THE STATE OF ASTHMA IN NASSAU, QUEENS, AND SUFFOLK COUNTIES

ASSESSING TRENDS IN ASTHMA BURDEN

ASTHMA COALITION OF LONG ISLAND

Asthma Coalition of Queens

TABLE OF CONTENTS

Anne Little, MPH, AE-C
Director, ACLI

Claudia Guglielmo, MPA, AE-C
Director, ACQ

A MESSAGE FROM THE ASTHMA COALITIONS

In 1999, then Governor George Pataki became aware of the high number of hospitalizations and emergency department visits for asthma across New York State. When asthma is properly managed, most hospitalizations and emergency department visits can be avoided. The Governor authorized grants to be offered by the New York State Department of Health called "A Systems Approach to Reducing the Burden of Asthma." The New York State Department of Health continues to fund eight regional asthma coalitions that are charged with reducing the burden of asthma in New York State.

The coalitions implement interventions in communities with high rates of asthma-related hospitalizations and emergency department visits; they identify and focus services on high-risk populations within their regions, convening and engaging local stakeholders; and they apply a population-based systems change approach that translates the National Asthma Education and Prevention Program (NAEPP) Expert Panel Report 3 Guidelines into practice. The goals of these interventions are to increase the quality of life among individuals living with asthma and to decrease the number of asthma-related hospitalizations, emergency department visits, urgent care visits and school or work days lost.

The Asthma Coalition of Long Island and the Asthma Coalition of Queens, programs of the American Lung Association of the Northeast, are guided by a strategic plan that helps promote systems changes within hospitals, primary care, and schools. Some examples of this work include:

- Project BREATHE (Bringing Resources for Effective Asthma Treatment through Health Education): a systems and culture change implemented for patients from Queens, Nassau and Suffolk counties. The program brings a multi-disciplinary approach to integrating NAEPP Guidelines-based care for patients admitted to the hospital or in the emergency room.
- Integration of the NAEPP Guidelines into primary care practices: building asthma care templates into the electronic medical records, embedding Guidelines into the daily workflow and educating each patient at every office visit about asthma.
- School Asthma Management: with the help of college nursing students, we implement evidence-based asthma management programs for children with asthma in high-needs school districts.

The team of experts from the Krasnoff Quality Management Institute (KQMI) has provided a provocative analysis of data about asthma hospitalizations, emergency department visits and intensive care admissions which heighten awareness of the regional problem of asthma. This report has the potential to identify the most vulnerable demographic subgroups and to promote discussion on addressing life-threatening asthma and its prevention. The data from this report can help enhance our current work and expand our reach in the future.

INTRODUCTION TO THE REPORT

What is Asthma?

Asthma is a chronic lung disease that causes inflammation and narrowing of the airways. Symptoms of asthma include recurring periods of wheezing, chest tightness, shortness of breath, and coughing. Asthma affects people of all ages but most often starts in childhood. In the United States more than 25 million people are known to have asthma; 7 million are children.

Exposures to triggers can cause asthma symptoms. Triggers include colds and infections, mold, dust, pet dander, pollen, tobacco smoke, and cockroaches. To prevent or minimize asthma symptoms, the National Asthma Education and Prevention Program Guidelines recommend that people avoid their triggers and be treated with inhaled corticosteroids.

When asthma is uncontrolled, urgent or emergency care may be needed. A severe attack can lead to hospitalization and sometimes turn life-threatening, necessitating an intensive care unit admission and in some cases, mechanical ventilation of the lungs.

Anyone with asthma can have a severe attack. In the United States there were 1.8 million emergency department visits with asthma as a primary diagnosis (2011[1]), 439,000 hospital discharges (2010[2]) and 3,651 asthma-related deaths (2014[3]).

Although asthma's impact does not discriminate, some groups are at higher risk for morbidity and mortality than others: children less than four years of age, ethnic and regional groups, such as Blacks and Puerto Ricans, and low income populations living in environmentally compromised housing/neighborhoods.

In the United States, uncontrolled asthma leads to:

1,800,000 annual Emergency Department Visits

439,000 annual Hospitalizations

3,651 annual Asthma-Related Deaths

[1] National Hospital Ambulatory Medical Care Survey; Emergency Department Summary Table 12
[2] National Hospital Discharge Survey
[3] CDC Wonder

We Hope to Trend Patterns of Emergency Department Visits Due to Asthma

Goals of the Asthma Report

- Identify the numbers of life-threatening cases of asthma, including the need for intensive care unit admission or assisted/mechanical ventilation
- Focus attention on the frequency of serious and life-threatening asthma attacks in the Queens and Long Island communities
- Highlight subgroups of the population that are most vulnerable to severe asthma attacks
- Identify communities with the highest asthma burden
- Provide a call for action to search for solutions to decrease the asthma burden on individuals, families and society
- Trend the patterns of asthma-related emergency department visits and hospitalizations over time

How Can Data Help Reduce the Burden?

Controlling asthma to reduce morbidity and mortality is a global priority. On a national and local level organizations link together to coordinate resources in order to reduce the burden of asthma. The Asthma Coalition of Long Island and the Asthma Coalition of Queens, programs of the American Lung Association, work with local stakeholders to develop comprehensive and collaborative strategies to decrease the burden of asthma in the counties of Nassau, Queens, and Suffolk. The Asthma Coalitions leverage data to develop strategies and allocate resources. While national and state reports define the larger problem, regional data helps identify areas of highest asthma burden, create local awareness of asthma severity, and establish benchmarks for success of ongoing initiatives.

It is important to review data that includes severe asthma events such as Emergency Department (ED) visits, hospitalizations and Intensive Care Unit (ICU) admissions. Assessing data trends helps to identify whether efforts to reduce asthma event severity are successful. Tracking asthma events by town of residence helps pinpoint the 'hotspots' where regional needs are the greatest. Analyzing data by age, race and gender enables more vulnerable demographic subgroups to be targeted. Data analysis also provokes discussion to find out 'why' these events are occurring, leading to new interventions.

Finally, identifying life-threatening cases of asthma, which require ICU admission or assisted ventilation, are of great concern to patients, families and the medical community. While this data is often not found in national or statewide reporting, we feel that more attention needs to be directed to these critical events. We include this data in the report with the goal of increasing awareness of life-threatening asthma and ultimately promoting its prevention.

METHODOLOGY

Data was Collected from 2006 to 2014

Data was obtained from the Statewide Planning and Research Cooperative System (SPARCS), which collects information on hospital services in New York State covered by all payors. Inpatient asthma data covers the period January 1, 2000 through December 31, 2014, and emergency department asthma data, January 1, 2006 through December 31, 2014. Data includes patient characteristics, coded diagnoses, procedures and services.

The asthma population in the following report was defined by a principal ICD-9 discharge diagnosis for hospitalized patients and treat-and-release emergency department visits. Emergency department visits admitted for inpatient hospitalization were defined by an admitting ICD-9 diagnosis of asthma.

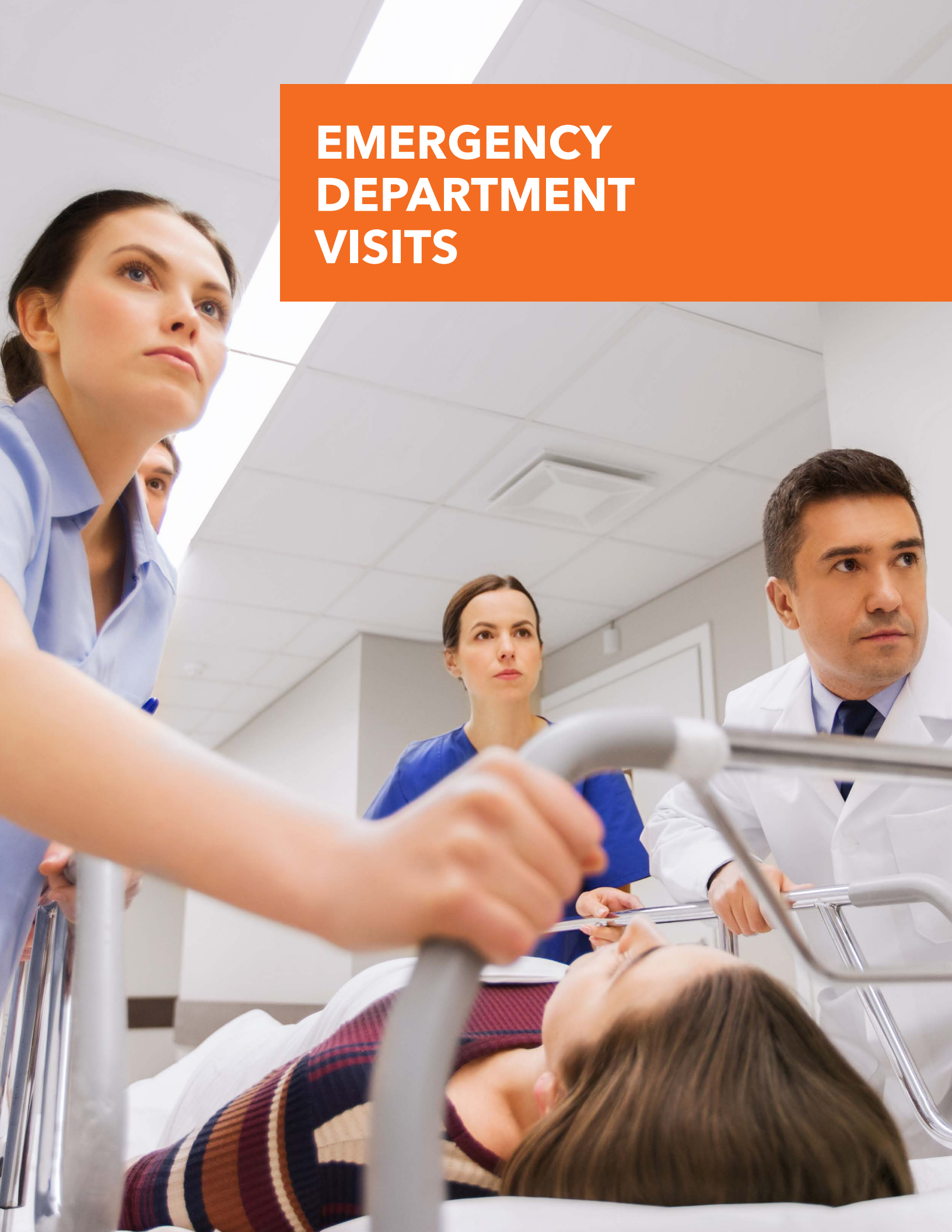
Descriptive analyses include patient location, age, race and ethnicity, and insurance status. ICU admission and mechanical ventilation were also reported, identified by revenue codes and ICD-9 procedure codes, respectively.

County level rates per ten thousand were constructed using the U.S. Census Bureau's annual population estimates, with each year's estimate used for each year reported. Town-level analyses used the 2010 U.S. Census zip-code level data. These rates represent the number of occurrences among 10,000 residents of the area, and allow comparison across areas with varying population densities or within a geographic area over time when the population density may have changed.

Since changes in reporting data on race and ethnicity occurred in 2005, we present specific race/ethnicity data starting from January 1st, 2006. For this report, race and ethnicity is presented either as Hispanic, Black/African American, White, Asian or Pacific Islander or Other/Unknown, which includes Multi-Racial, Native American (Native American or Inuit), other race, or missing. When ethnicity was indicated as Spanish or Hispanic origin, data was collapsed into the category termed Hispanic.

Methods of payment are based on the primary payor, such as Medicare, Medicaid third party payors, or self-pay. The category 'Other' includes payors such as Corrections, No Fault or Worker's Comp, Other Gov and Other forms of payment. Payment data reported for the inpatient population begins at January 1st, 2000. Emergency department payment data is reported starting January 1st, 2008 due to possible incomplete or missing data before that date.

EMERGENCY DEPARTMENT VISITS



There were 277,869 ED visits for asthma in Nassau, Suffolk, and Queens Counties during the nine-year period: 2006-2014.

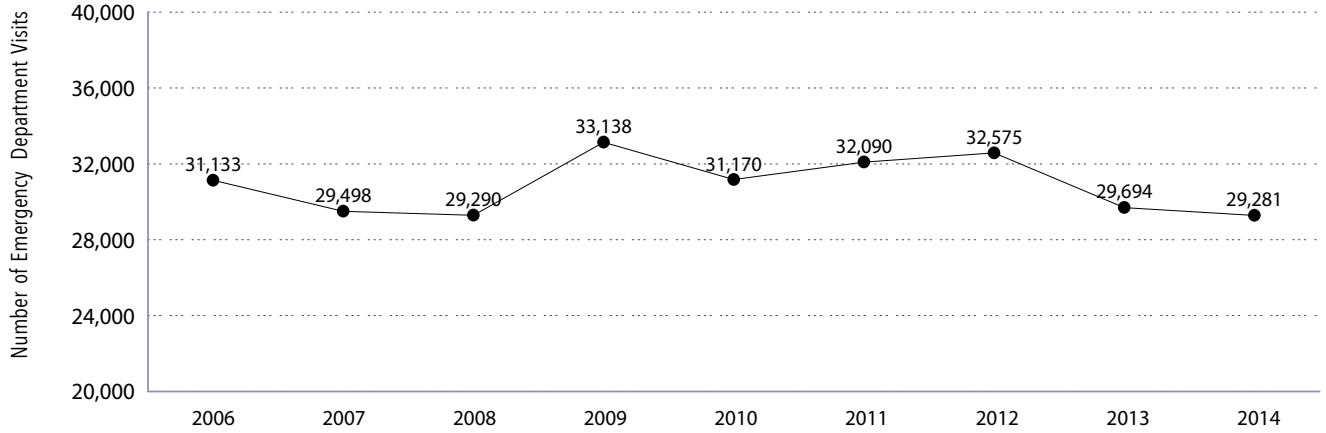
Although there is yearly fluctuation in the numbers of Emergency Department (ED) vis¬its for asthma, there were no clear changes over time. This pattern is similar to National and State trends where the numbers of ED visits for asthma did not change substantially over the past decade.

The top figure show the total number of ED visits per year for the combined three counties.

The bottom figure shows rates per 10,000 population per year. Rates take population shifts into account, allowing year to year comparisons. For example, in 2006 there were 62.6 asthma ED visits for every 10,000 people residing in Nassau, Suffolk, and Queens Counties that year.

Number of Asthma Emergency Department Visits by Year

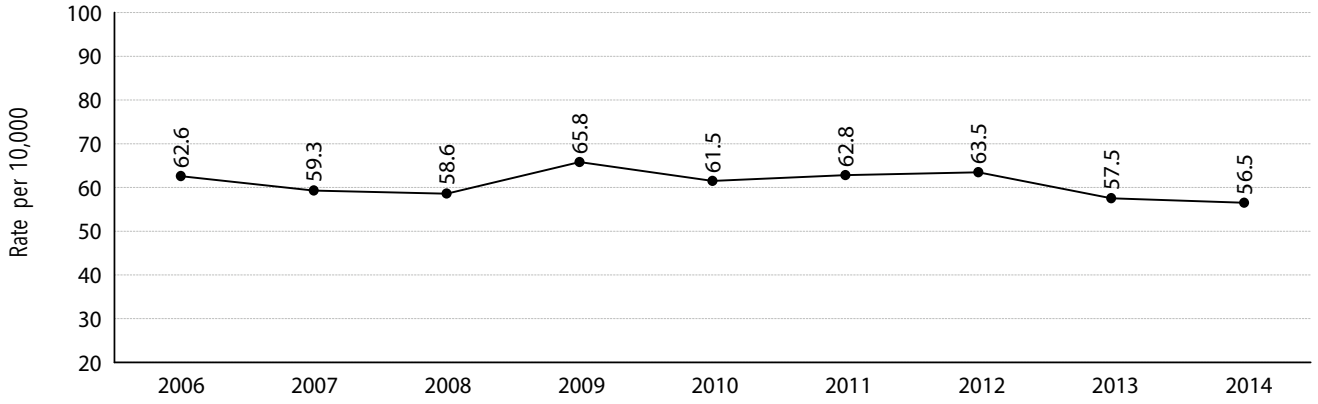
Nassau, Queens & Suffolk, 2006 -2014



Source: New York State SPARCS Database.

Rate of Asthma Emergency Department Visits by Year

Nassau, Queens & Suffolk, 2006 -2014



Source: New York State SPARCS Database; U.S Census Bureau Annual Population Estimates.

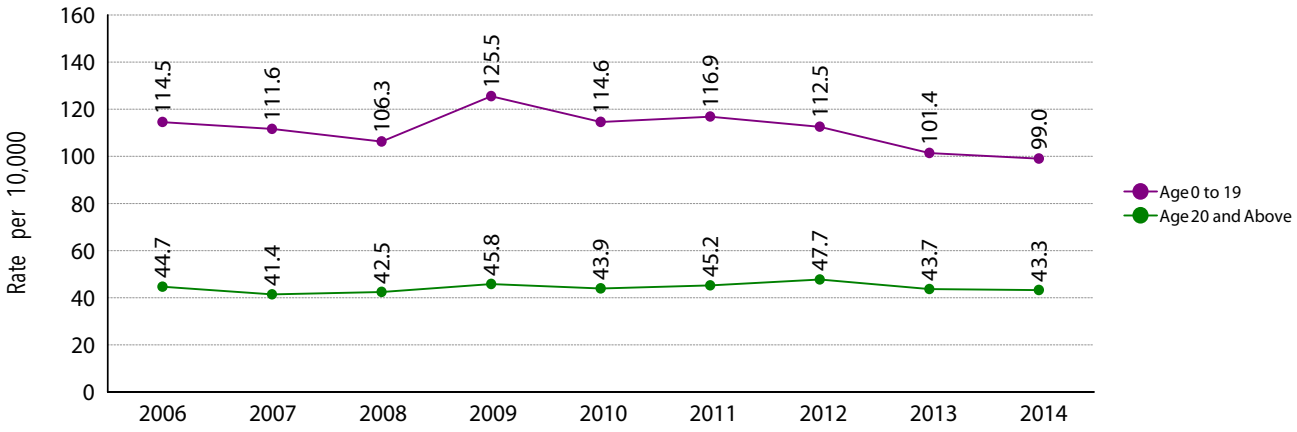
Among children (top line) there appears to be a downward trend in Emergency Department (ED) asthma visits in recent years. There does not appear to be much change in ED visit rates over time among adults.

This figure compares pediatric (age 0-19 years, top line) to adult (bottom line) yearly asthma ED visit rates.

Pediatric ED asthma visits are 2-3 times more common than those of adults (ages 20 and older).

Rate of Asthma Emergency Department Visits by Age Group & Year

Nassau, Queens & Suffolk, 2006-2014



Source: New York State SPARCS Database; U.S Census Bureau Annual Population Estimates.

Asthma Emergency Department Visits by Age Group and Year

Nassau, Queens & Suffolk, 2006-2014

		0-4	5-9	10-14	15-19	20-44	45-64	65+	Total
2006-2008	**Number of ED Visits**	17,233	11,652	7,557	5,746	26,973	15,684	5,076	**89,921**
	Rate per 10,000 Population	193.2	129.2	75.9	56.5	52.0	39.7	25.4	
2009-2011	**Number of ED Visits**	18,072	12,811	8,117	5,932	27,416	18,635	5,415	**96,398**
	Rate per 10,000 Population	205.2	140.4	83.8	58.4	53.1	44.5	25.9	
2012-2014	**Number of ED Visits**	14,658	12,003	6,872	5,249	27,015	19,871	5,882	**91,550**
	Rate per 10,000 Population	163.6	133.3	72.8	53.8	52.0	46.0	26.2	
Total	**Number of ED Visits**	**49,963**	**36,466**	**22,546**	**16,927**	**81,404**	**54,190**	**16,373**	**277,869**

Source: New York State SPARCS Database

Dividing data into specific age ranges allows clearer and more precise estimates of trends in age-related morbidity.

Emergency Department (ED) rates decrease as age increases.

Rates are highest in the youngest age groups and lowest in the oldest age groups. Because there are more years in the adult age range, the majority of asthma ED visits occur in those 20 years and older.

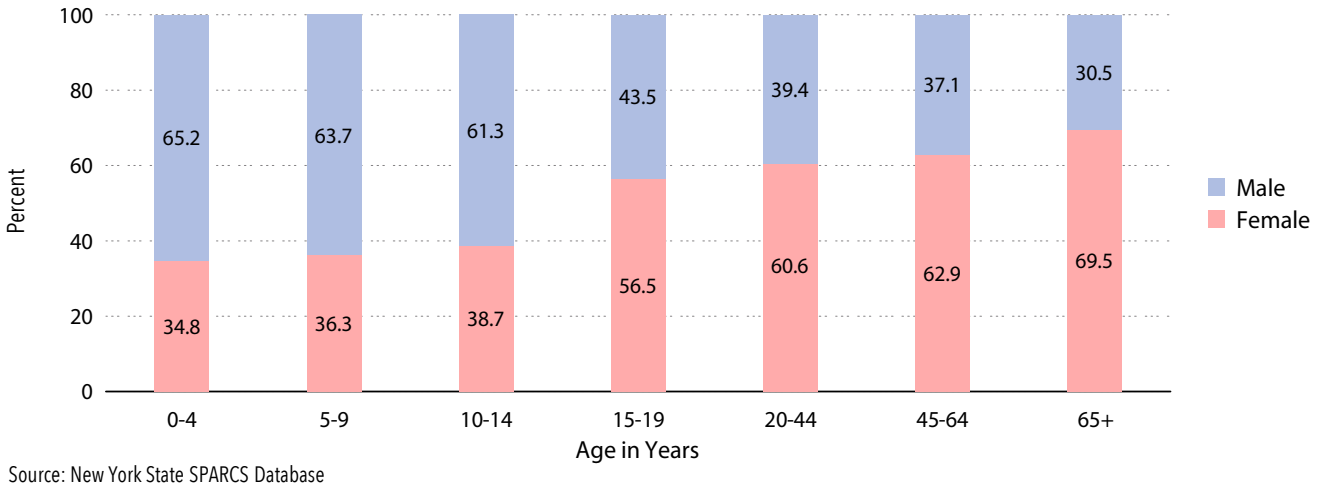
Among children, downward trends in asthma ED visits occur in most but not all ages. In contrast, among adults, asthma ED visits appear constant or are increasing over time.

Caution should be used in interpreting data among the very youngest (age 0-2 years) and the older populations where correct classification of asthma diagnosis is more challenging.

The figure shows data grouped into three year intervals and specific age ranges. Boxes show the total number of visits and the visit rate per 10,000 population. For example, in the years 2006-2008 there were 17,233 ED asthma visits for children age 0-4 years. The rate was 193.2 for 10,000 population. The bottom row, labeled "Total," summarizes the distribution of asthma ED visits by age. For example, for the 9 year observation period, 49,963/277,869 asthma ED visits occurred in children 0-4 years. The last column, labeled "Total," indicates the total number of visits for that time period. For example, there were 89,921 asthma ED visits for all ages in the years 2006-2008.

Percentage of Asthma Emergency Department Visits by Gender

Nassau, Queens & Suffolk, 2006-2014



Source: New York State SPARCS Database

As the figure indicates, in the younger age groups, most Emergency Department (ED) asthma visits occur in boys. This pattern begins to reverse in adolescence. With increasing age, most patients in the ED with asthma are female.

This figure shows the percentage of males and females who present to the ED for asthma for each age grouping. For example, of those age 0-4 years, 65.2% are female.

It is well known that asthma susceptibility is gender and age related. There is a greater prevalence of asthma and greater morbidity associated with asthma in males when young and females when older.

Queens has higher asthma ED visit rates than Nassau or Suffolk Counties.

Asthma Emergency Department Visits by County

Nassau, Queens & Suffolk, 2006-2014

ED Visits per 10,000 Population				
	Nassau	Queens	Suffolk	Total
2006-2008	40.3	78.1	51.4	60.2
2009-2011	43.7	81.6	53.7	63.4
2012-2014	40.5	76.3	49.6	59.2
All Years	41.5	78.7	51.6	60.9
% Change	+0.5	-2.3	-3.5	-1.7

Percent Change = Difference between 2006-2008 and 2012-2014.

Number of Asthma Emergency Department Visits 2006-2014

	Nassau	Queens	Suffolk	Total
Number of ED Visits	50,067	158,595	69,207	277,869

Source: New York State SPARCS Database

Queens has the highest asthma (Emergency Department) ED visit rates (78.7) when compared to Nassau (41.5) or Suffolk (51.6). When the earlier time periods are compared to the later time periods, there is little change in asthma ED visit rates for any of the three counties. For example, in Nassau County, there was only a 0.5% change over time.

The table compares asthma ED visit rates by county over time. Data is grouped into three year periods to allow for easier comparison. The row labeled "% change" compares years 2006-2008 to years 2012-2014 for each of the three counties as well as for the three counties combined.

HOSPITAL DISCHARGE RATES

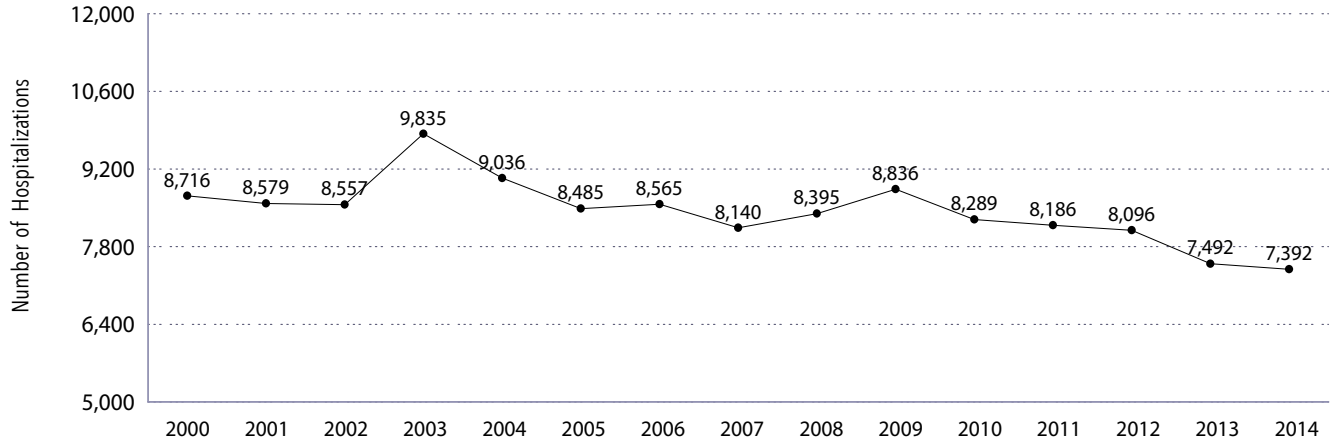
There were 126,599 asthma hospitalizations in Nassau, Queens, and Suffolk Counties during the 15-year period 2000-2014.

While there was yearly fluctuation in the number and rates of asthma hospitalizations, the overall yearly averages appear to trend downward over time. This pattern is similar to national trends where the rates of asthma hospitalizations appear to be decreasing over time (www.cdc.gov/ashtma/most_recent_data.htm).

The top figure presents the yearly number of asthma hospitalizations for the three counties. The bottom figure presents the annual rate of asthma hospitalizations for the three counties.

Number of Asthma Hospitalizations by Year

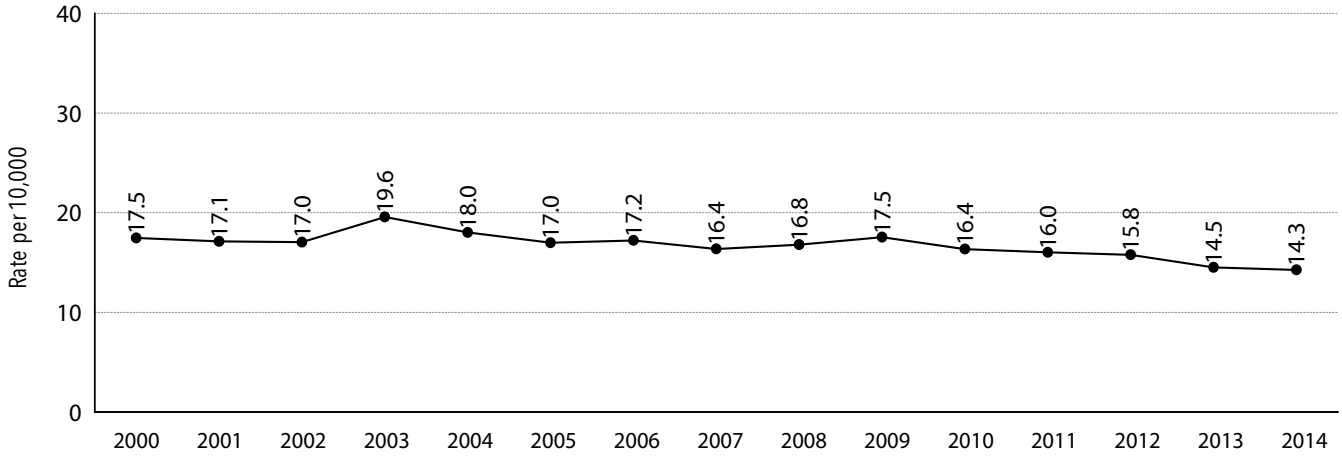
Nassau, Queens & Suffolk, 2000 -2014



Source: New York State SPARCS Database.

Rate of Asthma Hospitalizations by Year

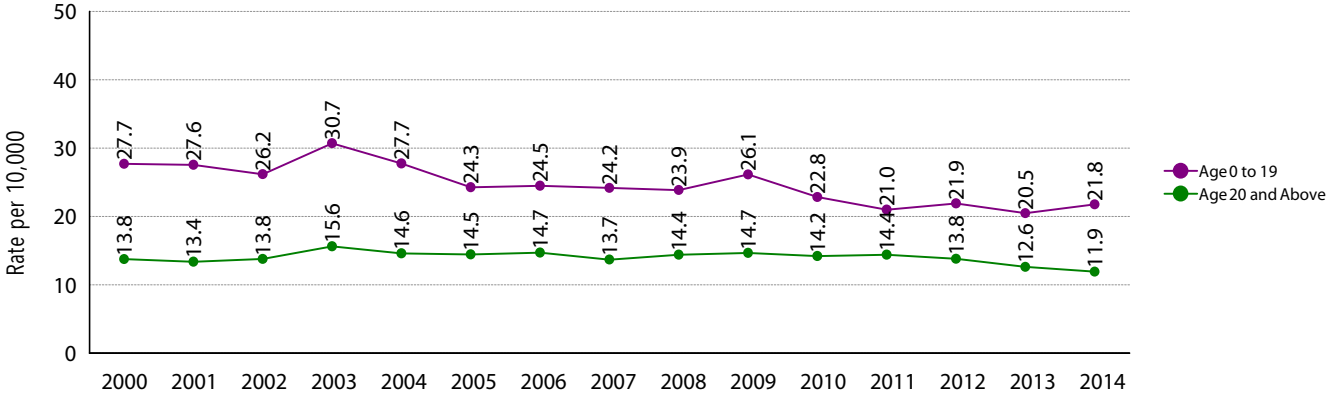
Nassau, Queens & Suffolk, 2000 -2014



Source: New York State SPARCS Database; U.S Census Bureau Annual Population Estimates.

Rate of Asthma Hospitalizations by Age Group & Year

Nassau, Queens & Suffolk, 2000 -2014



Source: New York State SPARCS Database; U.S Census Bureau Annual Population Estimates.

Similar to patterns of Emergency Department (ED) visits, pediatric asthma hospitalization rates are higher than adult asthma hospitalization rates.

This figure compares pediatric (0-19 years) with adult asthma hospitalization rates over time.

Over time there appears to be a downward trend in both pediatric and adult asthma hospitalization rates.

Drilling down into specific age groups reveals asthma hospitalization rates highest in the youngest and the oldest age groups and lowest in adolescence and in younger adults.

The age-related differences in hospitalization for asthma indicate the highest rates in the youngest and oldest age groups. This pattern contrasts with Emergency Department (ED) visits, where rates are highest in the youngest age groups and lowest in the oldest age groups. Hospitalization rates seem to be increasing over time in the oldest age group and decreasing in every other age group. As the row "Total" indicates, the majority of hospitalizations occurs in individuals over 20 years of age.

The table shows that hospitalizations are grouped into 5 year intervals and further broken down by specific age groups (rather than pediatric versus adult).

Asthma Hospitalizations by Age Group and Year

Nassau, Queens & Suffolk, 2000 -2014

		0-4	5-9	10-14	15-19	20-44	45-64	65+	Total
2000-2004	**Number of Hospitalizations**	10,241	4,372	2,538	1,264	9,125	9,746	7,437	**44,723**
	Rate per 10,000	63.8	26.2	14.6	8.0	9.9	16.3	22.6	
2005-2009	**Number of Hospitalizations**	8,606	3,883	2,089	1,059	7,037	10,308	9,439	**42,421**
	Rate per 10,000	57.6	25.7	12.6	6.3	8.1	15.6	28.2	
2010-2014	**Number of Hospitalizations**	7,026	3,581	1,876	974	5,331	10,738	9,929	**39,455**
	Rate per 10,000	47.3	23.7	11.8	5.9	6.2	15.1	27.2	
Total	**Number of Hospitalizations**	**25,873**	**11,836**	**6,503**	**3,297**	**21,493**	**30,792**	**26,805**	**126,599**

Sources: New York State SPARCS Database.

For the three counties combined, there is a 13.5% decrease in asthma hospitalization rates when years 2000-2004 are compared to more recent rates (see the last column). However, the decrease appears to be driven by the 24.2% drop in Queens County; rates changes little for Nassau and Suffolk Counties.

The table compares trends in asthma hospitalization admission rates over time among the three counties.

Queens has a higher asthma hospitalization rate (20.1) than Nassau (14.3) or Suffolk (13.8) Counties.

Asthma Hospitalizations by County of Residence

Nassau, Queens & Suffolk, 2000 - 2014

Hospitalization Rates per 10,000 Population				
	Nassau	**Queens**	**Suffolk**	**Total**
2000-2004	14.5	22.7	13.6	17.8
2005-2009	14.4	20.6	14.0	17.0
2010-2014	14.1	17.2	13.8	15.4
All Years	14.3	20.1	13.8	16.7
% Change	**-2.8**	**-24.2**	**+1.4**	**-13.5**

Percent Change=Difference between 2000-2004 and 2010-2014.

Number of Asthma Hospitalizations, 2000 - 2014

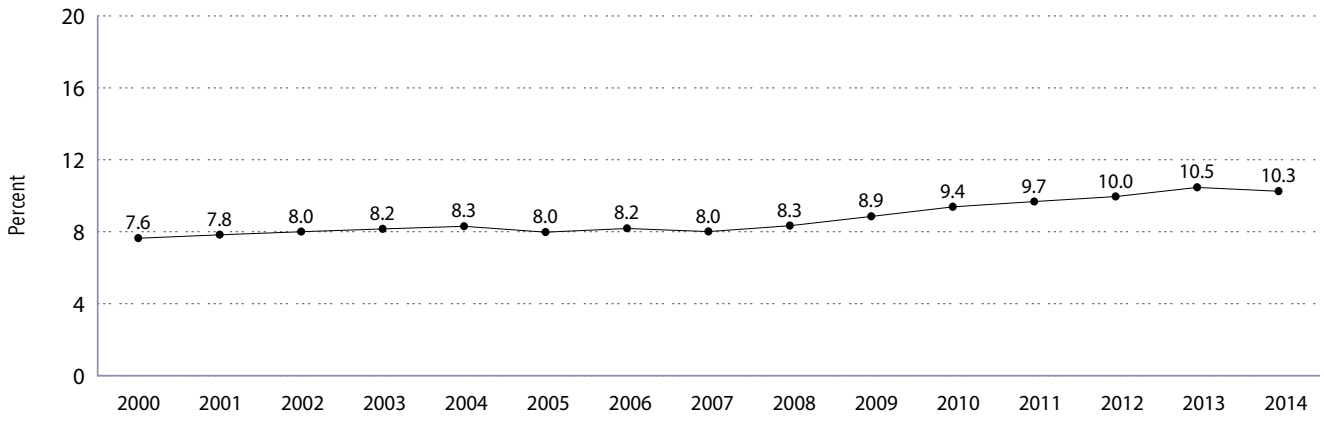
	Nassau	**Queens**	**Suffolk**
Number of Hospitalizations	28,723	67,344	30,532

Source: New York State SPARCS Database.

INTENSIVE CARE UNIT VISITS FOR ASTHMA

Percentage of Asthma Hospitalizations Admitted to the ICU by Year

Nassau, Queens & Suffolk, 2000-2014



Source: New York State SPARCS Database.

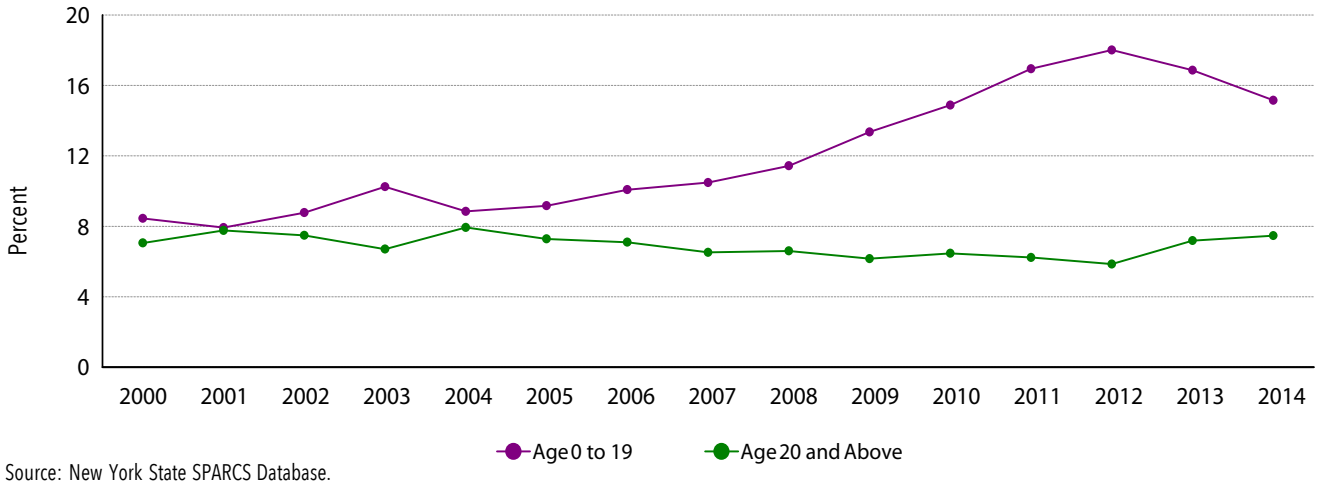
In 2000, 7.6% of those hospitalized for asthma were admitted to the Intensive Care Unit (ICU). In 2014, ICU admissions rose to 10.3%.

This figure shows the percent (%) of individuals hospitalized for asthma who were admitted to the ICU.

Among those hospitalized for asthma, ICU admissions are increasing over time.

Percentage of Asthma Hospitalizations Admitted to the ICU by Age Group and Year

Nassau, Queens & Suffolk, 2000 -2014



Source: New York State SPARCS Database.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Age 0-19 Percent	8.4	7.9	8.8	10.2	8.8	9.2	10.1	10.5	11.4	13.4	14.9	16.9	18.0	16.9	15.2
Age 20 and Above Percent	7.1	7.8	7.5	6.7	7.9	7.3	7.1	6.5	6.6	6.2	6.5	6.2	5.9	7.2	7.5

ICU admission rates for asthma have increased in children and not in adults.

There is a marked increase of the proportion of hospitalized children with asthma who were admitted to the Intensive Care Unit (ICU). Among adults, ICU admission rates for asthma appear to be unchanged.

This figure shows the percent of individuals hospitalized for asthma who were admitted to the ICU. Pediatric (0-19 years) trends are compared to adult trends.

Percentage of Asthma Hospitalizations Admitted to the ICU by Age Group

Nassau, Queens & Suffolk, 2000 - 2014

Age in Years	2000-2004	2005-2009	2010-2014	AllYears	% Change
0 to 4	8.0	9.7	13.7	10.1	+71.3
5 to 9	9.5	12.6	18.2	13.2	+91.6
10 to 14	10.2	12.3	20.0	13.7	+96.1
15 to 19	10.8	12.0	21.5	14.3	+99.1
20 to 44	7.2	6.6	7.9	7.2	+9.7
45 to 64	6.8	6.2	6.1	6.3	-10.3
65+	8.4	7.5	6.4	7.3	-23.8
All Ages	**8.0**	**8.3**	**9.9**	**8.7**	**+23.8**

Percent Change = Difference between 2000-2004 and 2010-2014.
Source: New York State SPARCS database.

Children and young adults experienced an increase in Intensive Care Unit (ICU) admissions among patients hospitalized for asthma; middle aged and older adults experienced a decrease.

The column labeled "All Years" represents ICU asthma admission averages for the 15 year period. For example, 13.7% of children age 10-14 years who were hospitalized for asthma were admitted to the ICU. The column, "% change," represents the proportional change in the frequency of ICU admissions when comparing the earlier years, 2000-2004, to the later years, 2020-2014. For example, children age 15-19 years had a 99.1% increase in ICU admissions for asthma between 2000-2004 and 2010-2014.

Similar to Emergency Department visits and hospitalizations for asthma, patterns in ICU age-related asthma admissions provide more meaningful information when divided into specific age groups.

Percentage of Asthma Hospitalizations Admitted to the ICU by Patient County

Nassau, Queens & Suffolk, 2000 - 2014

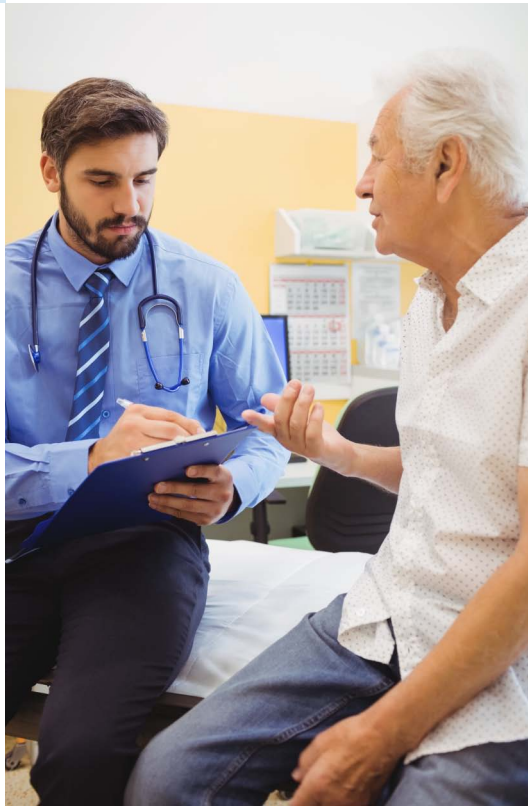
Percent Admitted to the ICU			
	Nassau	Queens	Suffolk
2000-2004	10.5	6.6	9.2
2005-2009	12.3	6.3	8.9
2010-2014	14.0	7.5	10.8
All Years	12.3	6.7	9.7
% Change	+33.3	+13.6	+17.4

Percent Change = Difference between 2000-2004 and 2010-2014.
Source: New York State SPARCS database.

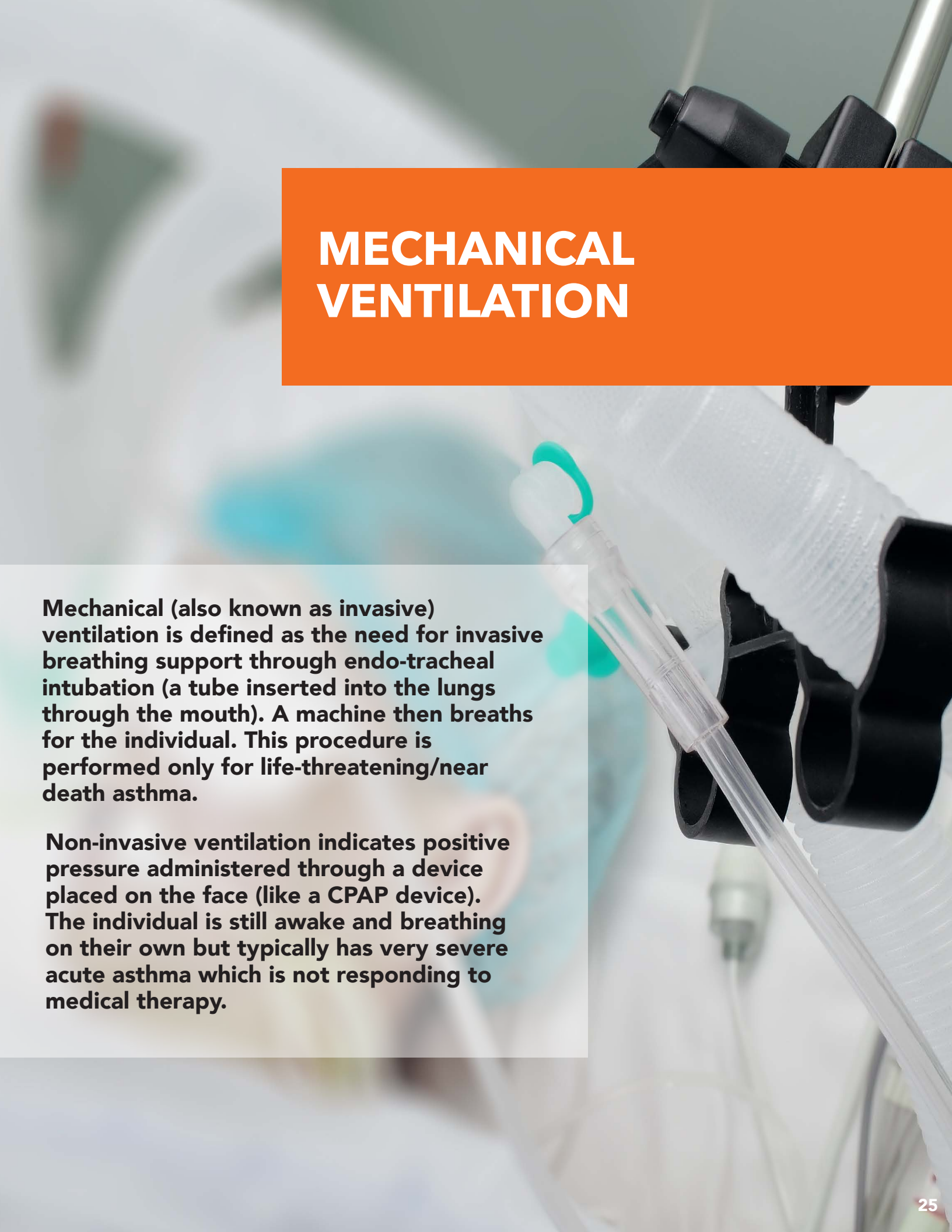
The greatest increase in ICU asthma admissions over time were in Nassau County.

Nassau County had the highest Intensive Care Unit (ICU) asthma admission rate of 12.3% and Queens had the lowest ICU asthma admission rate of 6.7%. The greatest increase in asthma ICU admission rates over time were seen in Nassau County (33.3% rise) although Queens and Suffolk Counties also experienced relatively large increases.

The table presents data on those admitted to the hospital for asthma who were admitted to the ICU. The row labeled "Total" indicates the percent (%) admitted for each county for all years. For example, in Queens 6.7% of those hospitalized for asthma were admitted to the ICU.



MECHANICAL VENTILATION

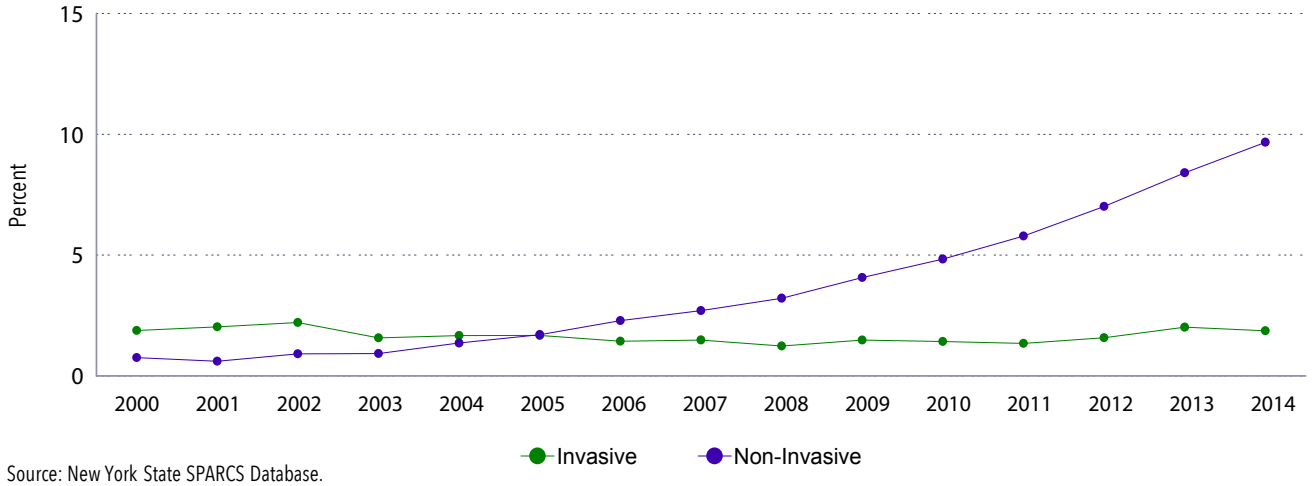


Mechanical (also known as invasive) ventilation is defined as the need for invasive breathing support through endo-tracheal intubation (a tube inserted into the lungs through the mouth). A machine then breaths for the individual. This procedure is performed only for life-threatening/near death asthma.

Non-invasive ventilation indicates positive pressure administered through a device placed on the face (like a CPAP device). The individual is still awake and breathing on their own but typically has very severe acute asthma which is not responding to medical therapy.

Percentage of Asthma Hospitalizations with Invasive & Non-Invasive Mechanical Ventilation by Year

Nassau, Queens & Suffolk, 2000 - 2014



Source: New York State SPARCS Database.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percent with Invasive Ventilation	0.8	0.6	0.9	0.9	1.4	1.7	2.3	2.7	3.2	4.1	4.8	5.8	7.0	8.4	9.7
Percent with Non-Invasive Ventilation	1.9	2.0	2.2	1.6	1.7	1.7	1.4	1.5	1.2	1.5	1.4	1.3	1.6	2.0	1.9

The use of non-invasive ventilation for asthma has skyrocketed over time.

Percentage of Asthma Hospitalizations with Invasive Mechanical Ventilation by Patient County

Nassau, Queens & Suffolk, 2000 -2014

Percent with Invasive Mechanical Ventilation				
	Nassau	**Queens**	**Suffolk**	**Total**
2000-2004	1.8	2.1	1.3	1.9
2005-2009	1.5	1.5	1.3	1.5
2010-2014	1.5	1.8	1.4	1.6
All Years	1.6	1.8	1.3	1.6
% Change	**-16.6**	**-14.3**	**+7.7**	**-15.8**

Percent Change = Difference between 2000-2004 and 2010-2014.
Source: New York State SPARCS database.

As the figure indicates, the frequency of invasive mechanical ventilation used to treat asthma has remained within a narrow range between the years 2000-2014.

In contrast, the use of non-invasive ventilation has substantially increased over the same time period. In 2014 nearly 1 in 10 of those hospitalized for asthma required non-invasive ventilation to treat their asthma.

Between 2000-2014, about 1 in 62 people hospitalized for asthma during that period were mechanically ventilated (1.6% of all hospitalizations).

As shown in the table (see row labeled "% for all years"), the need for invasive ventilation is slightly higher in Queens County than Nassau and Suffolk Counties.

The data on the graph represents the proportion of patients hospitalized for asthma who received non-invasive (orange) compared to invasive (black) ventilation. The table presents the proportion of those hospitalized for asthma who received invasive mechanical ventilation. Data is presented by county and 5 year time periods.

DEMOGRAPHICS

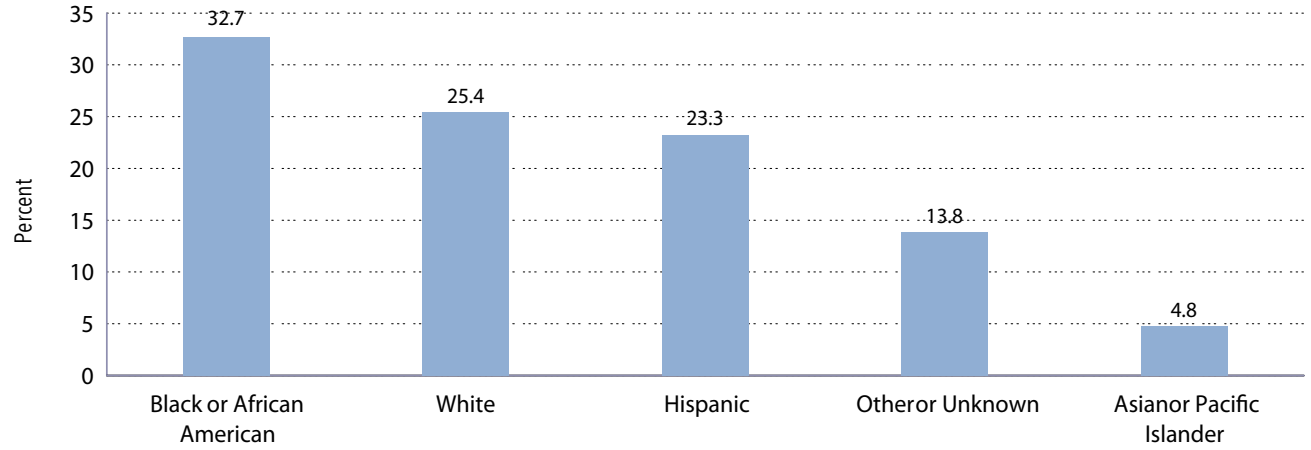
Black/African Americans represent the largest proportion of ED visits for asthma by race/ethnic group. Whites had the largest proportion of hospitalizations for asthma.

Of the individuals treated for asthma in the Emergency Department (ED), 32.7% were Black/African American. In contrast to the ED, the largest race/ethnic group for hospitalizations were White (36.7%) followed by Black/African American (26.7%).

The figures show the proportions of ED and hospitalizations for asthma by race/ethnicity. For each figure, the proportions add up to 100%.

Percentage of Asthma Emergency Department Visits by Race/Ethnicity

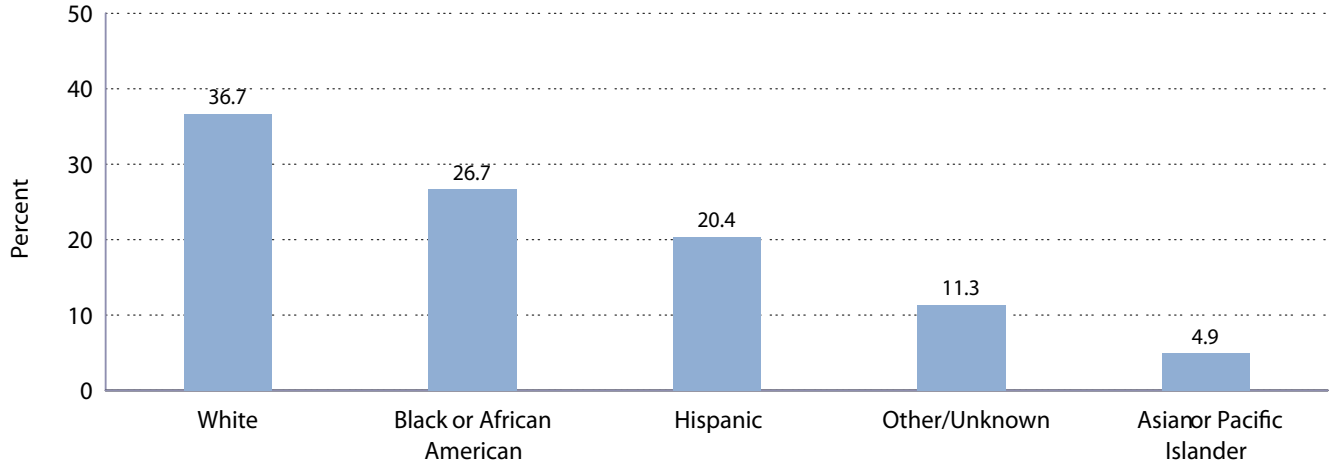
Nassau, Queens & Suffolk, 2006 -2014



Source: New York State SPARCS Database.

Percentage of Asthma Hospitalizations by Race/Ethnicity

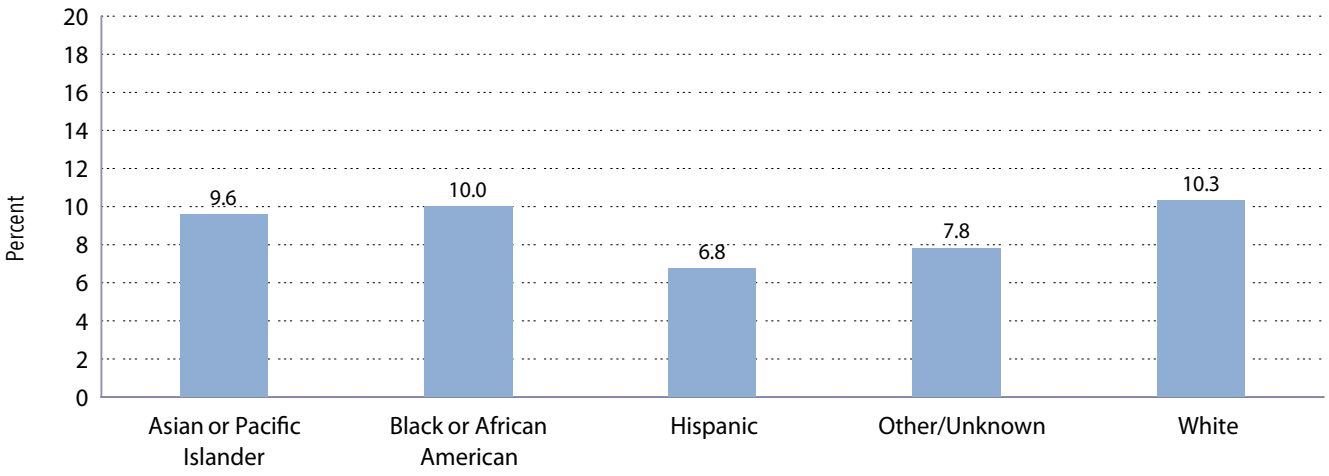
Nassau, Queens & Suffolk, 2000 -2014



Source: New York State SPARCS Database.

Percentage of Asthma Hospitalizations with an ICU Stay by Race/Ethnicity

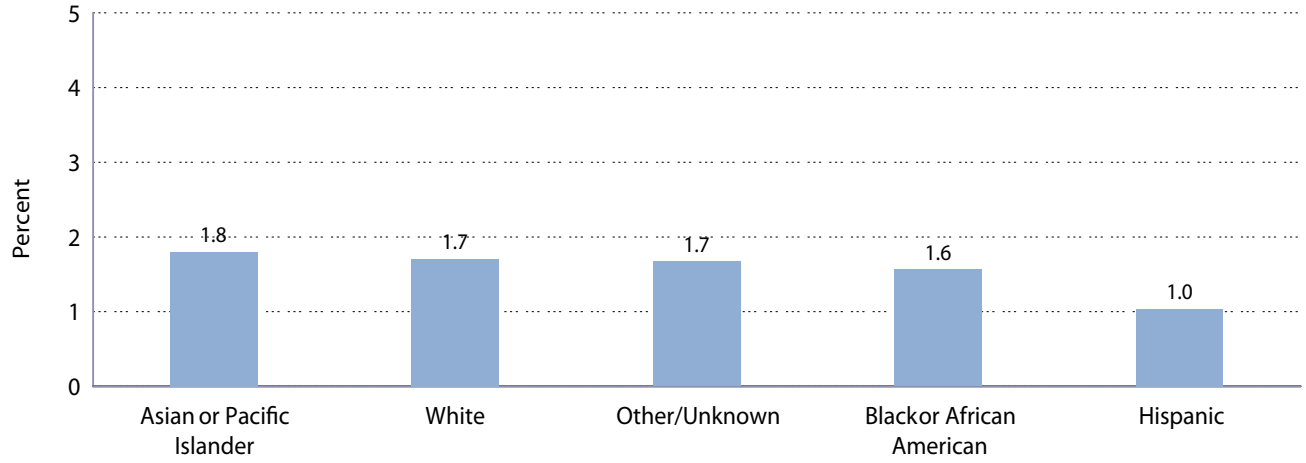
Nassau, Queens & Suffolk, 2000 -2014



Source: New York State SPARCS Database.

Percentage of Asthma Hospitalizations with Invasive Mechanical Ventilation by Race/Ethnicity

Nassau, Queens & Suffolk, 2000 -2014



Source: New York State SPARCS Database.

Patients who were White, Black/African American, or Asian/Pacific Islander had the highest proportion of Intensive Care Unit (ICU) admissions for asthma. Hispanics had the lowest proportion of ICU admission for asthma. Hispanics also appear to have the lowest proportion of invasive mechanical ventilation.

These figures represent the proportion of hospitalized individuals who were admitted to the ICU for asthma or mechanically ventilated. For example, 10.3% of White patients were admitted to the ICU.

There are racial/ethnic differences in the use of ICU and invasive mechanical ventilation for asthma.

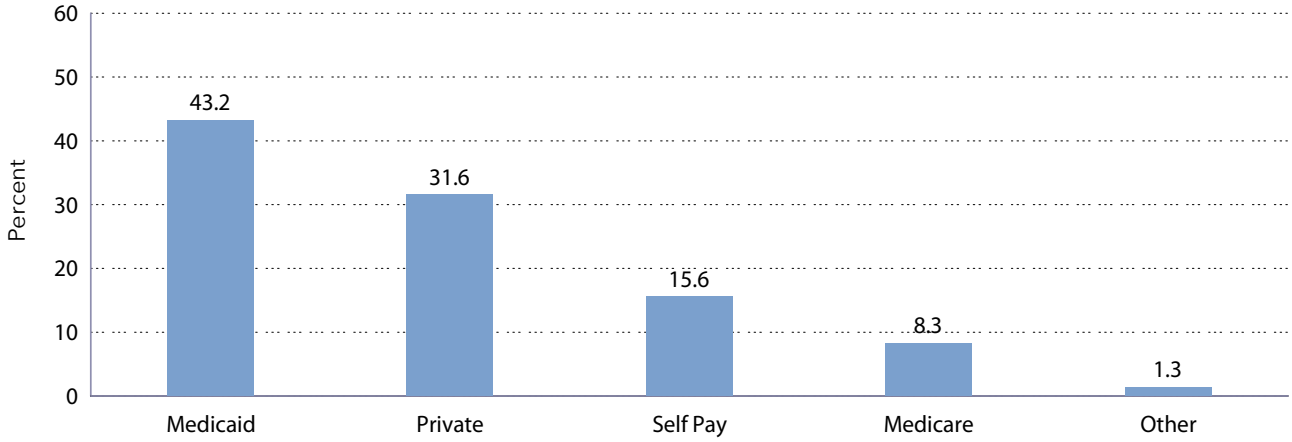
Among those who presented to the ED with asthma, Medicaid insurance was the most common form of payment.

Medicaid insurance was the most common form of payment for an asthma Emergency Department (ED) visit. Private and Medicaid insurance were the most common forms of payment for asthma hospitalizations.

These figures show the proportion of payment methods for asthma ED visits and hospitalizations. For example, 43.2% of those presenting to the ED had Medicaid insurance.

Percentage of Asthma Emergency Department Visits by Payer

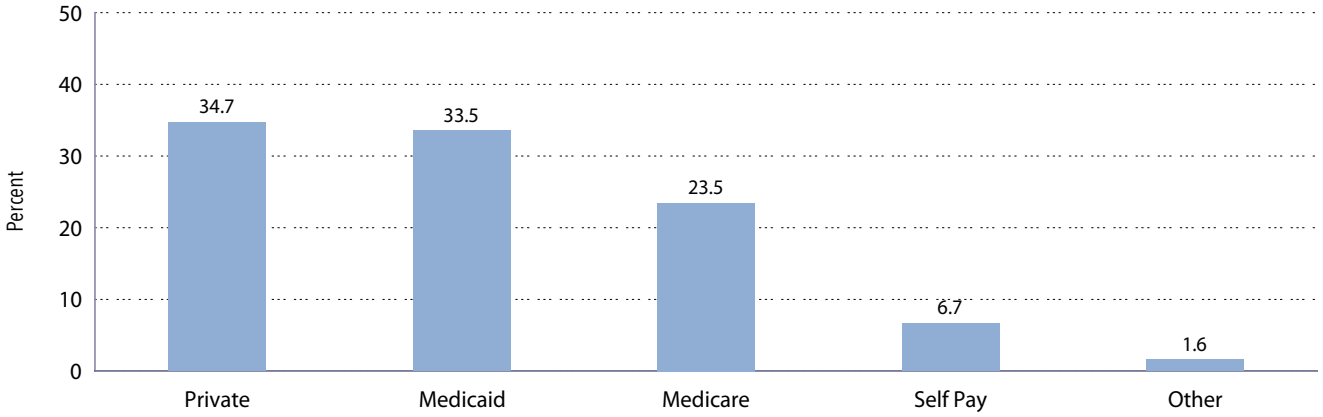
Nassau, Queens & Suffolk, 2008 -2014



Source: New York State SPARCS Database.

Percentage of Asthma Hospitalizations by Payer

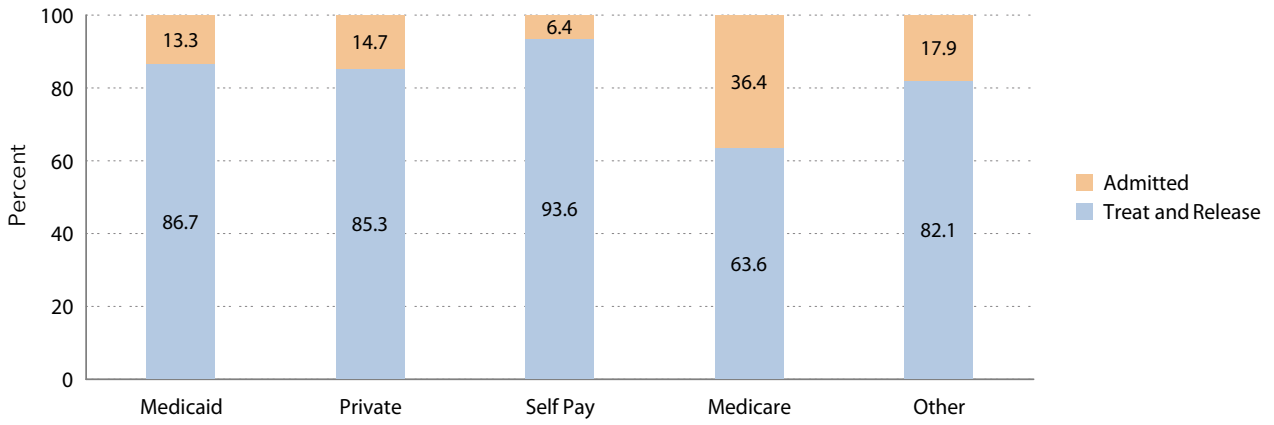
Nassau, Queens & Suffolk, 2000 - 2014



Source: New York State SPARCS Database.

Percentage of Asthma Emergency Department Visits by Disposition & Payer

Nassau, Queens & Suffolk, 2008 -2014

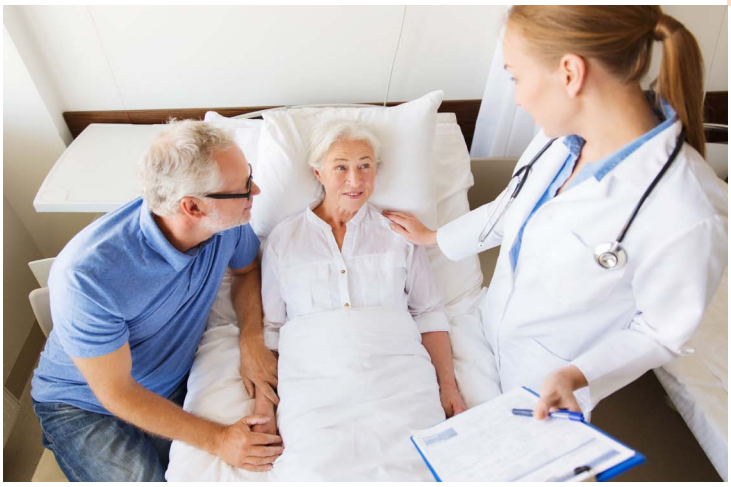


Source: New York State SPARCS Database.

Those individuals in the Emergency Department (ED) with asthma who self-pay for services are the least likely to be hospitalized for asthma, even when compared to those with Medicaid or private insurance. In contrast, those in the ED with asthma who have Medicare insurance, typically an older population, have the highest chance of being admitted for asthma.

This figure shows the proportion of individuals who present to the ED and are admitted to the hospital for asthma. Data is presented by payment type. For example, of all ED patients with asthma who pay with Medicaid insurance, 13.3% are hospitalized for asthma.

Those who are self-pay have the lowest hospitalization rates for asthma from the ED.



NASSAU COUNTY

Nassau County

Emergency Department Visits by Town - Towns with Highest Rates/10,000: 2014

Nassau County, 2014 — All Ages		Nassau Average: 58.8
Town	Rate per 10,000	ED Visits #
Hempstead	125.0	742
Roosevelt	105.7	172
Inwood	97.1	81
Uniondale	86.8	226
Elmont	77.1	319
Freeport	69.2	300
Westbury	62.1	284
West Hempstead	58.9	139
Valley Stream	58.1	233
Baldwin	52.3	173
Glen Cove	52.1	144
Bayville	46.5	31
Island Park	40.6	34
Bethpage	40.6	92
Hicksville	38.9	154
Mineola	38.1	73
So Valley Stream	33.1	69
East Rockaway	31.3	33
Port Washington	31.2	94
Long Beach	30.3	113

Ages 0 to 19		Nassau Average: 92.8
Town	Rate per 10,000	ED Visits #
Hempstead	216.0	368
Uniondale	175.8	129
Roosevelt	150.0	72
Elmont	128.8	141
Westbury	121.0	137
Inwood	112.1	28
Freeport	107.6	123
Baldwin	97.2	86
Valley Stream	97.0	100
Mineola	86.2	35
Glen Cove	81.3	51
West Hempstead	68.0	45
Hicksville	64.0	59
So Valley Stream	56.6	31
Bethpage	52.3	28
Long Beach	51.0	35
Levittown	50.6	55
Woodmere	50.3	21
Rockville Ctr	46.3	33
Franklin Square	43.0	24

Ages 20 and Above		Nassau Average: 44.4
Town	Rate per 10,000	ED Visits #
Inwood	90.6	53
Hempstead	88.3	374
Roosevelt	87.2	100
Elmont	58.5	178
Freeport	55.5	177
West Hempstead	55.3	94
Uniondale	51.9	97
Valley Stream	44.6	133
Glen Cove	43.5	93
Westbury	42.7	147
Bethpage	37.0	64
Baldwin	35.9	87
Hicksville	31.3	95
Port Washington	28.2	63
Long Beach	25.6	78
Mineola	25.2	38
So Valley Stream	24.7	38
Levittown	22.2	71
Farmingdale	20.3	49
East Meadow	18.7	55

The three tables list the top 20 towns by asthma Emergency Department (ED) rates in Nassau County for the year 2014. Table 1 presents asthma ED visits for all ages; table 2 for ages 0-19 years; table 3 for ages 20 years and older.

The third column of each table lists the actual numbers of visits for that town. As noted, a small town may have high asthma ED visit rate but relatively few actual visits, which may be related to the lower population in the smaller towns.

Nassau County

Hospital Discharges by Town - Towns with Highest Rates/10,000: 2014

Nassau County, 2014 — All Ages		Nassau Average: 17.6
Town	Rate per 10,000	Hospital Discharges #
Hempstead	38.7	230
Roosevelt	31.3	51
Uniondale	25.4	66
Freeport	23.5	102
West Hempstead	23.3	55
Lynbrook	19.4	44
Westbury	19.2	88
Elmont	17.4	72
Valley Stream	16.7	67
Glen Cove	15.6	43
Baldwin	13.9	46
Long Beach	13.1	49
Levittown	12.9	55
Rockville Ctr	12.4	33
Mineola	12.0	23
East Meadow	11.8	45
Hicksville	11.6	46
Oceanside	11.1	34
Bethpage	11.0	25
New Hyde Park	10.9	45

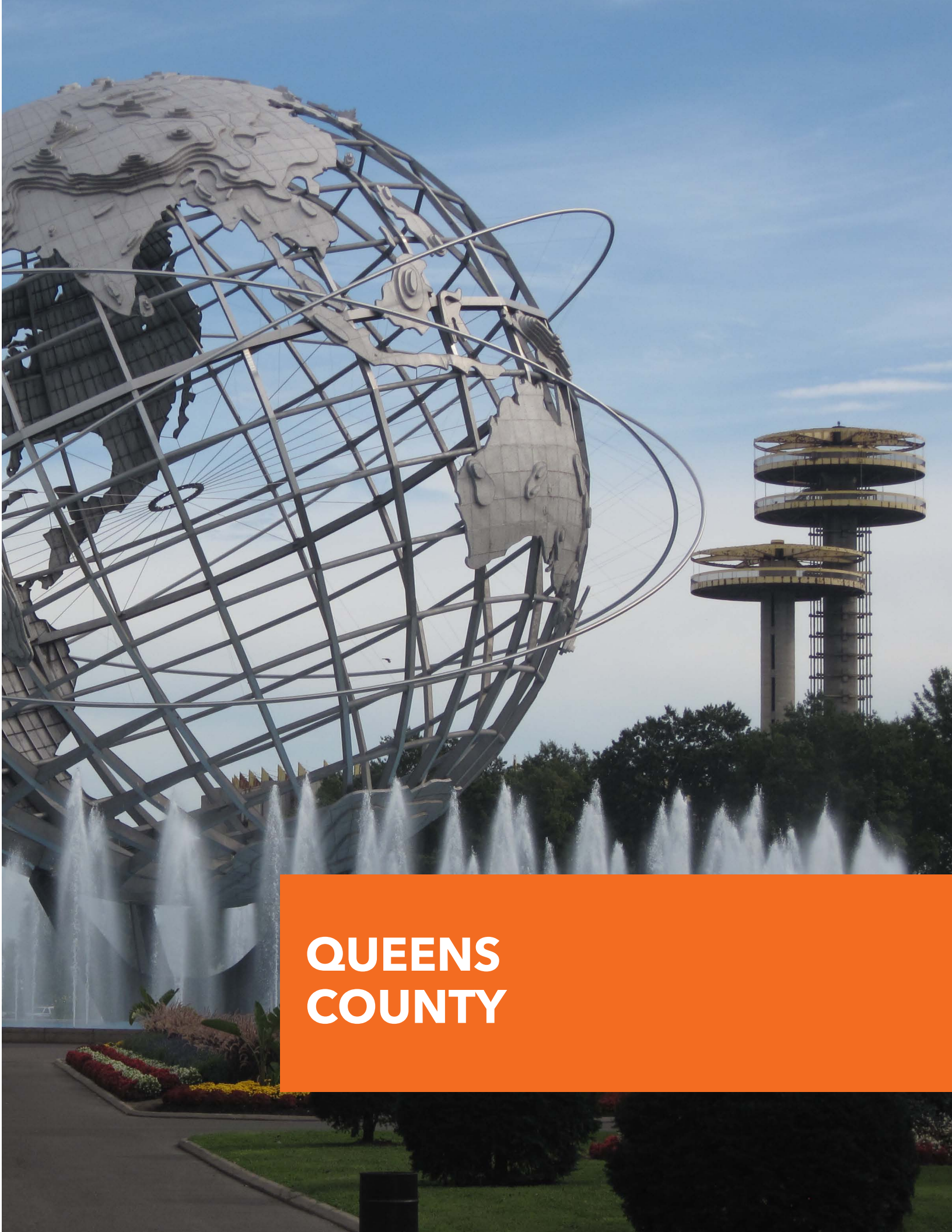
Ages 0 to 19		Nassau Average: 28.7
Town	Rate per 10,000	Hospital Discharges #
Hempstead	62.8	107
Roosevelt	60.4	29
Uniondale	50.4	37
Island Park	33.4	6
Elmont	32.9	36
Westbury	30.9	35
Valley Stream	30.1	31
Inwood	28.0	7
Mineola	24.6	10
Baldwin	23.7	21
Freeport	23.6	27
West Hempstead	22.7	15
Lawrence	22.7	6
Lynbrook	22.5	12
Floral Park	20.6	14
Levittown	20.3	22
Rockville Ctr	18.2	13
New Hyde Park	15.3	15
Farmingdale	15.2	12
East Meadow	14.9	13

Ages 20 and Above		Nassau Average: 14.7
Town	Rate per 10,000	Hospital Discharges #
Hempstead	29.1	123
West Hempstead	23.5	40
Freeport	23.5	75
Roosevelt	19.2	22
Lynbrook	18.5	32
Glen Cove	17.3	37
Uniondale	15.5	29
Westbury	15.4	53
Long Beach	13.5	41
Valley Stream	12.1	36
Elmont	11.8	36
Bethpage	11.6	20
Hicksville	11.2	34
East Meadow	10.9	32
Oceanside	10.8	25
Levittown	10.3	33
Baldwin	10.3	25
Rockville Ctr	10.2	20
New Hyde Park	9.5	30
Wantagh	9.0	21

The three tables list the top 20 towns by asthma visit rate in Nassau County for the year 2014.

Table 1 represents hospitalization visit data for all ages, table 2 for ages 0-19 years, and table 3 ages 20 years and older.

The third column in each table lists the actual numbers of visits for that town. As noted, a small town may have high rates, but relatively fewer visits than larger towns.



QUEENS COUNTY

Queens County

Emergency Department Visits by Town - Towns with Highest Rates/10,000: 2014

Queens County, 2014 — All Ages — Queens Average: 112.6		
Town	Rate per 10,000	ED Visits #
Far Rockaway	168.6	1,012
Rochdale Village	157.6	932
Arverne	155.9	289
Jamaica	143.0	2,105
St Albans	133.6	466
Springfield Gdns	119.5	465
Richmond Hill	117.5	426
Rockaway Beach	116.6	139
So Ozone Park	115.9	722
Long Island City	113.6	771
Woodhaven	104.5	409
Ozone Park	104.0	560
So Richmond Hill	100.4	474
Hollis	95.7	287
Rosedale	95.0	289
Ridgewood	91.9	906
Cambria Heights	91.1	169
Corona	79.0	868
Queens Village	78.5	533
Astoria	70.5	499

Queens Average: 176.2 — Ages 0 to 19		
Town	Rate per 10,000	ED Visits #
Jamaica	251.9	984
Rochdale Village	209.1	334
St Albans	200.8	184
Richmond Hill	199.8	196
Rockaway Beach	198.8	62
Arverne	197.6	117
So Ozone Park	180.5	308
Far Rockaway	178.1	349
Long Island City	175.5	220
So Richmond Hill	175.1	224
Woodhaven	172.2	181
Ozone Park	171.2	257
Ridgewood	170.8	430
Springfield Gdns	169.7	170
Corona	155.3	476
Rosedale	153.3	128
Kew Gardens	144.1	55
Hollis	141.2	102
Cambria Heights	140.4	60
Queens Village	138.0	228

Queens Average: 91.3 — Ages 20 and Above		
Town	Rate per 10,000	ED Visits #
Far Rockaway	163.9	663
Rochdale Village	138.6	598
Arverne	136.3	172
St Albans	109.6	282
Jamaica	103.7	1,121
Springfield Gdns	102.1	295
Long Island City	99.6	551
So Ozone Park	91.5	414
Rockaway Beach	87.5	77
Richmond Hill	87.0	230
Hollis	81.3	185
Woodhaven	79.7	228
Ozone Park	78.1	303
Cambria Heights	76.3	109
Rosedale	72.9	161
So Richmond Hill	72.6	250
Ridgewood	64.8	476
Astoria	62.7	366
Queens Village	59.4	305
Rockaway Park	59.3	94

The three tables list the top 20 towns by asthma visit rate in Queens County for the year 2014.

Table 1 represents ED visit data for all ages, table 2 for ages 0-19 years, and table 3 ages 20 years and older.

The third column in each table lists the actual numbers of visits for that town. As noted, a small town may have high rates, but relatively fewer visits than larger towns.

Queens County

Hospital Discharges by Town - Towns with Highest Rates/10,000: 2014

Queens County, 2014 — Queens Average: 20.0

All Ages

Town	Rate per 10,000	Hospital Discharges #
Rockaway Beach	29.4	35
Arverne	28.0	52
Rochdale Village	27.7	164
Long Island City	27.1	184
Far Rockaway	26.5	159
Jamaica	22.6	333
Springfield Gdns	22.6	88
St Albans	22.4	78
Woodhaven	22.0	86
So Ozone Park	21.8	136
Ozone Park	21.0	113
Rosedale	20.7	63
Corona	19.8	218
Astoria	19.8	140
Cambria Heights	19.4	36
Queens Village	19.3	131
Hollis	19.0	57
So Richmond Hill	18.0	85
Richmond Hill	16.5	60
Ridgewood	16.4	162

Queens Average: 34.8

Ages 0 to 19

Town	Rate per 10,000	Hospital Discharges #
Cambria Heights	44.4	19
Rosedale	44.3	37
Woodhaven	42.8	45
Rochdale Village	41.9	67
Rockaway Beach	41.7	13
St Albans	40.4	37
Queens Village	40.0	66
So Ozone Park	36.9	63
Jamaica	36.1	141
Ozone Park	34.0	51
Far Rockaway	33.7	66
Long Island City	33.5	42
Springfield Gdns	32.9	33
Arverne	32.1	19
Kew Gardens	28.8	11
Corona	27.4	84
So Richmond Hill	27.4	35
Howard Beach	27.0	14
Ridgewood	25.8	65
Linden Hill	25.6	24

Queens Average: 18.1

Ages 20 and Above

Town	Rate per 10,000	Hospital Discharges #
Arverne	26.1	33
Long Island City	25.7	142
Rockaway Beach	25.0	22
Far Rockaway	23.0	93
Rochdale Village	22.5	97
Astoria	20.9	122
Springfield Gdns	19.0	55
Hollis	18.4	42
Jamaica	17.8	192
Corona	16.9	134
Rockaway Park	16.4	26
So Ozone Park	16.1	73
Ozone Park	16.0	62
St Albans	15.9	41
Richmond Hill	15.1	40
So Richmond Hill	14.5	50
Woodhaven	14.3	41
Ridgewood	13.2	97
East Elmhurst	12.7	76
Queens Village	12.7	65

The three tables list the top 20 towns by asthma visit rate in Queens County for the year 2014.

Table 1 represents hospitalization data for all ages, table 2 for ages 0-19 years, and table 3 ages 20 years and older.

The third column in each table lists the actual numbers of visits for that town. As noted, a small town may have high rates, but relatively fewer visits than larger towns.

SUFFOLK COUNTY

Suffolk County

Emergency Department Visits by Town - Towns with Highest Rates/10,000: 2014

Suffolk County, 2014		Suffolk Average: 83.3
All Ages		
Town	Rate per 10,000	ED Visits #
Bellport	157.7	164
Wyandanch	134.2	206
Mastic	108.2	176
Central Islip	103.8	365
Mastic Beach	93.6	128
Brentwood	92.7	563
Shirley	92.2	245
Medford	89.1	254
Middle Island	78.2	106
Coram	76.1	221
Patchogue	76.1	341
Bay Shore	74.3	465
Amityville	72.7	197
Riverhead	68.8	187
Peconic	63.0	4
Selden	60.0	148
Copaigue	59.4	118
Greenport	55.8	24
Farmingville	54.8	115
Port Jefferson Station	54.5	132

		Suffolk Average: 116.2
Ages 0 to 19		
Town	Rate per 10,000	ED Visits #
Bellport	180.0	55
Wyandanch	178.5	90
Brentwood	165.9	305
Central Islip	149.9	157
Amityville	136.3	94
Patchogue	134.1	147
Bay Shore	126.0	219
Copaigue	123.9	64
Medford	121.1	92
Middle Island	119.6	37
Riverhead	119.4	72
Mastic	99.0	51
Coram	97.6	68
Mastic Beach	96.0	41
Shirley	94.1	75
Selden	86.1	58
Farmingville	85.8	49
Huntington Station	77.5	145
Bohemia	69.0	18
Ronkonkoma	63.5	63

		Suffolk Average: 70.8
Ages 20 and Above		
Town	Rate per 10,000	ED Visits #
Bellport	148.4	109
Wyandanch	112.6	116
Mastic	112.5	125
Mastic Beach	92.5	87
Shirley	91.3	170
Central Islip	84.2	208
Medford	77.5	162
Coram	69.3	153
Middle Island	66.0	69
Brentwood	60.9	258
Patchogue	57.3	194
Bay Shore	54.5	246
Riverhead	54.4	115
Port Jefferson Station	52.4	93
Amityville	51.0	103
Selden	50.2	90
Southampton	48.9	44
Centereach	48.1	102
Farmingville	43.2	66
Bohemia	40.8	33

The three tables list the top 20 towns by asthma visit rate in Suffolk County for the year 2014.

Table 1 represents ED visit data for all ages, table 2 for ages 0-19 years, and table 3 ages 20 years and older.

The third column in each table lists the actual numbers of visits for that town. As noted, a small town may have high rates, but relatively fewer visits than larger towns.

Suffolk County

Hospital Discharges by Town - Towns with Highest Rates/10,000: 2014

Suffolk County, 2014		Suffolk Average: 19.6
	All Ages	
Town	Rate per 10,000	Hospital Discharges #
Wyandanch	35.2	54
Bellport	30.8	32
Central Islip	23.0	81
Amityville	22.1	60
Mastic	22.1	36
Brentwood	22.1	134
North Babylon	20.1	33
Medford	20.0	57
Mastic Beach	19.7	27
Copaigue	18.6	37
Bay Shore	18.5	116
Riverhead	16.6	45
Coram	16.2	47
Shirley	16.2	43
Rocky Point	15.7	20
Selden	15.4	38
Deer Park	15.0	42
Port Jefferson Station	14.9	36
West Babylon	14.4	58
Holtsville	14.3	19

		Suffolk Average: 28.5
	Ages 0 to 19	
Town	Rate per 10,000	Hospital Discharges #
Amityville	47.8	33
Wyandanch	39.7	20
Central Islip	36.3	38
Copaigue	34.9	18
Brentwood	34.3	63
Medford	32.9	25
Bellport	32.7	10
Bay Shore	29.9	52
Shirley	28.9	23
Selden	26.7	18
Patchogue	26.5	29
Holbrook	25.6	18
Farmingville	24.5	14
Coram	24.4	17
Mastic Beach	23.4	10
Port Jefferson Station	23.1	15
Middle Island	22.6	7
Holtsville	19.4	7
Rocky Point	18.8	7
Lake Grove	18.2	6

		Suffolk Average: 16.8
	Ages 20 and Above	
Town	Rate per 10,000	Hospital Discharges #
Wyandanch	33.0	34
Bellport	29.9	22
Mastic	25.2	28
North Babylon	21.0	26
Mastic Beach	18.1	17
Central Islip	17.4	43
Brentwood	16.8	71
Riverhead	16.6	35
Medford	15.3	32
Deer Park	14.4	30
Bay Shore	14.2	64
Coram	13.6	30
Amityville	13.4	27
West Babylon	13.3	40
Copaigue	12.9	19
Kings Park	12.9	18
Centereach	12.7	27
Ronkonkoma	12.6	36
Port Jefferson Station	11.8	21
West Islip	11.7	22

The three tables list the top 20 towns by asthma visit rate in Suffolk County for the year 2014.

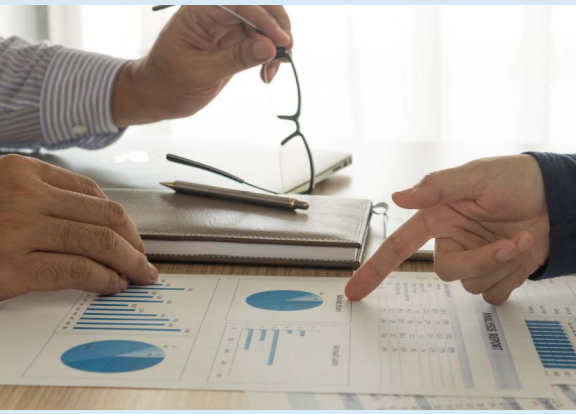
Table 1 represents hospitalization visit data for all ages, table 2 for ages 0-19 years, and table 3 ages 20 years and older.

The third column in each table lists the actual numbers of visits for that town. As noted, a small town may have high rates, but relatively fewer visits than larger towns.

SUMMARY OF DATA

SUMMARY

- The rate of asthma ED visits and hospitalizations are highest in the youngest age groups.
- There has been a decrease over time in asthma hospitalizations but not ED visits. Most of the decline in hospitalizations is attributed to reduction in pediatric hospitalizations.
- In contrast to hospitalizations, the number of asthma ICU admissions had markedly increased over time. This is driven by the marked increase in pediatric ICU admissions since ICU adult admissions have not changed much.
- The number of mechanical ventilations for life-threatening asthma had remained the same over time, while the number of non-invasive ventilations has risen substantially.
- Among insurance status, those who are self-pay are the least likely to be admitted, and those with Medicare are the most likely to be hospitalized from the ED.



TECHNICAL NOTES

Asthma Population

Hospitalizations: identified by any one of the following principal ICD-9 discharge diagnoses: 493.00, 493.01, 493.02, 493.10, 493.11, 493.12, 493.20, 493.21, 493.22, 493.80, 49381, 493.82, 493.90, 493.91 or 493.92.

Treat and Release Emergency Department Visits: identified by any one of the following principal ICD-9 discharge diagnoses: 493.00, 493.01, 493.02, 493.10, 493.11, 493.12, 493.20, 493.21, 493.22, 493.80, 49381, 493.82, 493.90, 493.91 or 493.92.

Emergency Department Visits Admitted Inpatient: identified by any one of the following admitting ICD-9 diagnoses: 493.00, 493.01, 493.02, 493.10, 493.11, 493.12, 493.20, 493.21, 493.22, 493.80, 49381, 493.82, 493.90, 493.91 or 493.92.

ICU Admission

Identified by any one of the following revenue codes (also referred to as location or accommodation codes): 0200 (General ICU), 0201 (Surgical ICU), 0202 (Medical ICU), 0203 (Pediatric ICU), 0206 (Intermediate ICU) or 0209 (Other ICU). Patients with multiple ICU codes are counted once.

Mechanical Ventilation

Identified by any one of the following ICD-9 procedure codes: 96.04 (endotracheal intubation), 96.70, 96.71 and 96.72 (invasive mechanical ventilation), or 93.90 and 93.91 (non-invasive mechanical ventilation).

ACKNOWLEDGEMENTS

This report was prepared the Kransnoff Quality Management Institute (KQMI), a division of Northwell Health, which provides hospitals, health systems and industry with customized methodologies to assess, monitor, improve and sustain an organization's performance. Led by Yosef D. Dlugacz, Ph.D., Senior Vice President and Chief of Clinical Quality, Education, and Research of Northwell Health, a nationally recognized quality theorist and author, KQMI's analysts and clinical quality experts develop sophisticated, accurate, comprehensible, and specifically tailored analytics about clinical and operational variables. The 21 hospitals comprising Northwell Health, its many outpatient clinics, and physician practices rely on the sophisticated tools and analytics developed by KQMI for monitoring and managing clinical and organizations processes.

The Krasnoff Quality Management Institute
1985 Marcus Avenue, Suite LL106
New Hyde Park, New York 11042-1013
Phone: (516) 472-3500 Fax: (516) 472-3535
Email: kqmi@nshs.edu

Additional information supplied by the Asthma Coalition of Long Island.

The State of Asthma in Nassau, Queens, and Suffolk Counties: Assessing Trends in Asthma Burden

Asthma Coalition of Long Island
700 Veterans Highway
Hauppauge, New York 11788
(631) 415-0940
www.AsthmaCoalitionOfLongIsland.org

Asthma Coalition of Queens
PO Box 230060
Hollis, New York 11243
(631) 415-0941
www.AsthmaCoalitionOfQueens.org