparison to these prematurity rates in the six surrounding towns taken individually, the rate in Pompton Lakes was again ranked around the middle.

Analyses of Birth Defects Registry data for children born from 1995 through 2007 showed there was not a statistically significant difference in the number of children born with birth defects in Pompton Lakes as compared to the six surrounding towns or New Jersey as a whole, for an aggregation of selected birth defects as well as for major cardiac birth defects. The rate of the aggregated birth defects -- including major cardiac defects, chromosomal defects, neural tube defects, oral clefts, hypospadias and choanal atresia, a disorder of the nasal passages -- was 92 per 10,000 births, which was slightly lower but statistically different from the rates in the six towns (108 per 10,000 births) and the State of New Jersey (100 per 10,000 births). Rates for the major cardiac defects alone were also similar among the three areas: Pompton Lakes (26 per 10,000 births); six towns (29 per 10,000 births); and the State (34 per 10,000 births). None of the differences in rates were statistically significant.

The number of in-patient hospitalizations for congenital anomalies from 2006-2010 was statistically significantly elevated among female Pompton Lake residents, and was higher than expected among males; ED visits for congenital anomalies was statistically significantly higher than expected among males, but not in females. These statistics do not appear consistent with the data from the Birth Defects Registry from 1995-2007. Differences may be due to the time periods examined. Also, as discussed above, it should be noted that there are limitations to interpretation of the hospitalization and ED datasets to estimate the prevalence of disease, because of the possibility of multiple visits per individual.

Based on data from birth certificates (2000-2007) and the Birth Defects Registry (1995-2007), adverse birth-related health outcomes have not occurred with unusual frequency in Pompton Lakes, in comparison to the State of New Jersey and the six surrounding municipalities.

Causes of Death

The pattern of mortality in the period 2004-2007 in Pompton Lakes was similar to the State of New Jersey as well as the six surrounding municipalities, for both males and females. The age-standardized mortality rate for all causes of death combined among Pompton Lakes residents was not statistically significantly different than among residents of the State of New Jersey, in the period 2004-2007. The relative frequency and rank order of the top 20 most common causes of death were similar among the three geographic areas. In all areas, mortality from heart diseases and cancers were by far the most common causes, together accounting for more than half of all deaths. Other important causes of death in all areas, each accounting for about 2% to 5% of all deaths statewide, were: cerebrovascular diseases (stroke); chronic lower respiratory diseases; diabetes; unintentional injuries; septicemia; Alzheimer's disease; kidney diseases; and influenza and pneumonia.

Concern had been expressed in meetings of the Health CAG that younger residents were more likely to die in Pompton Lakes than elsewhere. However, this does not appear to be the case over the years 2004-2007. Among Pompton Lakes residents less than age 80 years, age-specific mortality rates were consistent with those among residents in the six surrounding municipalities and in the State of New Jersey. Age-specific mortality rates in the age interval above 80 years, did appear to be higher among male and female Pompton Lakes residents compared to residents in the six surrounding municipalities and the State of New Jersey. This was observed for overall mortality as well as from the two leading causes of death, heart diseases and cancers (discussed further below).

Based on death certificate data in the period 2004-2007, the pattern of causes of death in Pompton Lakes appeared to be similar to the State of New Jersey and the six surrounding towns. While the mortality rate among adults under 80 years of age was similar among the geographic areas, Pompton Lakes showed a higher overall mortality rate among those 80 years of age and over; this was also true for both of the leading causes of death, heart disease and malignant neoplasms.

Heart and Cerebrovascular Diseases

Information on heart and cerebrovascular diseases was available from hospitalization and emergency department visit data, as well as from mortality records. For Pompton Lakes residents in comparison to the State of New Jersey, there were inconsistent findings for hospitalization and emergency department visits for heart disease in comparison to mortality rates due to heart disease.

In Pompton Lakes males and females, the rates of hospitalizations and emergency department visits for heart disease (2006-2010) were lower than expected. In contrast, the death rate due to heart disease (2004-2007) was higher than expected in both males and females. As discussed above under Causes of Death, the elevations in heart disease death rates in Pompton Lakes occurred primarily in the population above 80 years of age. Age-specific mortality rates among male and female residents less than age 80 years at the time of death were similar in Pompton Lakes to the State and the six surrounding towns.

There were no statistically significant differences in rates of cerebrovascular disease among Pompton Lakes males or females compared to the State of New Jersey, for mortality, in-patient hospitalization, or ED visits.

Cancers

Cancer incidence was evaluated in both the entire town of Pompton Lakes and the plume area. For the entire town of Pompton Lakes, overall cancer incidence was 8% higher (statistically significant) in females during 1990-2008 compared to the State of New Jersey. None of the other cancer sites analyzed was found to be statistically significantly elevated during this time period. The gender-specific cancer incidence distribution by type was compared across the geographic areas and the distribution in Pompton Lakes was similar to the State of New Jersey.

In the plume area, there were no statistically significant elevated rates of cancer incidence compared to the State of New Jersey during 1990-2008. In a previous analysis of the plume area, kidney cancer in females (over the period 1979-2006) and non-Hodgkin Lymphoma in males (over the period 1994-2006) were statistically significantly elevated. In the current updated analysis, these cancers were elevated to a similar degree as reported in previous analyses, but the rates are not significantly different in comparison to the State of New Jersey.

The number of in-patient hospitalizations among male and female Pompton Lakes residents with the principal diagnosis of malignant neoplasms was statistically significantly higher than expected. To further explore this, the percentages of specific type of cancer hospitalizations were compared across the three geographic areas for both males and females. The four most frequent in-patient hospitalizations for a specific cancer within the malignant neoplasms principal diagnosis category were consistent across the three geographic areas. As discussed previously, analyses based on the hospitalization and emergency department data should be interpreted cautiously as they are not collected for the purpose of determining incidence or disease morbidity.

The number of deaths due to malignant neoplasms in Pompton Lakes was higher than expected in both males and females (though not statistically significant). The proportion of specific types of cancer deaths in Pompton Lakes was very similar to the state. Among males, mortality from lung, trachea, and bronchus, colon and rectal, prostate, and pancreatic cancers accounted for more than half of all malignant neoplasm deaths in all areas. Among females, mortality from lung, trachea, and bronchus, breast, colon and rectal, and pancreatic cancers accounted for almost half of all malignant neoplasm deaths in all areas.

Age-specific mortality rates for all cancers combined in the age interval 80 years and above appeared to be higher in Pompton Lakes among both males and females in comparison to the State of New Jersey and the six surrounding towns. Conversely, age-specific mortality rates less than age 80 years are consistent with the State and six surrounding towns, indicating that younger residents of Pompton Lakes are not dying from cancer at a higher rate than residents in the other areas.

Respiratory Diseases

There was not a consistent pattern of respiratory disease occurrence among male or female residents of Pompton Lakes. Both male and female residents of Pompton Lakes had lower rates of hospitalization and emergency department visits for the broad grouping of diseases of the respiratory system, in comparison to the State. For asthma, one of the diseases in this broad grouping, hospitalization rates were lower in females but not males, while emergency department visits were lower in both males and females. The rates of death due to chronic lower respiratory diseases were based on relatively small numbers; observed rates were slightly higher than, but were not statistically different from, the State.

Neurological Diseases

Male and female residents of Pompton Lakes did not have a statistically significantly different rate of in-patient hospitalization for diseases of the nervous system and sense organs compared to the State of New Jersey. In contrast, male and female residents of Pompton Lakes had statistically significantly higher rates of emergency department visits for diseases of the nervous system and sense organs compared to the State of New Jersey.

To further explore these higher rates under this broad disease category, the proportions of specific diagnoses within in this disease grouping were compared for males and females separately with the State of New Jersey. The proportions of specific nervous system and sense organ diseases were similar among males across the three geographic areas, although males in Pompton Lakes had a higher percentage of visits due to ear infections and related disorders. Female residents of Pompton Lakes had a much higher percentage of visits diagnosed as migraine compared to the State of New Jersey, but the proportions of other specific nervous system and sense organ diseases were similar to the State of New Jersey. This indicates the higher SHR among females in Pompton Lakes is driven mostly by a higher rate of emergency department visits for migraines, and among males by a higher rate of emergency department visits for ear infections and related disorders.

Kidney Diseases

The rates of inpatient hospitalizations and ED visits for chronic renal failure among females in Pompton Lakes were statistically significantly higher than the State of New Jersey in the period 2006-2010. It is important to note the elevated rates of hospitalizations and ED visits were based on small numbers, so are subject to wide variability from time to time. The rates of hospitalization and ED visits for chronic renal failure among male Pompton Lakes residents were also based on small numbers, and neither was statistically significantly different from the State. The numbers of acute renal failure hospitalizations among males and females were lower than expected based on the state rate.

Mortality rates from kidney disease in Pompton Lakes males and females were not statistically different from the State of New Jersey.

Childhood Lead Exposure

The percentage of children in Pompton Lakes aged 6 to 29 months with blood lead levels at or above 10 µg/dL was 0.2%, which was similar to the percentage of children in the six surrounding municipalities (also 0.2%). Both percentages were much lower than that of the State of New Jersey (1.45%) in the same period (2000-2010). There were no children aged 6 to 29 months in Pompton Lakes who had blood lead levels at 20 µg/dL or above, compared to 0.25% of tested children in this age group statewide. About 8.9% of tested children aged 6 to 29 months in Pompton Lakes had a blood lead level of 5 µg/dL or higher. The percent was smaller in the six surrounding towns (6.4% combined, ranging from 4.0% to 8.3%), and was larger statewide (12.9%).

10. Conclusions and Recommendations

This Health Consultation (Community Health Profile) provides to the Health CAG in Pompton Lakes the findings of analyses of several health-related data sets of the NJDOH. The purpose of this Profile is to provide data to inform consideration of whether there are specific health outcomes that have occurred or might be occurring more frequently in the Pompton Lakes population than would be expected. Rates of health outcomes have been compared primarily to those of the State of New Jersey, and rates have also been provided for the six municipalities surrounding Pompton Lakes for additional perspective.

Based on the findings of the several data analyses, NJDOH and ATDSR have reached the following conclusions:

- Adverse birth-related health outcomes, including low birth weight, prematurity and a variety of birth defects, have not occurred with unusual frequency in Pompton Lakes.
- The leading causes of death in Pompton Lakes were similar to the leading causes of death in the comparison populations.
- The mortality rate among adults under 80 years of age was similar among the geographic areas, but Pompton Lakes showed a higher mortality rate among those 80 years of age and over, for all causes and for the two most frequent causes of death, heart disease and malignant neoplasms. Mortality rates among younger residents of Pompton Lakes were similar to those in the surrounding communities and the State.
- Overall cancer incidence in Pompton Lakes was 8% higher in females during 1990-2008 compared to the State of New Jersey, but no specific cancer site analyzed was statistically significantly elevated.
- In the groundwater contamination plume area of Pompton Lakes, there were no statistically significant elevated rates of cancer incidence compared to the State in the period 1990-2008.

- The incidence of kidney cancer in females and non-Hodgkin lymphoma in males had been found to be statistically significantly elevated in a previous analysis over different time frames; these cancers were elevated to a similar degree in this analysis, but the rates were not statistically different from the State.
- Mortality rates for all cancers combined in male and female Pompton Lakes residents age 80 years and above was higher than in the State and the six surrounding towns. Mortality rates in those less than age 80 years were similar to those in the comparison populations, indicating that younger residents of Pompton Lakes were not dying from cancer at a higher rate than residents in the other areas.
- Emergency department visits for diseases of the nervous system and sense organs (2006-2010) were higher in Pompton Lakes males and females than in the State. Further examination showed the most frequent types of ED visits for diseases of the nervous system and sense organs were generally consistent across the three geographic areas, with the exception of migraine headaches accounting for a higher proportion of ED visits among Pompton Lakes females.
- Analyses of health data sets for respiratory diseases and kidney diseases did not show that these outcomes are occurring with a pattern of increased frequency in Pompton Lakes.
- Children aged 6 to 29 months in Pompton Lakes are not exhibiting increased frequency of exposure to high levels of lead from the environment.

Overall, the rates of many of the health outcomes analyzed were similar in Pompton Lakes to the State and the six surrounding municipalities. Rates of some health outcomes in Pompton Lakes were lower than expected, while others were higher. The health outcomes that were higher include: mortality rates for cancer and heart disease among older residents; overall cancer incidence among females; kidney cancer incidence among females and non-Hodgkin lymphoma in males in one of the time periods analyzed; and emergency department visits for diseases of the nervous system and sense organs, in particular migraine among females. The NJDOH and ATSDR will consider the findings from this Community Health Profile in light of the findings of the NJDOH's Household Health Survey. Together, these complementary investigations will be used by NJDOH and ATSDR to guide decision-making about the need for further health investigations, in consultation with the Health CAG.

11. Public Health Action Plan

The purpose of a Public Health Action Plan (PHAP) is to ensure that a Health Consultation not only identifies public health hazards but also provides a plan of action to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. Included is a commitment on the part of ATSDR and NJDOH to follow up on the plan to ensure that it is implemented. The following are actions undertaken or planned in relation to community concerns about a variety of health outcomes in the community of Pompton Lakes, Passaic County, New Jersey:

Public Health Actions Undertaken by NJDOH and ATSDR

1. NJDOH and ATSDR established a Community Advisory Group for Health (Health CAG) to provide a forum for community representatives in Pompton Lakes to express concerns about health and environmental exposures, define questions regarding exposure and health, discuss solutions, and give advice to ATSDR and NJDOH on health investigation priorities.
2. NJDOH and ATSDR have completed this Health Consultation (Community Health Profile), whose purpose was to analyze existing NJDOH health-related data sets and provide information to the Health CAG. The information would be used to develop an understanding of whether there are specific health outcomes that are occurring more frequently in the Pompton Lakes population than would be expected.
3. NJDOH has conducted a Household Health Survey to provide complementary information to this Community Health Profile.

Public Health Actions Planned by NJDOH and ATSDR

4. NJDOH and ATSDR will provide the findings of this Community Health Profile to the Health CAG and the public in Pompton Lakes. The health agencies will continue dialogue with the Health CAG as needed to address health questions and concerns of the community.

References

[ACCLPP] Advisory Committee for Childhood Lead Poisoning Prevention. 2012. Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention, Report of the Advisory Committee on Childhood Lead Poisoning Prevention of the Centers for Disease Control and Prevention, January 4, 2012. Available at: http://www.cdc.gov/nceh/lead/ACCLPP/Final_Document_011212.pdf.

[ATSDR] Agency for Toxic Substances and Disease Registry, 1994. Petitioned Public Health Assessment, E.I. DuPont DeNemours, Pompton Lakes, New Jersey. Atlanta: U.S. Department of Health and Human Services.

[ATSDR and NJDHSS] Agency for Toxic Substances and Disease Registry, and New Jersey Department of Health and Senior Services, 1998. Lead and Mercury Exposure Screening of Children in Pompton Lakes. Atlanta: U.S. Department of Health and Human Services.

[ATSDR and NJDHSS] Agency for Toxic Substances and Disease Registry, and New Jersey Department of Health and Senior Services, 2009a. Health Consultation, DuPont Pompton Lakes Works Site: Analysis of the Vapor Intrusion Pathway in the Pompton Lakes Neighborhood Impacted by the DuPont Groundwater Contamination. Atlanta: U.S. Department of Health and Human Services.

[ATSDR and NJDHSS] Agency for Toxic Substances and Disease Registry, and New Jersey Department of Health and Senior Services, 2009b. Health Consultation, DuPont Pompton Lakes Works Site: Analysis of Cancer Incidence in the Pompton Lakes Neighborhood Impacted by the DuPont Groundwater Contamination. Atlanta: U.S. Department of Health and Human Services.

[CDC] Centers for Disease Control and Prevention 2005. Preventing Lead Poisoning in Young Children (5th Revision). Atlanta: U.S. Department of Health and Human Services.

[CDC] Centers for Disease Control and Prevention 2011. Lead (web page). Accessed online November 22, 2011: <http://www.cdc.gov/nceh/lead>.

[NJDHSS] New Jersey Department of Health and Senior Services, 2010. Pompton Lakes, New Jersey, SIR Cancer Analysis, 1979-2007. New Jersey Department of Health and Senior Services, Trenton, NJ (April 2010).

Report Preparation

This Health Consultation, “DuPont Pompton Lakes Works Site, Community Health Profile, Pompton Lakes, New Jersey” was prepared by the New Jersey Department of Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with the approved agency methods, policies, procedures existing at the date of publication. Editorial review was completed by the cooperative agreement partner. ATSDR has reviewed this document and concurs with its findings based on the information presented. ATSDR’s approval of this document has been captured in an electronic database.

Principal Authors

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

Contributing Analysts and Authors

Pamela Agovino, M.P.H.
Environmental and Occupational Health Surveillance Program
New Jersey Department of Health

Joseph Sweatlock, Ph.D., DABT
Nicole Zubizarreta
Leslie Beres-Sochka, MS Hyg, CPM
Mary Knapp, M.S.N., R.N.
Early Identification and Monitoring Program
New Jersey Department of Health

Jaydeep Nanavaty, M.S.
Childhood Lead Poisoning Prevention Program
New Jersey Department of Health

State Reviewer

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

ATSDR Reviewers

Gregory V. Ulirsch, MS, PhD and Mohammed Uddin, MD, MPH
Technical Project Officers

ATSDR Regional Representatives

Leah T. Graziano, R.S.
Senior Regional Representative
Office of Regional Operations, Region II

Lt. Elena Vaouli, M.P.H.
Associate Regional Representative
Office of Regional Operations, Region II

Appendix

Population Demographic Profile Pompton Lakes, New Jersey

Table A-1. Comparison of Populations of Pompton Lakes, the Six Surrounding Municipalities, and the State of New Jersey.

Statistic	Pompton Lakes	Six Towns	New Jersey
Total Population, 2010	11,097	105,342	8,791,894
Total Population, 2000	10,640	100,797	8,414,350
Percent Change in Population, 2000 to 2010	+ 4.3%	+ 5.0%	+ 4.5%
Persons under 5 years, percent, 2010	5.6%	4.8%	6.2%
Persons under 18 years, percent, 2010	22.2%	22.1%	23.5%
Persons 65 years and over, percent, 2010	12.7%	17.7%	13.5%
Female persons, percent, 2010	51.6%	52.1%	51.3%
White persons, percent, 2010 (a)	87.9%	89.0%	68.6%
Black persons, percent, 2010 (a)	1.4%	1.8%	13.7%
Asian persons, percent, 2010 (a)	5.4%	5.9%	8.3%
Persons of other or unknown race, percent, 2010	3.5%	1.8%	6.7%
Persons reporting two or more races, percent, 2010	1.8%	1.5%	2.7%
Persons of Hispanic or Latino origin, percent, 2010 (b)	10.9%	7.4%	17.7%
White persons not Hispanic, percent, 2010	81.3%	83.8%	59.3%
Living in same house 1 year & over, 2005-2009	91.2%	91.3%	89.0%
Foreign born persons, percent, 2005-2009	16.0%	15.8%	19.7%
Language other than English spoken at home, pct age 5+, 2005-2009	17.0%	20.6%	27.6%
High school graduates, percent of persons age 25+, 2005-2009	91.9%	91.1%	86.8%
Bachelor's degree or higher, pct of persons age 25+, 2005-2009	30.3%	40.5%	34.1%
Mean travel time to work (minutes), workers age 16+, 2005-2009	26.6	27.6	29.6
Housing units, 2010	4,341	39,962	3,553,562
Homeownership rate, 2005-2009	74.8%	83.9%	67.1%
Housing units in multi-unit structures, percent, 2005-2009	24.4%	20.3%	35.8%
Households, 2005-2009	3,716	35,680	3,152,877
Persons per household, 2005-2009	2.96	2.86	2.68
People of all ages in poverty - percent, 2005-2009	1.8%	3.3%	8.8%
Land area in square miles, 2010	2.91	58.15	7,354.22
Persons per square mile, 2010	3,809.5	1811.39	1,195.5

Data Source: U.S. Census Bureau State & County QuickFacts, available on-line at <http://quickfacts.census.gov/qfd/states/34/3460090.html>, supplemented by U.S. Census, DP-1: Profile of General Population and Housing Characteristics: 2010.

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

Table A-2. Detailed population characteristics of Pompton Lakes, 2010 U.S. Census.

By Sex and Age		
Characteristic	Number	Percent
<i>Total population</i>	<i>11,097</i>	<i>100.0</i>
<i>Male population</i>	<i>5,374</i>	<i>48.4</i>
Under 5 years	310	2.8
5 to 9 years	331	3.0
10 to 14 years	376	3.4
15 to 19 years	381	3.4
20 to 24 years	305	2.7
25 to 29 years	344	3.1
30 to 34 years	370	3.3
35 to 39 years	404	3.6
40 to 44 years	428	3.9
45 to 49 years	467	4.2
50 to 54 years	478	4.3
55 to 59 years	342	3.1
60 to 64 years	286	2.6
65 to 69 years	187	1.7
70 to 74 years	119	1.1
75 to 79 years	101	0.9
80 to 84 years	82	0.7
85 years and over	63	0.6
Median age (years)	38.6	--
<i>Female population</i>	<i>5,723</i>	<i>51.6</i>
Under 5 years	306	2.8
5 to 9 years	341	3.1
10 to 14 years	332	3.0
15 to 19 years	335	3.0
20 to 24 years	280	2.5
25 to 29 years	335	3.0
30 to 34 years	416	3.7
35 to 39 years	339	3.1
40 to 44 years	453	4.1
45 to 49 years	477	4.3
50 to 54 years	534	4.8
55 to 59 years	398	3.6
60 to 64 years	323	2.9
65 to 69 years	251	2.3
70 to 74 years	180	1.6
75 to 79 years	155	1.4
80 to 84 years	129	1.2
85 years and over	139	1.3
Median age (years)	42.1	--

Table A-2, continued.

By Race and Hispanic Ethnicity

Characteristic	Number	Percent
<i>Total population</i>	<i>11,097</i>	<i>100.0</i>
One Race	10,901	98.2
White	9,758	87.9
Black or African American	157	1.4
American Indian and Alaska Native	12	0.1
Asian	598	5.4
Native Hawaiian/Pacific Islander	2	0.0
Some Other Race	374	3.4
Two or More Races	196	1.8
Hispanic or Latino (of any race)	1,209	10.9
White alone	739	6.7
Black or African American alone	30	0.3
Other Race alone	357	3.2
Two or More Races	83	0.7
Not Hispanic or Latino	9,888	89.1
White alone	9,019	81.3
Black or African American alone	127	1.1
Other Race alone	629	5.8
Two or More Races	113	1.0

By Household Relationships

Characteristic	Number	Percent
<i>Total population</i>	<i>11,097</i>	<i>100.0</i>
In households	11,078	99.8
Householder	4,190	37.8
Spouse	2,346	21.1
Child	3,448	31.1
Own child under 18 years	2,275	20.5
Other relatives	667	6.0
Under 18 years	161	1.5
65 years and over	181	1.6
Nonrelatives	427	3.8
Under 18 years	21	0.2
65 years and over	23	0.2
Unmarried partner	227	2.0
In group quarters	19	0.2
<i>Total households</i>	<i>4,190</i>	<i>100.0</i>
Family households (families) [7]	2,933	70.0
With own children under 18 years	1,326	31.6
Nonfamily households [7]	1,257	30.0
Households with individuals under 18 years	1,423	34.0
Households with individuals 65 years and over	1,080	25.8
Average household size	2.64	--
Average family size [7]	3.20	--

Table A-2, continued.

Housing Occupancy and Tenure		
Characteristic	Number	Percent
<i>Total housing units</i>	4,341	100.0
Occupied housing units	4,190	96.5
Vacant housing units	151	3.5
Homeowner vacancy rate (percent) [8]	1.3	--
Rental vacancy rate (percent) [9]	5.6	--
Owner-occupied housing units	3,288	78.5
Population in owner-occupied housing units	9,092	--
Avg. household size of owner-occupied units	2.77	--
Renter-occupied housing units	902	21.5
Population in renter-occupied housing units	1,986	--
Avg. household size of renter-occupied units	2.20	--

Source: U.S. Census, DP-1: Profile of General Population and Housing Characteristics: 2010, available on-line at: <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>. See this website for definitions of terms.