Preliminary Analyses of
Hospitalization and Emergency Department Use
Community Health Profile
Pompton Lakes, New Jersey

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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 NJDHSS regulations.

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

Methods

Counts of Visit by Principal Diagnosis: 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.

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.

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 1).

Table 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.

Age-Adjusted Hospitalization Rates: A hospitalization rate is the number of visits in a defined population over a specific interval of time. A rate is usually expressed in a standard way such as "X visits due to cause Y per 100,000 people per year." Crude rates are simple rates and are calculated by dividing the number of events by the product of the total population and the number of years of observation. However, caution must be used when comparing crude rates between population groups (such as comparing a town to the state), or between different time periods (such as the same geographic area during different decades). Two populations with very different age distributions will have very different crude rates, since age may influence the risk of being hospitalized or visiting an emergency room.

One is often interested in comparing the risk of an event in two or more populations, after removing the effect of different age distributions. The "age-adjusted rate" is a construct that shows what the level of an event would be if the age composition was the same between two geographic areas or in two different time periods. Age-adjusted rates are more appropriate than crude rates as indicators of relative risk when comparing across geographic areas that have different age compositions. One way of adjusting for age differences is by computing a Standardized Hospitalization Rate (described below).

NJDHSS compared age-adjusted hospitalization rates for all visits combined and for the principal diagnosis groupings listed in Table 1. Age-adjusted rates were calculated for Pompton Lakes and for the six surrounding municipalities combined

(Oakland Borough, Pequannock Township, Riverdale Borough, Bloomingdale Borough, Wanaque Borough, and Wayne Township), 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.

The age-standardization method that NJDHSS used results in the calculation of a Standardized Hospitalization Ratio (SHR). The SHR is calculated by dividing the observed number of visits by an expected number of visits for the surveyed population over a specific time period. The expected number is the number of visits we would expect to see in the survey population if the hospitalization rates were the same as in the comparison population. The expected number is derived by multiplying the comparison population's age-sex-specific hospitalization rates and the study area age-sex-specific population figures. The comparison rates used to derive the expected number of cases were the New Jersey average annual hospitalization rates for 2006-2010. Population estimates were based on the U.S. Census Bureaus 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).

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

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

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 of Standardized Hospitalization Ratio Analyses

In-patient Hospitalizations

As shown in Table 2, during the 2006-2010 time period the SHRs for in-patient hospitalization were statistically significantly elevated 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.

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

Females

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	169	122.3	**1.38**	**1.18 , 1.61**	**Yes, high**
Benign Neoplasms	62	57.7	1.07	0.82 , 1.38	No
Diabetes Mellitus	25	37.2	**0.67**	**0.43 , 0.99**	**Yes, low**
Diseases of the Blood and Blood Forming Organs	34	38.5	0.88	0.61 , 1.24	No
Diseases of the Nervous System and Sense Organs	81	72.8	1.11	0.88 , 1.38	No
Diseases of the Circulatory System	465	521.9	**0.89**	**0.81 , 0.98**	**Yes, low**
Heart Disease	295	351.7	**0.84**	**0.75 , 0.94**	**Yes, low**
Cerebrovascular Disease	82	90.0	0.91	0.72 , 1.13	No
Diseases of the Respiratory System	236	296.8	**0.80**	**0.70 , 0.90**	**Yes, low**
Asthma	35	50.8	**0.69**	**0.48 , 0.96**	**Yes, low**
Diseases of the Digestive System	367	356.1	1.03	0.93 , 1.14	No
Chronic Renal Failure	4	0.5	**8.74**	**2.4 , 22**	**Yes, high**
Acute Renal Failure	20	27.0	0.72	0.44 , 1.12	No
Congenital Anomalies	11	2.7	**4.12**	**2.0 , 7.4**	**Yes, high**
All visits	3,837	3,964	0.97	0.94 , 1.0	No

Males (*Table 2 continued*)

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	118	95.6	**1.23**	**1.02 , 1.48**	**Yes, high**
Benign Neoplasms	9	3.9	**2.30**	**1.1 , 4.4**	**Yes, high**
Diabetes Mellitus	30	49.0	**0.61**	**0.41 , 0.87**	**Yes, low**
Diseases of the Blood and Blood Forming Organs	26	17.9	1.45	0.95 , 2.1	No
Diseases of the Nervous System and Sense Organs	49	55.1	0.89	0.66 , 1.17	No
Diseases of the Circulatory System	514	565.5	**0.91**	**0.83 , 0.99**	**Yes, low**
Heart Disease	378	413.4	0.91	0.82 , 1.01	No
Cerebrovascular Disease	67	72.5	0.92	0.72 , 1.17	No
Diseases of the Respiratory System	207	237.2	0.87	0.76 , 1.0	No
Asthma	31	23.2	1.34	0.91 , 1.9	No
Diseases of the Digestive System	279	285.8	0.98	0.86 , 1.1	No
Chronic Renal Failure	1	0.3	3.74	0.05 , 21	No
Acute Renal Failure	21	28.8	0.73	0.45 , 1.12	No
Congenital Anomalies	9	4.2	2.13	0.97 , 4.0	No
All visits	2,681	2,834	**0.95**	**0.91 , 0.98**	**Yes, low**

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 3).

Table 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.

Females

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	1,328	1,343	0.99	0.94 , 1.04	No
Benign Neoplasms	474	572.3	**0.83**	**0.76 , 0.91**	**Yes, low**
Diabetes Mellitus	285	515.4	**0.55**	**0.49 , 0.62**	**Yes, low**
Diseases of the Blood and Blood Forming Organs	407	556.5	**0.73**	**0.66 , 0.81**	**Yes, low**
Diseases of the Nervous System and Sense Organs	747	801.2	0.93	0.87 , 1.0	No
Diseases of the Circulatory System	5,870	6,536	**0.90**	**0.88 , 0.92**	**Yes, low**
Heart Disease	3,973	4,421	**0.90**	**0.87 , 0.93**	**Yes, low**
Cerebrovascular Disease	1,053	1,126	**0.93**	**0.88 , 0.99**	**Yes, low**
Diseases of the Respiratory System	3,410	3,536	0.96	0.93 , 1.0	No
Asthma	356	608.3	**0.59**	**0.53 , 0.65**	**Yes, low**
Diseases of the Digestive System	3,915	3,843	1.02	0.99 , 1.05	No
Chronic Renal Failure	12	12.4	0.97	0.50 , 1.69	No
Acute Renal Failure	315	411.5	**0.77**	**0.68 , 0.85**	**Yes, low**
Congenital Anomalies	56	48.4	1.16	0.87 , 1.50	No
All visits	38,240	40,972	**0.93**	**0.92 , 0.94**	**Yes, low**

Males

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	1,137	1,150	0.99	0.93 , 1.05	No
Benign Neoplasms	88	89.0	0.99	0.79 , 1.22	No
Diabetes Mellitus	349	605.8	**0.58**	**0.52 , 0.64**	**Yes, low**
Diseases of the Blood and Blood Forming Organs	313	374.2	**0.84**	**0.75 , 0.93**	**Yes, low**
Diseases of the Nervous System and Sense Organs	567	627.0	**0.90**	**0.83 , 0.98**	**Yes, low**
Diseases of the Circulatory System	6,369	6,769	**0.94**	**0.92 , 0.96**	**Yes, low**
Heart Disease	4,614	4,928	**0.94**	**0.91 , 0.96**	**Yes, low**
Cerebrovascular Disease	905	913.2	0.99	0.93 , 1.06	No
Diseases of the Respiratory System	2,954	2,925	1.01	0.97 , 1.05	No

Males *(Table 3 continued)*

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Asthma	217	351.0	**0.62**	**0.54 , 0.71**	**Yes, low**
Diseases of the Digestive System	3,092	3,021	1.02	0.99 , 1.06	No
Chronic Renal Failure	27	20.8	1.29	0.85 , 1.88	No
Acute Renal Failure	309	407.4	**0.76**	**0.68 , 0.85**	**Yes, low**
Congenital Anomalies	56	56.0	1.00	0.76 , 1.30	No
All visits	29,274	30,380	**0.96**	**0.95 , 0.97**	**Yes, low**

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 4). 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.

Table 4. Standardized Hospitalization Ratios (SHRs) for emergency department (ED) visits: Pompton Lakes compared to the State of NJ, 2006-2010, by sex.

Females

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	3	1.1	2.7	0.5 , 7.8	No
Benign Neoplasms	8	4.8	1.7	0.7 , 3.3	No
Diabetes Mellitus	30	34.5	0.87	0.59 , 1.24	No
Diseases of the Blood and Blood Forming Organs	11	10.1	1.08	0.54 , 1.94	No
Diseases of the Nervous System and Sense Organs	562	468.7	**1.20**	**1.10, 1.30**	**Yes, high**
Diseases of the Circulatory System	119	146.3	**0.81**	**0.67 , 0.97**	**Yes, low**
Heart Disease	34	38.8	0.88	0.61 , 1.23	No
Cerebrovascular Disease	8	7.1	1.1	0.5 , 2.2	No
Diseases of the Respiratory System	700	909.9	**0.77**	**0.71 , 0.83**	**Yes, low**
Asthma	109	169.6	**0.64**	**0.53 , 0.78**	**Yes, low**
Diseases of the Digestive System	430	534.4	**0.80**	**0.73 , 0.88**	**Yes, low**
Chronic Renal Failure	2	0.2	**11**	**1.2 , 39**	**Yes, high**
Acute Renal Failure	0	0.02	0.0	--	No
Congenital Anomalies	1	0.5	2.2	0.03 , 12	No
All visits	7,560	9,016	**0.84**	**0.82 , 0.86**	**Yes, low**

Males *(Table 4 continued)*

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	7	1.7	**4.08**	**1.64 , 8.41**	**Yes, high**
Benign Neoplasms	1	0.1	8.66	0.11 , 48.16	No
Diabetes Mellitus	25	41.1	**0.61**	**0.39 , 0.9**	**Yes, low**
Diseases of the Blood and Blood Forming Organs	16	13.5	1.19	0.68 , 1.93	No
Diseases of the Nervous System and Sense Organs	418	375.0	**1.11**	**1.01 , 1.23**	**Yes, high**
Diseases of the Circulatory System	95	128.3	**0.74**	**0.6 , 0.91**	**Yes, low**
Heart Disease	31	47.4	**0.65**	**0.44 , 0.93**	**Yes, low**
Cerebrovascular Disease	6	4.4	1.35	0.49 , 2.95	No
Diseases of the Respiratory System	622	738.8	**0.84**	**0.78 , 0.91**	**Yes, low**
Asthma	88	136.7	**0.64**	**0.52 , 0.79**	**Yes, low**
Diseases of the Digestive System	399	443.8	**0.90**	**0.81 , 0.99**	**Yes, low**
Acute Renal Failure	0	0.03	0.0	--	No
Congenital Anomalies	3	0.3	**10.72**	**2.15 , 31.31**	**Yes, high**
All visits	7,178	7,672.5	**0.94**	**0.91 , 0.96**	**Yes, low**

As shown in Table 5, during the 2006-2010 time period 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.

Table 5. 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.

Females

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	36	37.9	0.95	0.67 , 1.32	No
Benign Neoplasms	36	87.9	**0.41**	**0.29 , 0.57**	**Yes, low**
Diabetes Mellitus	205	419.1	**0.49**	**0.42 , 0.56**	**Yes, low**
Diseases of Blood and Blood Forming Organs	151	320.0	**0.47**	**0.4 , 0.55**	**Yes, low**
Diseases of the Nervous System and Sense Organs	3,227	4,235	**0.76**	**0.74 , 0.79**	**Yes, low**
Diseases of the Circulatory System	1,167	1,683	**0.69**	**0.65 , 0.73**	**Yes, low**
Heart Disease	406	516.2	**0.79**	**0.71 , 0.87**	**Yes, low**
Cerebrovascular Disease	75	130.0	**0.58**	**0.45 , 0.72**	**Yes, low**
Diseases of the Respiratory System	4,367	8,279	**0.53**	**0.51 , 0.54**	**Yes, low**
Asthma	733	1,563	**0.47**	**0.44 , 0.5**	**Yes, low**
Diseases of the Digestive System	3,250	4,935	**0.66**	**0.64 , 0.68**	**Yes, low**
Chronic Renal Failure	11	12.4	0.89	0.44 , 1.59	No
Acute Renal Failure	2	1.6	1.2	0.1 , 4.4	No
Congenital Anomalies	13	10.6	1.23	0.65 , 2.1	No
All visits	59,071	84,790	**0.70**	**0.69 , 0.7**	**Yes, low**

Males

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Malignant Neoplasms	36	35.2	1.02	0.72 , 1.42	No
Benign Neoplasms	12	9.6	1.25	0.65 , 2.19	No
Diabetes Mellitus	**213**	**452.9**	**0.47**	**0.41 , 0.54**	**Yes, low**
Diseases of Blood and Blood Forming Organs	**117**	**231.4**	**0.51**	**0.42 , 0.61**	**Yes, low**
Diseases of the Nervous System and Sense Organs	**2,510**	**3,380**	**0.74**	**0.71 , 0.77**	**Yes, low**
Diseases of the Circulatory System	**1,020**	**1,507**	**0.68**	**0.64 , 0.72**	**Yes, low**
Heart Disease	**447**	**576.5**	**0.78**	**0.71 , 0.85**	**Yes, low**
Cerebrovascular Disease	**85**	**113.3**	**0.75**	**0.6 , 0.93**	**Yes, low**
Diseases of the Respiratory System	**3,921**	**6,756**	**0.58**	**0.56 , 0.6**	**Yes, low**

Males *(Table 5 continued)*

Principal Diagnosis Category	Observed	Expected	SHR	95% Confidence Interval	Statistically Significant Difference?
Asthma	**648**	**1,309**	**0.50**	**0.46 , 0.53**	**Yes, low**
Diseases of the Digestive System	**2,832**	**3,998**	**0.71**	**0.68 , 0.74**	**Yes, low**
Chronic Renal Failure	16	15.8	1.01	0.58 , 1.64	No
Acute Renal Failure	1	0.5	1.9	0.02 , 10	No
Congenital Anomalies	14	12.7	1.11	0.6 , 1.85	No
All visits	**53,757**	**70,879**	**0.76**	**0.75 , 0.76**	**Yes, low**