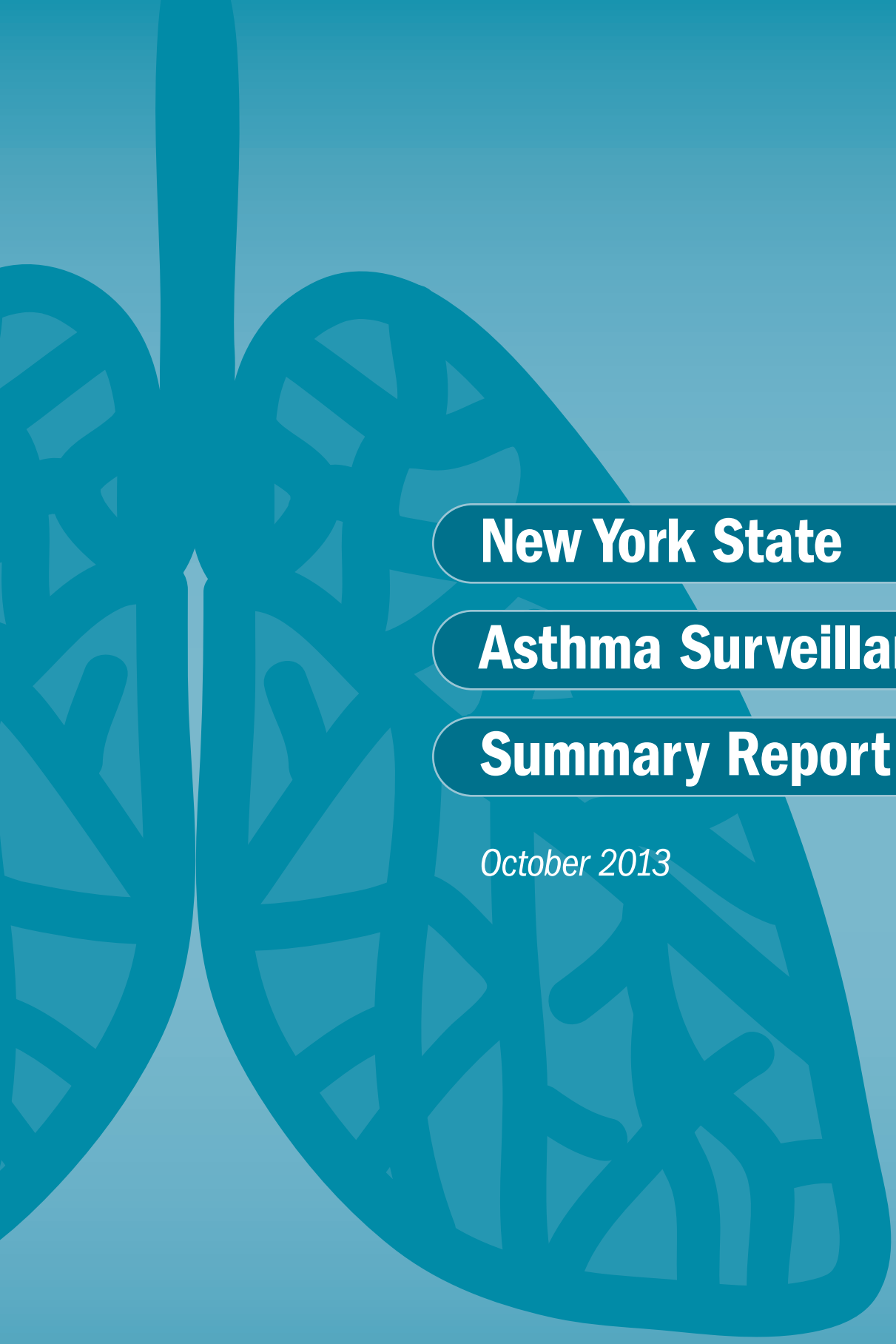

New York State Asthma Surveillance Summary Report

October 2013

Public Health Information Group
Center for Community Health
New York State Department of Health

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1 Introduction

Asthma has emerged as a significant chronic disease over the past 25 years and continues to be a major public health problem in the United States. In 2011, approximately 18.9 million (8.2%) adults and 7.1 million (9.5%) children indicated they currently had asthma.[1] During 2001-2009, the proportion of persons of all ages with asthma nationwide increased significantly (12.3%), from 7.3% (20.3 million persons) to 8.2% (24.6 million persons) of the population.[2] In 2010, there were 1.8 million emergency department visits for asthma nationally.[3]

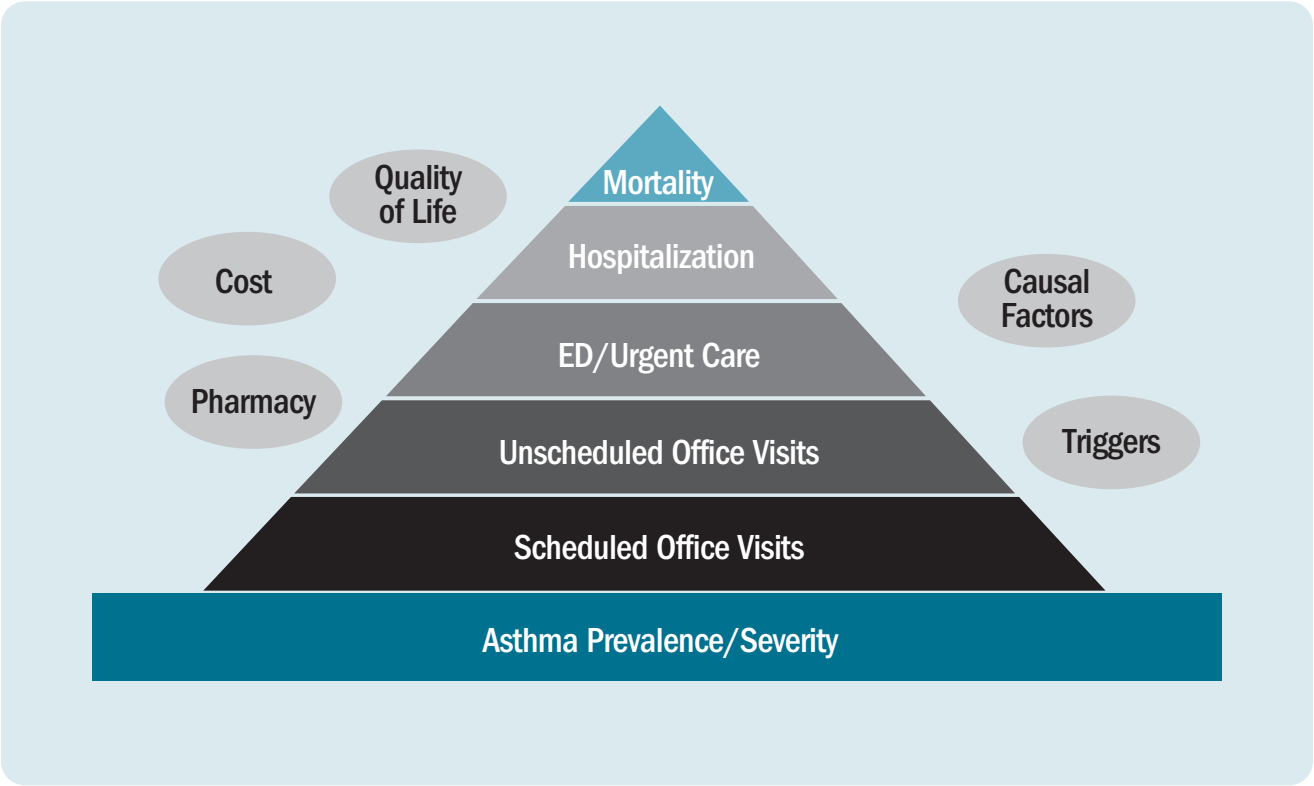
Asthma hospitalization rates decreased nationally from 2000 to 2004, and remained stable during 2005 to 2009.[4,5,6] The number of asthma deaths nationwide declined steadily from 2001 to 2009 at a rate of 3.3% annually.[4] However, in 2010, there were still 439,000 asthma hospitalizations and 3,404 deaths nationally due to asthma.[3] In 2008, persons with asthma missed 10.5 million school days and 14.2 million work days due to their asthma.[9] The direct costs of high levels of healthcare utilization and the indirect costs of premature death and absenteeism from school and work total a staggering $56 billion per year.[10]

Asthma remains a major problem in New York State (NYS) with significant public health and financial consequences. In 2011, an estimated 1.4 million adults currently had asthma.[1] Current asthma prevalence among adults increased from 7.7% in 2000 to 9.7% in 2011 and was higher than the national average for every year in the decade.[1] Current asthma prevalence for children (0-17 years) was 10.4% during 2006-2010 (an estimated 456,000 children).[11] There were more than 160,000 emergency department visits and over 38,000 hospitalizations per year due to asthma during 2009-2011. The rates of asthma emergency department visits and hospitalizations in NYS are higher than the national rates for all age groups and higher than the Healthy People 2020 objectives. During 2009-2011, an average of 258 deaths occurred annually due to asthma in NYS, which is an age-adjusted asthma mortality rate of 12.3 per 1 million residents. Additionally, only 30% of New Yorkers have an asthma self-management plan to help them control their asthma.[11]

The *NYS Asthma Surveillance Summary Report* was created in 2005 to better understand the burden of asthma in NYS. It is updated every four years. Information is generally presented on a statewide level and, where appropriate, at the county level, to help public health programs, policy makers and other health care providers recognize the scope of the problem and design solutions to reduce the burden of asthma in NYS. Data are presented for children and adults related to asthma prevalence, asthma-related risk behaviors, asthma emergency department visits, asthma hospitalizations, asthma mortality, Medicaid managed care and Child Health Plus, work-related asthma, asthma costs and asthma environmental triggers.

CDC defines surveillance as the "ongoing, systematic collection, analysis and interpretation of health-related data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those responsible for prevention and control."[12] Using various databases with information about asthma, the New York State Department of Health (NYSDOH) has constructed estimates for key indicators in the Asthma Surveillance Pyramid shown below.

Figure 1-1
The Asthma Surveillance Pyramid



Source: Centers for Disease Control and Prevention. "A Public Health Response to Asthma," PHTN Satellite Broadcast, Course Materials 2001.

Asthma Prevalence

Asthma prevalence is assessed through the Behavioral Risk Factor Surveillance System (BRFSS), Youth Risk Behavior Survey (YRBS), Youth Tobacco Survey (YTS), BRFSS Asthma Call-Back Survey and program-based data, including Medicaid managed care and Child Health Plus. The Occupational Health Clinic Network and the Occupational Lung Disease Registry also collect information about the incidence of work-related asthma.

Scheduled and Unscheduled Office Visits

The Medicaid managed care Quality Assurance Reporting Requirements (QARR) consist of measures from the National Committee for Quality Assurance's Healthcare Effectiveness Data Information Set (HEDIS®) and NYS-specific measures. This version of QARR incorporates measures from HEDIS.® The major areas of performance included in 2010 QARR are: Effectiveness of Care, Access to/Availability of Care, Satisfaction with the Experience of Care, Health Plan Stability, Use of Services, and Health Plan Descriptive Information. The BRFSS Asthma Call-Back Survey also has information on scheduled and unscheduled office visits.

Emergency Department/Urgent Care

Information about asthma-related emergency department visits is available from the SPARCS Outpatient Database. Medicaid managed care and Child Health Plus data also include emergency department visit information. The BRFSS Asthma Call-Back Survey has self-reported information on emergency department and urgent care visits.

Hospital Discharges

Asthma hospital discharge data are available through the Statewide Planning and Research Cooperative System (SPARCS) Hospital Inpatient Database. Medicaid managed care and Child Health Plus data include information about asthma hospital discharges. The BRFSS Asthma Call-Back Survey has self-reported information on asthma-related hospitalizations.

Mortality

Information on asthma mortality is available through the NYS Vital Statistics database.

Quality of Life

The BRFSS assessed the self-reported quality of life among adults currently suffering from asthma. The BRFSS Asthma Call-Back Survey collects data for several quality of life measures in both children and adults with asthma.

Cost

Hospital billing data are available through the SPARCS database. The Medicaid managed care data system has cost information for emergency department visits, hospitalizations, outpatient visits and pharmacy use.

Pharmacy

Medicaid managed care and Child Health Plus health insurance programs have detailed information about pharmacy dispensing events and costs. The BRFSS Asthma Call-Back Survey collects information about asthma medication used by both children and adults with asthma.

Triggers

The BRFSS Asthma Call-Back Survey collects information about the household environment for people with asthma. The NYS School Building Condition Survey has information about the indoor air quality in schools with regard to ventilation system problems, visible mold, moisture or humidity problems, and the presence of vermin. The Environmental Protection Agency Air Quality System collects information on daily levels of ozone and fine particulate matter ($PM_{2.5}$) in each state. The National Allergy Bureau, a section of the American Academy of Allergy, Asthma and Immunology's Aeroallergen Network, certifies pollen counters who operate pollen stations across the United States, including six in NYS that provide counts of mold spores and tree, grass and weed pollen.

Summary of Indicators and Data Sources in This Report

The data presented in this report are useful in characterizing the population(s) affected by asthma. The following table summarizes the source(s) of data used for each asthma indicator:

Table 1-1
Asthma Indicators and Data Sources in New York State

Indicator Type	Source	Most Recent Year of Data
Asthma Prevalence in Children (0-17 Years)	Behavioral Risk Factor Surveillance System (BRFSS)	2010
	BRFSS Asthma Call-Back Survey	2010
	New York State Youth Tobacco Survey	2012
Asthma Prevalence in Adults (18+ Years)	BRFSS	2011
Asthma Emergency Department Visits • Population-based rates • At-risk based rates	Statewide Planning and Research Cooperative System (SPARCS) Hospital Inpatient and Outpatient Databases	2011
Asthma Hospitalizations • Population-based rates • At-risk based rates	SPARCS Hospital Inpatient Database	2011
Asthma Deaths	Vital Records	2011

Table 1-1 *continued*
Asthma Indicators and Data Sources in New York State

Indicator Type	Source	Most Recent Year of Data
Asthma Prevalence Among Medicaid Managed Care (MMC) and Child Health Plus (CHP) Enrollees	NYSDOH Office of Health Insurance Programs (OHIP) Datamart	2006-2010 (MMC) 2010 (CHP)
Asthma-Related Healthcare Utilization: • Asthma outpatient visits • Emergency department visits • Hospitalizations • Pharmacy	NYSDOH Office of Health Insurance Programs (OHIP) Datamart	2009-2010 (MMC) 2010 (CHP)
Quality of Asthma Care: Appropriate Use of Asthma Medication Among People with Persistent Asthma	NYSDOH OHIP Datamart NYS Commercial Insurance Data	2010 2010
Asthma-Related Healthcare Costs Among Medicaid Managed Care Enrollees: • Asthma outpatient visits • Emergency department visits • Hospitalizations • Pharmacy	NYSDOH OHIP Datamart	2010
Prevention Quality Indicators (PQIs) and Pediatric Quality Indicators (PDIs) for Medicaid Managed Care Enrollees	NYSDOH OHIP Datamart	2010
Asthma Hospitalization Costs	SPARCS Hospital Inpatient Database	2011
Work-Related Asthma (WRA) Emergency Department Visits	SPARCS Outpatient Database	2010
Work-Related Asthma (WRA) Hospital Discharges	SPARCS Hospital Inpatient Database	2010
WRA Incidence	NYS Occupational Health Clinic Network NYS Occupational Lung Disease Registry	2010 2010
School Indoor Air Quality • Problems in the ventilation system • Visible mold • Moisture/humidity problems • Vermin/pests	NYS Building Condition Survey	2010
Outdoor Air Quality • Ozone • Particulate Matter ($PM_{2.5}$) • Pollen	Environmental Protection Agency Air Quality System National Allergy Bureau NYS Counting Stations	2009 2003-2010

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Executive Summary

The *New York State Asthma Surveillance Summary Report (October 2013)* examines the prevalence and impact of asthma in NYS, and compares NYS asthma data to U.S. data and to the *Healthy People 2020* asthma-specific objectives. In addition, this report provides detailed information regarding asthma prevalence in children and adults through 2011, and data on risk behaviors, emergency department visits, asthma hospitalizations, asthma mortality, Medicaid managed care asthma prevalence, asthma-related utilization of health services and costs, work-related asthma, and asthma costs through 2011.

This Executive Summary offers highlights of the asthma-related information in New York State detailed throughout the report. Results are often presented for single years as well as for combined years (e.g., results for combined three-year datasets 2009 through 2011 are indicated as 2009-2011). Refer to individual chapters for detailed asthma-related information.

Key Findings

- One in every 10 adults and one in every 10 children in New York State currently have asthma. This chronic disease remains an epidemic in New York with significant public health and financial consequences.
- Overall, there has been an upward trend in the prevalence of current asthma among New York State residents from 2001through 2010. New York State asthma prevalence has also been higher than the national average.
- The asthma hospital discharge rate in New York State decreased approximately 11% from 2002 to 2011. In addition, New York State's asthma mortality rate decreased 24% in the past 10 years. The asthma emergency department rate, however, increased 6% from 2005-2011.
- Compared to the nation, New York has higher asthma emergency department and hospital discharge rates for all age groups. New York State's rates are roughly twice the levels targeted in *Healthy People 2020*.
- Disparities exist among certain age groups. Children aged 5-9 years in New York State had the highest current asthma prevalence for 2006-2010. From 2005 to 2011, children aged 0-4 years had the highest emergency department visit and hospital discharge rates compared to all other age groups.
- Geographic differences continue to be seen. Adults who live in New York City had higher current asthma prevalence in 2011, and also had higher age-adjusted asthma emergency department visit, hospital discharge, and mortality rates for 2009-2011 when compared to residents in the Rest of State. At the county level, asthma emergency department visit and hospital discharge rates varied across New York State for 2009- 2011, with the highest rates in the Bronx.
- Disparities persist among racial and ethnic groups. Non-Hispanic black adults and children experience some of the highest asthma prevalence rates in New York State. Non-Hispanic black and Hispanic middle and high school students also experience higher asthma prevalence rates when compared to all other racial and ethnic groups. In addition, for 2009-2011, the age-adjusted asthma emergency department visit, hospital discharge and mortality rates were higher among non-Hispanic black and Hispanic New Yorkers than non-Hispanic whites.
- The total cost of asthma hospitalizations for 2011 was approximately $660 million, a 61% increase since 2002. The average cost per hospitalization was $17,954 in 2011, a 78% increase from 2002. Among the New York State Medicaid managed care population with asthma, more than $276 million were spent in 2010 for asthma-related services; the average cost was $1,109 per asthma enrollee.

Tracking Healthy People 2020 Asthma-Specific Objectives in New York State

- Compared to the 2005-2007 time period, the most recent data for NYS (2009-2011) showed an increase in asthma emergency department visit rates for all age groups, ranging from 3% to 7%. NYS asthma emergency department visit rates were higher for all age groups when compared to the nation. NYS asthma emergency department visit rates were also higher than the *Healthy People 2020* objectives for all age groups, especially among children aged 0-4 years.
- Compared to the 2001-2003 time period, 2009-2011 New York State asthma hospital discharge rates were lower (13-19%) for those aged 0-64 years. However, New York State asthma hospital discharge rates remained higher than the United States rates for all age groups. New York rates were roughly two to three times higher than the *Healthy People 2020* objectives for each age group.
- Compared to the 2001-2003 time period, 2009-2011 New York State asthma mortality rates showed a decrease for all age groups, ranging from 13% to 27%. Compared to the nation, New York State asthma mortality rates were higher for all age groups, and were two to three times higher than the *Healthy People 2020* objectives for the 35-year and older age groups.

Prevalence and Risk Behavior Information, New York State Asthma Survey Data

Current Asthma Prevalence and Risk Behaviors in Adults (Behavioral Risk Factor Surveillance System), 2002-2011

- There has been an upward trend in the prevalence of current asthma among New York State residents from 2002 through 2010.
- In 2011, approximately 1.4 million adult New Yorkers (9.7%) had self-reported current diagnosed asthma.
- Current asthma prevalence was consistently higher for females than males. The 2011 prevalence of current asthma among New York State women (12.3%) was 78% higher than the prevalence in men (6.9%).
- Current asthma prevalence in New York State for 2011 was inversely related to annual household income and educational attainment.
- Adults who live in New York City had higher current asthma prevalence (10.2%) than adults in the Rest of State (9.3%) in 2011.
- In 2011, the percentage of current smoking was higher for adult New Yorkers with asthma (23.2%) compared to those without asthma (17.6%).
- The prevalence of obesity in 2011 was higher among adults with asthma (33.4%) compared to non-asthmatic adult New Yorkers (23.5%).

Current Asthma Prevalence in Children (Behavioral Risk Factor Surveillance System), 2006-2010

- For 2006-2010, approximately 456,022 (10.4%) children (0-17 years) in New York State had current asthma.
- Children aged 0-4 years in New York State had the lowest current asthma prevalence (7.3%) in 2006-2010, while children aged 5-9 years had the highest current asthma prevalence (13.7%).
- In 2006-2010, the current asthma prevalence among boys (11.2%) in New York State was higher than the prevalence among girls (9.6%).
- The prevalence of current asthma was slightly higher for children who live outside New York City (the Rest of State) (10.5%) compared to those in New York City (10.3%) for 2006-2010.
- The prevalence of current asthma was higher among non-Hispanic black children (14.3%) in 2006-2010 compared to non-Hispanic white (8.5%) and Hispanic (11.7%) children.
- In 2006-2010, New York children from households with annual incomes less than $25,000 had higher current asthma prevalence compared to children from families with annual household incomes of greater than $75,000 (14.4% and 8.2%, respectively.)

Current Asthma Prevalence and Asthma Episodes/ Attacks in Middle and High School Students (New York State Youth Tobacco Survey), 2012

- In 2012, current asthma prevalence was 23.3% for middle school students and 24.0% for high school students.
- Current asthma prevalence for middle school non-Hispanic other (18.1%) students was lower than Hispanic (29.9%) and non-Hispanic white (20.2%) students. Similarly, among high school students, prevalence of current asthma among non-Hispanic other (17.5%) students was lower compared to non-Hispanic blacks (27.7%) and Hispanics (26.1%). These differences were statistically significant.
- Among New York State middle school students with current asthma, 28.2% reported having had an asthma episode/attack in the past 12 months. The asthma episode/attack prevalence was 30.3% among high school students with current asthma.
- Female New York State high school students with current asthma reported significantly more asthma episodes/ attacks in the past 12 months (38.0%) compared to their male counterparts (22.7%).
- There was no significant difference in the prevalence of asthma episodes/attacks by race and ethnicity among New York State middle school and high school students.
- In 2012, 4.3% of middle school students with asthma reported that they smoked cigarettes during the past 30 days, compared to 2.7% of those without asthma. The percentage of high school students who reported that they smoked cigarettes for the past 30 days was similar among students with asthma (11.9%) and those without asthma (12.0%).

Asthma Emergency Department Visits, 2005-2011

- The number of emergency department visits due to asthma in New York State increased 7% in the past seven years from 153,784 in 2005 to 164,810 in 2011.
- Asthma emergency department visit rates showed a 6% increase from 79.9 per 10,000 residents in 2005 to 84.7 per 10,000 in 2011.
- Overall, asthma emergency department visits showed a seasonal pattern with peaks in the spring and fall, and declines in the summer.
- From 2005 to 2011, the 0-4 year age group consistently had the highest emergency department visit rate compared to all other age groups. Each age group showed a slight increase from 2005 to 2011 with the exception of the 25-44 year age group.
- For 2009-2011, female New Yorkers had higher crude and age-adjusted asthma emergency department visit rates (crude rate 88.4 per 10,000; adjusted rate 92.3 per 10,000) compared to males (80.8 per 10,000; 83.8 per 10,000).
- For the period 2009-2011, crude and age-adjusted asthma emergency department visit rates for non-Hispanic black (220.0 per 10,000; 219.5 per 10,000) and Hispanic (115.6 per 10,000; 112.8 per 10,000) New York State residents were higher than the rates for non-Hispanic white residents (30.4 per 10,000; 33.1 per 10,000).
- New York City residents had crude and age-adjusted asthma emergency department visit rates (crude rate 129.6 per 10,000; adjusted rate 135.0 per 10,000) in 2009-2011 that were approximately 2.5 times higher than residents in the Rest of State (50.9 per 10,000; 54.2 per 10,000).
- Asthma emergency department visit rates at the county level varied across New York State for 2009-2011. New York City residents of the Bronx had the highest age-adjusted emergency department visit rate of 231.4 per 10,000 residents. Among counties in the Rest of State, Clinton County had the highest age-adjusted emergency department visit rate of 110.6 per 10,000 residents.

Asthma Emergency Department Visit Rates for Adults with Current Asthma (At-Risk Based Rates), 2005-2011

- From 2005 to 2011, the annual at-risk based rate for asthma emergency department visits in New York State remained relatively stable. The annual at-risk based rate was 6.9 per 100 adults with current asthma in 2011.
- From 2005 to 2011, among adults with current asthma, non-Hispanic blacks and Hispanics (15.5 and 8.5 per 100 in 2011, respectively) consistently had higher at-risk based rates for asthma emergency department visits compared to non-Hispanic whites (3.0 per 100 in 2011) in New York State.

- From 2005 to 2011, among adults with current asthma, New York City (9.8 per 100 in 2011) residents consistently had a higher at-risk based rate for asthma emergency department visits compared to those in the Rest of State (4.6 per 100 in 2011). The New York City rate decreased 25% from 13.0 per 100 in 2005 to 9.8 per 100 in 2011.

Asthma Emergency Department Visit Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2010

- For 2006-2010, there were approximately 13.5 asthma emergency department visits each year per 100 children with current asthma in New York State.
- Among New York State children with current asthma in 2006-2010, the 0-4 year age group had the highest at-risk based rate for asthma emergency department visits (29.4 per 100) compared to all other age groups.
- The at-risk based rate for asthma emergency department visits for 2006-2010 was higher among boys (15.0 per 100) than girls (12.0 per 100).
- Among children with current asthma, the 2006-2010 at-risk based rate for asthma emergency department visits was highest for Hispanic children (59.5 per 100), followed by non-Hispanic black children (31.5 per 100).
- The at-risk based rate for asthma emergency department visits for 2006-2010 was five times higher for children with current asthma living in New York City (30.2 per 100) compared to those living in the Rest of State (6.0 per 100).

Asthma Hospital Discharges, 2002-2011

- The number of hospital discharges in New York State due to asthma decreased approximately 9% in the past 10 years from 40,585 in 2002 to 36,778 in 2011.
- Asthma hospital discharge rates showed an 11% decline from 21.2 per 10,000 residents in 2002 to 18.9 per 10,000 in 2011.
- Overall, asthma hospital discharges showed a seasonal pattern, with peaks in the spring and fall and a decline in the summer.
- From 2002 to 2011, the 0-4 year age group had the highest asthma hospital discharge rate compared to all other age groups in NYS. Each age group showed a downward trend over time with the exception of the 65 year and older age group.
- From 2009 to 2011, the crude and age-adjusted asthma hospital discharge rates for female New Yorkers (23.4 per 10,000; 22.5 per 10,000) were higher compared to males (16.4 per 10,000; 17.0 per 10,000).
- For the period 2009-2011, crude and age-adjusted asthma hospital discharge rates for non-Hispanic black (42.4 per 10,000; 43.2 per 10,000) and Hispanic (38.1 per 10,000; 42.7 per 10,000) New York State residents were at least four times higher than non-Hispanic white residents (9.4 per 10,000; 8.9 per 10,000).
- New York City residents had crude and age-adjusted asthma hospital discharge rates (30.2 per 10,000; 31.0 per 0,000) in 2009-2011 that were more than 2.5 times higher than residents in the Rest of State (12.2 per 10,000; 12.1 per 10,000).
- Asthma hospital discharge rates for 2009-2011 varied across New York State, with the highest in the Bronx (63.3 per 10,000) and the lowest in Tioga County (2.7 per 10,000).

Asthma Hospital Discharge Rates for Adults with Current Asthma (At-Risk Based Rates), 2002-2011

- From 2002 to 2011, the annual at-risk based rate for asthma hospital discharges in New York State decreased from 2.25 asthma hospital discharges per 100 adults with current asthma in 2002 to 1.76 per 100 in 2011.
- Asthma hospital discharges among those with current asthma increased with age. The 65 year and older age group (3.6 per 100 in 2011) consistently had the highest at-risk based rate for asthma hospital discharges compared to other adult age groups in New York State.
- From 2002 to 2011, among adults with current asthma in New York State, women consistently had higher at-risk based rates for asthma hospital discharges compared to men (1.90 versus 1.51 per 100 in 2011, respectively). However, the rate decreased for both women and men during this period.
- From 2002 to 2011, among adults with current asthma, non-Hispanic Blacks (2.9 per 100 in 2011) and Hispanics (2.4 per 100 in 2011) consistently had higher at-risk based rates for asthma hospital discharges compared to non-Hispanic whites (1.02 per 100 in 2011) in New York State.

- From 2002 to 2011, the at-risk based rate for hospital discharges among adults with current asthma living in New York City was higher compared to those in the Rest of State (2.46 vs. 1.20 per 100 in 2011).

Asthma Hospital Discharge Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2010

- For 2006-2010, there was an annual average of 3.5 asthma hospital discharges per 100 children with current asthma in New York State.
- For 2006-2010, among New York State children with current asthma, the 0-4 year age group had the highest at-risk based rate for asthma hospital discharges (10.1 per 100) compared to all other child age groups.
- The at-risk based rate for asthma hospital discharges for 2006-2010 was higher for boys (4.0 per 100) compared to girls with current asthma (3.0 per 100).
- Among children with current asthma, the 2006-2010 at-risk based rate for asthma hospital discharges was highest for Hispanic children (15.4 per 100) followed by non-Hispanic black children (7.1 per 100).
- The at-risk based rate for asthma hospital discharges for 2006-2010 was almost five times higher for children with current asthma living in New York City (7.7 per 100) compared to those living in the Rest of State (1.6 per 100).

Asthma Deaths, 2002-2011

- New York had an annual average of 258 deaths from asthma for 2009-2011, for a rate of 13.3 deaths per 1 million residents.
- In the past 10 years, New York State's asthma death rate decreased 24% from 17.2 per 1 million residents in 2002 to 13.1 per 1 million residents in 2011. Similar decreases were seen for residents of the Rest of State and New York City.
- For 2009-2011, New York State women had a slightly lower 2009-2011 age-adjusted asthma death rate (12.1 per 1 million) compared to men (12.3 per 1 million).
- For 2009-2011, non-Hispanic black (31.7 per 1 million) and Hispanic (22.1 per 1 million) New York State residents had higher age-adjusted mortality rates compared to non-Hispanic white residents (6.7 per 1 million).
- For 2009-2011, New York City's age-adjusted asthma mortality rate (19.8 per 1 million) was more than double the rate for the Rest of State (7.2 per 1 million). Within New York City, Bronx County had the highest age-adjusted asthma death rate (43.5 per 1 million.

Asthma Death Rates for Adults with Current Asthma (At-Risk Based Rates), 2002-2011

- From 2002 to 2011, the annual at-risk based rate for asthma deaths in New York State decreased from 27.2 asthma deaths per 100,000 adults with current asthma in 2002 to 16.7 per 100,000 in 2011. Similar decreases were seen for residents of the Rest of State and New York City.
- From 2002 to 2011, the at-risk based rate for asthma deaths decreased for both women and men. Women had the highest at-risk based asthma death rate for 2004 to 2006. However, in more recent years from 2007 through 2011, men had higher rates than women.
- From 2002 to 2011, among adults with current asthma, non-Hispanic blacks (37.3 per 100,000 in 2011) and Hispanics (18.8 per 100,000 in 2011) consistently had higher at-risk based rates for asthma deaths compared to non-Hispanic whites (10.7 per 100,000 in 2011).
- Among adults with current asthma, the 2011 at-risk based rate for asthma deaths was approximately two times higher for residents with current asthma in New York City compared to those in the Rest of State (24.5 vs.10.3 per 100,000).

Asthma Universe Prevalence Among the Medicaid Managed Care Population, 2006-2010

- There were 249,350 (11.5%) Medicaid managed care enrollees that were classified as asthma universe in 2010.
- Overall, asthma universe prevalence for Medicaid managed care enrollees increased between 2006 and 2010 for all age groups. In 2010, enrollees aged 5-11 years had the highest prevalence rate of asthma universe (15.1%), followed by enrollees aged 0-4 years (13.8%).
- Hispanic enrollees consistently had the highest prevalence rate of asthma universe. In 2010 that prevalence was 13.5%, followed closely by non-Hispanic black enrollees at 13.1%.
- Prevalence of asthma universe increased in both New York City and Rest of State regions from 2006 to 2010. In 2010, Rest of State residents had a higher prevalence rate of asthma universe (12.6%) compared to New York City residents (11.0%).
- The asthma universe prevalence rate increased from 2006 to 2009 for females (19%) and males (9%), followed by a slight decrease beginning in 2010 for males.
- Prevalence of asthma universe among Medicaid managed care enrollees varied by county. For 2010, enrollees from Columbia County (17.4%) and Sullivan County (17.2%) had the highest asthma universe prevalence rates, while enrollees from Wyoming County had the lowest prevalence rate (6.2%).

Persistent Asthma Prevalence Among the Medicaid Managed Care Population, 2009-2010

- Among the Medicaid managed care enrollees with 24 months continuous enrollment by the end of 2009 or 2010 respectively, 70,275 (4.9%) and 80,586 (5.2%) met the definition of persistent asthma.
- Enrollees aged 51-64 years had the highest prevalence rate of persistent asthma in 2009 (7.8%) and in 2010 (8.9%).
- Females had a slightly higher prevalence rate of persistent asthma (5.0% in 2009 and 5.4% in 2010) compared to males (4.7% in 2009 and 4.9% in 2010)
- Persistent asthma prevalence in Medicaid managed care enrollees varied by race and ethnicity. Hispanic enrollees had the highest prevalence rate of persistent asthma (6.2% in 2009 and 6.4% in 2010), followed by non-Hispanic black enrollees (5.8% in 2009 and 6.2% in 2010).
- For 2010, enrollees from Columbia, Cattaraugus and Tompkins counties had the highest persistent asthma prevalence at 7.3%, 7.2%, and 7.1%, respectively.

Utilization of Health Services by the Medicaid Managed Care Asthma Universe Population, 2009-2010

- Overall, there were 392,379 outpatient asthma visits in 2009 and 408,517 in 2010; 38,590 asthma emergency department visits in 2009 and 37,488 in 2010; and 8,910 asthma hospitalizations in 2009 and 7,762 in 2010 among the asthma universe population. For the same time period, more than 1.5 million asthma-related pharmacy dispensing events occurred.
- The rate of outpatient visits, emergency department visits, and hospitalization was highest among children aged 0-4 years for 2009 (203.9 visits per 100 Medicaid managed care asthma universe enrollees, 22.5 per 100, 6.4 per 100, respectively) and 2010 (202.9 per 100, 20.9 per 100, and 5.2 per 100, respectively).
- Asthma-related pharmacy dispensing events increased with age. The highest rate was among adults aged 51-64 years (1,107.0 and 1,174.6 dispensing events per 100 Medicaid managed care asthma universe enrollees in 2009 and 2010 respectively).
- Female enrollees had a lower outpatient visit rate (165.6 per 100 Medicaid managed care asthma universe enrollees in 2009 and 161.9 per 100 in 2010). Rates of emergency department visits were also lower for female universe enrollees with asthma (15.9 per 100 in 2009 and 14.2 per 100 in 2010).
- Hispanic enrollees had the highest outpatient visit and pharmacy dispensing event rates in both 2009 (180.0 and 705.3 per 100 Medicaid managed care asthma universe enrollees, respectively) and in 2010 (177.7 and 738.8 per 100 respectively).
- Asthma emergency department visit rates and hospitalization rates varied by race and ethnicity, with the highest rate among non-Hispanic black enrollees in both 2009 (25.0 and 5.6 per 100 Medicaid managed care asthma universe enrollees, respectively) and 2010 (23.3 and 4.6 per 100, respectively).
- Enrollees in New York City had a lower outpatient visit rate (165.9 per 100 Medicaid managed care asthma universe enrollees in 2009 and 162.8 per 100 in 2010) than Medicaid managed care asthma universe enrollees from the Rest of State (173.8 per 100 in 2009 and 166.1

per 100 in 2010). However, rates of asthma emergency department visits, hospitalizations, and pharmacy dispensing events were higher for those who reside in New York City for both 2009 (18.2, 4.2, and 693.3 per 100, respectively) and 2010 (16.8, 3.5, and 734.6 per 100, respectively) compared to those in the Rest of State in 2009 (12.4, 2.8, and 566.6 per 100, respectively) and 2010 (11.0, 2.1, and 598.4 per 100, respectively).

Asthma Universe Prevalence Among the Child Health Plus Population, 2010

- A total of 226,019 children aged 0-18 were enrolled in the Child Health Plus program (CHP) in 2010, and 23,553 (10.4%) enrollees were classified as asthma universe.
- In 2010, the asthma universe prevalence rate was highest among the 0-4 age category (12.9%), and the 5-11 year age category (12.8%). The highest asthma universe prevalence rate by gender, race and ethnicity, region and county was observed among male enrollees (11.7%); non-Hispanic black enrollees (11.5%); residents of the Rest of State (11.6%); and residents of Livingston County (16.4%) respectively.

Persistent Asthma Prevalence Among the Child Health Plus Population, 2010

- In 2010, there were 9,320 (6.4%) Child Health Plus enrollees classified as having persistent asthma.
- The highest persistent asthma prevalence was seen among those aged 5-11 years (8.3%), male enrollees (7.4%), non-Hispanic black enrollees (7.4%), Rest of State residents (7.4%), and residents of St. Lawrence County (10.6%).

Utilization of Health Services by the Child Health Plus Asthma Universe Population, 2010

- In 2010, there were 35,899 outpatient visits; 2,218 emergency department visits; and 537 hospitalizations due to asthma among the asthma universe population for Child Health Plus enrollees. In addition, 104,046 asthma-related dispensing events occurred in 2010.
- The highest rate of outpatient visits, emergency department visits, and hospitalizations were seen among children aged 0-4 years (182.6, 14.5, and 5.8 per 100 Child Health Plus asthma universe enrollees, respectively).
- Asthma-related pharmacy dispensing event rates varied by age group. The highest rate was among the 5-11 year old age group (478.6 dispensing events per 100 Child Health Plus asthma universe enrollees).
- Child Health Plus asthma universe female enrollees had a lower outpatient visit rates, emergency department visit rates, and pharmacy dispensing events (148.5, 8.7, and 422.1 per 100 CHP asthma universe enrollees, respectively) than male enrollees (155.3, 10.0, and 456.3 per 100, respectively). Asthma hospitalizations were the same across gender for 2010 (2.3 per 100).
- Non-Hispanic black enrollees had the lowest outpatient visit rate (147.7 per 100 Child Health Plus asthma universe enrollees). Non-Hispanic white and Hispanic enrollees had the highest outpatient visit rates (154.4 and 154.2 per 100, respectively).
- Asthma emergency department visit and hospitalization rates were highest among non-Hispanic black enrollees (16.6 and 4.7 per 100 Child Health Plus asthma universe enrollees, respectively).
- The highest rate of asthma-related pharmacy dispensing events was among Hispanic and non-Hispanic other enrollees (406.6 and 407.9 dispensing events per 100 Child Health Plus asthma universe enrollees, respectively).
- Those living in Rest of State had a higher outpatient visit rate and rates of pharmacy dispensing events (156.7 and 465.0 per 100 Child Health Plus asthma universe enrollees, respectively) than those living in New York City (143.3 and 392.3 per 100, respectively). However, rates of asthma emergency department visits and hospitalizations were higher for those living in New York City (13.3 and 2.8 per 100, respectively) compared to those living in the Rest of State (7.6 and 2.1 per 100, respectively).

Managed Care Quality Assurance Reporting Requirement Asthma-Specific Indicator, 2010

- Among children with persistent asthma ages 5-11, 96% of enrollees of Commercial plans and 95% of enrollees of Child Health Plus plans received appropriate medications for asthma, compared to 92% for children with persistent asthma in Medicaid managed care plans.
- In 2010, Commercial HMO plans showed a slightly higher proportion of enrollees aged 12-50 years with persistent asthma receiving appropriate medications (91%) compared to enrollees in Medicaid (88%) or Commercial PPO (82%) plans.
- In 2010, children aged 5-11 years with persistent asthma who were enrolled in Commercial (82%) health plans and Child Health Plus (81%) were more likely to have three or more controller medications dispensed in the past year compared to those enrolled in Medicaid managed care plans (76%).

- In 2010, a higher proportion of individuals aged 12-50 years with persistent asthma who were enrolled in Commercial health plans had three or more controller medications dispensed in the past year (81%) compared to those enrolled in Medicaid managed care plans (77%).
- In 2010, among individuals aged 5-50 years with persistent asthma, Orleans County had the lowest percentage of individuals (less than 80%) who received appropriate medications to control their asthma.
- In 2010, among children aged 5-11 years with persistent asthma, children in Orleans and Genesee counties had the lowest percentage of children (less than 70%) who had three or more controller medication dispensing events in the past year.

Prevention Quality Indicators and Pediatric Quality Indictors for the Medicaid Managed Care Asthma Universe Population, 2010

- In 2010, among the asthma universe population aged 2-17 years, 44.2% of asthma hospital admissions in New York State could potentially have been avoided through more effective outpatient care. The number of preventable asthma hospital admissions was nearly two times higher for children (0-17 years) than adults (18-39 and 40+ years).
- In 2010, among the asthma universe population aged 18-39 years, 22.5% of asthma hospital admissions in New York State could potentially have been avoided through more effective outpatient care.
- In 2010, among the asthma universe population aged 40 years and older, 23.7% of asthma hospital admissions in New York State could potentially have been avoided through more effective outpatient care.

Work-Related Asthma, 2001-2010

- For 2005-2010, approximately 14.9% of adults with current asthma in New York State indicated that either a health professional had informed them they had work-related asthma, or they had informed a health professional of such.
- For 2001 to 2010, annual work-related asthma hospital discharges ranged from 41 to 90 per year in New York State.
- The average length of stay for a work-related asthma hospitalization increased over time from 3.8 to 4.1 days, and the average cost increased for the 2001 to 2010 time period. The total cost of all work-related asthma hospitalizations in 2010 was approximately $1.085 million.

Asthma Costs, 2002-2011

- The total cost of asthma hospitalizations in New York State for 2011 was approximately $660 million, a 61% increase in cost since 2002 ($409 million). The Consumer Price Index-adjusted asthma hospitalization cost increased 19% from the 2002 adjusted cost of $556 million.
- The average cost per asthma hospitalization increased 78% from $10,080 in 2002 to $17,954 in 2011. The average adjusted asthma hospitalization cost increased 27% over this time. This occurred despite the average length of stay for an asthma hospitalization decreasing 5%, from 3.8 days to 3.6 days, for the same time period.
- The average cost per asthma hospitalization increased with age. The 2011 average costs ranged from $10,308 for the 0-4 year age group to $26,459 for those aged 65 years and older.
- In 2010, among the Medicaid managed care population, more than $276 million was spent on more than 249,350 asthma universe individuals for asthma-related services. The average cost was $1,109 per asthma enrollee.
- The average asthma-related service cost among the Medicaid managed care asthma universe population was highest for patients aged 51-64 ($1,864), for non-Hispanic black and Hispanic patients ($1,187 and $1,182, respectively) and for patients who reside in New York City ($1,191).

2010 NYS Building Condition Survey

The NYS Building Condition Survey tracks conditions in NYS public schools that may affect school indoor air quality.

Although relatively few school buildings reported having noticeable moldy odors (3.8%) in 2010, about 35% reported at least one type of moisture or humidity problem, which can indicate the potential for mold growth.

Various ventilation-related problems, which can affect indoor air quality, were reported by schools in 2010. About one-fifth of schools reported inadequate outside air intake, about 13% reported problems with malfunctioning dampers, and about 10% reported potential diesel intrusion, blocked air intakes and dirt or dust near or in the system.

About 5% of buildings reported rodents, cockroaches, wood eating insects or other pests in 2010.

Ozone and $PM_{2.5}$

For 2007-2009, there were unhealthy ozone days each year at several locations across the state. Elevated ozone levels occurred most commonly near and downwind of major cities. Unhealthy ozone days mainly occur from May through September. The frequency of unhealthy ozone days per year tended to decline from 2000 to 2009.

For 2007-2009, the number of days when fine particle concentrations were unhealthy for sensitive groups, such as people with asthma, was greatest in the New York City area, less in the smaller-sized cities and lowest in rural areas. The frequency of unhealthy fine particle days per year tended to decline from 2000 to 2009.

Pollen

Tree pollen season typically begins in the spring and ends in early summer. For 2003 to 2010, the average percentage of days in late March to mid-June when tree pollen counts were at or above the national threshold for a “high” pollen count ranged from 49% to 84%.

Grass pollen season typically begins later in the spring and continues through late summer or early fall. For 2003 to 2010 the average percentage of days in late April to mid-September when grass pollen counts were at or above the national threshold for a “high” pollen count ranged from 3% to 67%.

Weed pollen season typically begins mid to late summer and continues through the fall. For 2003 to 2010, the average percentage of days in late May to early October when weed pollen counts were at or above the national threshold for a “high” pollen count ranged from none to 37%.

3

New York State Department of Health Asthma Initiatives

The New York State Department of Health (NYSDOH) aims to reduce the burden of asthma, as demonstrated by a reduction in asthma emergency department visits, a reduction in asthma hospital discharge rates, and an increase in the quality of life for all New Yorkers with asthma, especially those disproportionately impacted by asthma. To accomplish this, the NYSDOH is committed to:

- Promoting a healthy and safe environment for New Yorkers with asthma,
- Increasing access to quality, guideline-concordant asthma care,
- Eliminating disparities in health outcomes for New Yorkers with asthma,
- Using NYS asthma surveillance data in the development and monitoring of asthma policies, programs and actions implemented throughout the state, and
- Maintaining a coordinated approach to achieving stated outcomes.

Overview of New York State Department of Health Asthma Initiatives

Asthma Partnership of New York (APNY)

The Asthma Partnership of New York (APNY), a public and private collaboration, has mobilized a coalition of partners across the state to plan, implement and evaluate community-based and patient-centered strategies to improve asthma-associated outcomes. The APNY connects an expansive network of organizations and experts to implement key asthma initiatives, focusing on areas with a high burden of asthma. Partners include the New York City Department of Health and Mental Hygiene, the New York State Education Department, the Business Council of New York State, medical societies, regional asthma coalitions, professional societies and associations, health plans, hospitals, clinics, home intervention programs and community organizations.

Surveillance and Program Evaluation

- **Maintaining and updating asthma measures for the following datasets:** Behavioral Risk Factor Surveillance System (BRFSS); BRFSS Asthma Call-Back Survey; emergency department visit data; hospital discharge data; mortality data; Medicaid encounter data; Occupational Lung Disease Registry; Occupational Health Clinic Network data; and the New York State Youth Tobacco Survey.
- **Asthma population-based survey surveillance:** Collect data and analyze lifetime and current asthma prevalence, age at diagnosis, symptoms/episodes, knowledge of asthma/management plan, medications, modifications to environment, school/work-related asthma, and access to care information annually using the BRFSS Core Survey and the BRFSS (Child and Adult) Asthma Call-Back Survey.
- **Asthma emergency department visit surveillance:** Obtain data and analyze asthma ED emergency department visit rates by socio-demographic categories as well as generate asthma emergency department visit rates at the state, regional, county and ZIP code levels
- **Asthma hospital discharge surveillance:** Obtain data and analyze asthma hospital discharge rates by socio-demographic categories as well as generate asthma hospital discharge rates at the state, regional, county and ZIP code levels.
- **Asthma mortality surveillance:** Obtain and analyze crude and age-adjusted asthma mortality rates by socio-demographic categories as well as generate asthma mortality rates at the state, regional and county levels.

- **Asthma Medicaid and Child Health Plus surveillance:** Utilize Medicaid and Child Health Plus encounter and claim data derived from the Office of Health Insurance Programs to assess asthma prevalence, costs, health care utilization, and quality of care among the Medicaid and Child Health Plus populations.

- **Work-related asthma surveillance:** Assess work-related asthma incidence utilizing the Occupational Lung Disease Registry and the Occupational Health Clinic Network. Work-related asthma hospitalizations and costs in NYS are generated using hospital discharge data, the BRFSS Core Survey, and the BRFSS Adult Asthma Call-Back Survey.

- Disseminating current NYS asthma surveillance information via surveillance reports, presentations and articles, and the NYSDOH public website (see www.health.ny.gov/statistics/ny_asthma/index.htm). The following asthma information is presented on the NYSDOH public website:

  – Lifetime and current asthma prevalence by selected socio-demographic groups are presented for the United States and NYS. Asthma prevalence data are produced from the responses to two asthma questions on the BRFSS Core Questionnaire.

  – Emergency department and hospital discharge data are used to create county-specific and ZIP code level asthma emergency department and hospital discharge data tables, graphs, and maps organized by NYS regions.

  – Death certificate data from the NYS Vital Statistics database are used to create both crude and age-adjusted county-specific asthma death rates, organized by NYS regions.

- **Providing technical assistance:** Technical assistance regarding needs assessment, program targeting, evidence-based interventions and program monitoring and evaluation are provided to local health departments, hospitals, regional asthma coalitions and other partners.

- **Evaluating the NYS Asthma Program:** NYS has developed and implemented a five-year strategic evaluation plan for the Asthma Program based on the CDC Framework for Program Evaluation in Public Health. A comprehensive evaluation is under way of the NYS asthma partnership, asthma surveillance system and key asthma interventions. Findings will be used to guide program and policy efforts and will be shared with local, statewide and national audiences.

Health Care

- **Child Health Plus:** Child Health Plus provides coverage to children under the age of 19 residing in NYS with limited family incomes and no health insurance (see www.health.ny.gov/health_care/child_health_plus/).

- **Healthy New York:** This program provides reduced-cost, comprehensive health insurance to small employers, uninsured working individuals, and sole proprietors. (A sole proprietor is a person who owns a business in which he or she is the only employee). (See www.health.ny.gov/publications/0548/healthy_new_york.htm)

- **Medicaid:** Medicaid recipients have access to a benefit package covering services necessary to manage asthma, including but not limited to medications and prescription drugs, spacers, pulmonary diagnostic tests, doctor visits and hospital care (see www.nyhealth.gov/health_care/medicaid/index.htm).

- **Quality Assurance Reporting Requirements (QARR) Report:** The most recent version of this report identifies how Medicaid managed care plans and commercial insurance plans perform on specific health measures, including use of appropriate medications for asthma. The report represents one of the most comprehensive report cards for managed care in the nation (see www.health.ny.gov/health_care/managed_care/reports/quality_performance_improvement.htm#link2).

- **Clinical Guidelines for the Diagnosis, Evaluation, and Management of Adults and Children with Asthma** is a clinical decision support tool produced by a NYS expert panel, and is based on the Clinical Application of the National Asthma Education and Prevention Program's (NAEPP) Expert Panel Report-3 (EPR-3), which provides guidelines for the diagnosis and management of asthma. This decision support tool has established a common standard of care for providers and health plans, has been endorsed by professional societies, associations and health plans, and distributed to more than 24,000 physicians in NYS (see www.health.ny.gov/diseases/asthma/).

- **Asthma in Primary Care Practice:** This tutorial is based on the NAEPP EPR-3 and promotes the translation of the asthma guidelines into primary care practice. The course was reviewed and is acceptable for three evidenced-based CME credits by the American Academy of Family Physicians. To order the course on DVD, see www.health.ny.gov/forms/order_forms/asthma.pdf. To access the on-line course, see http://jeny.ipro.org/files/Asthma/.

- **Asthma Self-Management Education:** Medicaid coverage for Asthma Self- Management Training (ASMT) services is provided in NYS for Medicaid beneficiaries diagnosed with asthma when these services are ordered by a physician, registered physician's assistant, registered nurse practitioner, or a licensed midwife. ASMT services must be provided by a New York State licensed, registered, or certified health care professional, holding a current certification as an educator by the National Asthma Educator Certification Board. Certified Asthma Educators (AE-Cs) are required to enroll in the NYS Medicaid program as non-billing providers and must be employed by or contracted with an appropriate billing provider. For more information about AE-C enrollment forms and instructions see www.emedny.org/info/ProviderEnrollment/index.aspx. For detailed information regarding asthma education services, refer to the October 2008 Medicaid Update (see www.nyhealth.gov/health_care/medicaid/program/update/2008/2008-10.htm#dia).

Community-Based Initiatives

- **Asthma Website:** The NYSDOH maintains a public asthma website (see www.health.ny.gov/diseases/asthma/) with information on asthma surveillance, interventions, care and educational materials.
- **Regional Asthma Coalitions:** The NYSDOH funds regional asthma coalitions in areas with a high burden of asthma across the state. The coalitions bring healthcare and community partners together, including hospitals, clinics, primary care health providers, asthma specialists, health plans, schools, community organizations, public health, businesses and other public and private groups, to respond to the asthma epidemic that must be addressed and solved locally. The coalitions develop, implement, spread and sustain population-based, policy and system level changes with and for their communities. For more information and to contract your regional asthma coalition, see www.health.ny.gov/diseases/asthma/coalitions.htm
- **NYS Asthma Outcomes Learning Network:** Implementation of this large scale, population based, system change intervention is accomplished in collaboration with the regional asthma coalitions. Teams of local health care and community partners receive training and coaching on using evidence based approaches to to translate the NAEPP EPR-3 guidelines into practice. Key learning principles, tools, and results are shared through the network.
- **Asthma and Influenza:** NYSDOH launched an Asthma and Influenza Education Campaign to raise awareness about the importance of receiving influenza vaccination, especially for those with asthma. Educational materials for providers, people with asthma and their families, and the community were developed and are available on the public web site (see www.health.ny.gov/diseases/asthma/influenza).
- **Winning with Asthma Coaches Clipboard Program:** This 30-minute online educational program was created to train coaches about asthma, how asthma affects an athlete's ability to compete, and how a coach can help athletes control their asthma while playing their very best (see www.health.ny.gov/diseases/asthma/athletic_field.htm). The Asthma Program is promoting this program among coaches of youth sports and activities, athletic directors, physical education teachers and school nurses.
- **Students with Asthma:** NYS Legislation passed in 1998 (Education Law 16, Article 19, Section 916) requires schools and Boards of Cooperative Educational Services (BOCES) to allow students who have been diagnosed by a physician with a severe asthmatic condition to carry and use prescribed inhalers for the school day.

Environmental and Occupational Health

- **Healthy Neighborhoods Program:** The Healthy Neighborhoods Program provides in-home assessments and interventions for asthma, tobacco cessation, indoor air quality, lead and fire safety in selected communities throughout NYS. For residents with asthma, interventions may include asthma trigger education; dust, mold, and pest control measures; distribution of pillow and mattress covers; and smoking cessation education. An evaluation of the asthma component of this program for 1997-2000 found that it reduced hospitalizations and was cost-effective. A more recent program evaluation indicates significant improvements in exposure to environmental triggers, patient self-management and short-term asthma morbidity. The program received the *National Environmental Leadership in Asthma Management Award* from the U.S. Environmental Protection Agency in 2011 (see www.asthmacommunitynetwork.org/node/6163, www.health.ny.gov/environmental/indoors/healthy_neighborhoods/, and https://health.data.ny.gov/Health/Healthy-Neighborhoods-Revisited-Dwellings-Initial-49ua-zw9a).

- **Healthy Home Environments for New Yorkers with Asthma (HHENYA):** People with asthma frequently live in environments that exacerbate their symptoms and minimize their ability to control their asthma. In Western NY, NYSDOH collaborated with four managed care plans and the Erie County Healthy Neighborhoods Program to develop and implement a pilot program to integrate management of environmental triggers into routine asthma care. Participating health plans identified and referred eligible patients to the HHENYA program, which provided each patient with an in-home assessment, education, supplies and referrals to address environmental and other problems identified for the home visit. To reinforce the education provided, a summary of the home visit was sent to each patient, his or her doctor and the referring health plan. Preliminary findings suggest that this may be an effective approach for reducing exposure to environmental asthma triggers, improving patient self-management and reducing short-term asthma morbidity (see www.publichealthreports.org/EOH-abstracts/Places.cfm).

- **School AIR Collaborative (Addressing Indoor Air Quality (IAQ) Roadblocks):** Many resources are available to help schools identify and fix IAQ problems that may affect students and staff with asthma, but these resources are not always used. Findings from earlier NYSDOH surveys suggest that even when policies or practices exist, they are not always enforced or fully implemented. An interdisciplinary team within the NYS Asthma Program worked with 10 schools in the Capital District region to learn more about potential barriers to implementation of IAQ programs and to identify strategies for overcoming those barriers. The majority of staff rated IAQ as a high priority, comparable in importance to other health and safety issues, felt that IAQ had an impact on students and staff and reported a willingness to take responsibility for IAQ in their schools. However, there were notable differences in the IAQ challenges faced by different school types (e.g., elementary vs. high school) and in the perceptions, beliefs and attitudes of different occupational groups (e.g., teachers vs. facilities staff). An improved understanding of potential differences and similarities between occupational groups and school types may improve programs and materials at the individual school level and for programs developing regional or statewide approaches to improving school indoor air quality.

- **School Environmental Assessment Project:** This project consisted of surveying school nurses, custodians and district facilities managers to determine the influence of the school environment on childhood asthma, and the programs, practices and policies in place to address the school environment. The NYS Education Department's (NYSED) 2000 Building Condition Survey (BCS) provided information about the overall condition of NYS school buildings and the condition of building systems, such as ventilation, plumbing, building envelope, etc. Hospitalization data were analyzed to identify patterns that may be linked to these school building conditions. A summary report, *Asthma and the School Environment in NYS*, was disseminated to school districts and stakeholders across NYS to share project findings and statewide information that may help schools to create asthma-friendly learning environments (see www.health.ny.gov/diseases/asthma/asthma_in_schools.htm). Since the BCS is conducted every five years, Bureau of Environmental and Occupational Epidemiology staff have added questions to subsequent BCS's that are specific to indoor air quality; staff continue to monitor changing school conditions over time using this instrument.

- **Green Schools Project:** The relationship between occupant health and performance and "green" school characteristics such as indoor air quality, dryness, well-maintained systems, good acoustics and lighting were examined through data sources. These data are obtained from the 2005 school Building Condition Survey, attendance and academic test score data from New York State Education Department, hospitalization data, teacher surveys and selected school walkthroughs. When examining the potential relationship between building conditions and school district asthma hospitalization rates, results indicated that lower admission rates were associated with school districts that had a higher "cleanliness score" even after controlling for potential confounders.

- In a statewide teacher survey that was conducted in collaboration with New York State United Teachers in 2010, almost 10% of surveyed teachers reported they had asthma. In this random sample of almost 500 teachers, they frequently reported conditions known to be asthma triggers in their classroom. Lastly, many teachers (43.5%) reported experiencing one or more allergic symptoms during the 2010-2011 school year.

- **EPA STAR Grant (Environmental Protection Agency Science to Achieve Results grant):** A new project, *Assessing the Linkage Between School-Related Environment, Children's School Performance and Health, and Environmental Policies Through Public Health Tracking*, will develop new and improve existing Environmental Public Health Indicators (EPHIs) related to

the school environment. It will also evaluate the linkage between school and children's health and school performance (test scores, attendance), as well as the impacts of environmental policy on these outcomes. The development and evaluation of school-related environmental health indicators could help enhance the capacity of NYS's Environmental Public Health Tracking (EPHT) program to monitor school environments and their potential impacts. Also, indoor and outdoor school environmental hazards will be examined in relation to asthma hospital admissions, emergency department visits and other school-related outcomes.

- **Work-Related Asthma:** Work-related asthma (WRA) affects at least one out of every six individuals with asthma, and is the most prevalent occupational lung disease in developed countries. The NYSDOH conducts surveillance of WRA, provides education on WRA to physicians and individuals with asthma, and conducts interventions to help prevent ongoing and future exposures. Physicians are provided information on the diagnosis of WRA and encouraged to consider workplace factors with every case of adult-onset asthma or asthma that worsens in adulthood. The program follows up with workers and employers to help prevent ongoing and future exposures, using phone consultations, industrial hygiene site visits and hazard alerts (see www.health.ny.gov/diseases/asthma/work_related_asthma.htm).

- **American Academy of Allergy Asthma and Immunology (AAAAI) ARTrust Mini-grant:** A project titled *Cleaning Products and Asthma: Education and Information for the Hospitality Industry* will develop educational materials regarding cleaning products and asthma to be distributed to the hospitality industry in NYS. Materials will be developed for workers and employers. Worker materials will be translated into Spanish. The educational materials will include information on the association between cleaning products and asthma, symptoms that may indicate asthma, how to choose and safely use less toxic cleaning products, proper use of personal protective equipment and a list of additional resources. Materials will be distributed to the approximately 5,500 permitted temporary residences in NYS. The availability of the educational materials will be promoted through educational webinars for businesses that are part of professional organizations. The materials will also be made available through the NYSDOH website.

- **Air Quality Health Advisories:** The Commissioners of NYSDOH and the NYS Department of Environmental Conservation (NYSDEC) issue a joint press release when forecasted levels of outdoor ground-level ozone or fine particle concentrations are of concern, especially for people with health conditions such as asthma. Local health units and media outlets are notified of advisories in their regions and are directed to the NYSDOH and NYSDEC websites for advice on ways to reduce exposure and steps that citizens can take to reduce air pollution (see www.health.ny.gov/environmental/air_quality/index.htm#outdoor_air, www.dec.ny.gov/public/43563.html and www.dec.ny.gov/cfmx/extapps/aqi/aqi_forecast.cfm).

- **Asthma-Related NYSDEC Enforcement Programs and Initiatives:** NYSDEC's *Stop Smoking Trucks and Idling Vehicles Initiative* addresses heavy duty diesel vehicle emissions in environmental justice communities (See Appendix 1) experiencing high asthma hospitalization rates by conducting enforcement activities that target vehicle emissions. Under the initiative, NYSDEC law enforcement officers issue tickets to diesel trucks that fail to comply with state standards on emissions and to trucks or buses idling illegally. After piloting the initiative in New York City in 2007, NYSDEC expanded the program statewide in November 2008. NYSDEC's targeted enforcement operations continue in environmental justice communities across New York. Building on the success of the Stop Smoking and Idling Trucks Initiative, NYSDEC developed and launched *Operation ECO-Quality Pilot Program* in Westchester County in Fall 2010. While Operation ECO-Quality continues to focus on addressing the air quality impacts of diesel trucks on communities with elevated asthma rates, the Pilot Program expands the scope of enforcement efforts to include activities related to selected large and smaller regulated facilities. (See www.dec.ny.gov/docs/permits_ej_operations_pdf/ecoqualrpt.pdf).

- **Environmental Education and Outreach Project:** Through this project, a statewide asthma educational needs assessment was conducted to determine key messages and best-practice educational materials regarding the environmental and occupational triggers of asthma. The assessment found persistent problems in communication between providers and their patients. As a result, NYSDOH and partners developed new educational materials to enhance communication between patients and providers, including the new *Have Asthma?* brochure and *Trigger Tracker* tool. These materials are designed to meet a range of literacy skills and are available in English and Spanish (see www.health.ny.gov/publications/4990/). The Pediatric/Adult Asthma Coalition of New Jersey recently produced a video series, *Six Steps to Controlling Your*

Asthma, which features the NYSDOH Trigger Tracker as a tool for helping doctors and patients communicate about asthma triggers (see www.pacnj.org/triggers.html).

- **Environmental Public Health Tracking (EPHT):** EPHT is the ongoing collection, integration, analysis and interpretation of data on environmental hazards and potential health effects related to exposures to these hazards. For nine years, NYSDOH has received funding from the Centers for Disease Control and Prevention (CDC) to develop an EPHT network that tracks a core set of nationally consistent data relating to issues such as asthma, ambient air concentrations of ozone and fine particles. The NYS EPHT program is collaborating with the NYSDOH Asthma Program, the NYSDEC, CDC and the U.S. Environmental Protection Agency to disseminate coherent public health messages based on the analyses of these data, and has partnered with Emory University, University of Medicine and Dentistry New Jersey, National Aeronautics and Space Administration (NASA) and the University of California at Berkeley in projects to better understand the impact of air pollution on health outcomes, including asthma (see www.health.ny.gov/environmental/public_health_tracking/)
- **Environmental Health Research:** The NYSDOH supports continuing analysis and exploration to determine the key environmental factors contributing to asthma development and morbidity.

  – www.health.ny.gov/environmental/ public_health_tracking/program/publications Some research included studies of the potential health effects associated with ambient air contaminants; a study of the potential health impact of residential proximity to large NYS airports; a study of meteorological conditions (e.g., extreme heat) and health outcomes; assessment of asthma and contributing factors in the school and home environments.

  – www.health.ny.gov/diseases/asthma/asthma_in_schools.htm A study of green school building attributes and occupant health and performance; and follow-up health studies of World Trade Center responders and community residents.

  – www.health.ny.gov/environmental/investigations/wtc/health_studies/ Multiple projects assessing climate change on different health outcomes. The NYSDOH builds upon information from environmental asthma research to develop more effective public health programs aimed at reducing or eliminating exposure to environmental factors.

4

Tracking Healthy People 2020 Asthma-Specific Objectives in New York State

The *Healthy People 2020* initiative provides a comprehensive set of national objectives for disease prevention and health promotion to be achieved over the second decade of this century. Sponsored by the U.S. Department of Health and Human Services, the objectives were developed through a broad consultation process and are built on the best scientific knowledge about population health. The objectives include public health priorities that can be used by individuals, states, communities and professional organizations to develop health improvement programs.[13]

Healthy People 2020 objectives are national benchmarks. Its *Focus Area 24: Respiratory Diseases*[14] includes objectives for asthma emergency department visits, asthma hospitalizations, activity limitations, school or work days lost due to asthma, patient education, appropriate asthma care, asthma mortality and maintaining and improving asthma surveillance systems. NYS uses the *Healthy People 2020* asthma-related objectives to guide asthma prevention and control efforts, compare our progress with other states and, ultimately, document New York's contribution toward achieving national objectives.

This section provides the *Healthy People 2020* national objectives and updated data for asthma ED visits, asthma hospitalizations and asthma mortality for NYS and the nation.

Asthma Emergency Department Visits

Table 4-1
Asthma Emergency Department Visit Rate per 10,000 Residents by Age Group for New York State (2005-2011), United States (2009), and Healthy People 2020 Objectives

Age Group	New York			United States 2009	Healthy People 2020
	2005-2007	2007-2009	2009-2011		
0–4	215.5	218.5	230.7	131.5	95.6
5–64	80.1	81.7	82.6	N/A	49.7
65+	31.4	31.5	32.8	22.8	13.8

Compared to the 2005-2007 time period, the most recent data for NYS (2009-2011) showed an increase in asthma emergency department visit rates for all age groups, ranging from 3% to 7%. NYS asthma emergency department visit rates were higher for all age groups when compared to the nation. NYS asthma emergency department visit rates were also higher than the *Healthy People 2020* objectives for all age groups, especially among children aged 0-4 years (Table 4-1).

Asthma Hospital Discharges

Table 4-2
Asthma Hospital Discharge Rate per 10,000 Residents by Age Group for New York State (2001-2011), Healthy People 2020 Objectives, and United States (2009)

Age Group	New York					United States 2009	Healthy People 2020
	2001-2003	2003-2005	2005-2007	2007-2009	2009-2011		
0–4	71.5	67.2	59.1	58.8	58.0	40.6	18.1
5–64	17.3	17.0	15.3	15.5	15.1	N/A	8.6
65+	26.7	30.0	29.9	31.2	32.2	29.0	20.3

Compared to the 2001-2003 time period, the most recent data for NYS (2009-2011) showed a reduction for asthma hospital discharge rates for those aged 0-64 years, ranging from 13% to 19%. However, asthma hospital discharge rates increased 21% for the population aged 65 years and older. Compared to the nation, NYS asthma hospital discharge rates were higher for all age groups. The 2009-2011 figures show that New York rates were still roughly two to three times higher than the *Healthy People 2020* objectives for each age group (Table 4-2).

Asthma Mortality

Table 4-3
Asthma Mortality Rate per 1,000,000 Residents by Age Group for New York State (2001-2009), United States (2009), and Healthy People 2020 Objectives

Age Group	New York					United States 2009	Healthy People 2020
	2001-2003	2003-2005	2005-2007	2007-2009	2009-2011		
0–34	5.4	4.7	4.2	4.0	4.6	N/A	N/A
35–64	21.2	17.5	14.3	13.6	15.4	10.9	6.0
65+	50.1	50.1	42.3	35.3	36.9	38.8	22.9

Compared to the 2001-2003 time period, the most recent data for NYS (2009-2011) showed a decrease in asthma mortality rates for all age groups, ranging from 15% to 27%. However, compared to the nation, NYS asthma mortality rates were higher for each age group with the exception of the population aged 65 years and older. Also, NYS mortality rates were roughly two to three times higher than the *Healthy People 2020* objectives for the 35 year and older age groups (Table 4-3).

5

Asthma Survey Data

There are several different sources for asthma prevalence data. However, population-based surveys are among the most commonly used sources for estimating asthma prevalence. The wording of questions may differ between surveys, or can change from year to year.[15] Asthma prevalence from survey data for children and adults in New York State (NYS) and/or the United States (U.S.) is presented in this chapter.

The following surveys are included:

- Behavioral Risk Factor Surveillance System, 2002-2011
- Youth Tobacco Survey, 2012

Highlights: Asthma Survey Data

Behavioral Risk Factor Surveillance System, 2002-2011

Current Asthma Prevalence and Risk Behaviors in Adults, 2002-2011

- In 2011, approximately 1.4 million adult New Yorkers (9.7%) had self-reported current asthma.
- From 2002 to 2010, there was an upward trend in the prevalence of current asthma among NYS residents.
- Adults who lived in New York City had a higher current asthma prevalence rate (10.2%) compared to adults who lived in Rest of State (9.3%) in 2011.
- For the past 10 years, current asthma prevalence varied by age group and fluctuated over time. In 2011, adults aged 18-24 years had the highest current asthma prevalence (11.2%), while adults aged 35-44 and 65+ years had the lowest prevalence (8.9% and 8.7%, respectively).
- Current asthma prevalence was consistently higher for females than males. The 2011 prevalence of current asthma among NYS women (12.3%) was 78% higher than the prevalence in men (6.9%).
- From 2003 to 2011, current asthma prevalence varied by race and ethnicity. In 2011, Hispanic (10.9%) and non-Hispanic white (9.0%) New Yorkers had lower asthma prevalence than non-Hispanic black (12.9%) New Yorkers.
- Current asthma prevalence in 2011 was highest in adults who had not graduated from high school (12.3%). College graduates had the lowest prevalence (8.0%). This pattern was consistent from 2003 to 2010.
- From 2003 to 2010, current asthma prevalence was inversely proportional to annual household income. In 2011, current asthma prevalence was highest for adults with annual household income levels less than $15,000 (17.2%). Adults in households with incomes of $75,000 or more had the lowest prevalence (7.4%).
- The 2011 prevalence of current smoking was higher for adult New Yorkers with asthma (23.2%) compared to those without asthma (17.6%).
- In 2011, 28.9% of adult New Yorkers with asthma reported no leisure-time physical activity for the past month compared to 26.0% of those without asthma.
- In 2011, 33.4% of adults with asthma were obese, compared to 23.5% of adults without asthma in New York State.

Current Asthma Prevalence in Children, 2006-2010

- For 2006-2010, approximately 456,022 (10.4%) children (0-17 years) in NYS had current asthma.
- For 2006-2010, children aged 0-4 years in NYS had the lowest current asthma prevalence at 7.3%, while children aged 5-9 years had the highest current asthma prevalence at 13.7%.
- For 2006-2010, the asthma prevalence among boys (11.2%) was higher than the prevalence among girls (9.6%) residing in NYS.
- Children who live in New York City had slightly lower current asthma prevalence (10.3%) in 2006-2010 compared to children in the Rest of State (10.5%).
- The prevalence of current asthma was higher among non-Hispanic blacks (14.3%) in 2006-2010 compared to non-Hispanic white (8.5%) and Hispanic (11.7%) New Yorkers.
- For 2006-2010, New York children from households with an annual income less than $25,000 had higher current asthma prevalence compared to children from families with annual household incomes of $25,000 or more (14.4% and 8.2% respectively).

Youth Tobacco Survey, 2012

Current Asthma Prevalence and Asthma Episodes/Attacks in Middle and High School Students

- In 2012, current asthma prevalence was 23.3% for middle school students and 24.0% for high school students.
- Current asthma prevalence for 2012 was 24.9% for middle school students in New York City and 22.3% for middle school students in the Rest of State. Among high school students, current asthma prevalence for those in New York City was 23.2% and 24.4% for students in the Rest of State.
- Among middle school students, current asthma prevalence was 24.3% for males and 22.3% for males. The prevalence among high school males was 24.1% compared to 23.8% among females.
- In 2012, current asthma prevalence for middle school non-Hispanic other (18.1%) students was lower than Hispanic (29.9%) and non-Hispanic white (20.2%) students. Similarly, among high school students, prevalence of current asthma among non-Hispanic other (17.5%) students was lower compared to non-Hispanic blacks (27.7%) and Hispanics (26.1%). These differences were statistically significant.
- Among New York State middle school students with current asthma, 28.2% reported having had an asthma episode/attack in the past 12 months. The asthma episode/attack prevalence was 30.3% among high school students with current asthma.
- The asthma episode/attack prevalence for 2012 was 26.8% for middle school students in New York City and 29.1% for middle school students in the Rest of State. Among high school students, asthma episode/attack prevalence for those in New York City was 27.1% and 32.0% for students in the Rest of State.
- In New York State, female high school students with current asthma reported a greater number of asthma episodes/attacks in the past 12 months (38.0%) compared to their male counterparts (22.7%).
- The prevalence of having had asthma episodes/attacks in the past 12 months for NYS middle school students was highest for non-Hispanic whites (32.6%), and lowest for non-Hispanic black (23.0%), and non-Hispanic other students (23.3%).
- Among high school students with current asthma, non-Hispanic black students had the highest prevalence of having had asthma episodes/attacks in the past 12 months (31.1%), while non-Hispanic other high school students had the lowest prevalence (23.0%).
- Among middle school students, the prevalence of adolescent smoking was higher for those with asthma (4.3%) compared to those without asthma (2.7%). The prevalence rates were similar for high school students with asthma (11.9%) and those without (12.0%).

Methodology

The Behavioral Risk Factor Surveillance System (BRFSS) is a statewide random-digit-dialing telephone survey of the non-institutionalized population living in New York State (NYS). The BRFSS, which began in NYS in 1983, has been conducted annually since 1985 following procedures established by the CDC. Data are collected from a representative sample of about 5,700 adults (aged 18 years and older) each year, and then weighted to adjust for the selection probabilities and estimates of the socio-demographic distribution of adults in NYS for each calendar year. This survey provides information on behaviors and risk factors for chronic diseases (including asthma), infectious diseases, and other health conditions for NYS adults.

For 2002 through 2011, the NYS BRFSS survey included two questions for assessing both lifetime and current asthma prevalence among adults: "*Have you ever been told by a doctor, nurse, or other health professional that you had asthma?*" and [If Yes] "*Do you still have asthma?*"

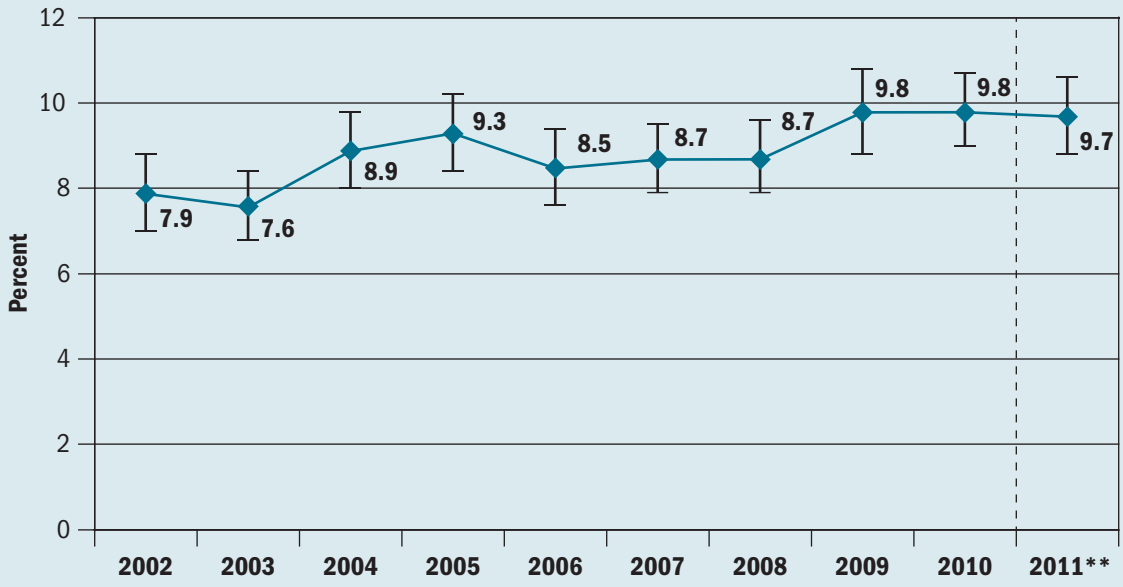
Beginning in 2006, NYS added questions to this survey about asthma prevalence and demographic characteristics for children (0-17 years) including two questions for assessing both lifetime and current asthma prevalence among children: "*Has a doctor or other medical professional ever said that the child has asthma?*" and [If Yes] "*Does the child still have asthma?*"

Based on responses to these questions, successive years of data were combined to generate more stable estimates for subgroup comparisons among both adults and children. Estimates are considered statistically "significantly different" from each other when they do not have overlapping confidence intervals (CIs). Stable estimate are calculated by combining two consecutive years of data for adults for years 2002 through 2010, and by combining five consecutive years of results for children from survey years 2006 through 2010. Prevalence estimates for adults are presented as a single year for 2011.

Beginning in 2011, BRFSS data included data from interviews completed by people living in cell phone only households in addition to interviews completed by people living in households with landlines. The data also reflect changes in CDC's weighting methodology. Weighting ensures that the data collected are as representative of New York's population as possible. The new method of weighting ensures that the weighted results will be consistent with known distributions for more socio-demographic variables. While these two changes improve the accuracy of the BRFSS, they can result in prevalence estimates that are significantly different from those calculated previously. **Because of the differences in data collection and the weighting methodology, it is not appropriate to make comparisons of 2011 data to prior years**.

Limitations of the BRFSS data include the following: (1) information about an asthma diagnosis was obtained by self-report and may be subject to recall bias; (2) households that did not have a telephone were not represented in this survey; (3) data were not available at the county level; and (4) a low response rate was observed (41% for 2010 and 38% for 2011); (4) the inability to compare between pre-2011 and 2011 data, including the inability to determine trends between these two periods.

Figure 5-1
Prevalence* of Current Asthma Among Adults (18+ Years), New York State, BRFSS, 2002-2011



*Prevalence rates were obtained from the CDC BRFSS Trends Data Query website[16] and are presented with 95% Confidence Intervals.

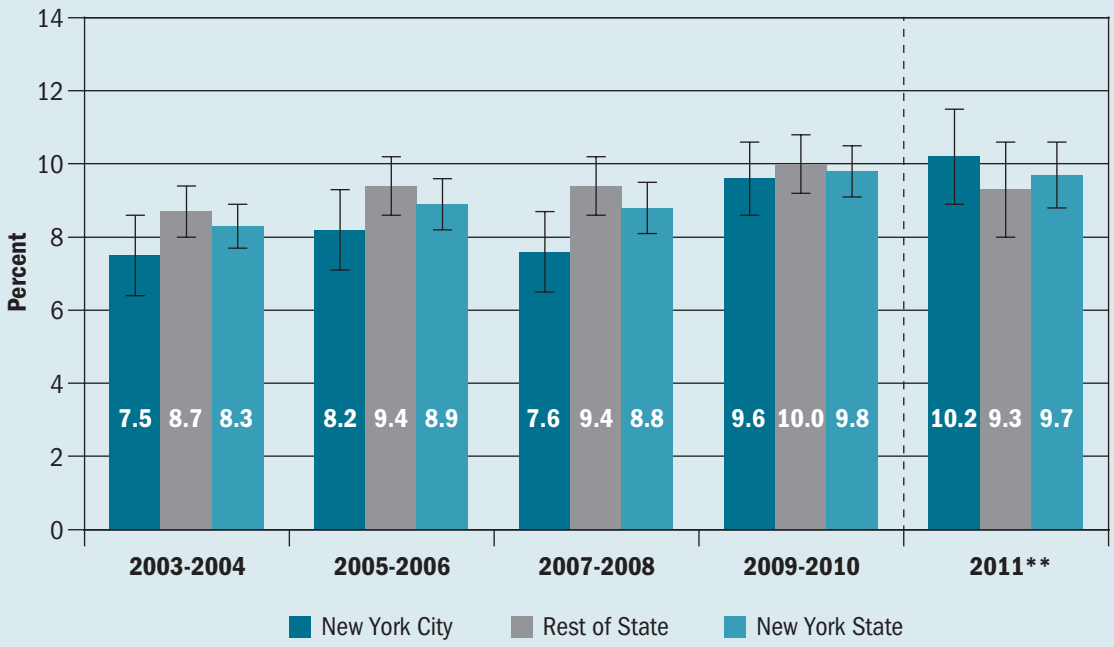
**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011**
New York State	7.9	7.6	8.9	9.3	8.5	8.7	8.7	9.8	9.8	9.7
United States	7.6	7.6	8.3	8.0	8.4	8.3	8.7	8.8	9.0	9.1

Current asthma prevalence increased 24% among adult New Yorkers from 7.9% in 2002 to 9.8% in 2010. In 2011, current asthma prevalence was 9.7%.

Current asthma prevalence for NYS was higher than the U.S. prevalence for most years, except 2003 and 2008, when the asthma prevalence was the same (Figure 5-1).

Figure 5-2
Prevalence* of Current Asthma Among Adults (18+ Years) by Region and Combined Survey Years, New York State, BRFSS, 2003-2011**



*Prevalence rates are presented with 95% Confidence Intervals.

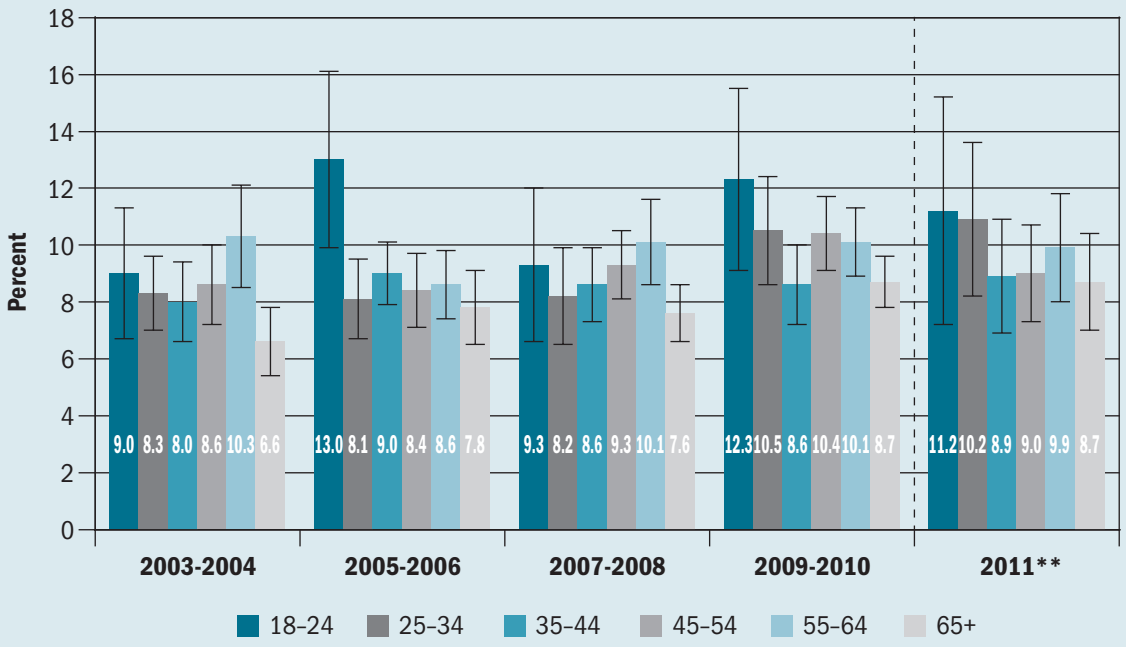
**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

Region	2003–2004		2005–2006		2007-2008		2009-2010		2011**	
	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
New York City	7.5	6.5–8.5	8.2	7.1–9.3	7.6	6.5–8.7	9.6	8.5–10.6	10.2	8.9–11.5
Rest of State	8.7	8.0–9.4	9.4	8.6–10.1	9.4	8.6–10.1	10.0	9.2–10.8	9.3	8.0–10.6
New York State	8.3	7.7–8.9	8.9	8.2–9.6	8.8	8.1–9.5	9.8	9.1–10.5	9.7	8.8–10.2

An estimated 1.4 million (9.7%) NYS adults reported that they currently had asthma in 2011.

From 2003 to 2010, current asthma prevalence increased slightly for adults living in New York City and the Rest of State. In 2011, adults in New York City had higher current asthma prevalence (10.2%) compared to those living in the Rest of State (9.3%) (Figure 5-2).

Figure 5-3
Prevalence* of Current Asthma Among Adults (18+ Years) by Age Group and Combined Survey Years,**
New York State, BRFSS, 2003-2011



*Prevalence rates are presented with 95% Confidence Intervals.

**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

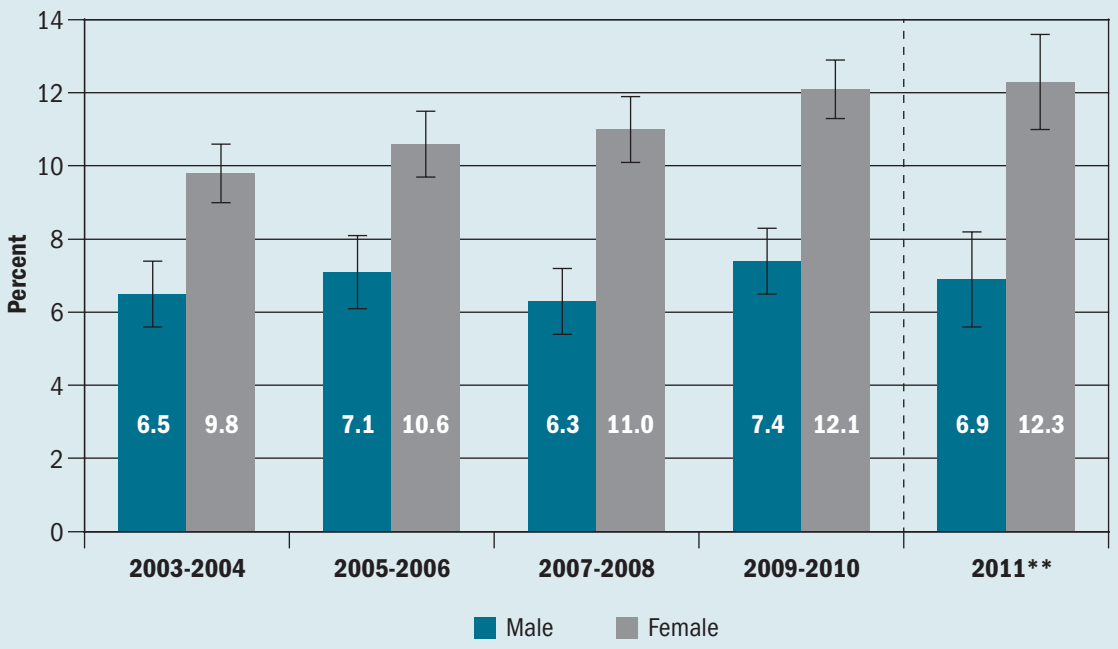
	2003–2004		2005–2006		2007-2008		2009-2010		2011**	
Age Group	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
18-24	9.0	6.7–11.2	13.0	9.8–16.1	9.3	6.6–12.0	12.3	9.1–15.5	11.2	7.2–15.2
25-34	8.3	6.9–9.7	8.1	6.7–9.5	8.2	6.6–9.9	10.5	8.5–12.4	10.9	8.2–13.6
35-44	8.0	6.8–9.2	9.0	7.8–10.2	8.6	7.2–9.9	8.6	7.2–10.0	8.9	6.9–10.9
45-54	8.6	7.2–10.0	8.4	7.1–9.6	9.3	8.2–10.5	10.4	9.1–11.6	9.0	7.3–10.7
55-64	10.3	8.5–12.1	8.6	7.4–9.9	10.1	8.6–11.6	10.1	8.9–11.3	9.9	8.0–11.8
65+	6.6	5.5–7.7	7.8	6.5–9.1	7.6	6.6–8.6	8.7	7.9–9.6	8.7	7.0–10.4

From 2003 to 2010, current asthma prevalence varied by age group and fluctuated over time.

In 2011, adults aged 35-44 years and 65 years and older had the lowest current asthma prevalence, at 8.9% and 8.7%, respectively. Adults aged 18-24 years had the highest current asthma prevalence at 11.2% (Figure 5-3).

Figure 5-4

Prevalence* of Current Asthma Among Adults (18+ Years) by Gender and Combined Survey Years, New York State, BRFSS, 2003-2011**



*Prevalence rates are presented with 95% Confidence Intervals.

**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

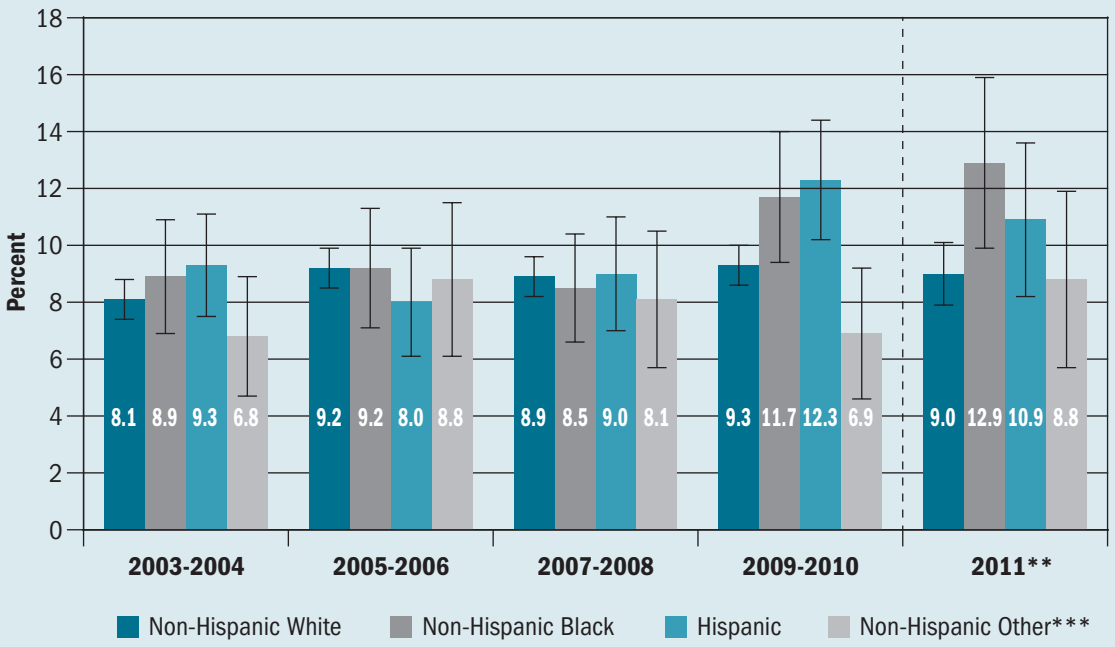
	2003–2004		2005–2006		2007-2008		2009-2010		2011**	
Gender	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
Male	6.5	5.7–7.4	7.1	6.1–8.0	6.3	5.4–7.2	7.4	6.4–8.3	6.9	5.6–8.2
Female	9.8	9.0–10.7	10.6	9.8–11.5	11.0	10.1–11.9	12.1	11.2–12.9	12.3	11.0–13.6

The NYS current adult asthma prevalence was higher in females than in males for all time periods. From 2003 to 2010, asthma prevalence increased for females from 9.8% to 12.1%. The prevalence for males fluctuated during this period with rates ranging from 6.3% to 7.4%.

In 2011, the prevalence among females (12.3%) was 78% higher than the prevalence among males (6.9%) (Figure 5-4).

Figure 5-5

Prevalence* of Current Asthma Among Adults (18+ Years) by Race/Ethnicity and Combined Survey Years,**
New York State, BRFSS, 2003-2011



*Prevalence rates are presented with 95% Confidence Intervals.

**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

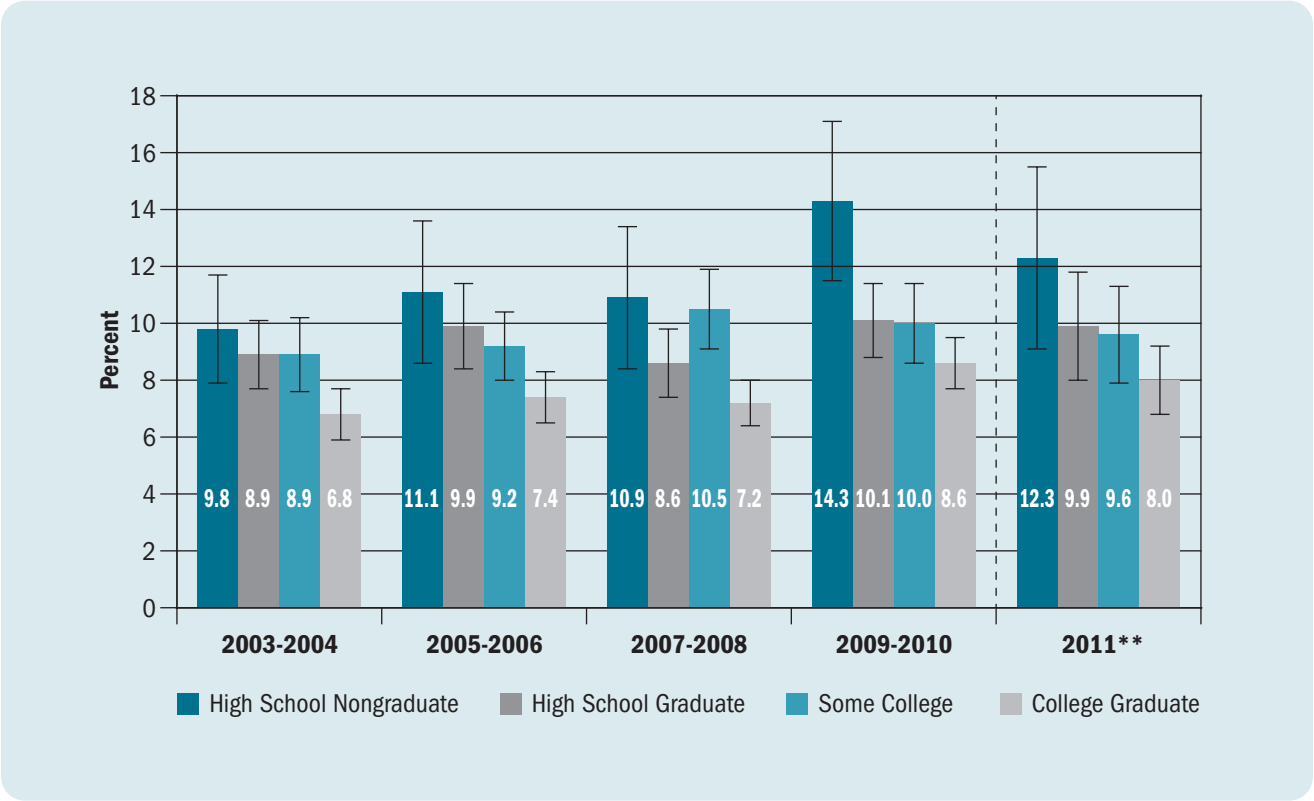
***Non-Hispanic other race included American Indian, Alaskan Native, Asian, Native Hawaiian, Pacific Islander, Other race and Multiracial.

	2003–2004		2005–2006		2007-2008		2009-2010		2011**	
Race/Ethnicity	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
Non-Hispanic White	8.1	7.4–8.8	9.2	8.5–9.9	8.9	8.2–9.6	9.3	8.6–10.0	9.0	7.9–10.1
Non-Hispanic Black	8.9	7.0–10.9	9.2	7.1–11.3	8.5	6.7–10.4	11.7	9.4–14.0	12.9	9.9–15.9
Hispanic	9.3	7.5–11.1	8.0	6.2–9.9	9.0	7.0–11.0	12.3	10.2–14.4	10.9	8.2–13.6
Non-Hispanic Other***	6.8	4.8–8.9	8.8	6.1–11.4	8.1	5.8–10.5	6.9	4.6–9.2	8.8	5.7–11.9

From 2003 to 2010, current asthma prevalence varied by race and ethnicity. In 2011, non-Hispanic black New Yorkers had the highest asthma prevalence rate at 12.9%, Hispanic adults had a current asthma prevalence rate of 10.9%, while non-Hispanic whites had a rate of 9.0% (Figure 5-5).

Figure 5-6

Prevalence* of Current Asthma Among Adults (18+ Years) by Educational Attainment and Combined Survey Years, New York State, BRFSS, 2003-2011**



*Prevalence rates are presented with 95% Confidence Intervals.

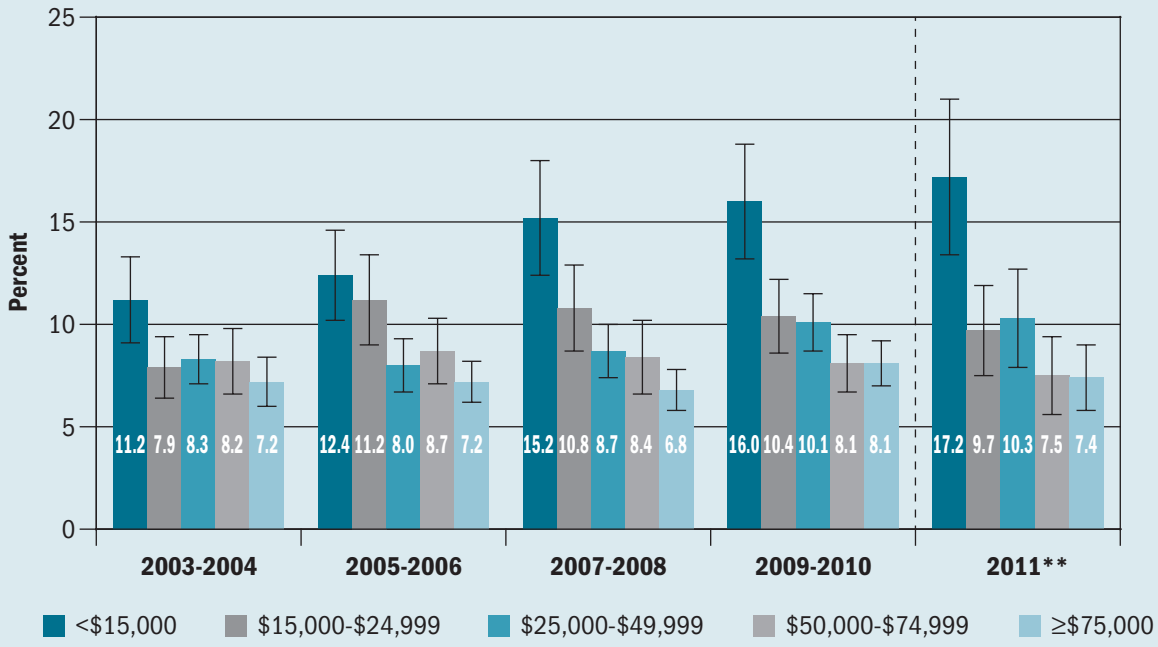
**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

	2003–2004		2005–2006		2007-2008		2009-2010		2011**	
Educational Attainment	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
High School Nongraduate	9.8	7.9–11.7	11.1	8.6–13.5	10.9	8.4–13.3	14.3	11.5–17.1	12.3	9.1–15.5
High School Graduate	8.9	7.7–10.0	9.9	8.5–11.4	8.6	7.4–9.8	10.1	8.8–11.4	9.9	8.0–11.8
Some College	8.9	7.7–10.2	9.2	8.0–10.4	10.5	9.1–11.9	10.0	8.7–11.4	9.6	7.9–11.3
College Graduate	6.8	5.9–7.7	7.4	6.5–8.2	7.2	6.4–8.0	8.6	7.7–9.5	8.0	6.8–9.2

From 2003 to 2010, current asthma prevalence varied by educational attainment. Prevalence remained highest for adults who reported that they had not graduated from high school. Adult college graduates had the lowest current asthma prevalence rate.

Adults with less than a high school education had current asthma prevalence at 12.3% in 2011, while adults with a college education had the lowest current asthma prevalence at 8.0% (Figure 5-6).

Figure 5-7
Prevalence* of Current Asthma Among Adults (18+ Years) by Household Income and Combined Survey Years,**
New York State, BRFSS, 2003-2011



*Prevalence rates are presented with 95% Confidence Intervals.

**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

	2003–2004		2005–2006		2007-2008		2009-2010		2011**	
Household Income	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
<$15,000	11.2	9.1–13.2	12.4	10.2–14.6	15.2	12.4–17.9	16.0	13.2–18.8	17.2	13.4–21.0
$15,000–$24,999	7.9	6.4–9.4	11.2	9.0–13.3	10.8	8.8–12.9	10.4	8.7–12.2	9.7	7.5–11.9
$25,000–$49,999	8.3	7.1–9.5	8.0	6.7–9.3	8.7	7.4–10.0	10.1	8.7–11.5	10.3	7.9–12.7
$50,000–$74,999	8.2	6.6–9.8	8.7	7.1–10.2	8.4	6.6–10.2	8.1	6.7–9.5	7.5	5.6–9.4
≥$75,000	7.2	6.0–8.4	7.2	6.2–8.2	6.8	5.8–7.7	8.1	7.0–9.2	7.4	5.8–9.0

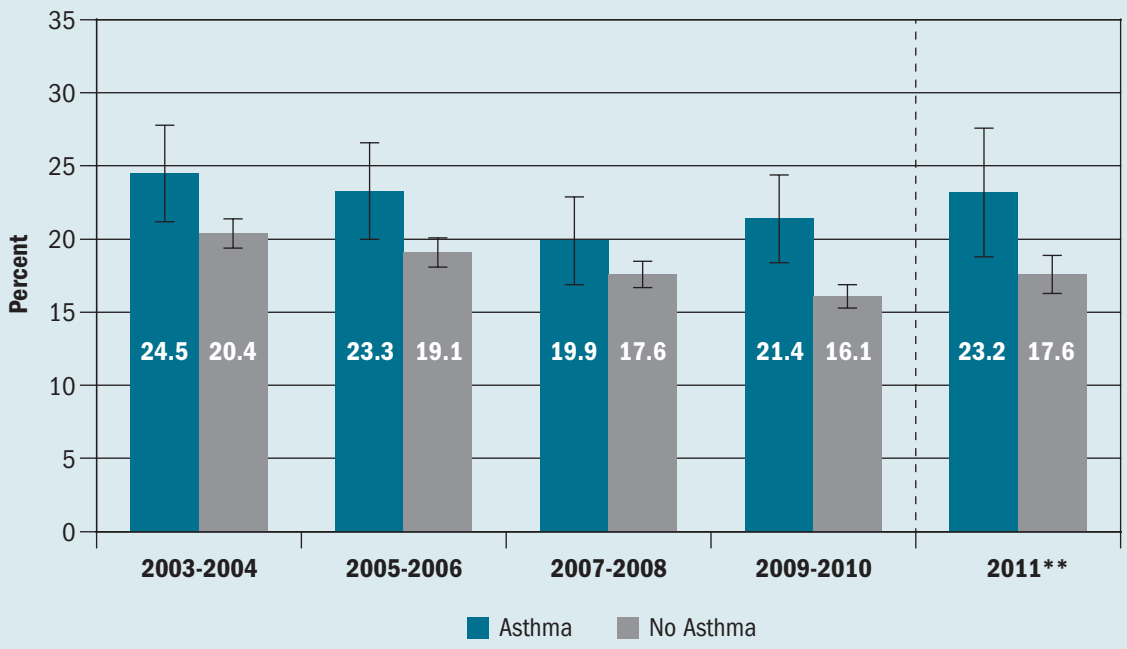
From 2003 to 2010, current asthma prevalence was inversely proportional to annual household income. Households with an annual income less than $15,000 had the highest current asthma prevalence.

In 2011, adults with an annual household income of less than $15,000 had the highest current asthma prevalence at 17.2%, while adults with an annual household income level of $75,000 or more had the lowest current asthma prevalence at 7.4%. In general, prevalence increased over time for adults with annual household income levels less than $15,000.

Because income was not adjusted for inflation, comparisons of annual income categories across years should be made with caution (Figure 5-7).

Figure 5-8

Percentage* of Adult (18+ Years) New Yorkers Who Currently Smoke*** by Asthma Status and Combined Survey Years,** New York State, BRFSS, 2003-2011



*Prevalence rates are presented with 95% Confidence Intervals.

**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

***A person who has smoked at least 100 cigarettes in his/her lifetime and now smokes every day or some days.

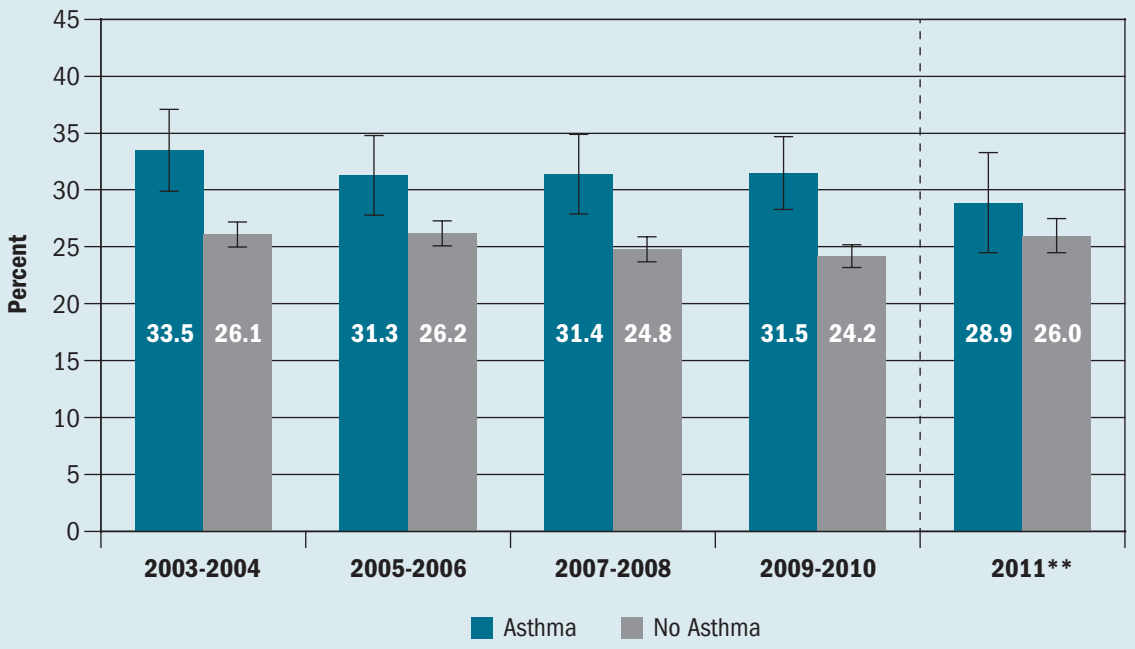
Year	Asthma		No Asthma	
	Weighted Percentage (%)	95% CI	Weighted Percentage (%)	95% CI
2003-2004	24.5	21.2–27.7	20.4	19.5–21.4
2005-2006	23.3	20.0–26.6	19.1	18.1–20.0
2007-2008	19.9	16.9–22.8	17.6	16.7–18.5
2009-2010	21.4	18.4–24.4	16.1	15.2–16.9
2011**	23.2	18.8–27.6	17.6	16.3–18.9

For each survey period during 2003 to 2010, the percentage of current smoking was consistently higher for adults with asthma compared to those without asthma.

In 2011, 23.2% of adults with asthma reported that they were current smokers, compared to 17.6% of those without asthma (Figure 5-8).

Figure 5-9

Percentage* of Adult (18+ Years) New Yorkers Who Have Not Participated in Recent Leisure Time Physical Activity* by Asthma Status and Combined Survey Years,** New York State, BRFSS, 2003-2011**



*Prevalence rates are presented with 95% Confidence Intervals.

**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

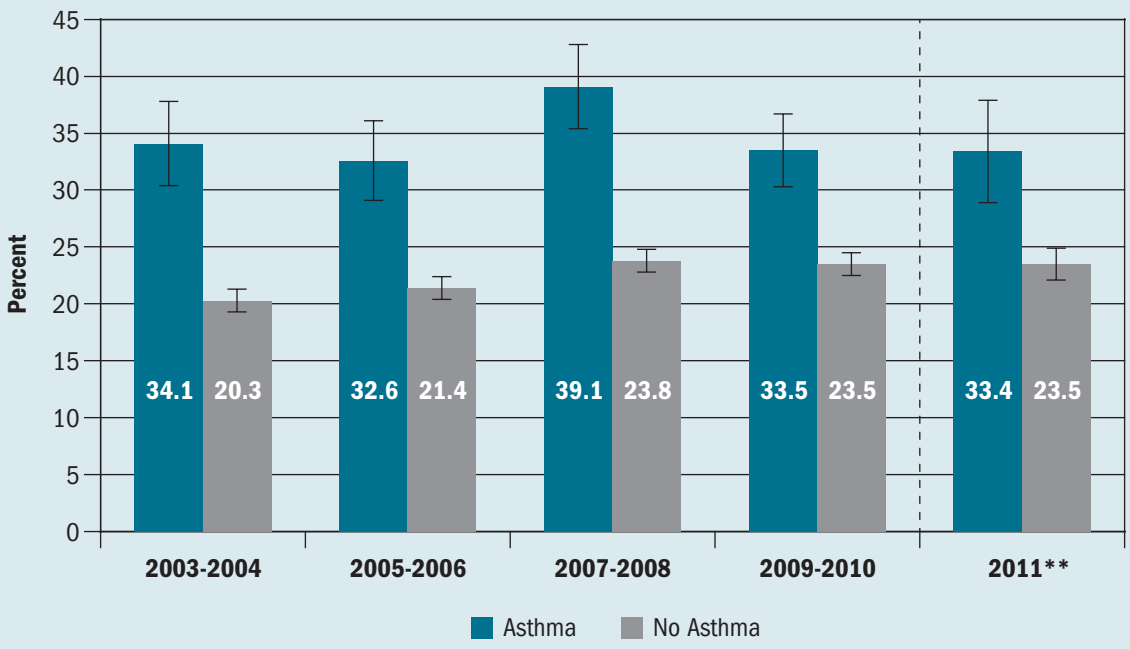
***A respondent who answered "No" when asked "For the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?"

	Asthma		No Asthma	
Year	Weighted Percentage (%)	95% CI	Weighted Percentage (%)	95% CI
2003-2004	33.5	30.0–37.1	26.1	24.4–26.6
2005-2006	31.3	27.8–34.8	26.2	25.4–27.4
2007-2008	31.4	28.0–34.9	24.8	23.8–25.9
2009-2010	31.5	28.4–34.7	24.2	23.2–25.2
2011**	28.9	24.5–33.3	26.0	24.5–27.5

For 2003 to 2010, the percentage of respondents who reported no leisure-time physical activity decreased in adult New Yorkers with asthma. However, persons with asthma were still more likely to report no leisure-time physical activity in the past month than those without asthma.

In 2011, 28.9% of adults with asthma reported no leisure-time physical activity compared to 26.0% for those without asthma (Figure 5-9).

Figure 5-10
Percentage* of Adult (18+ Years) New Yorkers Who Are Obese*** by Asthma Status and Combined Survey Years,**
New York State, BRFSS, 2003-2011



*Prevalence rates are presented with 95% Confidence Intervals.

**2011 data should not be compared to data from prior years because of the differences in data collection and weighting methodology.

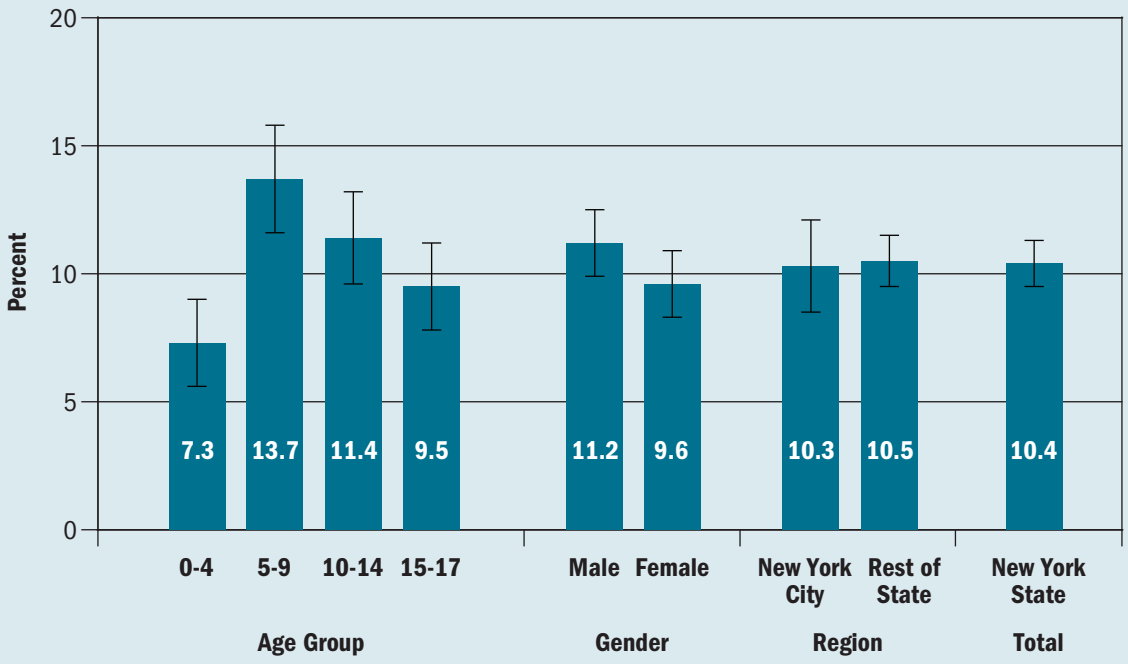
***Obese individuals have a BMI > 30.0 kg/m^2

Year	Asthma		No Asthma	
	Weighted Percentage (%)	95% CI	Weighted Percentage (%)	95% CI
2003-2004	34.1	30.4–37.8	20.3	19.4–21.3
2005-2006	32.6	29.2–36.1	21.4	20.5–22.4
2007-2008	39.1	35.4–42.8	23.8	22.8–24.8
2009-2010	33.5	30.3–36.7	23.5	22.5–24.5
2011**	33.4	28.8–37.9	23.5	22.1–24.9

For 2003 to 2010, the percentage of respondents who were obese was consistently greater among adults with asthma than adults without asthma.

In 2011, 33.4% of adults with asthma were obese compared to 23.5% for those without asthma (Figure 5-10).

Figure 5-11
Prevalence* of Current Asthma Among Children (0-17 Years) by Age Group, Gender and Region, New York State, BRFSS, Combined Survey Years 2006-2010



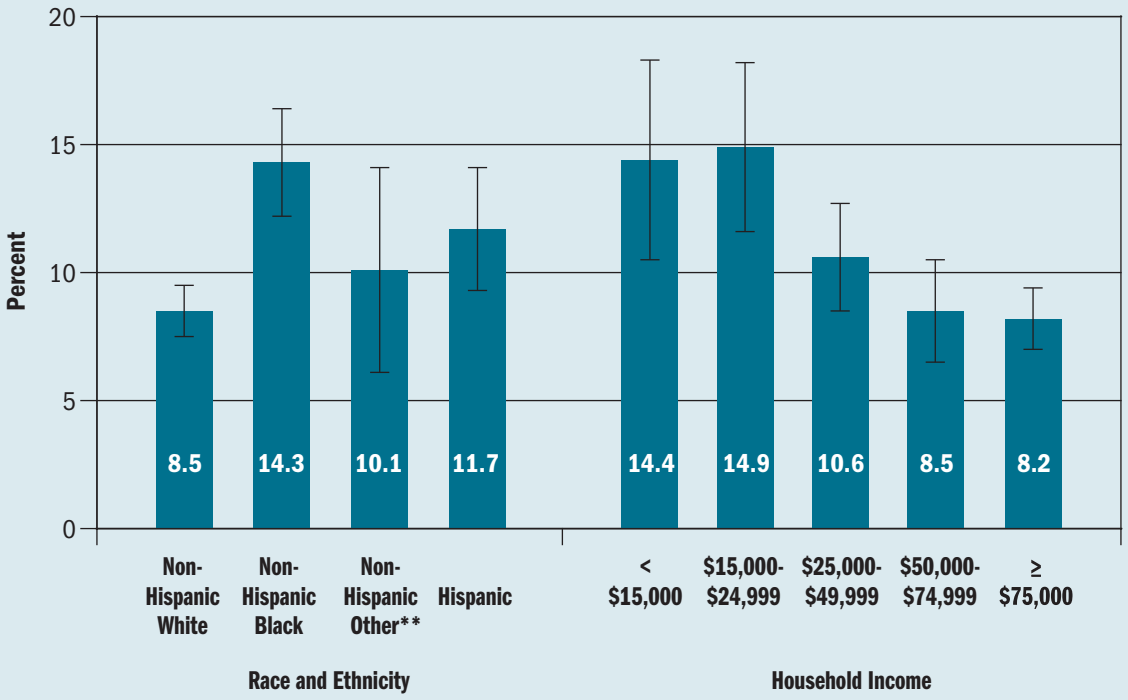
*Prevalence rates are presented with 95% Confidence Intervals.

		Weighted Prevalence (%)	95% CI
Age Group	0–4	7.3	5.6–9.0
	5–9	13.7	11.6–15.8
	10–14	11.4	9.6–13.2
	15–17	9.5	7.8–11.2
Gender	Male	11.2	9.9–12.5
	Female	9.6	8.4–10.9
Region	New York City	10.3	8.5–12.1
	Rest of State	10.5	9.5–11.5
Total	*New York State*	*10.4*	*9.5–11.3*

For 2006-2010, approximately 456,000 (10.4%) children (0-17 years) in NYS had current asthma. For this time period, children aged 0-4 years had the lowest current asthma prevalence at 7.3%, while children aged 5-9 years had the highest current asthma prevalence at 13.7%.

The prevalence among boys (11.2%) was higher than the prevalence for girls (9.6%). Current asthma prevalence was similar for children who live in New York City (10.3%) and the Rest of State (10.5%) (Figure 5-11).

Figure 5-12
Prevalence* of Current Asthma Among Children (0-17 Years) by Race/Ethnicity and Household Income, New York State, BRFSS, Combined Survey Years 2006-2010



*Prevalence rates are presented with 95% Confidence Intervals.

**Non-Hispanic other race included American Indian, Alaskan Native, Asian, Native Hawaiian, Pacific Islander, Other race and Multiracial.

		Weighted Prevalence (%)	95% CI
Race/Ethnicity	Non-Hispanic White	8.5	7.5–9.5
	Non-Hispanic Black	14.3	10.8–17.8
	Non-Hispanic Other**	10.1	6.2–14.1
	Hispanic	11.7	9.3–14.1
Household Income	<$15,000	14.4	10.6–18.3
	$15,000–$24,999	14.9	11.6–18.2
	$25,000–$49,999	10.6	8.5–12.6
	$50,000–$74,999	8.5	6.5–10.5
	≥$75,000	8.2	7.0–9.3

The 2006-2010 prevalence of current asthma was higher in non-Hispanic black children (14.3%) compared to non-Hispanic white (8.5%) and Hispanic (11.7%) children. In 2006-2010, children from households with an annual income between $15,000 and $24,999 had the highest current asthma prevalence at 14.9%, while children from households with annual household incomes of $75,000 or more had the lowest current asthma prevalence at 8.2% (Figure 5-12).

Methodology

The Youth Tobacco Survey (YTS) collects self-reported information among middle and high school students about the prevalence of current cigarette smoking, behaviors and attitudes toward smoking, and several health-related issues including asthma.

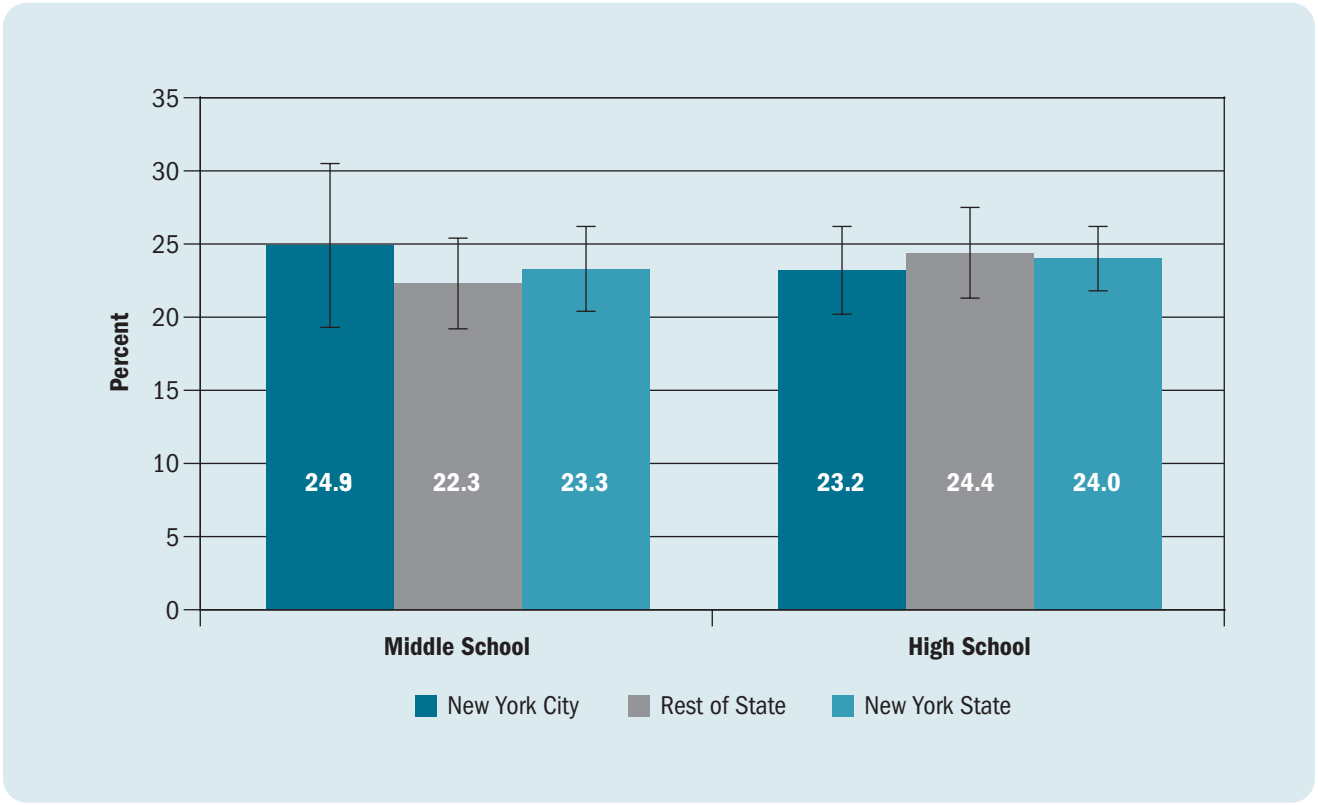
The YTS is administered in NYS every two years to students in grades 6 through 12. For the 2012 survey, there were 8,421 students from 74 schools across the state. Middle school surveys included students who reported they were in grades 6, 7 or 8, while high school surveys included students who reported they were in grades 9, 10, 11 or 12.

The 2012 YTS included two questions for assessing lifetime and current prevalence of asthma: "*Has a doctor or nurse ever told you that you have asthma?*" and "*During the past 12 months, have you had an episode of asthma or an asthma attack?*"

Possible responses to the second question were: a) "*I do not have asthma.*"; b) "*No, I have asthma but I have not had an episode of asthma or an asthma attack during the past 12 months.*"; c) "*Yes, I have had an episode of asthma or an asthma attack during the past 12 months.*"; and d) "*Not sure.*" This question allowed the estimation of current asthma prevalence (sum of responses b and c divided by the sum of a, b, and c), as well as the prevalence of having an asthma episode/attack among children with current asthma (response c divided by the sum of responses b and c). Unknown or missing values were not included in the sample sizes or analyses.

This report provides 2012 weighted estimates of current asthma prevalence for middle and high school students for the total population and by gender, race and ethnicity, and geographic region (New York City and Rest of State). In addition, weighted estimates for asthma episodes/attacks in the past year among students with current asthma are provided. The 95% confidence intervals (CIs) for these estimates are presented. Estimates are considered statistically "significantly different" from each other when they do not have overlapping CIs.

Figure 5-13
Prevalence* of Current Asthma Among Middle and High School Students by Region, New York State, YTS, 2012



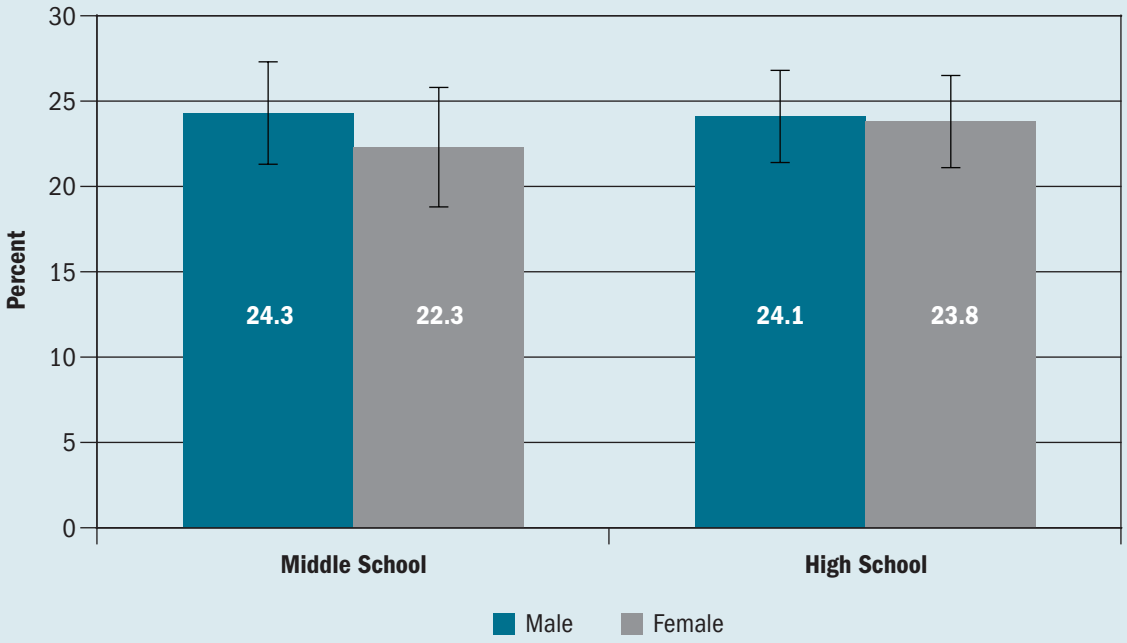
*Prevalence rates are presented with 95% Confidence Intervals.

	Region	Weighted Prevalence (%)	95% CI
Middle School	New York City	24.9	19.4–30.5
	Rest of State	22.3	19.3–25.4
	New York State	23.3	20.4–26.2
High School	New York City	23.2	20.2–26.2
	Rest of State	24.4	21.3–27.5
	New York State	24.0	21.7–26.2

In 2012, the current asthma prevalence was 23.3% for middle school students and 24.0% for high school students in NYS.

Current asthma prevalence was 24.9% for New York City middle school students compared to 22.3% for those in the Rest of State. Among high school students, prevalence of current asthma for New York City students was 23.2%, and 24.4% for those in the Rest of State (Figure 5-13).

Figure 5-14
Prevalence* of Current Asthma Among Middle and High School Students by Gender, New York State, YTS, 2012

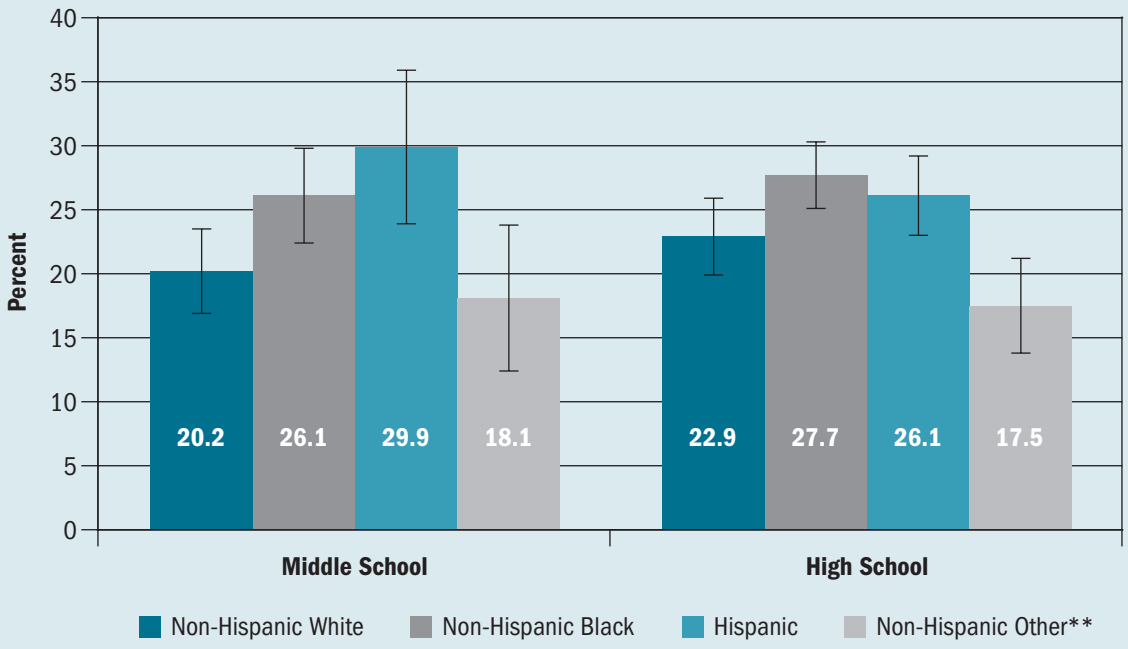


*Prevalence rates are presented with 95% Confidence Intervals.

	Gender	Weighted Prevalence (%)	95% CI
Middle School	Male	24.3	21.4–27.3
	Female	22.3	18.8–25.8
High School	Male	24.1	21.4–26.8
	Female	23.8	21.1–26.6

Among middle school students, current asthma prevalence was 24.3% for males and 22.3% for females. The prevalence among high school males was 24.1% compared to 23.8% among females (Figure 5-14).

Figure 5-15
Prevalence* of Current Asthma Among Middle and High School Students by Race/Ethnicity,** New York State, YTS, 2012



*Prevalence rates are presented with 95% Confidence Intervals.

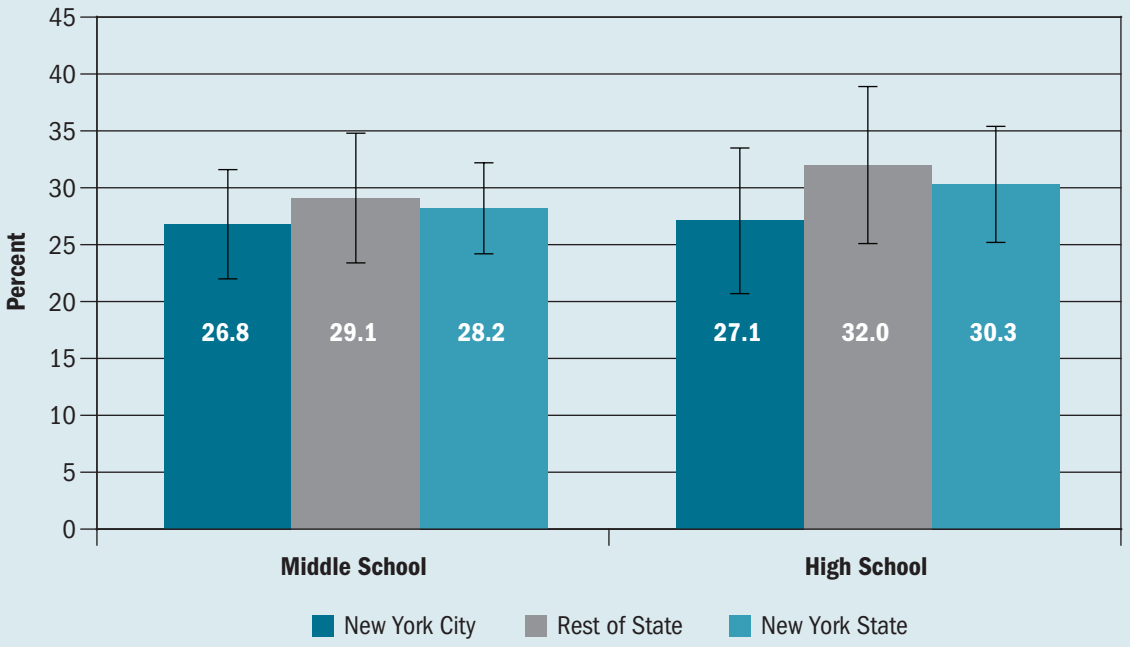
**Other race included American Indian/Alaskan Native, Asian, and Native Hawaiian/Pacific Islander.

	Race/Ethnicity	Weighted Prevalence (%)	95% CI
Middle School	Non-Hispanic White	20.2	16.9–23.5
	Non-Hispanic Black	26.1	22.4–29.8
	Hispanic	29.9	23.8–35.9
	Non-Hispanic Other**	18.1	12.3–23.8
High School	Non-Hispanic White	22.9	20.0–25.9
	Non-Hispanic Black	27.7	25.0–30.3
	Hispanic	26.1	23.1–29.2
	Non-Hispanic Other**	17.5	13.8–21.2

Current asthma prevalence for middle school non-Hispanic other (18.1%) students was lower than Hispanic (29.9%) and non-Hispanic white (20.2%) students. These differences were statistically significant.

Similarly, among high school students, prevalence of current asthma among non-Hispanic other (17.5%) students was lower compared to non-Hispanic Blacks (27.7%) and Hispanics (26.1%). These differences were statistically significant (Figure 5-15).

Figure 5-16
Prevalence* of Asthma Episodes/Attacks** For the Past 12 Months Among
Middle and High School Students with Current Asthma by Region, New York State, YTS, 2012



*Prevalence of having had an asthma episode/attack is presented with 95% Confidence Intervals.

**The question asked of the respondent was: "During the past 12 months, have you had an episode of asthma or an asthma attack?"

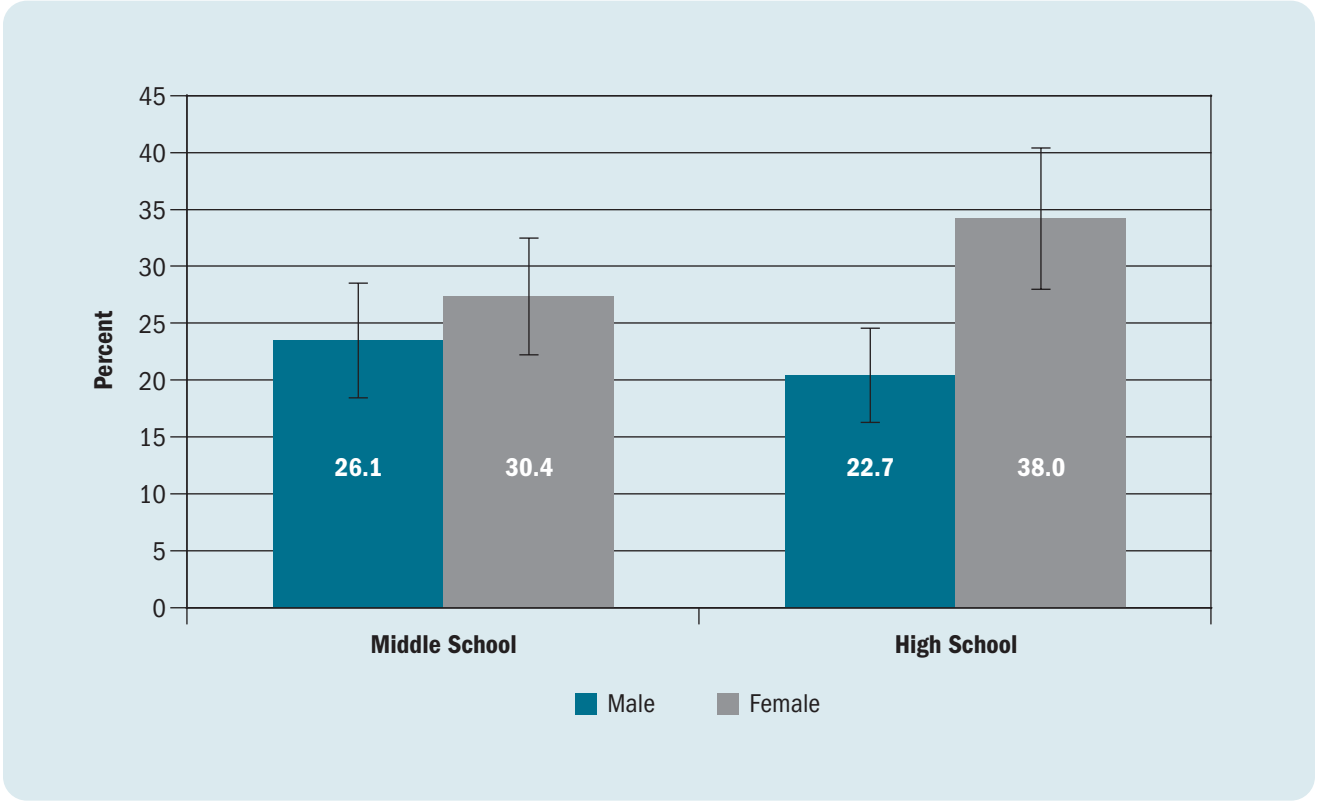
	Region	Weighted Prevalence (%)	95% CI
Middle School	New York City	26.8	22.0–31.6
	Rest of State	29.1	23.5–34.8
	New York State	28.2	24.2–32.2
High School	New York City	27.1	20.8–33.5
	Rest of State	32.0	25.1–38.9
	New York State	30.3	25.3–35.4

Among NYS middle school students with current asthma, 28.2% reported having had an asthma episode/attack in the past 12 months. For high school students with current asthma, 30.3% reported having asthma episodes/attacks in the past 12 months.

When analyzed by region, 26.8% of New York City middle school students with current asthma reported having had asthma episodes/attacks for the past 12 months compared to 29.1% of their counterparts in the Rest of State.

The proportion of high school students with current asthma who reported having asthma episodes/attacks among New York City and Rest of State students was 27.1% and 32.0%, respectively. (Figure 5-16).

Figure 5-17
Prevalence* of Asthma Episodes/Attacks For the Past 12 Months Among Middle and High School Students with Current Asthma by Gender, New York State, YTS, 2012**



*Prevalence of having had asthma episodes/attacks is presented with 95% Confidence Intervals.

**The question asked of the respondent was: "During the past 12 months, have you had an episode of asthma or an asthma attack?"

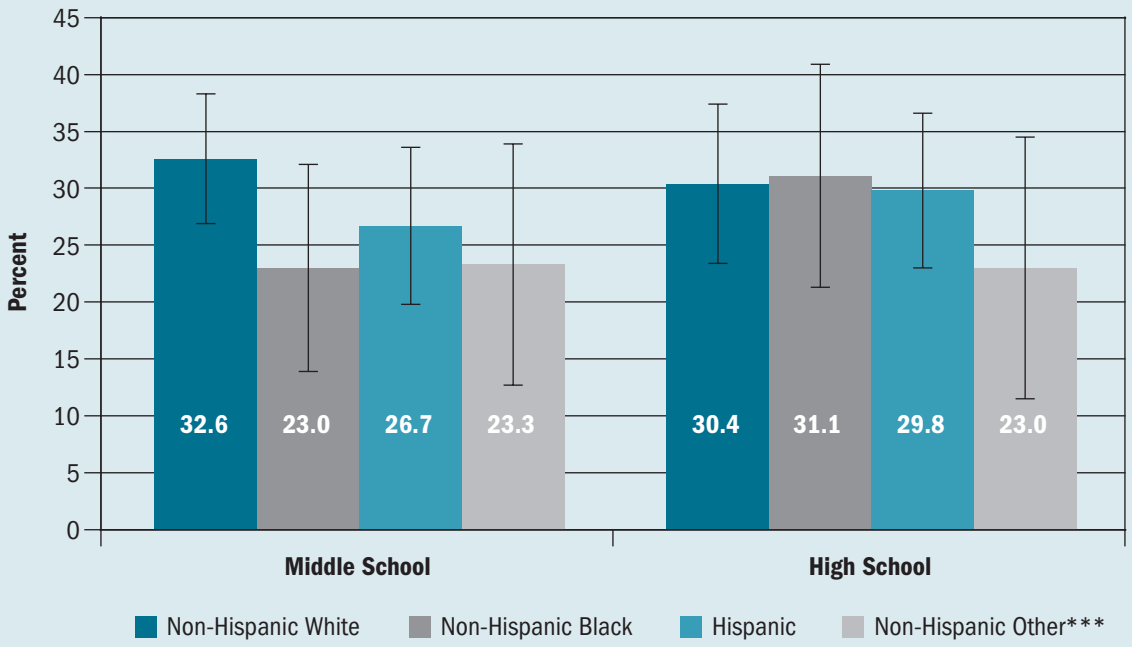
	Gender	Weighted Prevalence (%)	95% CI
Middle School	Male	26.1	20.6–31.7
	Female	30.4	24.7–36.1
High School	Male	22.7	18.1–27.3
	Female	38.0	31.0–44.9

There was no significant difference by gender in the prevalence of asthma attacks among middle school students with current asthma. Among female NYS middle school students with current asthma, 30.4% reported having had asthma episodes/attacks compared to 26.1% among male middle school students.

In contrast, there were significantly more female NYS high school students with current asthma (38.0%) who reported having an asthma attack in the past 12 months compared to males (22.7%) (Figure 5-17).

Figure 5-18

Prevalence* of Asthma Episodes/Attacks** For the Past 12 Months Among Middle and High School Students with Current Asthma by Race/Ethnicity,*** New York State, YTS, 2012



*Prevalence of having had asthma episodes/attacks is presented with 95% Confidence Intervals.

**The question asked of the respondent was: "During the past 12 months, have you had an episode of asthma or an asthma attack?"

***Non-Hispanic other race included American Indian/Alaskan Native, Asian, and Native Hawaiian/Pacific Islander.

	Race/Ethnicity	Weighted Prevalence (%)	95% CI
Middle School	Non-Hispanic White	32.6	26.79–38.33
	Non-Hispanic Black	23.0	13.88–32.08
	Hispanic	26.7	19.69–33.61
	Non-Hispanic Other***	23.3	12.75–33.85
High School	Non-Hispanic White	30.4	23.38–37.39
	Non-Hispanic Black	31.1	21.34–40.93
	Hispanic	29.8	22.97–36.64
	Non-Hispanic Other***	23.0	11.54–34.52

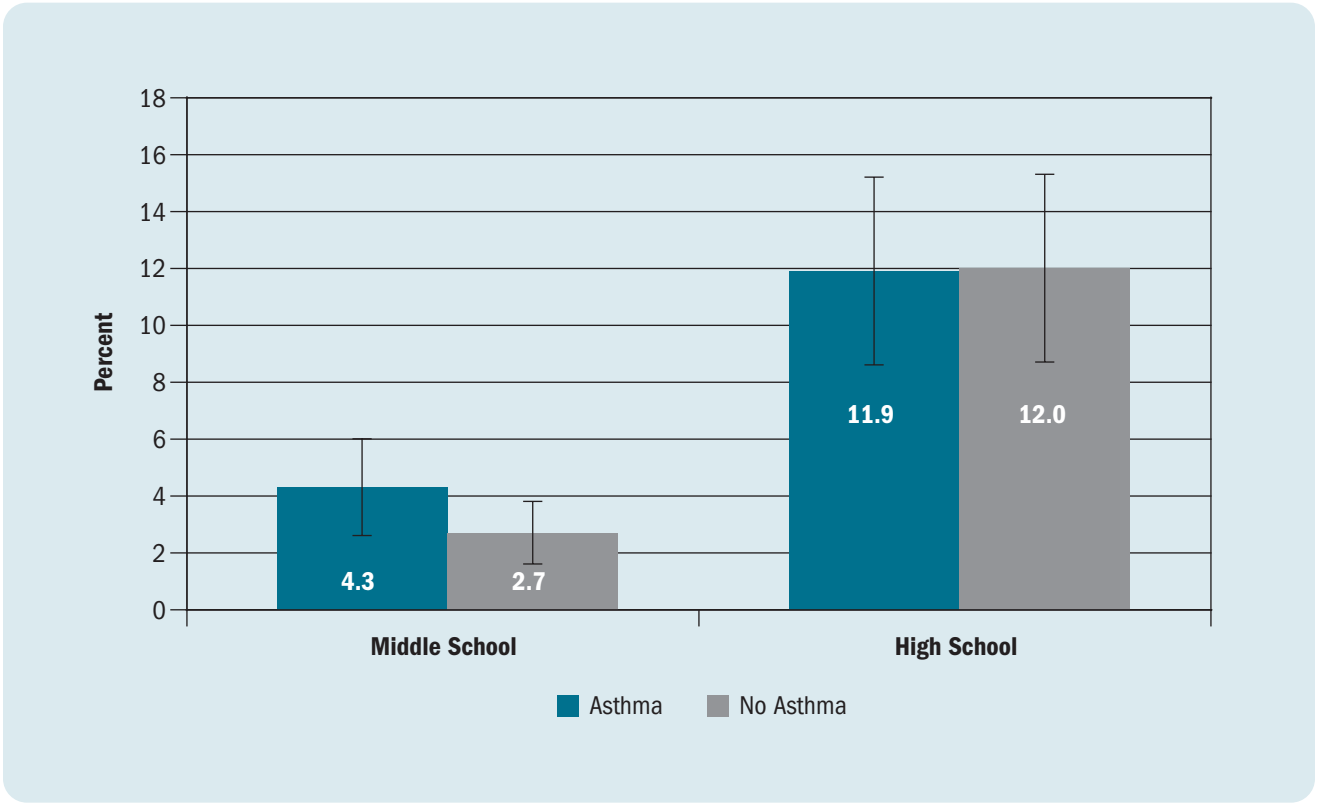
There were no significant differences in the prevalence of asthma episodes/attacks by race and ethnicity among NYS middle school or high school students with current asthma.

The prevalence of having had an asthma episode/attack in the past 12 months for NYS middle school non-Hispanic White, non-Hispanic Black, and Hispanic students was 32.6%, 23.0%, and 26.7%, respectively.

Hispanic, non-Hispanic white, and non-Hispanic black high school students with current asthma reported a similar prevalence of having had an asthma episode/attack in the past 12 months (29.8%, 30.4% and 31.1%, respectively). These prevalence rates were not significantly different from those reported by non-Hispanic other high school students (23.0%) with current asthma (Figure 5-18).

Figure 5-19

Percentage* of Middle and High School Students Who Smoked in the Past 30 Days by Asthma Status, New York State, YTS, 2012**



*Percentages are presented with 95% Confidence Intervals.

**A respondent who answered 1 through 30 when asked: "For the past 30 days, on how many days did you smoke cigarettes?"

	Asthma		No Asthma	
	Weighted Percentage (%)	95% CI	Weighted Percentage (%)	95% CI
Middle School	4.3	2.6–6.0	2.7	1.6–3.8
High School	11.9	8.5–15.2	12.0	8.6–15.3

In 2012, 4.3% of middle school students with asthma reported that they smoked cigarettes during the past 30 days, compared to 2.7% of those without asthma.

The percentage of high school students who reported that they smoked cigarettes during the past 30 days was similar among students with asthma (11.9%) and those without asthma (12.0%) (Figure 5-19).

6

Asthma Emergency Department Visits

Highlights: Asthma Emergency Department Visits

- The number of emergency department visits due to asthma in New York State increased 7% in the past seven years from 153,784 in 2005 to 164,810 in 2011.
- Asthma emergency department visit rates showed a 6% increase from 79.9 per 10,000 residents in 2005 to 84.7 per 10,000 in 2011.
- Overall, asthma emergency department visits showed a seasonal pattern, with peaks in the spring and fall and a decline in the summer.
- For 2009-2011, 16% of asthma emergency department visits were for children aged 0-4 years, 24% were for adults 25-44 years of age and older, and 21% were for adults ages 45-64 years. In addition, 54% of asthma emergency department visits were for females, and 66% were for New York City residents.
- From 2005 to 2011, the 0-4 year age group consistently had the highest emergency department visit rate compared to all other age groups. Each age group showed a slight increase from 2005 to 2011 with the exception of the 25-44 year age group.
- For 2009-2011, female New Yorkers had higher crude and age-adjusted asthma emergency department visit rates (88.4 per 10,000; 92.3 per 10,000) compared to males (80.8 per 10,000; 83.8 per 10,000).
- For 2009-2011, males had a higher percentage of asthma emergency department visits compared to females in the 0-4 year (64% vs. 36%) and 5-14 year (61% vs. 39%) age groups. However, males had lower percentages for all remaining age groups.
- For the period 2009-2011, crude and age-adjusted asthma emergency department visit rates for non-Hispanic black (220.0 per 10,000; 219.5 per 10,000) and Hispanic (115.6 per 10,000; 112.8 per 10,000) New York State residents were higher than the rates for non-Hispanic white residents (30.4 per 10,000; 33.1 per 10,000).
- New York City residents had crude and age-adjusted asthma emergency department visit rates (129.6 per 10,000; 135.0 per 10,000) in 2009-2011 that were approximately 2.5 times higher than residents in the Rest of State (50.9 per 10,000; 54.2 per 10,000).
- Asthma emergency department visit rates at the county level varied across New York State for 2009-2011. New York City residents of the Bronx had the highest age-adjusted emergency department visit rate of 231.4 per 10,000 residents. Among counties in the Rest of State, Clinton County had the highest age-adjusted emergency department visit rate of 110.6 per 10,000 residents.
- For 2009-2011, other third party or private insurance payers were the source of payment for 60% of the asthma emergency department visits in New York. Medicaid was the payment source for 19% of emergency department visits, while Medicare was the payment source for 5% of visits.

Asthma Emergency Department Visit Rates for Adults with Current Asthma (At-Risk Based Rates), 2005-2011

- From 2005 to 2011, the annual at-risk based rate for asthma emergency department visits in New York State remained relatively stable. The annual at-risk based rate was 6.9 per 100 adults with current asthma in 2011.
- From 2006 to 2011, the 18-34 year age group (7.7 per 100 in 2011) had the highest at-risk based rate for asthma emergency department visits compared to other adult age groups in New York State.
- From 2006 to 2011, among adults with current asthma in New York State, men had slightly higher at-risk based rates for asthma emergency department visits compared to women (7.5 and 6.7 per 100 in 2011, respectively).
- From 2005 to 2011, among adults with current asthma, non-Hispanic blacks and Hispanics (15.5 and 8.5 per 100 in 2011, respectively) consistently had higher at-risk based rates for asthma emergency department visits compared to non-Hispanic whites (3.0 per 100 in 2011) in New York State.
- From 2005 to 2011, among adults with current asthma, New York City (9.8 per 100 in 2011) residents consistently had a higher at-risk based rate for asthma emergency department visits compared to those in the Rest of State (4.6 per 100 in 2011). The New York City rate decreased 25% from 13.0 per 100 in 2005 to 9.8 per 100 in 2011.

Asthma Emergency Department Visit Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2010

- For 2006-2010, there were 13.5 asthma emergency department visits each year per 100 children with current asthma in New York State.
- For 2006-2010, among New York State children with current asthma, the 0-4 year age group had the highest at-risk based rate for asthma emergency department visits (29.4 per 100) compared to all other child age groups.
- The at-risk based rate for asthma emergency department visits for 2006-2010 was higher for boys (15.0 per 100) compared to girls (12.0 per 100).
- Among children with current asthma, the 2006-2010 at-risk based rate for asthma emergency department visits was highest for Hispanic children (59.5 per 100), followed by non-Hispanic black children (31.5 per 100).
- The at-risk based rate for asthma emergency department visits for 2006-2010 was five times higher for children living in New York City (30.2 per 100) compared to those living in the Rest of State (6.0 per 100).

Methodology

This analysis examines emergency department (ED) visits due to asthma that occurred in New York State (NYS) hospitals, including patients who were admitted to the hospital directly from the ED. NYS ED visit information has been obtained from two databases within the Statewide Planning and Research Cooperative System (SPARCS): (1) the Hospital Inpatient Database and (2) the Outpatient Database. These two mutually exclusive files contain record level detail on patient characteristics, diagnoses, services and residence location for every ED visit to hospitals within NYS.

The SPARCS Hospital Inpatient Database collects information on all hospital discharges from acute care and rehabilitation hospitals located in NYS. This database includes records for patients who are admitted to the hospital directly from the ED and for those who are hospitalized without first utilizing the ED. It is possible that the same patient may be hospitalized for asthma multiple times and as a result could be counted more than once in these data.

The SPARCS Outpatient Database contains information on ED visits for patients who visit the ED but are not hospitalized. It is possible that the same patient may visit the ED for asthma multiple times and as a result could be counted more than once in these data. The ED data reporting began on a voluntary basis in September 2003, and was mandated in January 2005.

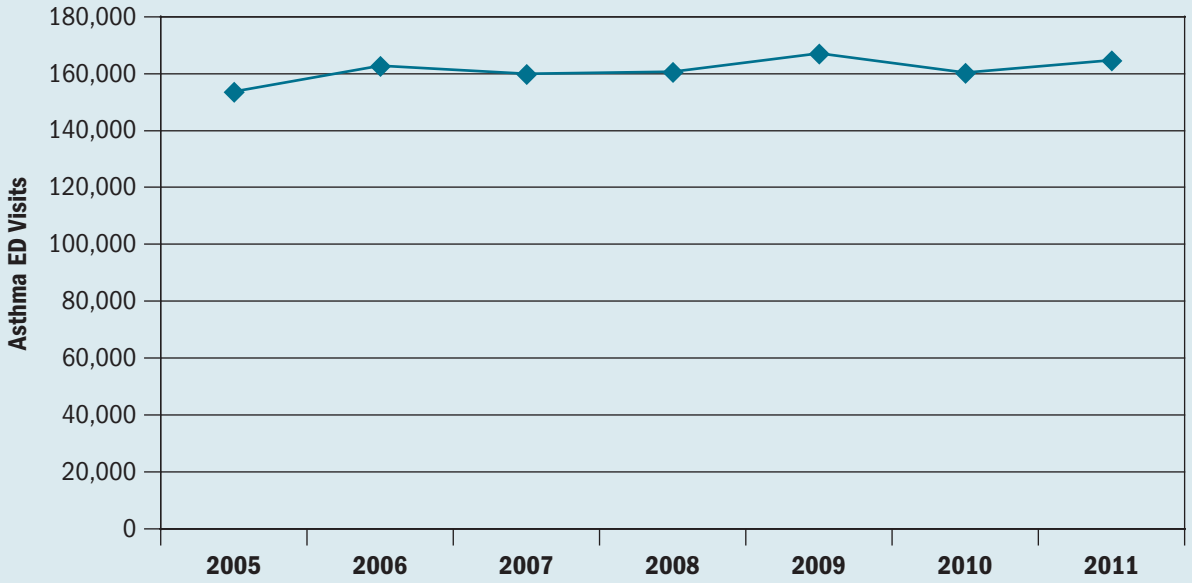
For the SPARCS Hospital Inpatient Database, an asthma ED visit was defined as having been admitted to the hospital directly from the ED and having an **admitting diagnosis** with an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code of 493. For the SPARCS Outpatient Database, an asthma ED visit was defined as having a **principal diagnosis** with an ICD-9-CM code of 493. Population estimates used for computing the asthma ED visit rates were obtained from the U.S. Census Bureau.

Crude and age-adjusted asthma ED visit rates were calculated per 10,000 residents. The age-adjusted rates were calculated using the 2000 U.S. Standard Population (see Appendix 2).

Trends in asthma ED visit data (2005-2011) are presented for the state total, and by age group, gender and geographic region (New York City and Rest of State). Asthma ED visit rates for a specific year were calculated by dividing the number of asthma ED visits by the population of that year and then multiplying by 10,000.

Combined years (2009-2011) of data for asthma ED visits are presented by age group, gender, race and ethnicity and geographic region (New York City and Rest of State). The combined asthma ED visit rates for 2009-2011 were calculated as follows: the total number of asthma ED visits for the three-year period was divided by three to get the average number of asthma ED visits per year. The average number of asthma ED visits was then divided by the middle year population (2010) and multiplied by 10,000. Asthma ED visit data for 2009-2011 are also presented as tables, maps and graphs at the state and county level.

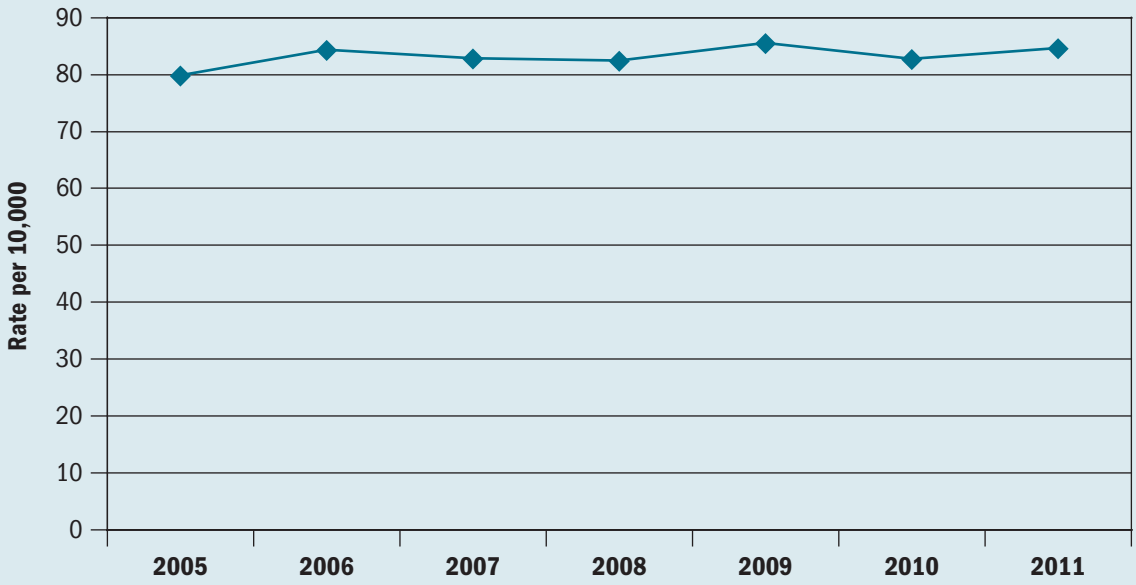
Figure 6-1
Annual Asthma Emergency Department Visits, New York State, 2005-2011



	2005	2006	2007	2008	2009	2010	2011
Asthma ED Visits	153,784	162,867	160,032	160,760	167,212	160,441	164,810

From 2005 to 2011, the annual number of asthma ED visits among NYS residents increased 7% from 153,784 in 2005 to 164,810 in 2011 with a peak in 2009 (Figure 6-1).

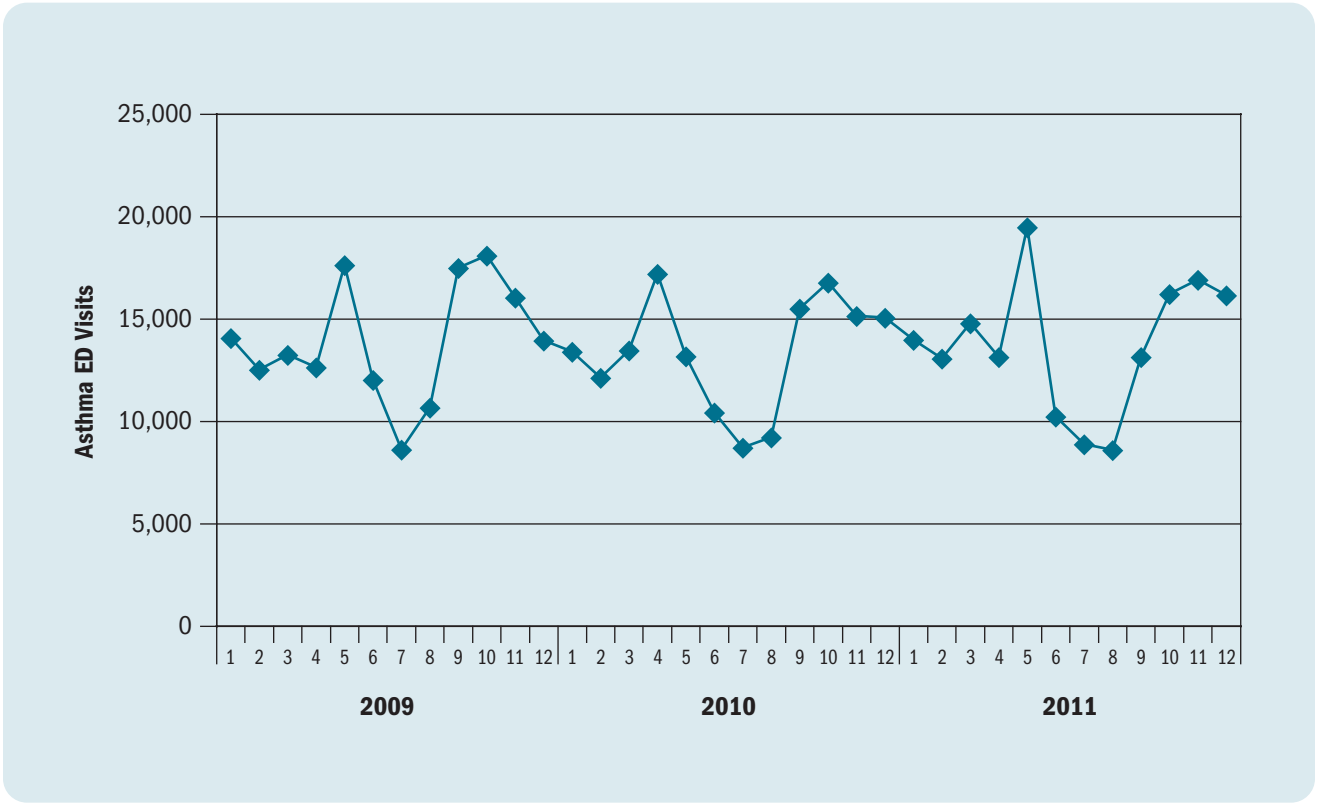
Figure 6-2
Annual Asthma Emergency Department Visit Rate per 10,000 Residents, New York State, 2005-2011



	2005	2006	2007	2008	2009	2010	2011
Rate per 10,000	79.9	84.4	82.9	82.5	85.6	82.8	84.7

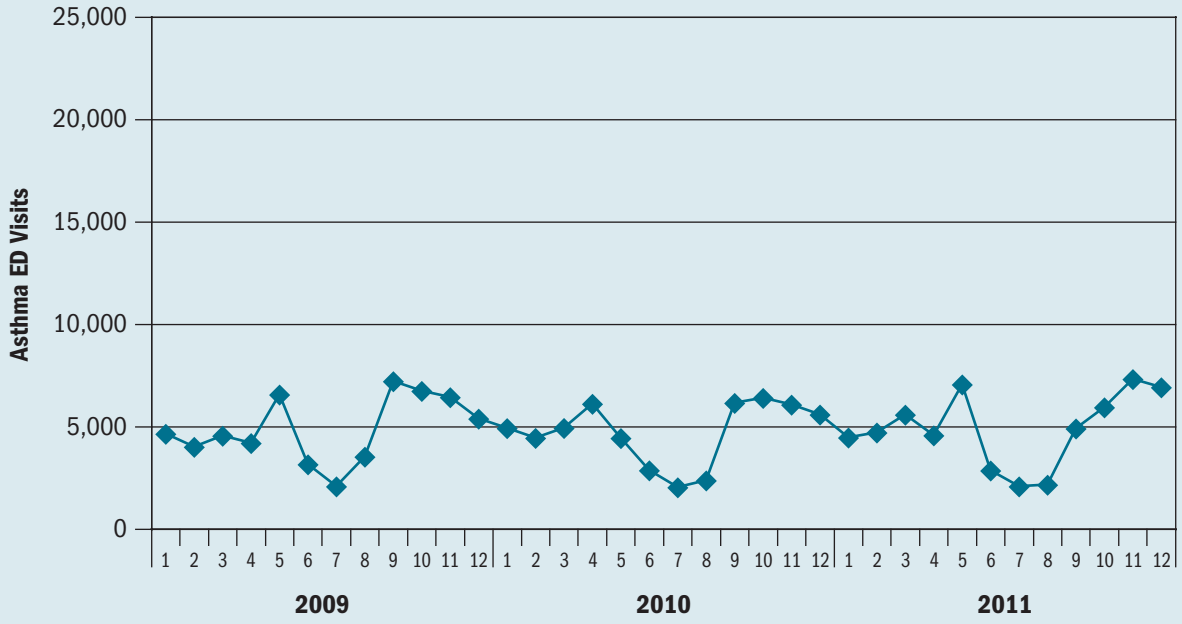
The annual asthma ED visit rate in NYS increased 6% from 79.9 asthma ED visits per 10,000 residents in 2005 to 84.7 asthma ED visits per 10,000 residents in 2011, with a peak in 2009 (Figure 6-2).

Figure 6-3
Asthma Emergency Department Visits by Month, New York State, 2009-2011



When reviewed by month of admission, asthma ED visits showed a seasonal pattern with peaks in the spring and fall, and a decline in the summer (Figure 6-3).

Figure 6-4
Asthma Emergency Department Visits by Month, Ages 0-14 Years, New York State, 2009-2011



From 2009 to 2011, asthma ED visits for those aged 0-14 years showed a similar seasonal pattern with peaks in the spring and fall, and a decline in the summer (Figure 6-4).

Table 6-1
Crude and Age-Adjusted* Asthma Emergency Department Visit Rate per 10,000 Residents by Gender, Race/Ethnicity and Region, New York State, 2009-2011

		Crude	Age-Adjusted*
Gender	Male	80.8	83.8
	Female	88.4	92.3
Race/Ethnicity	Non-Hispanic White	30.4	33.1
	Non-Hispanic Black	220.0	219.5
	Non-Hispanic Other	76.5	82.0
	Hispanic	115.6	112.8
Region	New York City	129.6	135.0
	Rest of State	50.9	54.2
Total	New York State	84.5	88.3

*Adjusted rates are age-adjusted to the 2000 United States population.

For 2009-2011, the crude asthma ED visit rate for NYS was 84.5 per 10,000 residents and the age-adjusted asthma ED visit rate was 88.3 per 10,000.

Female New Yorkers had higher crude and age-adjusted asthma ED visit rates (88.4 per 10,000; 92.3 per 10,000) compared to males (80.8 per 10,000; 83.8 per 10,000).

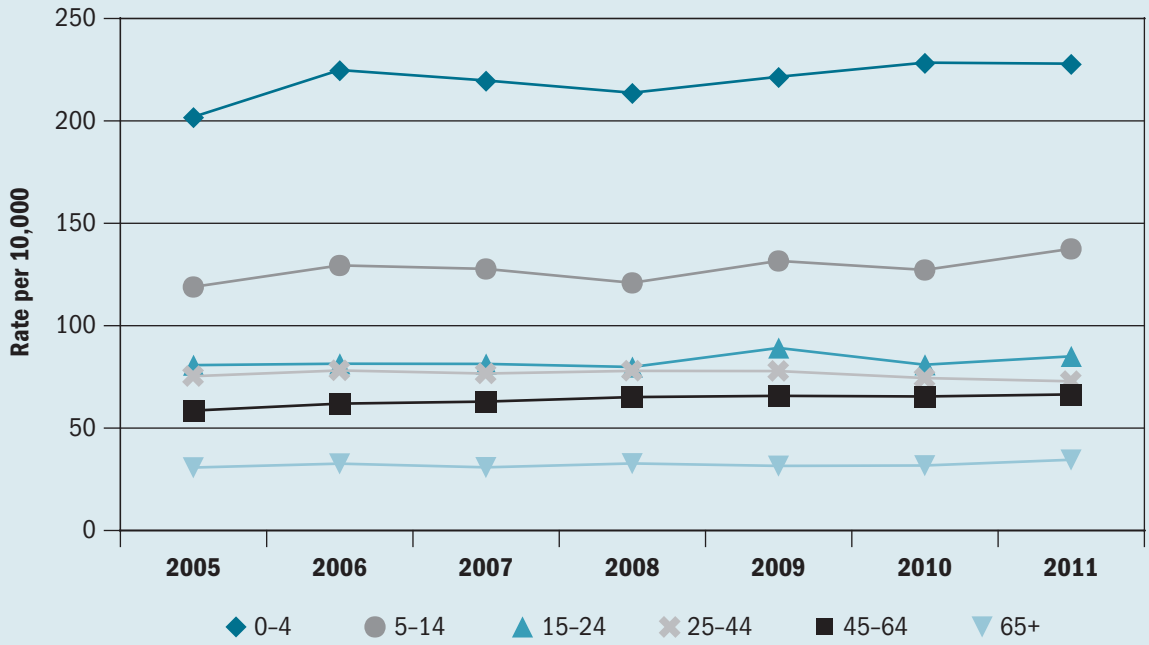
Non-Hispanic black New Yorkers had crude and age-adjusted ED visit rates (220.0 per 10,000; 219.5 per 10,000) that were approximately seven times higher than non-Hispanic white New Yorkers (30.4 per 10,000; 33.1 per 10,000).

Hispanic New Yorkers had crude and age-adjusted ED visit rates (115.6 per 10,000; 112.8 per 10,000) that were almost four times higher than non-Hispanic white residents (30.4 per 10,000; 33.1 per 10,000).

Non-Hispanic New Yorkers who were included in the other category (neither black nor white), had crude and age-adjusted ED visit rates (76.5 per 10,000; 82.0 per 10,000) that were 2.5 times higher than non-Hispanic white New Yorkers (30.4 per 10,000; 33.1 per 10,000).

New York City residents had crude and age-adjusted asthma ED visit rates (129.6 per 10,000; 135.0 per 10,000) in 2009-2011 that were approximately 2.5 times higher than residents in the Rest of State (50.9 per 10,000; 54.2 per 10,000) (Table 6-1).

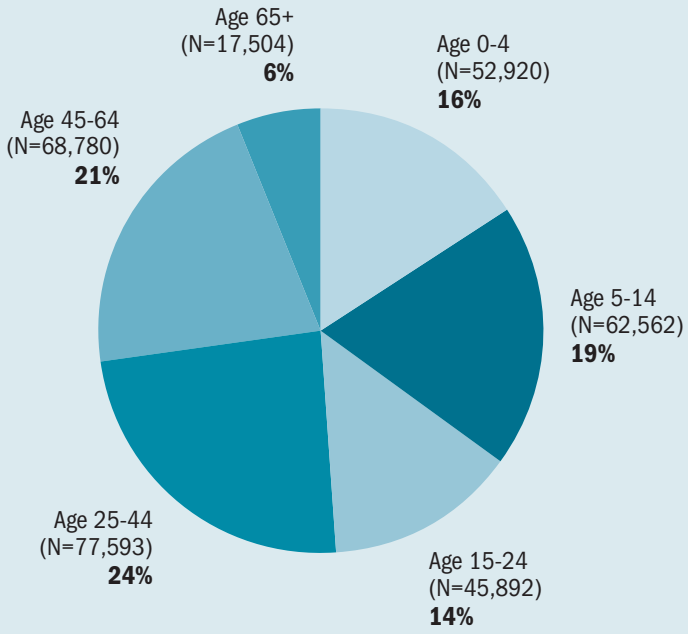
Figure 6-5
Asthma Emergency Department Visit Rate per 10,000 Residents by Age Group and Year, New York State, 2005-2011



Age Group	2005	2006	2007	2008	2009	2010	2011
0–4	201.9	224.8	219.7	213.7	221.5	228.4	227.9
5–14	118.9	129.4	127.7	120.9	131.6	127.2	137.5
15–24	80.7	81.4	81.3	79.8	89.1	80.9	85.0
25–44	75.3	78.1	76.6	77.9	77.8	74.4	72.8
45–64	58.5	61.9	62.9	65.1	65.7	65.4	66.4
65+	30.7	32.6	30.8	32.7	31.5	31.7	34.5

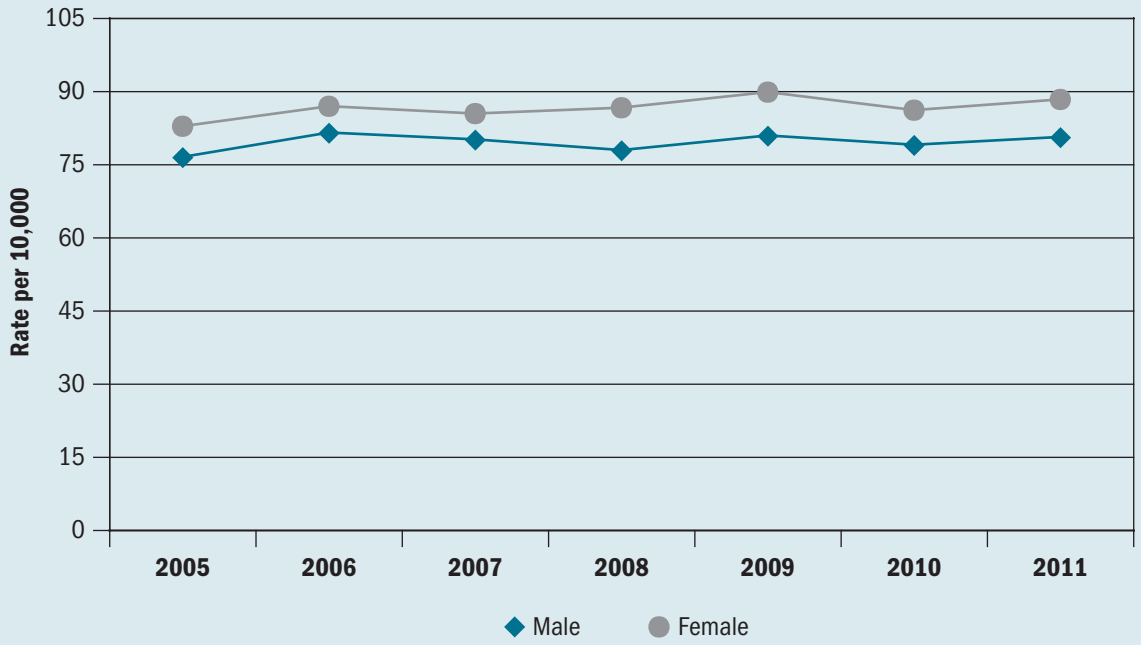
From 2005 to 2011, the 0-4 year age group consistently had the highest asthma ED visit rate compared to all other age groups in NYS. Each age group showed a slight increase from 2005 to 2011 with the exception of the 25-44 year age group (Figure 6-5).

Figure 6-6
Asthma Emergency Department Visits by Age Group, New York State, 2009-2011



For 2009-2011, 16% of the asthma ED visits were for children aged 0-4 years; 24% of the asthma ED visits were for the 25-44 year age group, and 21% were for the 45-64 year age group (Figure 6-6).

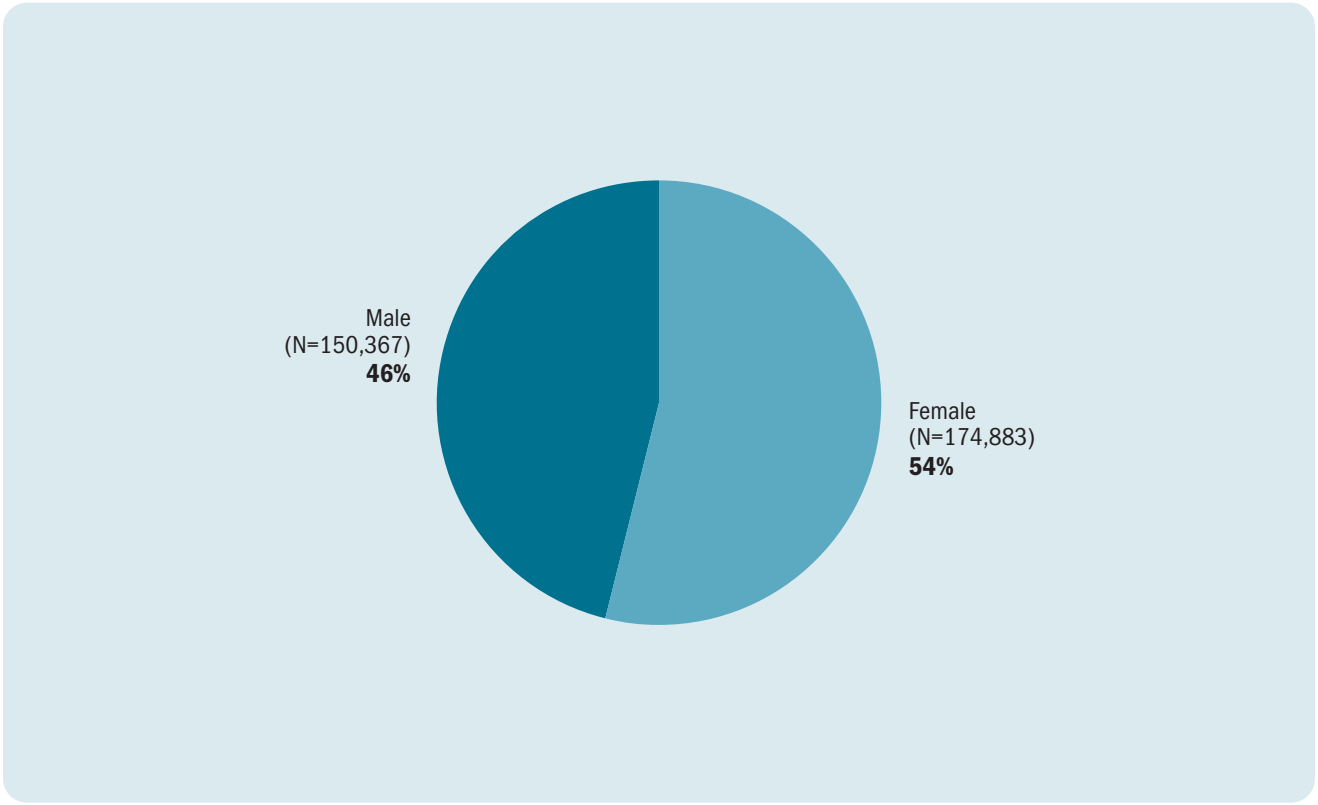
Figure 6-7
Asthma Emergency Department Visit Rate per 10,000 Residents by Gender and Year, New York State, 2005-2011



Gender	2005	2006	2007	2008	2009	2010	2011
Male	76.6	81.6	80.2	78.0	81.0	79.1	80.7
Female	82.9	87.0	85.5	86.7	89.9	86.2	88.4

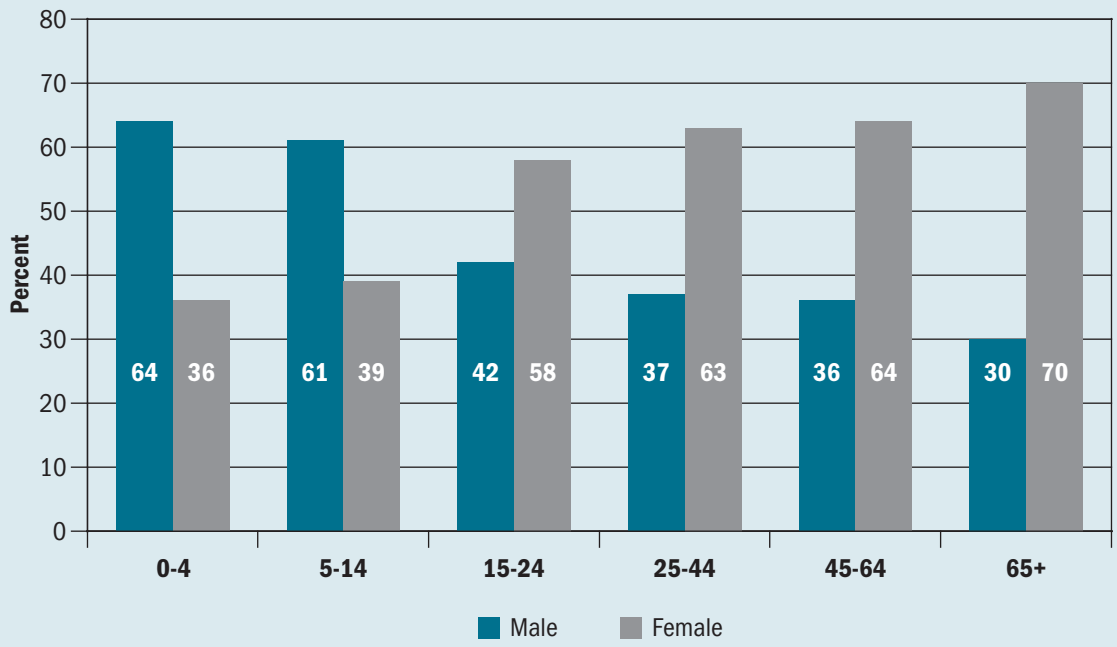
From 2005 to 2011, the asthma ED visit rates fluctuated for both males and females. However, the rates for females were consistently higher than the rates for males. In 2011, the asthma ED visit rates were 80.7 per 10,000 residents for males and 88.4 per 10,000 residents for females (Figure 6-7).

Figure 6-8
Asthma Emergency Department Visits by Gender, New York State, 2009-2011



For 2009-2011, 54% of the asthma ED visits were by female New Yorkers (Figure 6-8).

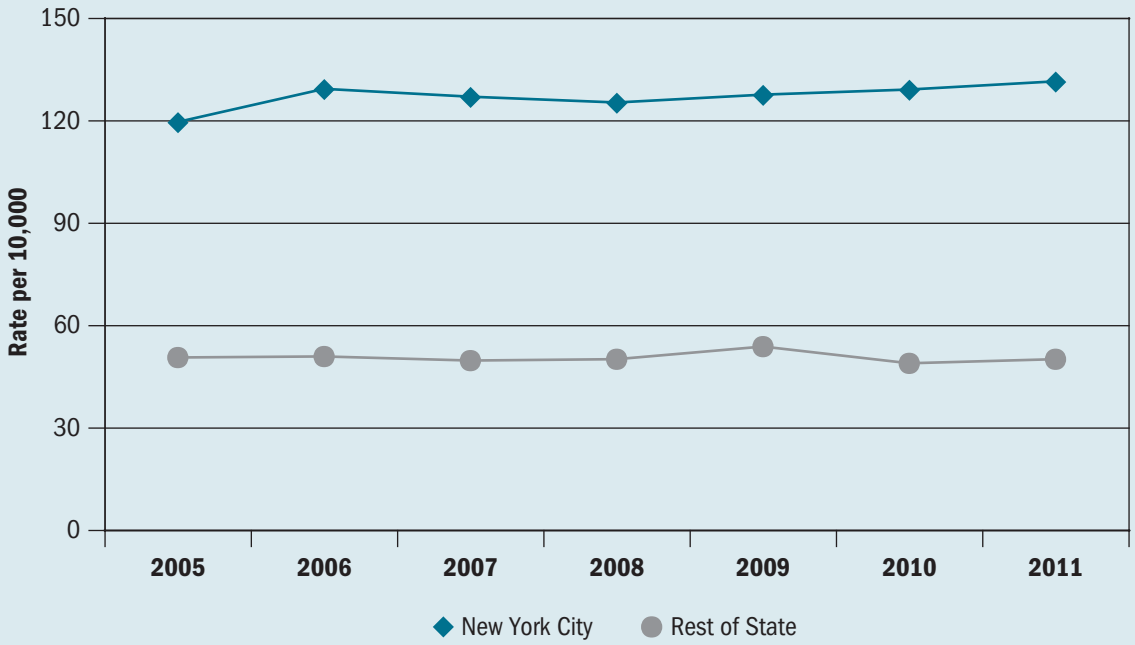
Figure 6-9
Percent of Asthma Emergency Department Visits by Age Group and Gender, New York State, 2009-2011



For 2009-2011, there was a higher proportion of asthma ED visits for males than females among those aged 0-14 years (0-4 years: males-64%, females-36%; 5-14 years: males-61%, females-39%).

In contrast, among those aged 15 years and older, females accounted for a higher proportion of asthma ED visits compared to males (15-24 years: males-42%, females-58%; 25-44 years: males-37%, females-63%; 45-64 years: males-36%, females-64%; 65+ years: males-30%, females-70%) (Figure 6-9).

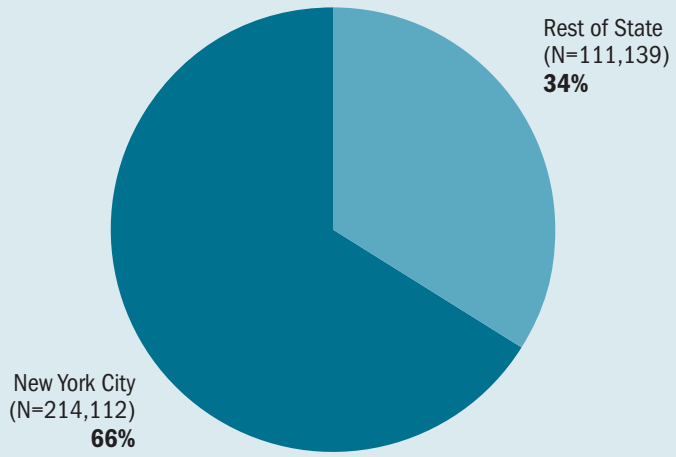
Figure 6-10
Asthma Emergency Department Visit Rate per 10,000 Residents by Region and Year, New York State, 2005-2011



Region	2005	2006	2007	2008	2009	2010	2011
New York City	119.7	129.4	127.1	125.4	127.7	129.2	131.6
Rest of State	50.7	51.0	49.8	50.2	53.9	49.0	50.2

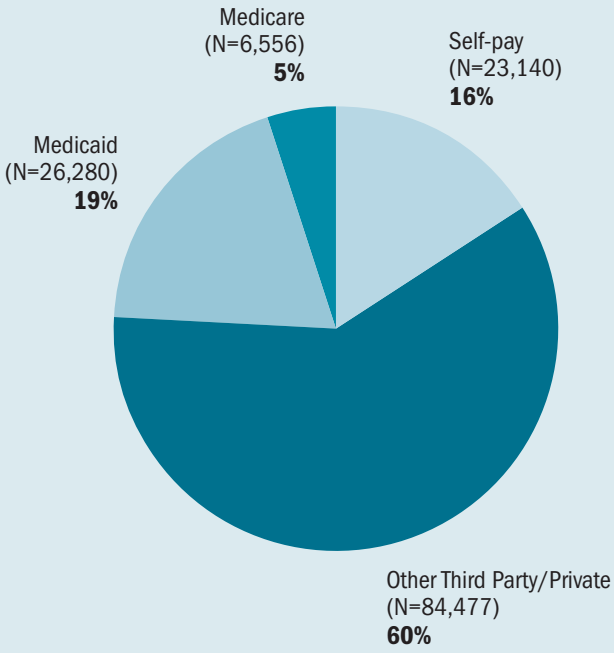
From 2005 to 2011, there was a 10% increase in the asthma ED visit rate for New York City residents, while the rate remained relatively stable for those living in the Rest of State. New York City residents had consistently higher asthma ED visit rates compared to residents in the Rest of State. In 2011, New York City residents had an asthma ED visit rate (131.6 per 10,000) that was 2.5 times higher than the residents living in the Rest of State (50.2 per 10,000) (Figure 6-10).

Figure 6-11
Asthma Emergency Department Visits by Region, New York State, 2009-2011



For 2009-2011, New York City residents accounted for 66% of all asthma ED visits in New York State (Figure 6-11).

Figure 6-12
Asthma Emergency Department Visits by Source of Payment, New York State, 2009-2011



Other third party or private insurance was the source of payment for 60% of all the 2009-2011 asthma-related ED visits in NYS. Medicaid was the payment source for 19% of asthma ED visits and Medicare was the source for only 5% of asthma ED visits (Figure 6-12).

Table 6-2
Crude and Age-Adjusted* Asthma Emergency Department Visit Rates per 10,000 Residents by Region and County, New York State, 2009-2011

Region/County	ED Visits 2009	2010	2011	Total	Average Population 2009-2011	Crude Rate	Adjusted Rate
REGION 1: WESTERN NEW YORK							
Allegany	143	144	234	521	48,960	35.5	39.1
Cattaraugus	488	485	470	1,443	79,946	60.2	65.7
Chautauqua	866	860	833	2,559	134,259	63.5	69.7
Erie	5,519	5,058	4,942	15,519	915,438	56.5	61.1
Genesee	256	204	192	652	59,313	36.6	40.5
Niagara	1,305	1,023	979	3,307	215,679	51.1	56.2
Orleans	183	151	141	475	42,519	37.2	40.6
Wyoming	142	131	108	381	41,832	30.4	32.3
Region Total	*8,902*	*8,056*	*7,899*	*24,857*	*1,537,947*	*53.9*	*58.4*
REGION 2: FINGER LAKES							
Chemung	632	580	681	1,893	88,667	71.2	76.6
Livingston	260	277	246	783	64,445	40.5	45.2
Monroe	4,477	4,341	4,487	13,305	741,224	59.8	63.7
Ontario	483	403	355	1,241	107,369	38.5	42.0
Schuyler	100	103	98	301	18,475	54.3	58.9
Seneca	114	96	98	308	34,833	29.5	31.4
Steuben	499	467	454	1,420	98,192	48.2	52.0
Wayne	456	340	389	1,185	92,833	42.5	46.9
Yates	140	93	90	323	25,095	42.9	49.0
Region Total	*7,161*	*6,700*	*6,898*	*20,759*	*1,271,131*	*54.4*	*58.3*
REGION 3: CENTRAL NEW YORK							
Cayuga	337	251	209	797	79,763	33.3	36.1
Cortland	175	187	273	635	48,898	43.3	45.4
Herkimer	220	242	161	623	63,638	32.6	35.9
Jefferson	597	609	554	1,760	117,619	49.9	49.3
Lewis	92	125	113	330	26,772	41.1	43.5
Madison	359	407	356	1,122	72,254	51.8	57.1
Oneida	1,366	1,286	1,306	3,958	233,403	56.5	61.0
Onondaga	2,076	1,860	1,894	5,830	462,913	42.0	44.7
Oswego	415	401	390	1,206	121,905	33.0	35.1
St. Lawrence	726	683	861	2,270	111,116	68.1	71.7
Tompkins	295	221	246	762	101,689	25.0	28.2
Region Total	*6,658*	*6,272*	*6,363*	*19,293*	*1,439,971*	*44.7*	*47.3*

*Adjusted rates are age-adjusted to the 2000 United States population.

Table 6-2 *continued*
Crude and Age-Adjusted* Asthma Emergency Department Visit Rates per 10,000 Residents by Region and County, New York State, 2009-2011

Region/County	ED Visits 2009	2010	2011	Total	Average Population 2009-2011	Crude Rate	Adjusted Rate
REGION 4: NEW YORK-PENNSYLVANIA							
Broome	880	837	1,008	2,725	198,087	45.9	49.2
Chenango	236	266	230	732	50,405	48.4	54.5
Tioga	64	55	81	200	50,744	13.1	14.4
Region Total	*1,180*	*1,158*	*1,319*	*3,657*	*299,236*	*40.7*	*44.1*
REGION 5: NORTHEASTERN NEW YORK							
Albany	2,160	1,952	1,949	6,061	302,018	66.9	72.9
Clinton	891	803	455	2,149	81,897	87.5	89.4
Columbia	282	216	237	735	62,421	39.2	47.8
Delaware	187	177	185	549	47,018	38.9	44.5
Essex	197	173	192	562	38,746	48.3	53.3
Franklin	350	304	251	905	51,141	59.0	62.0
Fulton	407	337	365	1,109	55,255	66.9	74.3
Greene	178	128	128	434	49,041	29.5	34.1
Hamilton	18	12	22	52	4,851	35.7	49.8
Montgomery	371	417	503	1,291	49,584	86.8	93.4
Otsego	144	122	137	403	61,926	21.7	25.8
Rensselaer	1,010	933	983	2,926	158,122	61.7	66.6
Saratoga	677	670	630	1,977	220,186	29.9	32.1
Schenectady	1,136	1,055	1,159	3,350	153,985	72.5	78.1
Schoharie	56	77	52	185	32,285	19.1	22.1
Warren	335	339	291	965	65,853	48.8	55.4
Washington	246	232	208	686	63,045	36.3	38.6
Region Total	*8,645*	*7,947*	*7,747*	*24,339*	*1,497,372*	*54.2*	*59.0*
REGION 6: HUDSON VALLEY							
Dutchess	1,570	1,312	1,479	4,361	296,350	49.1	50.8
Orange	2,594	2,495	2,482	7,571	377,072	66.9	67.5
Putnam	276	293	315	884	99,636	29.6	31.6
Rockland	1,088	1,105	1,121	3,314	309,006	35.7	36.1
Sullivan	434	399	406	1,239	76,758	53.8	59.7
Ulster	794	734	832	2,360	182,127	43.2	46.9
Westchester	5,826	5,714	5,875	17,415	953,658	60.9	63.5
Region Total	*12,582*	*12,052*	*12,510*	*37,144*	*2,294,607*	*54.0*	*56.0*

*Adjusted rates are age-adjusted to the 2000 United States population.

Table 6-2 *continued*

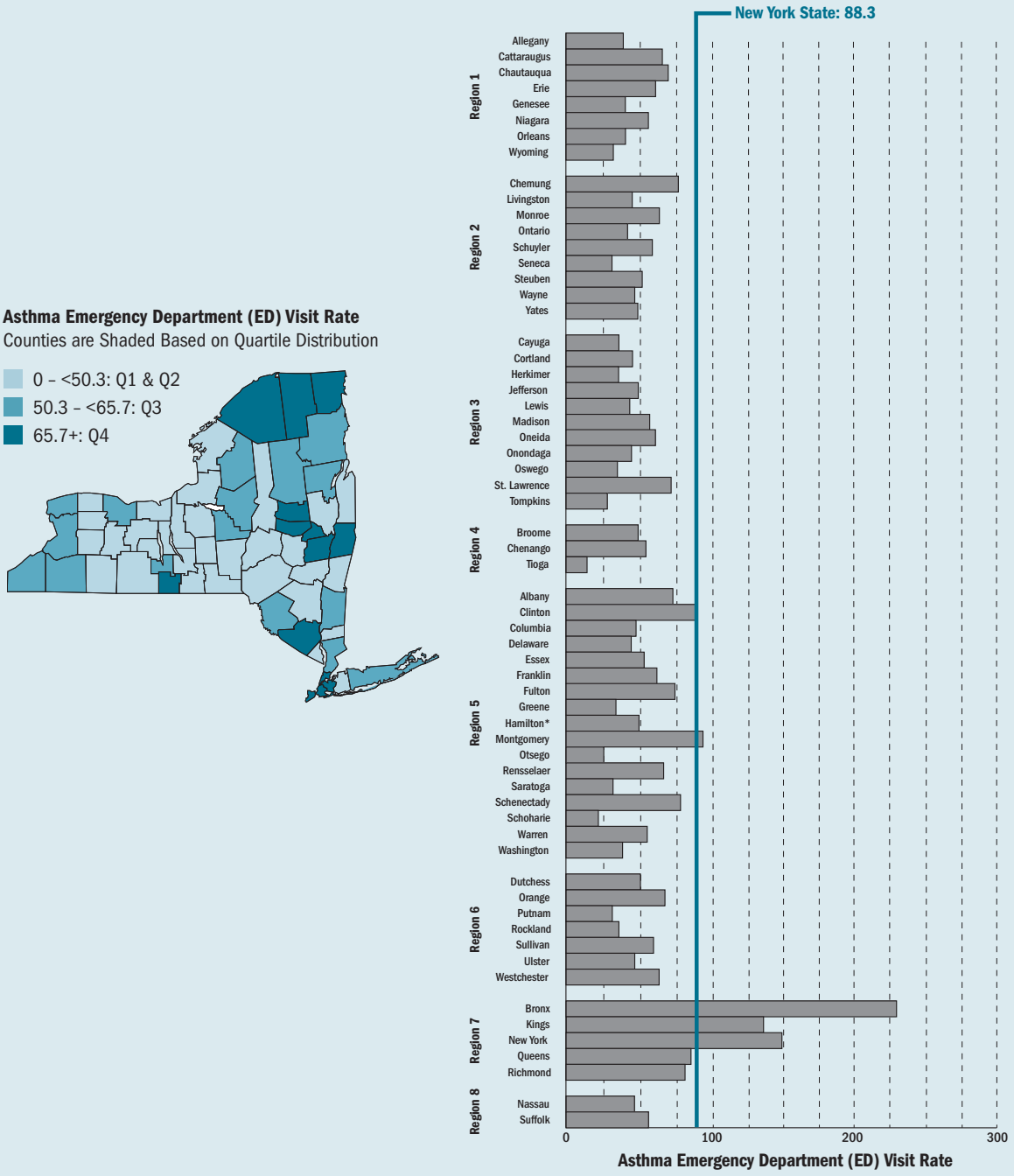
Crude and Age-Adjusted* Asthma Emergency Department Visit Rates per 10,000 Residents by Region and County, New York State, 2009-2011

Region/County	ED Visits				Average Population 2009-2011	Crude Rate	Adjusted Rate
	2009	2010	2011	Total			
REGION 7: NEW YORK CITY							
Bronx	32,368	31,789	31,515	95,672	1,391,466	229.2	225.3
Kings	32,469	33,553	35,084	101,106	2,534,814	133.0	134.5
New York	20,509	19,081	20,132	59,722	1,605,625	124.0	147.2
Queens	18,067	17,610	18,170	53,847	2,261,761	79.4	85.2
Richmond	3,732	3,570	3,890	11,192	476,976	78.2	81.2
Region Total	*107,145*	*105,603*	*108,791*	*321,539*	*8,270,641*	*129.6*	*135.0*
REGION 8: NASSAU-SUFFOLK							
Nassau	6,157	5,650	5,820	17,627	1,347,132	43.6	46.7
Suffolk	8,797	7,460	7,877	24,134	1,503,547	53.5	56.3
Region Total	*14,954*	*13,110*	*13,697*	*41,761*	*2,850,679*	*48.8*	*51.8*
New York State	*167,227*	*160,898*	*165,224*	*493,349*	*19,461,584*	*84.5*	*88.3*

*Adjusted rates are age-adjusted to the 2000 United States population.

Figure 6-13

Age-Adjusted* Asthma Emergency Department Visit Rate per 10,000 Residents by County, New York State, 2009-2011



Source: SPARCS

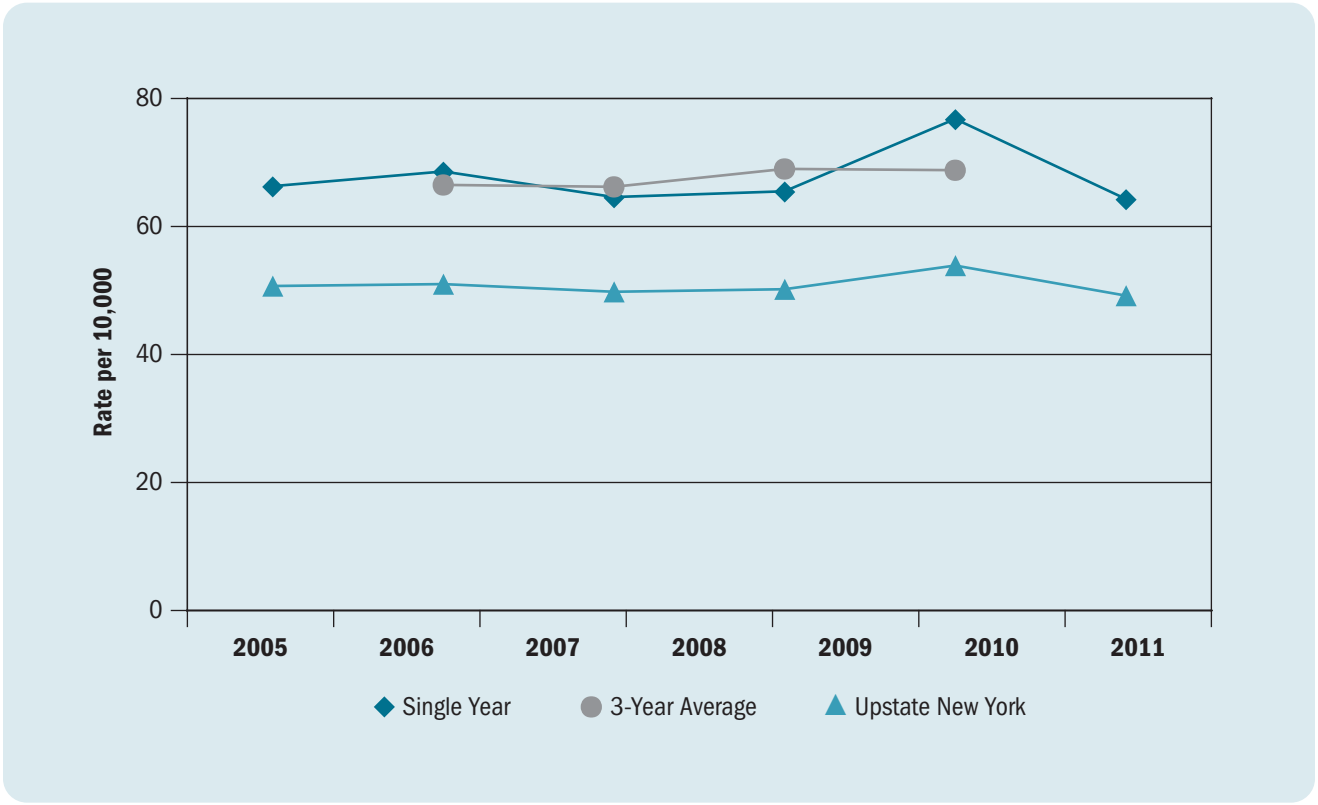
*Adjusted rates are age-adjusted to the 2000 United States population.

Table 6-2 presents the crude and age-adjusted county-specific asthma ED visit rates, and Figure 6-13 is a NYS map that shows the age-adjusted NYS county-specific asthma ED visit rates for 2008-2010. Similar data for specific age groups (e.g., 0-4 years, 0-14 years, 0-17 years, 18-64 years, and 65+ years) are available at the NYSDOH Asthma Surveillance website (see: http://www.health.ny.gov/statistics/ny_asthma/).

Asthma ED visit rates varied by region and county of residence. For New York City, the Bronx had the highest age-adjusted asthma ED visit rate of 231.4 per 10,000 residents followed by New York County with an age-adjusted rate of 144.3 per 10,000 residents.

For counties in the Rest of State, age-adjusted rates ranged from highs of 110.6 per 10,000 residents in Clinton County and 83.6 per 10,000 residents in Montgomery County, to 12.8 per 10,000 residents in Tioga County and 21.9 per 10,000 residents in Schoharie County.

Figure 6-14
Albany County: Asthma Emergency Department Visit Rate per 10,000 Residents, 2005-2011



*Adjusted rates are age-adjusted to the 2000 U.S. population.

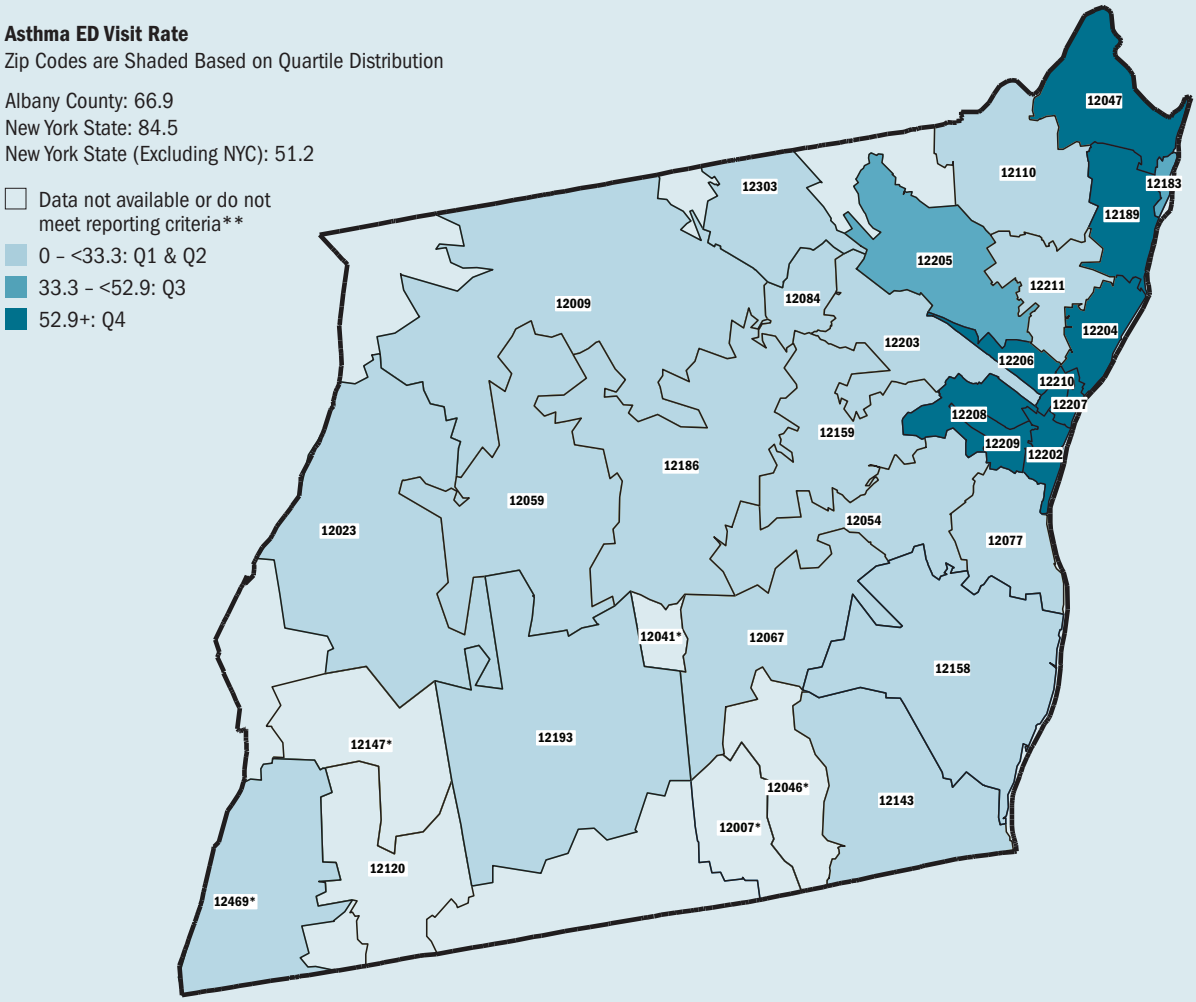
Table 6-3
Albany County: Asthma Emergency Department Visit Rate per 10,000 Residents, 2005-2011

Year	Crude Rate			Age-adjusted Rate		
	Single Year	3-Year Average	NYS Exc. NYC	Single Year	3-Year Average	NYS Exc. NYC
2005	66.3		50.7	70.5		52.8
2006	68.5	66.5	51.0	73.0	70.7	53.4
2007	64.7	66.2	49.8	68.4	70.4	52.4
2008	65.3	67.5	50.2	70.0	72.5	53.0
2009	72.4	67.3	53.9	79.7	72.9	57.4
2010	64.2	66.9	49.4	69.7	72.9	52.4
2011	64.2		50.3	70.3		53.6

Figure 6-14 and Table 6-3 are examples of three-year trend data for asthma emergency department visit rates for Albany County. Data for specific age groups (i.e., 0-4 years, 0-14 years, 0-17 years, 15-24 years, 25-44 years, 45-64 years, 18-64 years, and 65+ years) for Albany County, as well as for every other county in NYS, are available at the NYSDOH Asthma Surveillance website (see: http://www.health.ny.gov/statistics/ny_asthma/).

Figure 6-15

Albany County: Total Asthma Emergency Department Visit Rate per 10,000 Residents by ZIP Code, 2009-2011



*Less than or equal to 10 emergency department visits, therefore rate may not be stable (Relative Standard Error >30%).

**Data is suppressed for confidentiality purposes if there are less than 6 emergency department visits per ZIP code.

A non-shaded area indicates that the ZIP code predominantly lies in an adjacent county.

Table 6-4

Albany County: Total Asthma Emergency Department Visit Rate per 10,000 Residents by ZIP Code, Three-Year Average 2009-2011

ZIP Code	ED Visits 2009–2011	ED Visit Rate	ZIP Code	ED Visits 2009–2011	ED Visit Rate
12007	s	s	12183	40	53.3
12009	74	32.6	12186	26	13.2
12023	20	32.0	12189	308	59.7
12041	s	s	12193*	10	16.0
12046	s	s	12202	815	289.6
12047	377	70.7	12203	267	26.3
12054	109	21.8	12204	244	122.9
12059	13	24.4	12205	404	51.0
12067	11	24.0	12206	1,343	284.1
12077	47	25.4	12207	158	254.1
12084	38	25.6	12208	400	62.9
12110	150	25.2	12209	349	115.4
12120	s	s	12210	523	189.8
12143	57	31.7	12211	76	18.5
12147	s	s	12469*	7	28.1
12158	63	32.3	12470	s	s
12159	61	28.3			

s: Data is suppressed for confidentiality purposes if there are less than 6 ED visits per ZIP code.

*Less than or equal to 10 ED visits, therefore rate may not be stable (RSE>30%).

Figure 6-15 and Table 6-4 are examples of three-year combined data for asthma emergency department visit rates for Albany County ZIP codes. Data for specific age groups (i.e., 0-4 years, 0-14 years, 0-17 years, 18-64 years, and 65+ years) for Albany County, as well as for every other county in NYS, are available at the NYSDOH Asthma Surveillance website (see: http://www.health.ny.gov/statistics/ny_asthma/).

At-risk Based Rates for Asthma Emergency Department Visits

Methodology

At-risk based rates (ARR) for asthma emergency department (ED) visits are the **number of asthma-related ED visits for individuals with current asthma rather than for the general population.** Rates for a specific period of time were calculated by dividing the number of asthma ED visits by the estimated number of people with current asthma for that time period and then multiplying by 100.[17-20]

The number of asthma ED visits in NYS was generated from two databases within the Statewide Planning and Research Cooperative System (SPARCS). (See the Methodology section on page 58 for a full description of the criteria for selection of asthma ED visits.) The number of asthma ED visits was the numerator for the ARR.

The Behavioral Risk Factor Surveillance System (BRFSS) data were used to estimate the number of children (0-17 years) and adults (18+ years) with current asthma. (See the Methodology section on page 35 for a full description of how current asthma was defined and how current asthma prevalence was calculated). The number of people with current asthma was estimated using the weighted current asthma prevalence. The estimates were used as the denominator for the ARR.

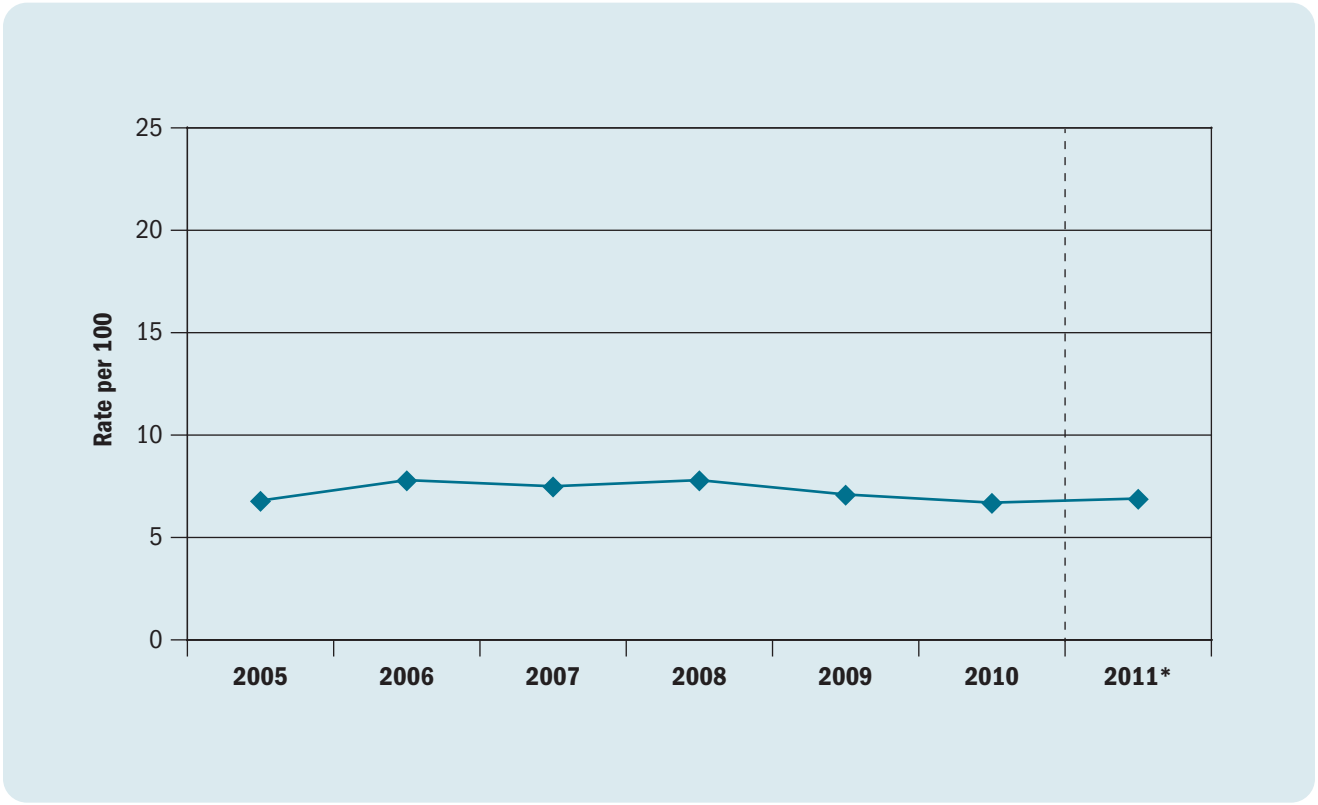
Beginning in 2011, BRFSS data included data from interviews completed by people living in cell phone only households in addition to interviews completed by people living in households with landlines. The data also reflect changes in CDC's weighting methodology. Weighting ensures that the data collected are as representative of New York's population as possible. The new method of weighting ensures that the weighted results will be consistent with known distributions for more socio-demographic variables. While these two changes improve the accuracy of the BRFSS, they can result in prevalence estimates that are significantly different from those calculated previously. **Because of the differences in data collection and the weighting methodology, it is not appropriate to make comparisons of 2011 data to prior years**.

ARR for asthma ED visits for adults with current asthma are presented by age group, gender, race and ethnicity, and geographic region (New York City and Rest of State) for individual years from 2005 through 2011.

ARR for asthma ED visits among children with asthma are also presented by age group, gender, race and ethnicity, and geographic region. However, for children the rates were computed for combined years due to the small sample size of children in the BRFSS. The BRFSS child data are available only for years 2006 through 2011, while SPARCS ED data are available beginning in year 2005. In addition, 2011 BRFSS data cannot be combined with previous years of data due to a change in data collection methods and weighting that occurred for the BRFSS Core survey in 2011 (e.g., incorporation of households with cell phones and use of iterative proportional weights). Therefore, the ARR for children was calculated only for combined years 2006-2010. The ARR for asthma ED visits for children was calculated by dividing the average annual number of asthma ED visits for 2006-2010 by the average estimated number of children with current asthma in the same time period.

The 95% confidence intervals (CIs) for these estimates are provided for both children and adults. Estimates are considered statistically "significantly different" from each other when they do not have overlapping CIs.

Figure 6-16
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma, New York State, 2005-2011

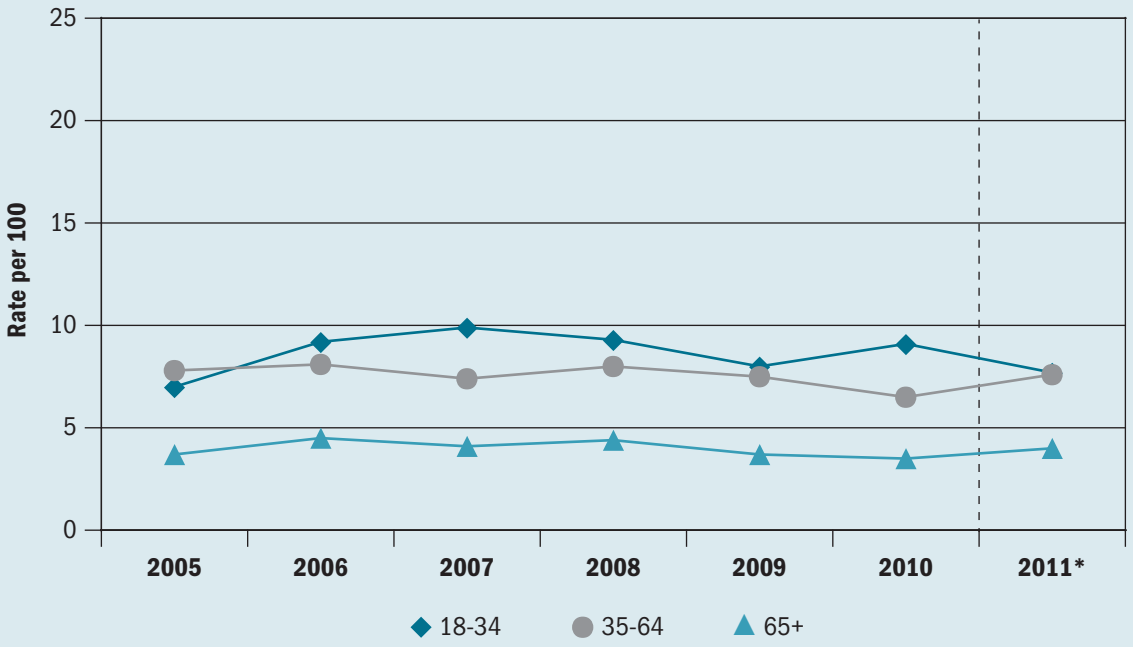


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
New York State	6.8 (6.78-6.87)	7.8 (7.77-7.88)	7.5 (7.48-7.58)	7.8 (7.71-7.81)	7.05 (7.01-7.09)	6.7 (6.63-6.71)	6.9 (6.90-6.99)

The annual ARR for asthma ED visits in New York State has remained relatively constant since 2005. In 2011, the ED ARR was 6.94 per 100 adults (Figure 6–16).

Figure 6-17
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Age Group and Year, New York State, 2005-2011

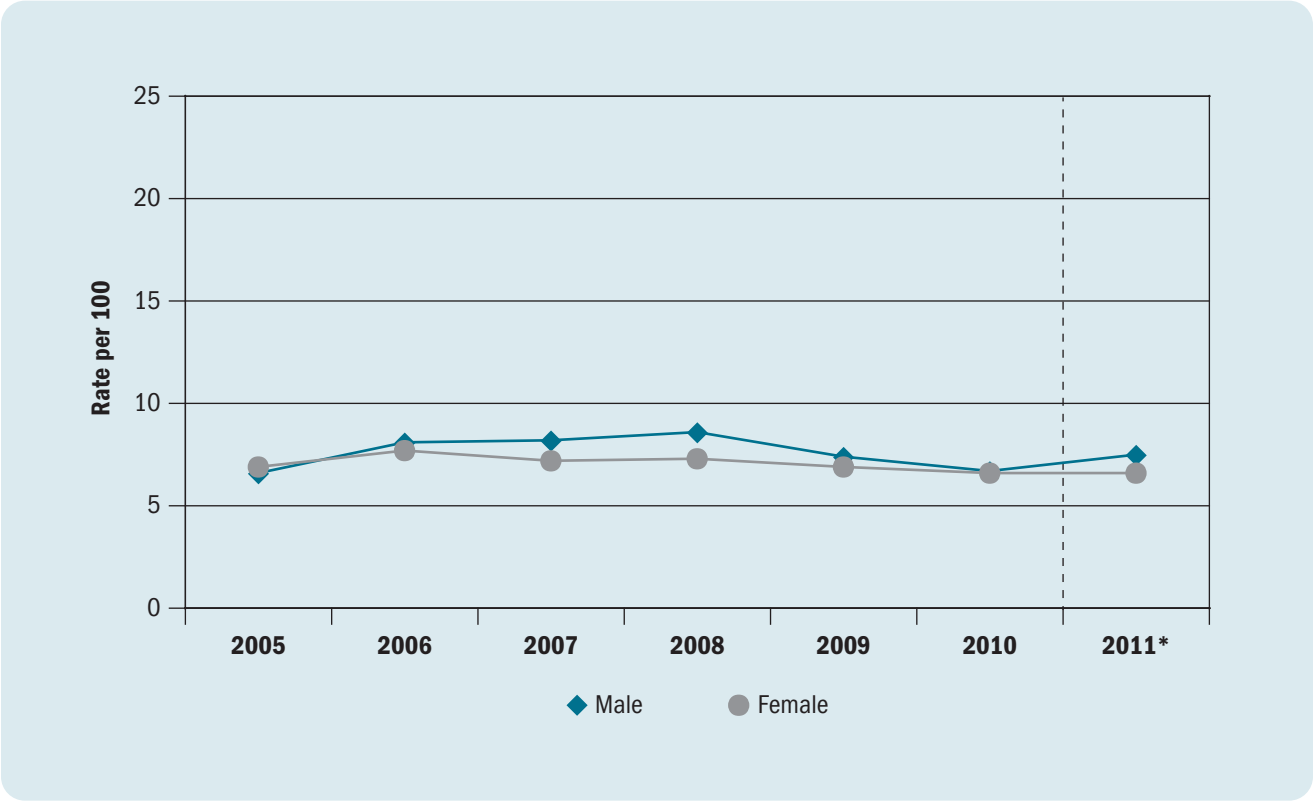


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Age Group	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
18–34	7.0 (6.94-7.09)	9.2 (9.08-9.28)	9.9 (9.79-10.01)	9.3 (9.17-9.37)	8.0 (7.95-8.12)	9.1 (8.99-9.19)	7.7 (7.59-7.75)
35–64	7.8 (7.74-7.88)	8.1 (8.04-8.18)	7.4 (7.29-7.42)	8.0 (7.90-8.04)	7.5 (7.39-7.52)	6.5 (6.48-6.59)	7.6 (7.55-7.68)
65+	3.7 (3.59-3.76)	4.5 (4.43-4.63)	4.1 (3.98-4.17)	4.4 (4.26-4.45)	3.7 (3.67-3.83)	3.5 (3.40-3.55)	4.0 (3.87-4.03)

From 2006 to 2011, the 18-34 year age group had the highest ARR for asthma ED visits compared to other adult age groups in NYS (Figure 6-17).

Figure 6-18
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Gender and Year, New York State, 2005-2011

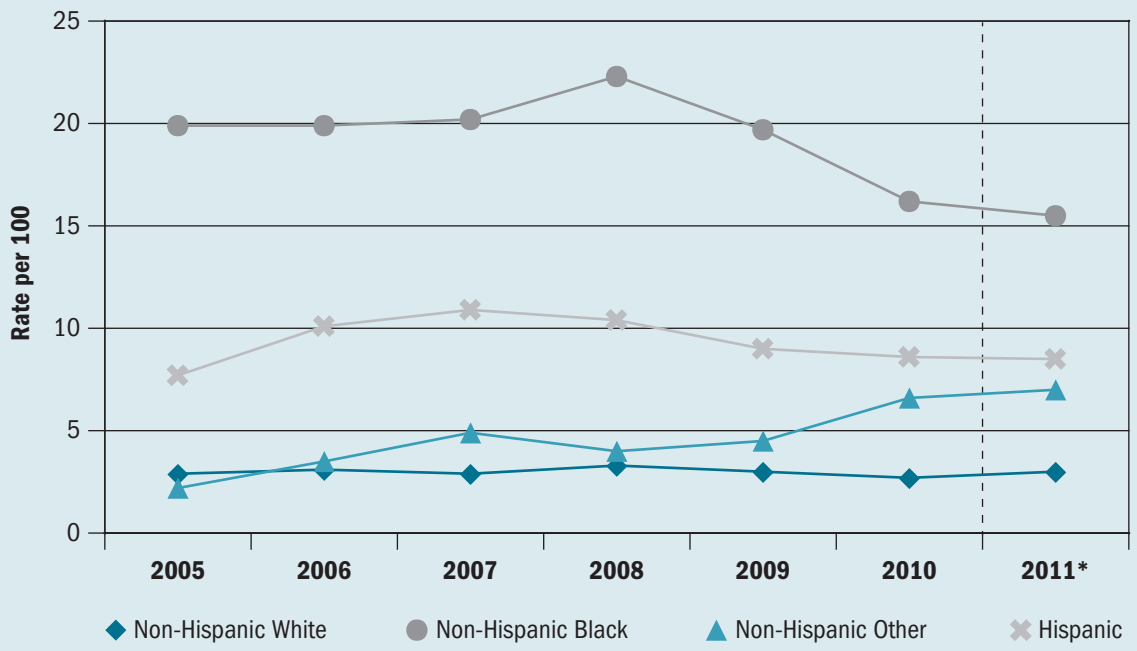


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Gender	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
Male	6.6 (6.56-6.70)	8.1 (7.98-8.15)	8.2 (8.09-8.27)	8.6 (8.50-8.68)	7.4 (7.33-7.49)	6.7 (6.66-6.81)	7.5 (7.44-7.60)
Female	6.9 (6.88-7.00)	7.7 (7.62-7.75)	7.2 (7.13-7.25)	7.3 (7.28-7.39)	6.9 (6.80-6.91)	6.6 (6.58-6.68)	6.66 (6.59-6.70)

From 2006 to 2011, among adults with current asthma in NYS, men had slightly higher ARR for asthma ED visits compared to women. (Figure 6-18).

Figure 6-19
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Race/Ethnicity and Year, New York State, 2005-2011

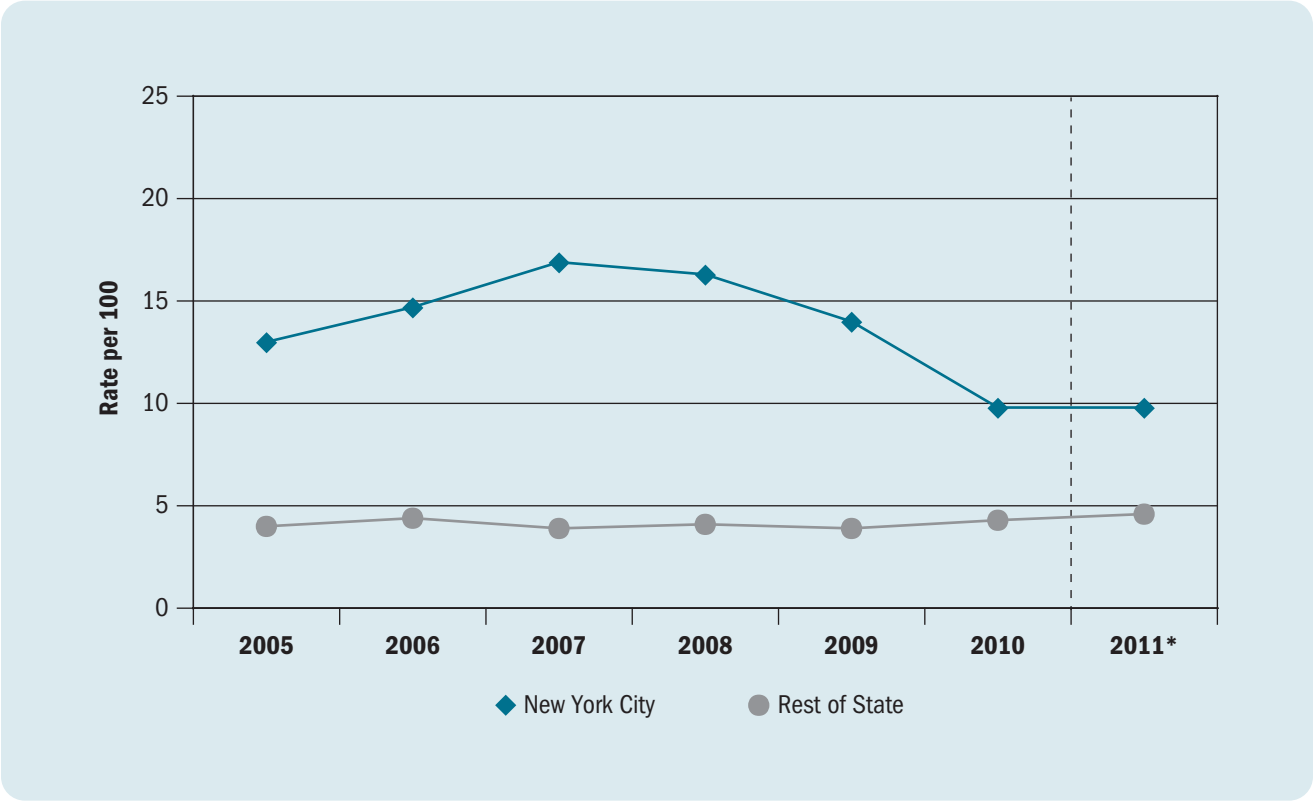


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Race/Ethnicity	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
Non-Hispanic White	2.9 (2.89-2.96)	3.1 (3.09-3.17)	2.95 (2.91-2.98)	3.3 (3.24-3.32)	3.04 (3.00-3.08)	2.7 (2.64-2.79)	3.0 (2.96-3.03)
Non-Hispanic Black	19.9 (19.65-20.13)	19.9 (19.68-20.15)	20.2 (19.96-20.42)	22.3 (22.02-22.51)	19.7 (19.51-19.93)	16.2(16.02-16.37)	15.5 (15.35-15.68)
Non-Hispanic Other	2.2 (2.11-2.27)	3.5 (3.38-3.62)	4.9 (4.76-5.06)	4.0 (3.91-4.14)	4.5 (4.36-4.62)	6.6 (6.40-6.79)	7.0 (6.89-7.20)
Hispanic	7.7 (7.54-7.79)	10.1 (9.98-10.28)	10.9 (10.76-11.07)	10.4 (10.29-10.57)	9.0 (8.83-9.08)	8.6 (8.50-8.74)	8.5 (8.37-8.61)

From 2005 to 2011, the ARR for asthma ED visits among adults with current asthma varied by race and ethnicity. Non-Hispanic blacks consistently had the highest ARR for asthma ED visits compared to other racial and ethnic groups in NYS. This rate decreased from 19.9 per 100 in 2002 to 15.5 per 100 in 2011, with a more drastic decline seen beginning in 2008, which was predominantly due to an increase in the number of non-Hispanic black adults with self-reported current asthma. In 2011, the ARR for Non-Hispanic black residents (15.5 per 100 adults) was 5 times the rate for Non-Hispanic white residents (3 per 100 adults) (Figure 6-19).

Figure 6-20
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Region and Year, New York State, 2005-2011

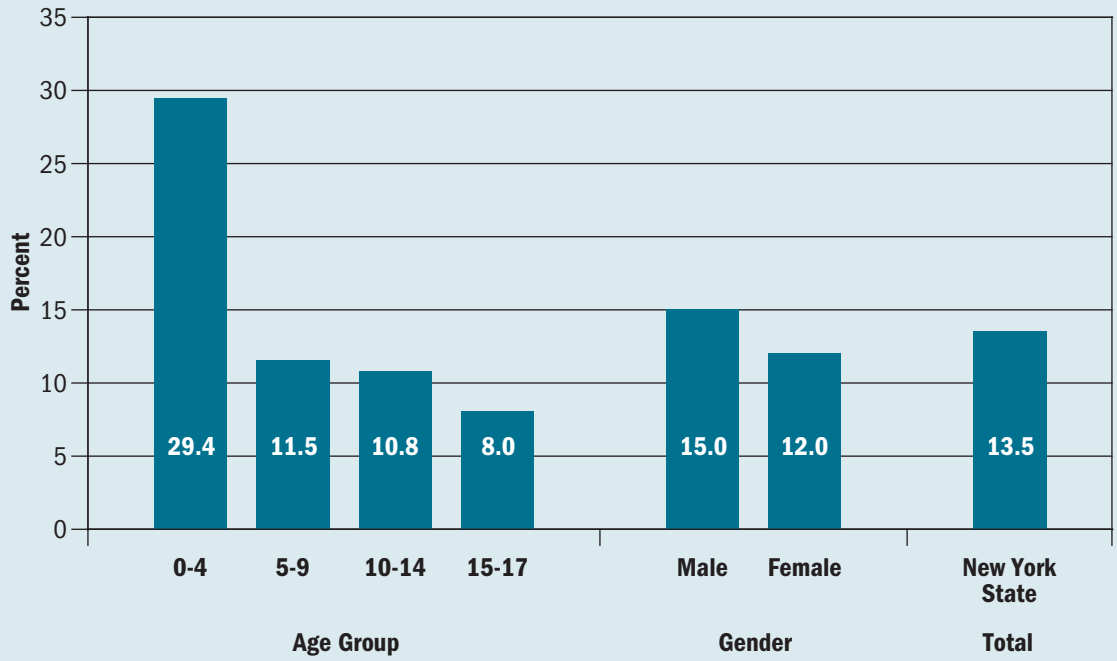


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Region	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
New York City	13.0 (12.89-13.11)	14.7 (14.53-14.78)	16.9 (16.79-17.08)	16.3 (16.15-16.43)	14.0 (13.93-14.16)	9.8 (9.71-9.87)	9.8 (9.74-9.90)
Rest of State	3.96 (3.92-4.00)	4.4 (4.37-4.47)	3.9 (3.84-3.92)	4.1 (4.10-4.18)	3.9 (3.85-3.93)	4.3 (4.25-4.34)	4.6 (4.55-4.65)

The ARR for New York City residents decreased 25% from 13.0 in 2005 to 9.8 in 2011, with a more drastic decline occurring during 2008 to 2010, which was predominantly due to a substantial increase in the number of New York City residents with self-reported current asthma. The ARR from 2005 to 2011 for the Rest of State remained fairly constant (Table 6-20).

Figure 6-21
Asthma Emergency Department Visit Rate per 100 Children (0-17 Years) with Current Asthma by Age Group and Gender, New York State, 2006-2010



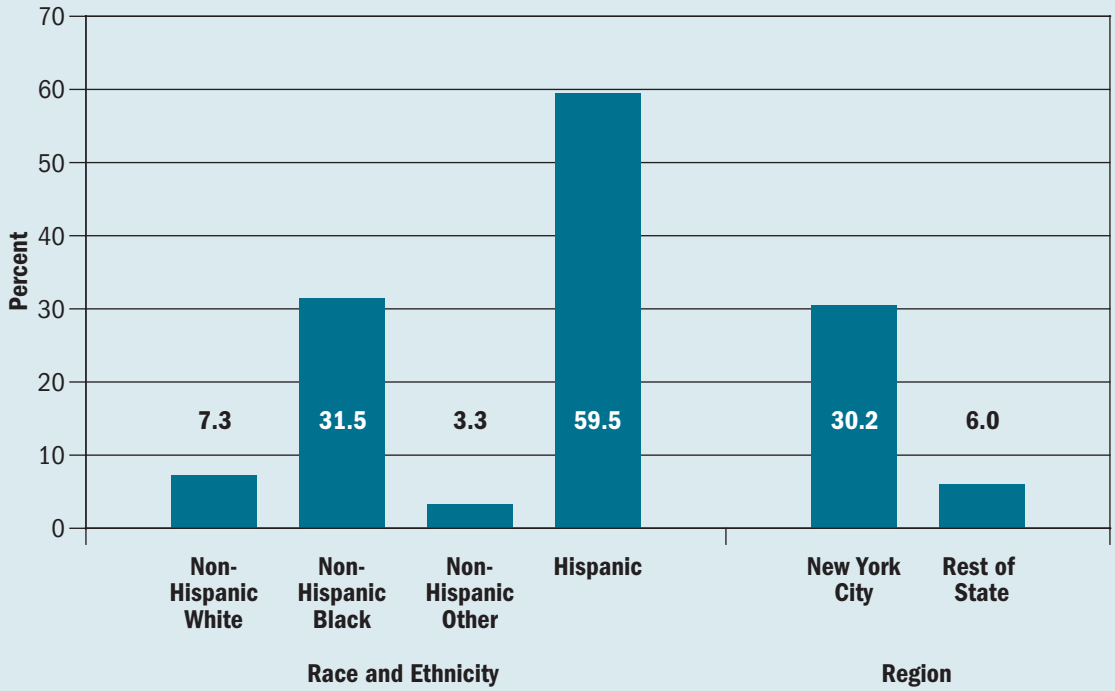
		Rate per 100 with Current Asthma	95% CI
Age Group	0-4	29.4	28.97-29.78
	5-9	11.5	11.30-11.65
	10-14	10.8	10.62-11.03
	15-17	8.0	7.75-8.17
Gender	Male	15.0	14.79-15.11
	Female	12.0	11.85-12.16
Total	*New York State*	*13.5*	*13.43-13.65*

For the 2006-2010, there were 13.5 asthma ED visits each year per 100 children with current asthma in NYS. This rate is nearly double the ARR seen for adults (Figure 6-16 and 6-21).

Among NYS children with current asthma, the 0-4 year age group had the highest 2006-2010 ARR for asthma ED visits (29.4 per 100) compared to all other child age groups.

The ARR for asthma ED visits was higher for boys (15.0 per 100) compared to girls (12.0 per 100) for 2006-2010 (Figure 6-21).

Figure 6-22
Asthma Emergency Department Visit Rate per 100 Children (0-17 Years) with Current Asthma by Race/Ethnicity and Region, New York State, 2006-2010



		Rate per 100 with Current Asthma	95% CI
Race/Ethnicity	Non-Hispanic White	7.3	7.20-7.49
	Non-Hispanic Black	31.5	31.02-31.94
	Non-Hispanic Other	3.3	3.25-3.45
	Hispanic	59.5	58.39-60.69
Region	New York City	30.2	29.92-30.56
	Rest of State	6.0	5.94-6.12

For children with current asthma in 2006-2010, Hispanics had the highest ARR for asthma ED visits at 59.5 per 100, followed by non-Hispanic black children at 31.5 per 100. Non-Hispanic other children had the lowest ARR at 3.3.

The 2006-2010 ARR for asthma ED visits was five times higher for children with asthma living in New York City (30.2 per 100) compared to those living in the Rest of State (6.0 per 100) (Figure 6-22).

7

Asthma Hospital Discharges

Highlights: Asthma Hospital Discharges

- The number of hospital discharges due to asthma in New York State decreased 9% in the past 10 years from 40,585 in 2002 to 36,778 in 2011.
- Asthma hospital discharge rates showed an 11% decrease from 21.2 per 10,000 residents in 2002 to 18.9 per 10,000 in 2011.
- Overall, asthma hospital discharges showed a seasonal pattern with peaks in the spring and fall, and a decline in the summer.
- For 2009-2011, 17% of asthma hospital discharges were for children aged 0-4 years, 22% were for adults 65 years of age and older, and 29% were for adults ages 25-44 years. In addition, 60% of asthma hospital discharges were for females, and 65% were for New York City residents.
- From 2002 to 2011, the 0-4 year age group had the highest hospital discharge rate compared to all other age groups. Each age group showed a downward trend over time with the exception of the 65 year and older age group.
- For 2009-2011, the crude and age-adjusted asthma hospital discharge rates for female New Yorkers (23.4 per 10,000; 22.5 per 10,000) were higher compared to males (16.4 per 10,000; 17.0 per 10,000).
- Males had a higher percentage of asthma hospital discharges compared to females in the 0-4 year (64% vs,36%) and 5-14 year (59% vs.41%) age groups. However, males had lower percentages for all remaining age groups.
- For the period 2009-2011, crude and age-adjusted asthma hospital discharge rates for non-Hispanic black (42.4 per 10,000; 43.2 per 10,000) and Hispanic (38.1 per 10,000; 42.7 per 10,000) New York State residents were at least four times higher than non-Hispanic white residents (9.4 per 10,000; 8.9 per 10,000).
- New York City residents had crude and age-adjusted asthma hospital discharge rates (30.2 per 10,000; 31.0 per 1,000) in 2009-2011 that were 2.5 times higher than residents in the Rest of State (12.2 per 10,000; 12.1 per 10,000).
- Asthma hospital discharge rates at the county level varied across New York State for 2009-2011. New York City residents of the Bronx had the highest age-adjusted hospital discharge rate of 63.3 per 10,000 residents. Among counties in the Rest of State, Oneida County had the highest age-adjusted emergency department visit rate of 16.0 per 10,000 residents.
- For 2009-2011, Medicaid was the source of payment for 41% of the asthma hospital discharges in New York State. Medicare was the payment source for 26% of the asthma hospital discharges. Other, third party or private insurance payers were the payment source for 25% of asthma hospital discharges.

Asthma Hospital Discharge Rates for Adults with Current Asthma (At-Risk Based Rates), 2002-2011

- From 2002 to 2011, the annual at-risk based rate for asthma hospital discharges in New York State decreased from 2.25 asthma hospital discharges per 100 adults with current asthma in 2002 to 1.76 per 100 in 2011.
- Asthma hospital discharges among those with current asthma increased with age. The 65 year and older age group (3.6 per 100 in 2011) consistently had the highest at-risk based rate for asthma hospital discharges compared to other adult age groups in New York State.
- From 2002 to 2011, among adults with current asthma in New York State, women consistently had higher at-risk based rates for asthma hospital discharges compared to men (1.90 and 1.51 per 100 in 2011, respectively). The rates decreased for both women and men during this time period.

- From 2002 to 2011, among adults with current asthma, non-Hispanic blacks and Hispanics (2.9 and 2.4 per 100 in 2011, respectively) consistently had higher at-risk based rates for asthma hospital discharges compared to non-Hispanic whites (1.02 per 100 in 2011) in New York State.
- From 2002 to 2011, the at-risk based rate for hospital discharges among adults with current asthma was higher for residents in New York City compared to those in the Rest of State (2.46 and 1.20 per 100 in 2011, respectively).

Asthma Hospital Discharge Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2010

- For 2006-2010, there was an annual average of 3.5 asthma hospital discharges per 100 children with current asthma in New York State.
- For 2006-2010, among New York State children with current asthma, the 0-4 year age group had the highest at-risk based rate for asthma hospital discharges (10.1 per 100) compared to all other child age groups.
- The at-risk based rate for asthma hospital discharges for 2006-2010 was higher for boys (4.0 per 100) compared to girls with current asthma (3.0 per 100).
- Among children with current asthma, the 2006-2010 at-risk based rate for asthma hospital discharges was highest for Hispanic children (15.4 per 100) followed by non-Hispanic black children (7.1 per 100).
- The at-risk based rate for asthma hospital discharges for 2006-2010 was almost five times higher for children with current asthma living in New York City (7.7 per 100) compared to those living in the Rest of State (1.6 per 100).

Asthma Hospital Discharges

Methodology

Asthma hospital discharge information for New York State (NYS) was obtained from the Statewide Planning and Research Cooperative System (SPARCS) Hospital Inpatient Database. This database contains information about all hospital discharges from acute care and rehabilitation hospitals located in NYS. It includes record-level detail on patient characteristics, diagnoses and treatments, services, residence location and charges for every hospital discharge in NYS. An asthma hospital discharge was defined as having a principal diagnosis with an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code of 493. It is possible that a person may be hospitalized for asthma multiple times and as a result could be counted more than once in these data. Population estimates used for computing the asthma hospital discharge rates were obtained from the United States Census Bureau.

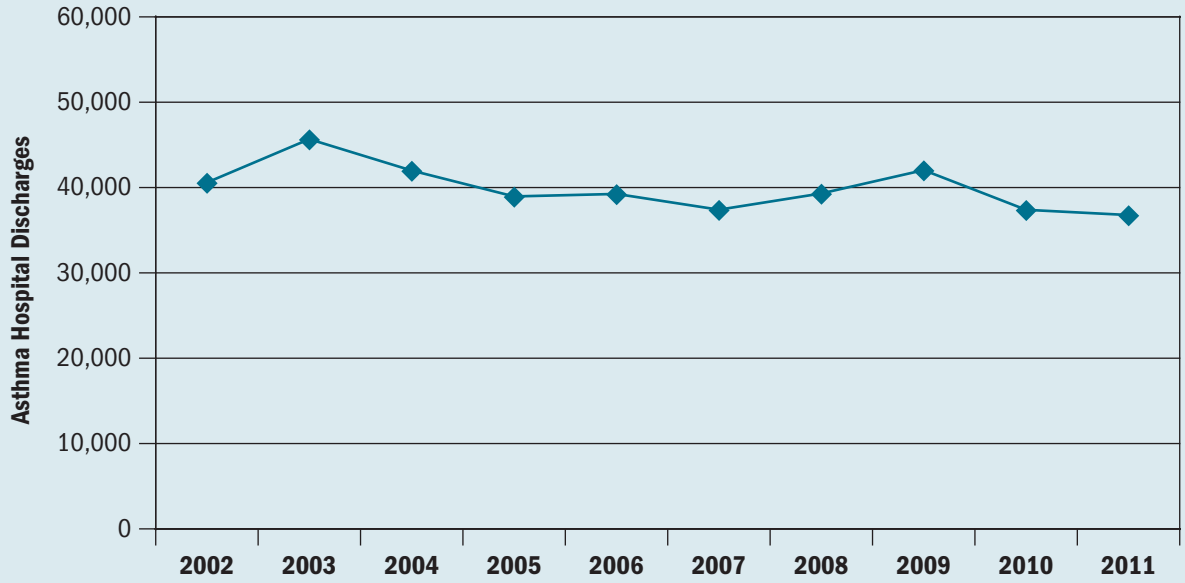
Crude and age-adjusted asthma hospital discharge rates were calculated per 10,000 residents. The age-adjusted rates were calculated using the 2000 U.S. Standard Population (see Appendix 2).

Ten-year trends of asthma hospital discharge data (2002-2011) are presented by state total, age group, gender, and geographic region (New York City and Rest of State). Asthma hospital discharge rates for a specific year were calculated by dividing the number of asthma hospital discharges by the population of that year and then multiplying by 10,000.

Combined years (2009-2011) of data for asthma hospital discharges are presented by age group, gender, race and ethnicity, and geographic region (New York City and Rest of State). The combined asthma hospital discharge rates for 2009-2011 were calculated as follows: the total number of asthma hospital discharges for the three-year period was divided by three to get the average number of asthma hospital discharges per year. The average number of asthma hospital discharges was then divided by the middle year population (2010) and multiplied by 10,000.

Asthma hospital discharge data for 2009-2011 are also presented as tables, maps and graphs at the state and county level. An example of asthma hospital discharge ZIP code level data for counties is also included.

Figure 7-1
Annual Asthma Hospital Discharges, New York State, 2002-2011



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Asthma Hospital Discharges	40,585	45,670	41,991	38,957	39,250	37,404	39,306	42,040	37,391	36,778

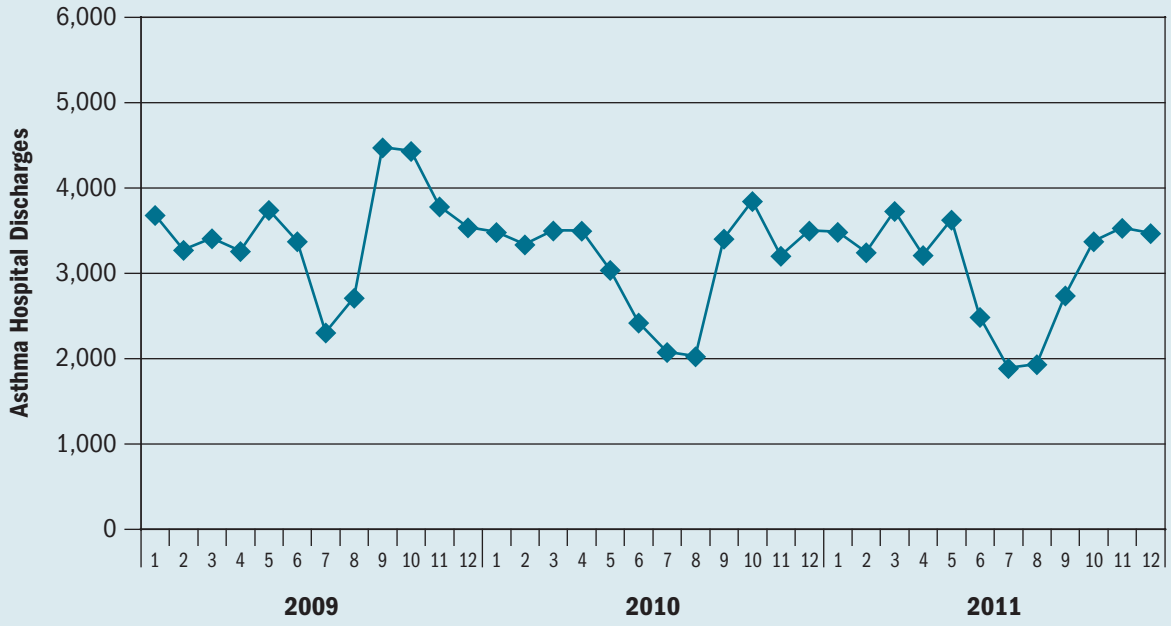
From 2002 to 2011, the annual number of asthma hospital discharges among NYS residents decreased 9% from 40,585 to 36,778, with peaks in 2003 and 2009 (Figure 7–1).

Figure 7-2
Annual Asthma Hospital Discharge Rate per 10,000 Residents, New York State, 2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Rate per 10,000	21.2	23.8	21.8	20.2	20.3	19.4	20.2	21.5	19.3	18.9

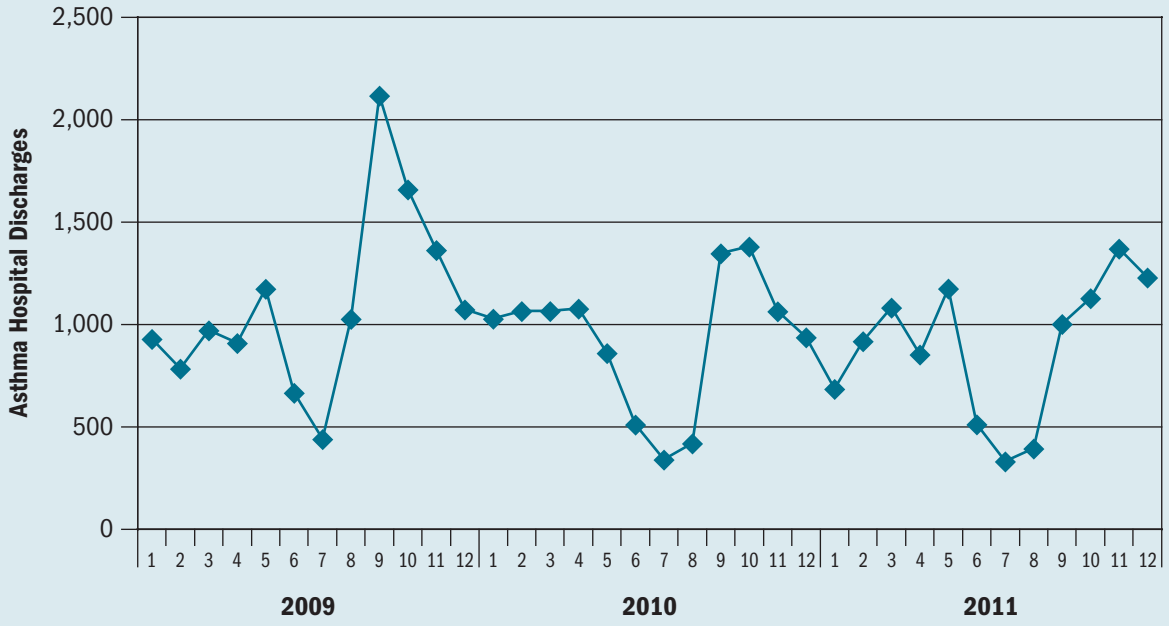
The annual asthma hospital discharge rate in NYS decreased 11% from 21.2 asthma hospital discharges per 10,000 residents in 2002 to 18.9 asthma hospital discharges per 10,000 residents in 2011, with peaks in 2003 and 2009 (Figure 7-2).

Figure 7-3
Asthma Hospital Discharges by Month, New York State, 2009-2011



When reviewed by month of admission, asthma hospital discharges showed a seasonal pattern with peaks in the spring and fall, and a decline in the summer (Figure 7-3).

Figure 7-4
Asthma Hospital Discharges by Month, Ages 0-14 Years, New York State, 2009-2011



For 2009-2011, the number of asthma hospital discharges for those aged 0-14 years showed a similar seasonal pattern with peaks in the spring and fall, and a decline in the summer (Figure 7–4).

Table 7-1
Crude and Age-Adjusted* Asthma Hospital Discharge Rate per 10,000 Residents by Gender, Race/Ethnicity and Region, New York State, 2009-2011

		Crude	Age-Adjusted*
Gender	Male	16.4	17.0
	Female	23.4	22.5
Race/Ethnicity	Non-Hispanic White	9.4	8.9
	Non-Hispanic Black	42.4	43.2
	Non-Hispanic Other	18.9	21.9
	Hispanic	38.1	42.7
Region	New York City	30.2	31.0
	Rest of State	12.2	12.1
Total	*New York State*	*19.9*	*19.9*

*Adjusted rates are age-adjusted to the 2000 United States population.

For 2009-2011, the crude and age-adjusted asthma hospital discharge rates for NYS were the same, at 19.9 per 10,000 residents.

Female New Yorkers had higher crude and age-adjusted asthma hospital discharge rates (23.4 per 10,000; 22.5 per 10,000) compared to males (16.4 per 10,000; 17.0 per 10,000).

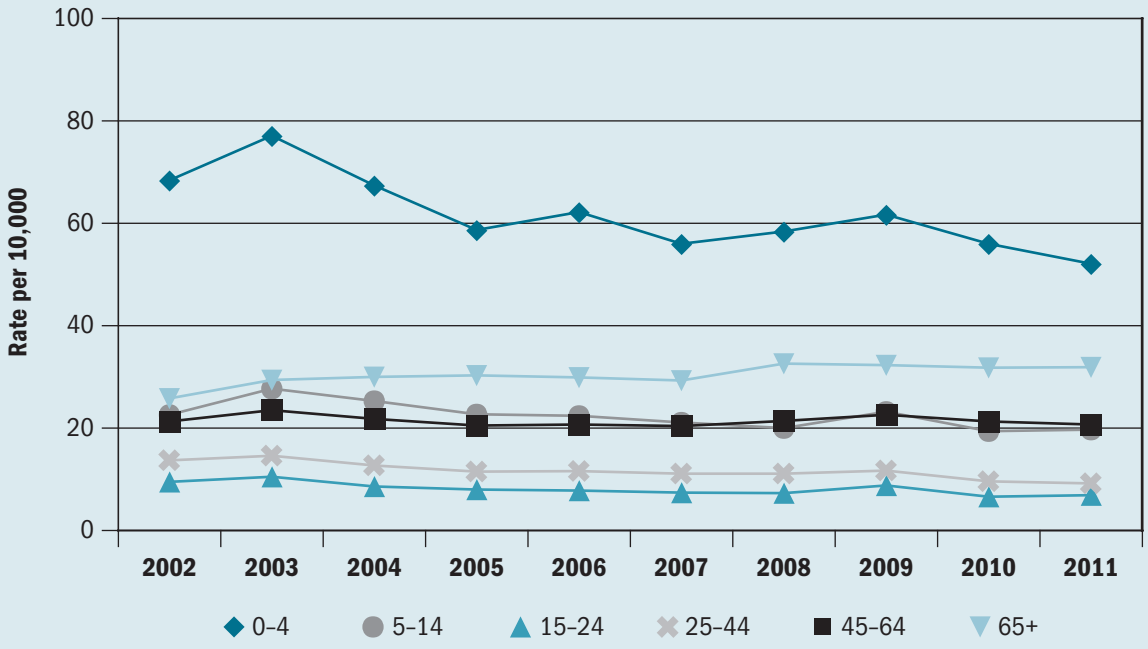
Non-Hispanic black New Yorkers had crude and age-adjusted hospital discharge rates (42.4 per 10,000; 43.2 per 10,000) that were almost five times higher than non-Hispanic white New Yorkers (9.4 per 10,000; 8.9 per 10,000).

Hispanic New Yorkers had crude and age-adjusted hospital discharge rates (38.1 per 10,000; 42.7 per 10,000) that were at least four times higher than non-Hispanic white residents (9.4 per 10,000; 8.9 per 10,000).

Non-Hispanic New Yorkers who were included in the other category (neither black nor white), had crude and age-adjusted hospital discharge rates (18.9 per 10,000; 21.9 per 10,000) that were double those of non-Hispanic white New Yorkers (9.4 per 10,000; 8.9 per 10,000).

New York City residents had crude and age-adjusted asthma hospital discharge rates (30.2 per 10,000; 31.0 per 10,000) in 2009-2010 that were 2.5 times higher than residents in the Rest of State (12.2 per 10,000; 12.1 per 10,000) (Table 7-1).

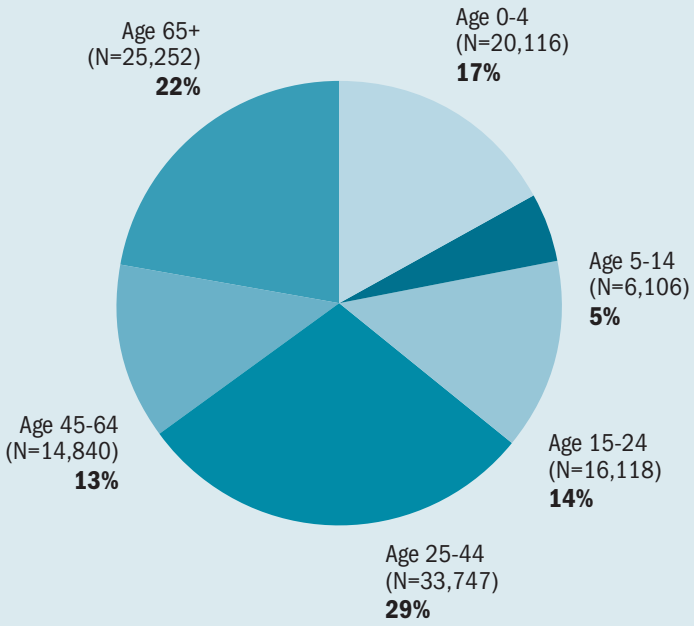
Figure 7-5
Asthma Hospital Discharge Rate per 10,000 Residents by Age Group and Year, New York State, 2002-2011



Age Group	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0–4	68.4	77.1	67.4	58.7	62.2	56.0	58.4	61.7	56.0	52.1
5–14	22.6	27.7	25.3	22.7	22.4	21.1	20.0	23.2	19.4	19.7
15–24	9.5	10.5	8.6	8.0	7.8	7.4	7.3	8.8	6.6	6.9
25–44	13.7	14.6	12.7	11.5	11.6	11.1	11.1	11.7	9.6	9.2
45–64	21.3	23.5	21.8	20.5	20.7	20.4	21.4	22.6	21.3	20.7
65+	25.8	29.4	30.0	30.3	29.9	29.3	32.6	32.3	31.8	31.9

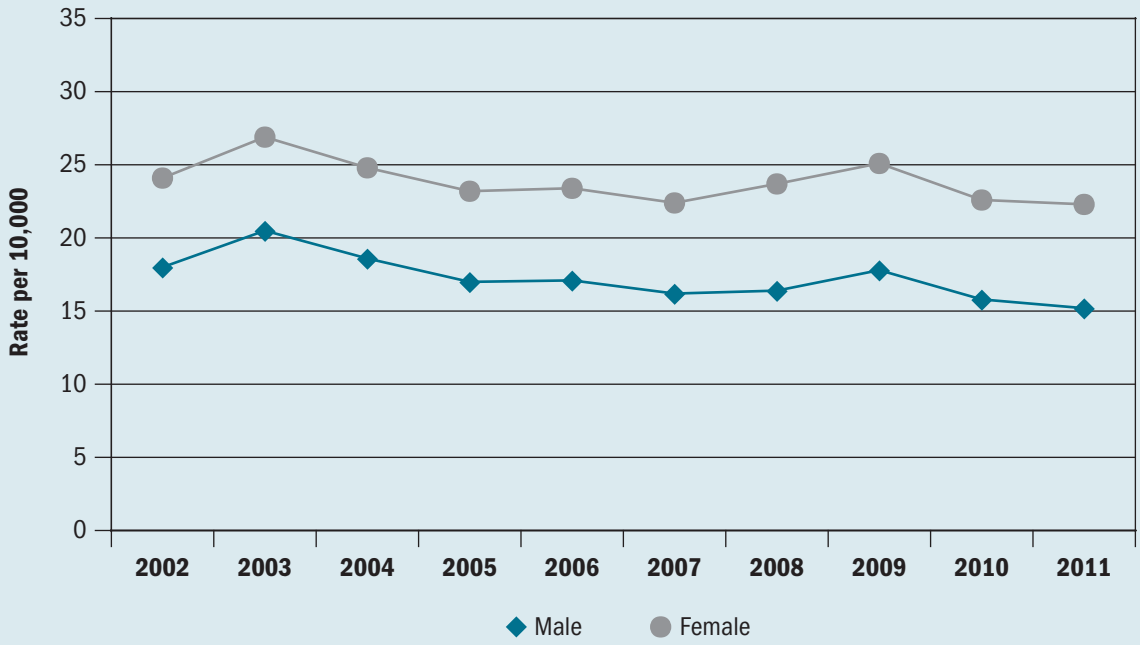
From 2002 to 2011, the 0-4 year age group had the highest asthma hospital discharge rate compared to all other age groups in NYS. Each age group showed a downward trend over time with the exception of the 65 year and older age group (Figure 7-5).

Figure 7-6
Asthma Hospital Discharges by Age Group, New York State, 2009-2011



For 2009-2011, 17% of the asthma hospital discharges were for children aged 0-4 years, 29% of the asthma hospital discharges were for the 25-44 year age group, and 22% were for the 65 and older age group (Figure 7-6).

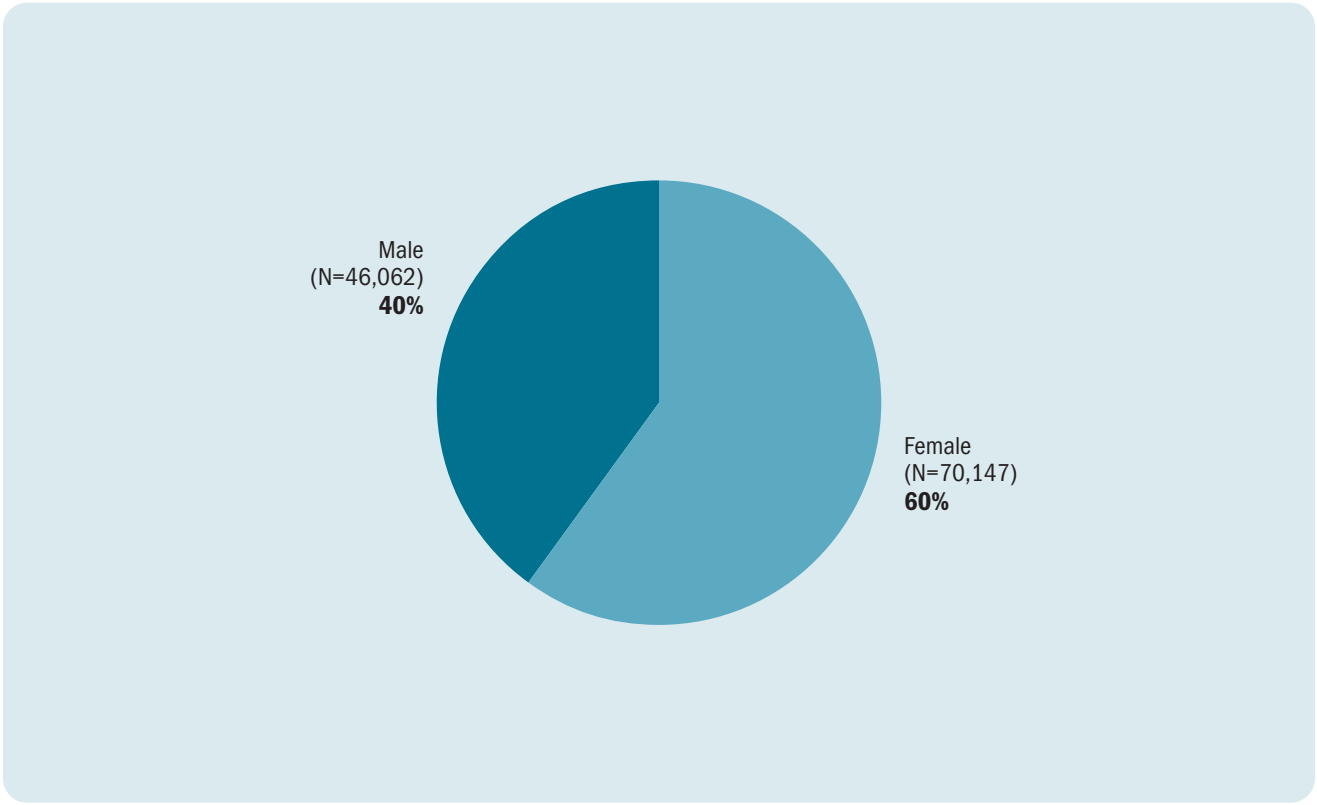
Figure 7-7
Asthma Hospital Discharge Rate per 10,000 Residents by Gender and Year, New York State, 2002-2011



Gender	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Male	18.0	20.5	18.6	17.0	17.1	16.2	16.4	17.8	15.8	15.2
Female	24.1	26.9	24.8	23.2	23.4	22.4	23.7	25.1	22.6	22.3

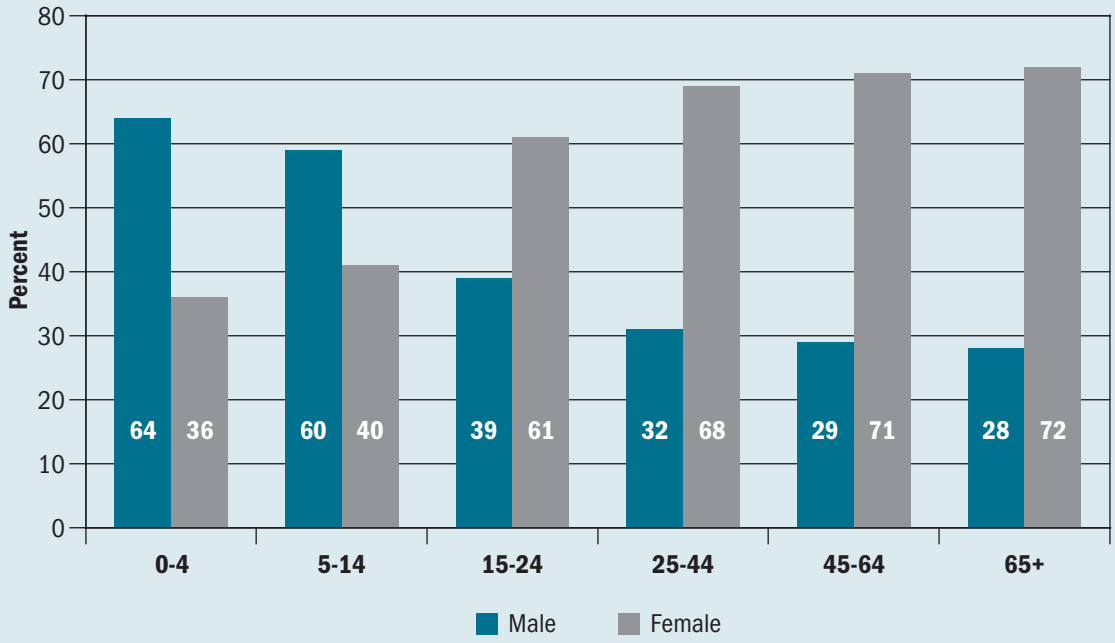
Asthma hospital discharge rates decreased over time, but fluctuated from year to year for both males and females from 2002 to 2011. The rate for females was consistently higher than the rate for males. In 2011, the asthma hospital discharge rate for females (22.3 per 10,000) was 32% higher than the asthma hospital discharge rate for males (15.2 per 10,000) (Figure 7-7).

Figure 7-8
Asthma Hospital Discharges by Gender, New York State, 2009-2011



For 2009-2011, 60% of asthma hospital discharges were by female New Yorkers (Figure 7-8).

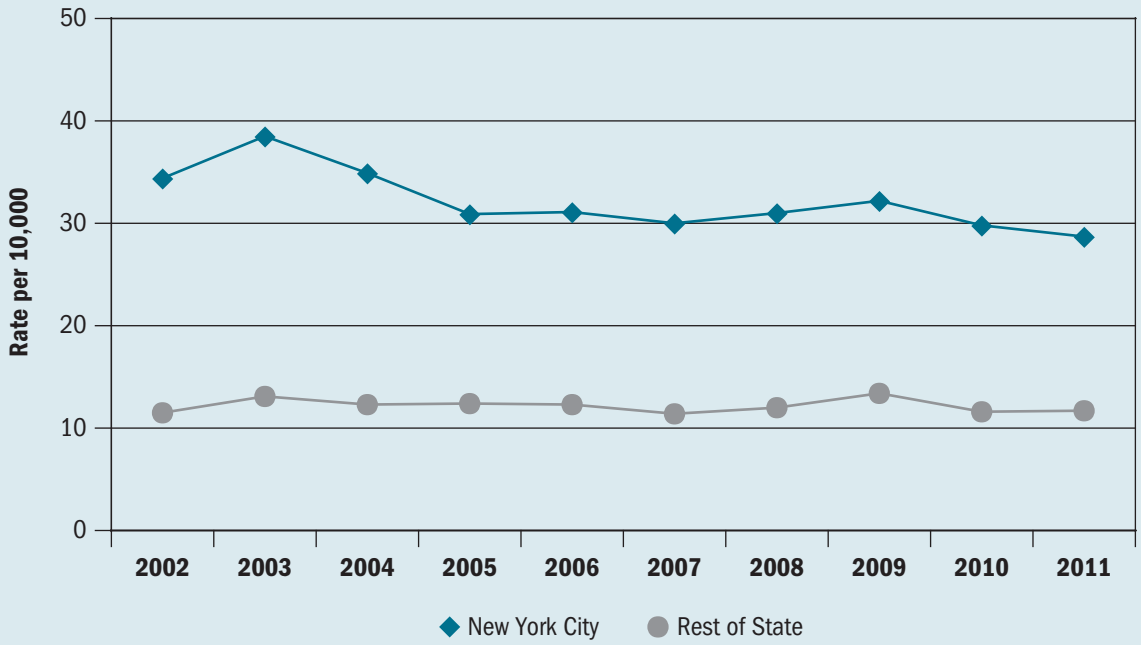
Figure 7-9
Percentage of Asthma Hospital Discharges by Age Group and Gender, New York State, 2009-2011



For 2009-2011, there was a higher proportion of asthma hospital discharges for males than females among those aged 0-14 years (0-4 years: males-64%, females-36%; 5-14 years: males-59%, females-41%).

In contrast, among those aged 15 years and older, females accounted for a higher proportion of asthma hospital discharges compared to males (15-24 years: males-39%, females-61%; 25-44 years: males-31%, females- 69%; 45-64 years: males-29%, females-71%; 65+ years: males-28%, females-72%) (Figure 7-9).

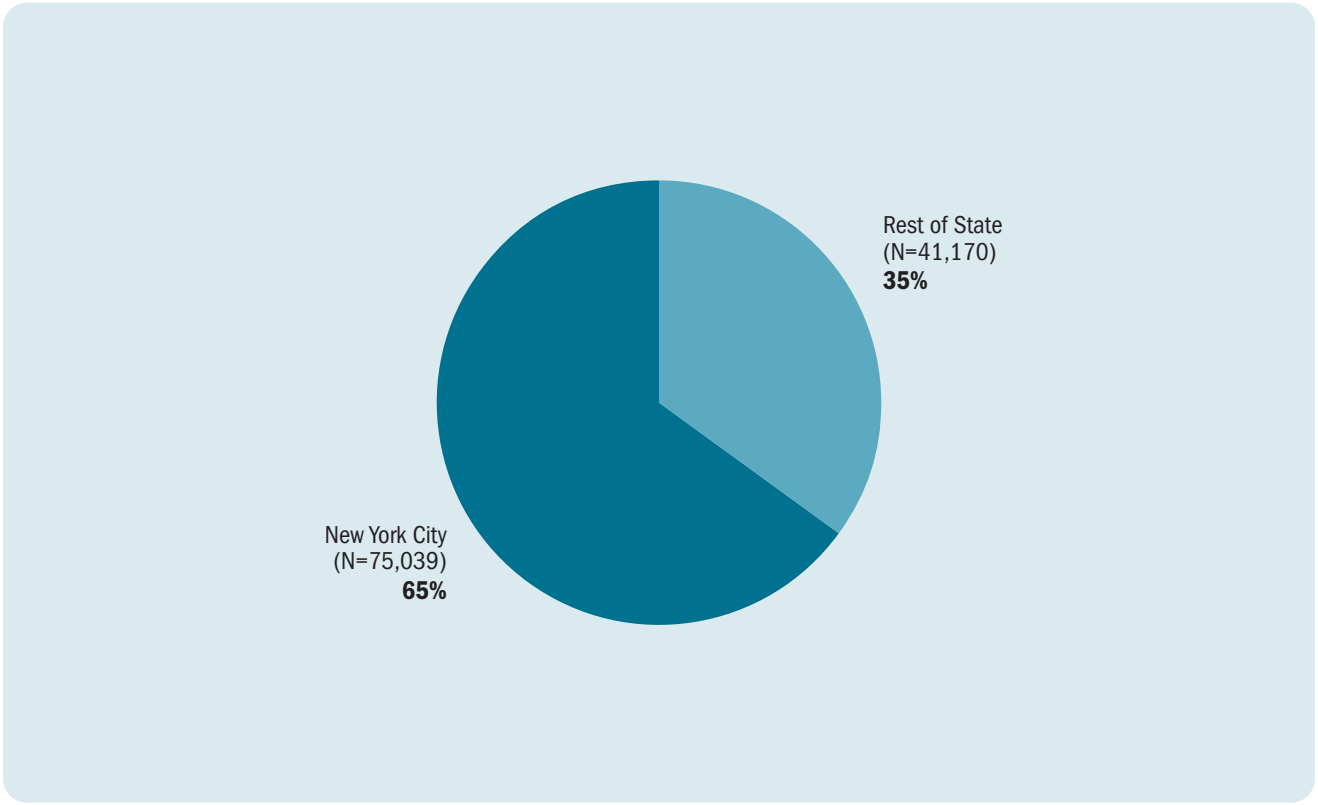
Figure 7-10
Asthma Hospital Discharge Rate per 10,000 Residents by Region and Year, New York State, 2002-2011



Region	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
New York City	34.4	38.5	34.9	30.9	31.1	30.0	31.0	32.2	29.8	28.7
Rest of State	11.5	13.1	12.3	12.4	12.3	11.4	12.0	13.4	11.6	11.7

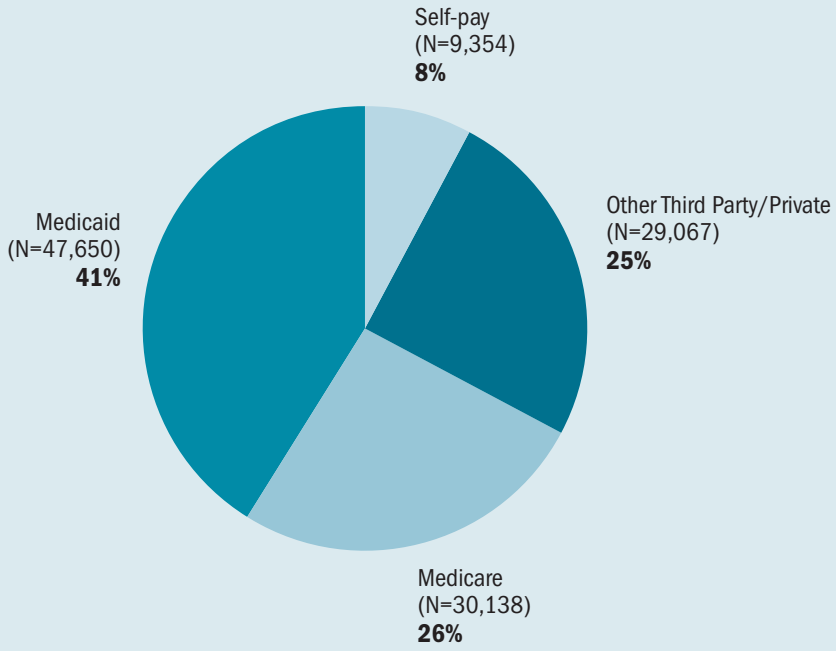
From 2002 to 2011, there was a 17% decline in asthma hospital discharge rates for New York City residents, while the rate remained relatively stable for those living in the Rest of State. New York City residents had consistently higher asthma hospital discharges when compared to residents in the Rest of State (Figure 7-10).

Figure 7-11
Asthma Hospital Discharges by Region, New York State, 2009-2011



For 2009-2011, New York City residents accounted for 65% of all asthma hospital discharges in New York State (Figure 7-11).

Figure 7-12
Asthma Hospital Discharges by Source of Payment, New York State, 2009-2011



For 2009-2011, Medicaid was the source of payment for 41% of the asthma hospital discharges in New York State. Medicare was the payment source for 26% of asthma hospital discharges, and Other third party or private insurance was the payment source for 25% of the asthma hospital discharges (Figure 7-12).

Table 7-2

Crude and Age-Adjusted* Asthma Hospital Discharge Rate per 10,000 Residents by Region and County, New York State, 2009-2011

Region/County	Discharges				Average Population 2009-2011	Crude Rate	Adjusted Rate
	2009	2010	2011	Total			
REGION 1: WESTERN NEW YORK							
Allegany	54	47	51	152	48,960	10.3	10.9
Cattaraugus	106	90	80	276	79,946	11.5	12.0
Chautauqua	135	122	101	358	134,259	8.9	8.8
Erie	1,402	1,127	1,003	3,532	915,438	12.9	13.2
Genesee	54	49	45	148	59,313	8.3	8.0
Niagara	287	198	188	673	215,679	10.4	10.2
Orleans	35	33	20	88	42,519	6.9	6.7
Wyoming	41	46	48	135	41,832	10.8	10.4
Region Total	*2,114*	*1,712*	*1,536*	*5,362*	*1,537,947*	*11.6*	*11.8*
REGION 2: FINGER LAKES							
Chemung	152	134	118	404	88,667	15.2	14.8
Livingston	59	45	41	145	64,445	7.5	8.0
Monroe	920	797	806	2,523	741,224	11.3	11.2
Ontario	83	55	52	190	107,369	5.9	5.6
Schuyler	19	21	15	55	18,475	9.9	9.4
Seneca	14	21	24	59	34,833	5.6	5.6
Steuben	116	93	72	281	98,192	9.5	9.4
Wayne	85	95	79	259	92,833	9.3	9.0
Yates	25	6	11	42	25,095	5.6	6.1
Region Total	*1,473*	*1,267*	*1,218*	*3,958*	*1,271,131*	*10.4*	*10.2*
REGION 3: CENTRAL NEW YORK							
Cayuga	87	94	82	263	79,763	11.0	10.3
Cortland	30	25	30	85	48,898	5.8	6.3
Herkimer	51	66	44	161	63,638	8.4	7.8
Jefferson	84	78	80	242	117,619	6.9	6.7
Lewis	17	23	19	59	26,772	7.3	6.7
Madison	69	63	66	198	72,254	9.1	9.5
Oneida	418	357	336	1,111	233,403	15.9	15.0
Onondaga	416	383	349	1,148	462,913	8.3	8.3
Oswego	113	96	75	284	121,905	7.8	8.1
St. Lawrence	143	111	138	392	111,116	11.8	12.1
Tompkins	59	36	40	135	101,689	4.4	5.9
Region Total	*1,487*	*1,332*	*1,259*	*4,078*	*1,439,971*	*9.4*	*9.5*

*Adjusted rates are age-adjusted to the 2000 United States population.

Table 7-2 *continued*

Crude and Age-Adjusted* Asthma Hospital Discharge Rate per 10,000 Residents by Region and County, New York State, 2009-2011

Region/County	ED Visits 2009	2010	2011	Total	Average Population 2009-2011	Crude Rate	Adjusted Rate
REGION 4: NEW YORK-PENNSYLVANIA							
Broome	227	186	226	639	198,087	10.8	10.9
Chenango	39	43	37	119	50,405	7.9	7.3
Tioga	17	12	12	41	50,744	2.7	2.7
Region Total	*283*	*241*	*275*	*799*	*299,236*	*8.9*	*8.9*
REGION 5: NORTHEASTERN NEW YORK							
Albany	449	405	346	1,200	302,018	13.2	13.7
Clinton	127	142	126	395	81,897	16.1	15.8
Columbia	57	49	47	153	62,421	8.2	8.5
Delaware	49	37	56	142	47,018	10.1	9.6
Essex	28	32	24	84	38,746	7.2	6.5
Franklin	86	66	64	216	51,141	14.1	13.9
Fulton	120	93	91	304	55,255	18.3	19.2
Greene	48	40	45	133	49,041	9.0	9.2
Hamilton	s	s	s	s	4,851	s	s
Montgomery	48	51	61	160	49,584	10.8	10.7
Otsego	77	55	60	192	61,926	10.3	10.6
Rensselaer	266	207	165	638	158,122	13.4	13.7
Saratoga	182	162	167	511	220,186	7.7	7.6
Schenectady	193	160	162	515	153,985	11.1	11.1
Schoharie	29	19	14	62	32,285	6.4	7.0
Warren	86	107	79	272	65,853	13.8	13.6
Washington	93	83	75	251	63,045	13.3	12.5
Region Total	*1,939*	*1,710*	*1,584*	*5,233*	*1,497,372*	*11.6*	*11.7*
REGION 6: HUDSON VALLEY							
Dutchess	400	294	328	1,022	296,350	11.5	11.9
Orange	556	467	570	1,593	377,072	14.1	14.0
Putnam	105	79	99	283	99,636	9.5	9.7
Rockland	423	346	446	1,215	309,006	13.1	12.6
Sullivan	126	60	78	264	76,758	11.5	12.1
Ulster	219	174	187	580	182,127	10.6	10.5
Westchester	1,441	1,311	1,354	4,106	953,658	14.4	13.9
Region Total	*3,270*	*2,731*	*3,062*	*9,063*	*2,294,607*	*13.2*	*12.9*

*Adjusted rates are age-adjusted to the 2000 United States population.

s: Data do not meet reporting criteria

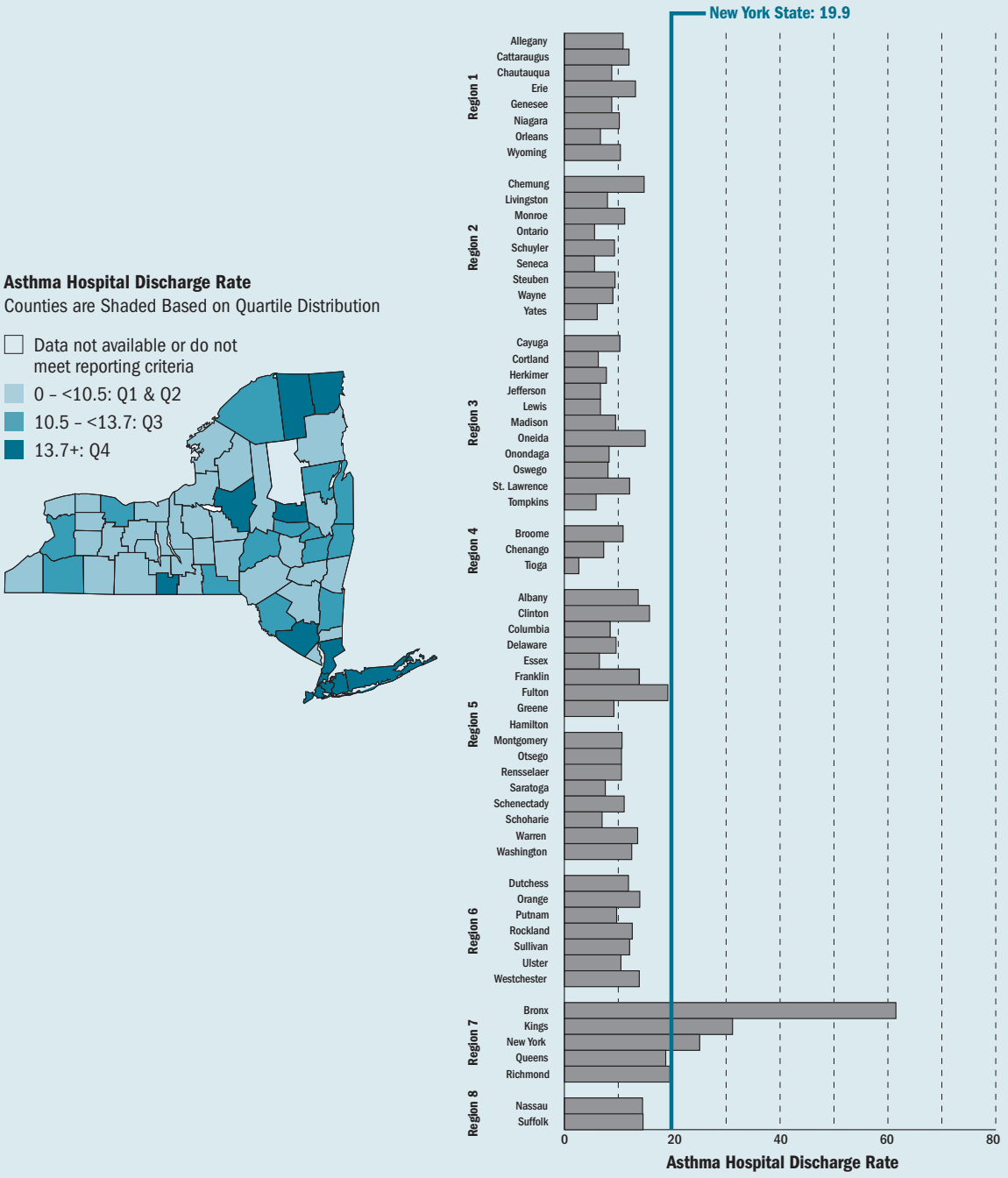
Table 7-2 *continued*

Crude and Age-Adjusted* Asthma Hospital Discharge Rate per 10,000 Residents by Region and County, New York State, 2009-2011

Region/County	ED Visits				Average Population 2009-2011	Crude Rate	Adjusted Rate
	2009	2010	2011	Total			
REGION 7: NEW YORK CITY							
Bronx	9,298	8,179	7,946	25,423	1,391,466	60.9	61.5
Kings	8,328	7,560	7,449	23,337	2,534,814	30.7	31.2
New York	4,020	3,596	3,401	11,017	1,605,625	22.9	25.1
Queens	4,382	4,097	3,907	12,386	2,261,761	18.3	18.8
Richmond	1,020	918	938	2,876	476,976	20.1	19.6
Region Total	*27,048*	*24,350*	*23,641*	*75,039*	*8,270,641*	*30.2*	*31.0*
REGION 8: NASSAU-SUFFOLK							
Nassau	2,037	1,947	2,050	6,034	1,347,132	14.9	14.5
Suffolk	2,389	2,101	2,153	6,643	1,503,547	14.7	14.6
Region Total	*4,426*	*4,048*	*4,203*	*12,677*	*2,850,679*	*14.8*	*14.6*
New York State	*42,040*	*37,391*	*36,778*	*116,209*	*19,461,584*	*19.9*	*19.9*

*Adjusted rates are age-adjusted to the 2000 United States population.

Figure 7-13
Age-Adjusted* Asthma Hospital Discharge Rate per 10,000 Residents by County, New York State, 2009-2011



*Adjusted rates are age-adjusted to the 2000 United States population.

Table 7-2 presents the crude and age-adjusted county-specific asthma hospital discharge rates, and Figure 7-13 is a NYS map that shows the age-adjusted NYS county-specific asthma hospital discharge rates for 2009-2011. Similar data for specific age groups (e.g., 0-4 years, 5-11 years, 12-17 years, 0-17 years, 18-64 years, and 65+ years) are available at the NYSDOH Asthma Surveillance website (see: http://www.health.ny.gov/statistics/ny_asthma/).

Asthma hospital discharge rates varied by region and county of residence. For New York City, the Bronx had the highest age-adjusted asthma hospital discharge rate of 61.5 per 10,000 residents, followed by Kings County with an age-adjusted rate of 31.2 per 10,000 residents.

For counties in the Rest of State, age-adjusted rates ranged from highs of 19.2 per 10,000 residents in Fulton County and 15.8 per 10,000 residents in Clinton County to 2.7 per 10,000 residents in Tioga County.

Figure 7-14
Albany County: Asthma Hospital Discharge Rate per 10,000 Residents, 2002-2011

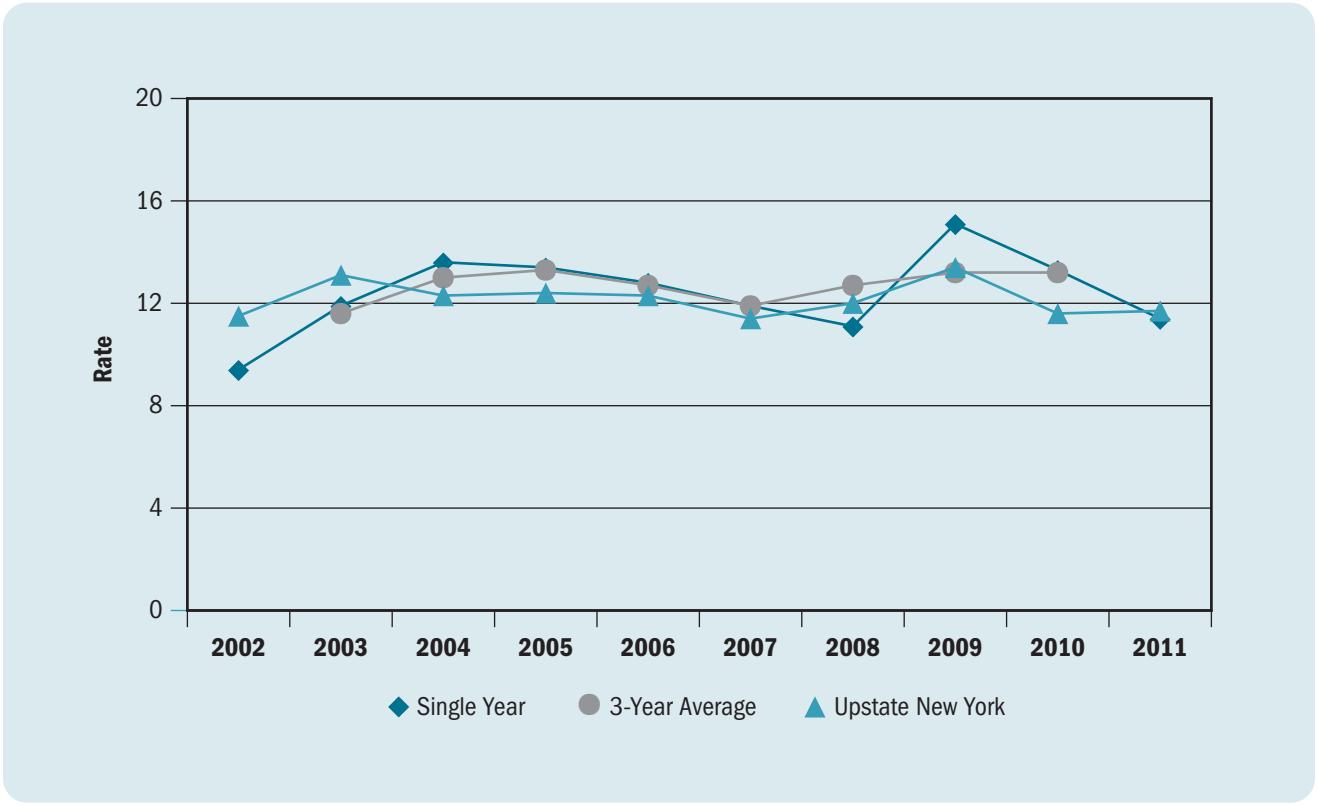


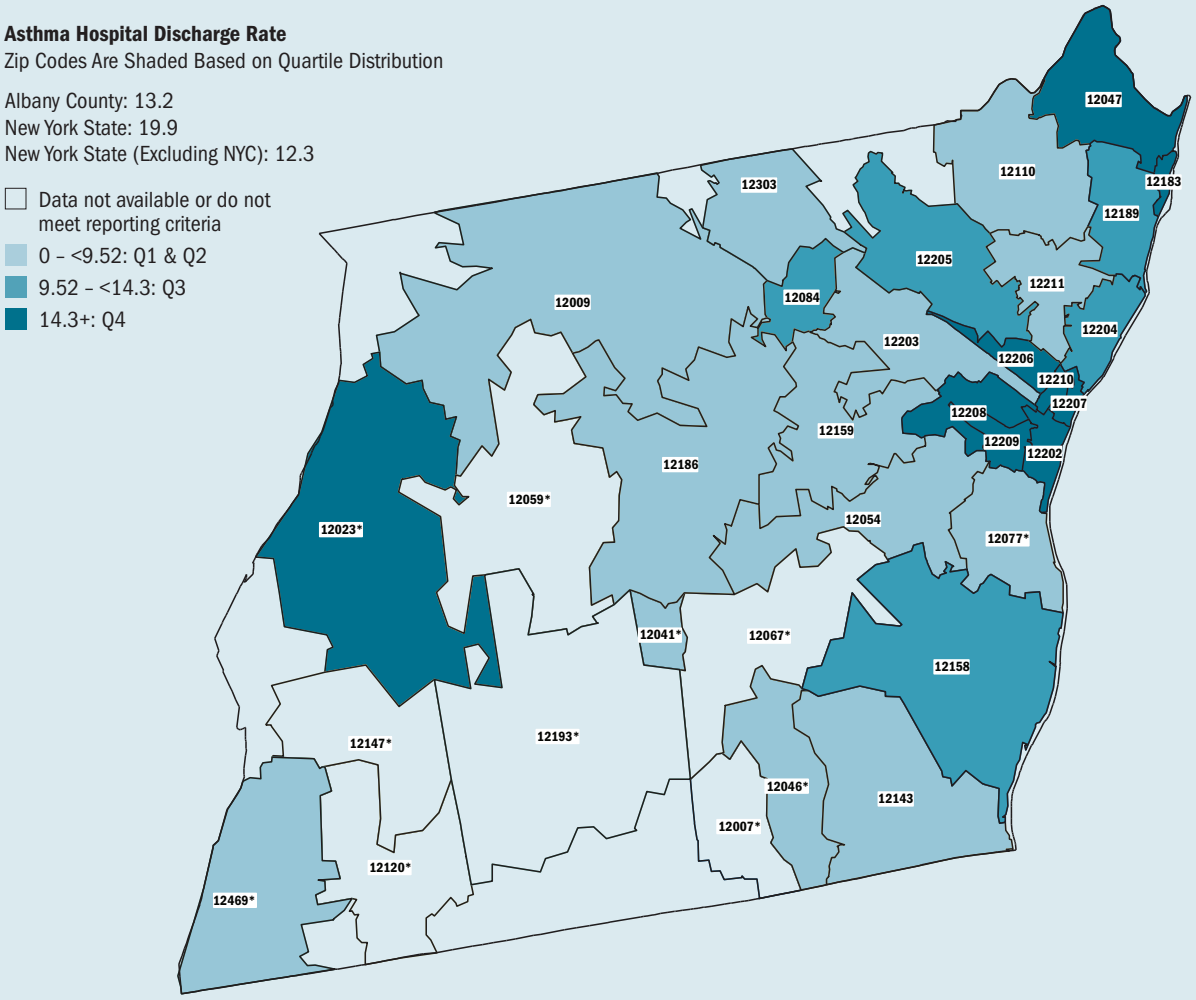
Table 7-3
Albany County: Asthma Hospital Discharge Rate per 10,000 Residents, 2002-2011

	Crude Rate			Age-Adjusted Rate		
Year	Single Year	3-Year Average	NYS Exc. NYC	Single Year	3-Year Average	NYS Exc. NYC
2002	9.4	–	11.5	9.7	–	11.6
2003	11.9	11.6	13.1	12.3	12.1	13.3
2004	13.6	13.0	12.3	14.1	13.5	12.3
2005	13.4	13.3	12.4	14.1	13.9	12.4
2006	12.8	12.7	12.3	13.4	13.3	12.4
2007	11.9	11.9	11.4	12.5	12.4	11.4
2008	11.1	12.7	12.0	11.5	13.3	12.0
2009	15.1	13.2	13.4	15.9	13.5	13.4
2010	13.3	13.2	11.6	13.3	13.7	11.5
2011	11.4	–	11.7	11.9	–	11.5

Figure 7-14 and Table 7-3 are examples of 10-year trend data for asthma hospital discharge rates for Albany County. Data for specific age groups (i.e., 0-4 years, 0-14 years, 0-17 years, 15-24 years, 25-44 years, 45-64 years, 18-64 years, and 65+ years) for Albany County, as well as for every other county in NYS, are available at the NYSDOH Asthma Surveillance website (see: http://www.health.ny.gov/statistics/ny_asthma/).

Figure 7-15

Albany County: Total Asthma Hospital Discharge Rate per 10,000 Residents by ZIP Code, 2009-2011



*Less than or equal to 10 hospital discharges, therefore rate may not be stable (Relative Standard Error >30%).

**Data is suppressed for confidentiality purposes if there are less than 6 hospital discharges per ZIP code.

A non-shaded area indicates that the ZIP code predominantly lies in an adjacent county.

Table 7-4

Albany County: Total Asthma Hospital Discharge Rate per 10,000 Residents by ZIP Code, Three-Year Average 2009–2011

ZIP Code	Discharges 2009–2011	Discharge Rate	ZIP Code	Discharges 2009–2011	Discharge Rate
12007	s	s	12183	12	16.0
12009	17	7.5	12186	11	5.6
12023	11	17.6	12189	62	12.0
12041	s	s	12193	s	s
12046	s	s	12202	145	51.5
12047	82	15.4	12203	67	6.6
12054	34	6.8	12204	20	10.1
12059	s	s	12205	86	10.8
12067	s	s	12206	204	43.1
12077*	8	4.3	12207	34	54.7
12084	16	10.8	12208	92	14.5
12110	48	8.1	12209	79	26.1
12120	s	s	12210	69	25.0
12143	13	7.2	12211	26	6.3
12147	s	s	12303	79	9.3
12158	21	10.8	12469	s	s
12159	15	7.0			

s: Data is suppressed for confidentiality purposes if there are less than 6 discharges per ZIP code.

*Less than or equal to 10 discharges, therefore rate may not be stable (RSE>30%).

Figure 7-15 and Table 7-4 are examples of three-year combined data for asthma hospital discharge rates for Albany County ZIP codes. Data for specific age groups (i.e., 0-4 years, 0-14 years, 0-17 years, 18-64 years, and 65+ years) for Albany County, as well as for every other county in NYS, are available at the NYSDOH Asthma Surveillance website: (see: http://www.health.ny.gov/statistics/ny_asthma/).

At-risk Based Rates for Asthma Hospital Discharges

Methodology

At-risk based rates (ARR) for asthma hospital discharges are the **number of asthma-related hospital discharges for individuals with current asthma rather than for the general population.** Rates for a specific period of time were calculated by dividing the number of asthma hospital discharges by the estimated number of people with current asthma for that time period and then multiplying by 100.[17-20]

The number of asthma hospital discharges in NYS was generated from the inpatient database within the Statewide Planning and Research Cooperative System (SPARCS). (See the Methodology section on page 89 for a full description of the criteria for selection of asthma hospital discharges.) The number of asthma hospital discharges was the numerator for the ARR.

The Behavioral Risk Factor Surveillance System (BRFSS) data were used to estimate the number of children (0-17 years) and adults (18+ years) with current asthma. (See the Methodology section on page 35 for a full description of how current asthma was defined and how current asthma prevalence was calculated). The number of people with current asthma was estimated using the weighted current asthma prevalence. The estimates were used as the denominator for the ARR.

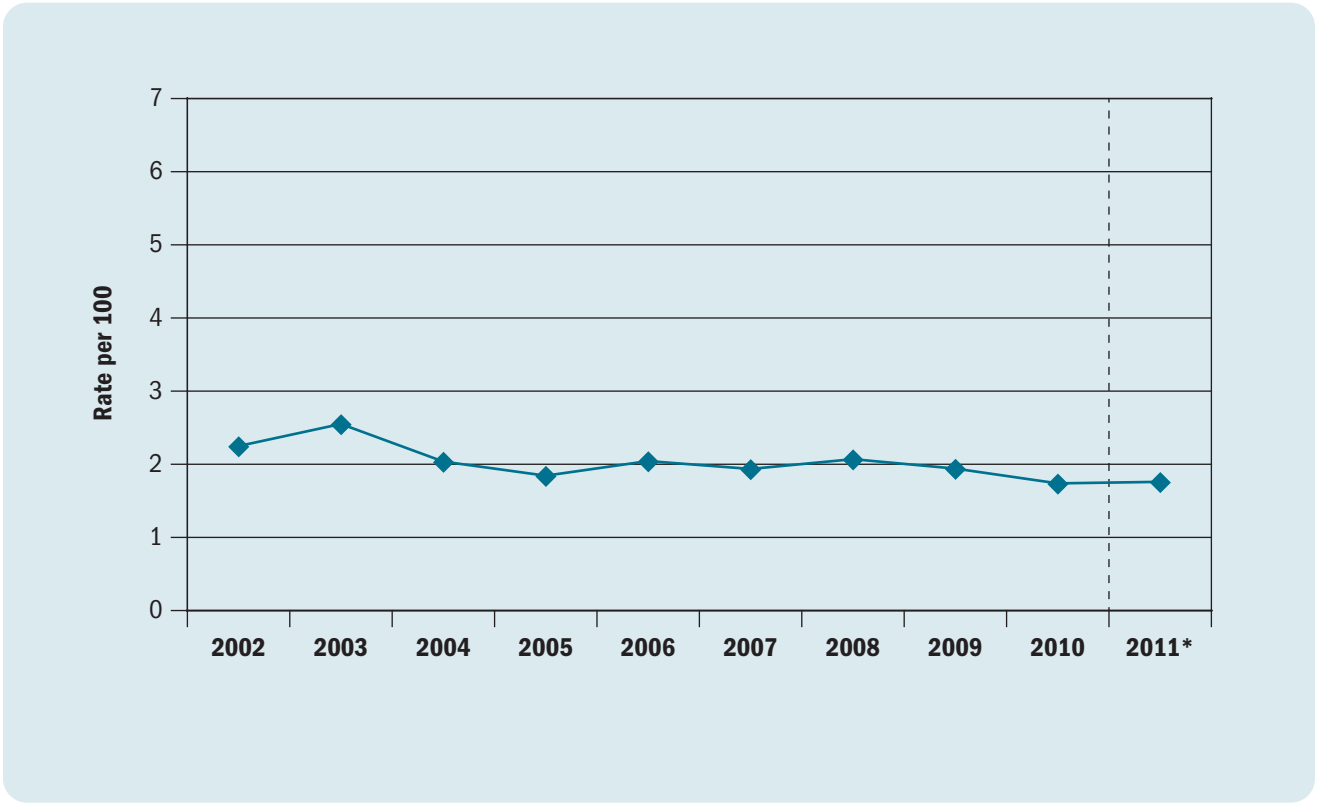
Beginning in 2011, BRFSS data included data from interviews completed by people living in cell phone only households in addition to interviews completed by people living in households with landlines. The data also reflect changes in CDC's weighting methodology. Weighting ensures that the data collected are as representative of New York's population as possible. The new method of weighting ensures that the weighted results will be consistent with known distributions for more socio-demographic variables. While these two changes improve the accuracy of the BRFSS, they can result in prevalence estimates that are significantly different from those calculated previously. **Because of the differences in data collection and the weighting methodology, it is not appropriate to make comparisons of 2011 data to prior years**

ARR for asthma hospital discharges for adults with current asthma are presented by age group, gender, race and ethnicity, and geographic region (New York City and Rest of State) for individual years from 2002 through 2011.

ARR for asthma hospital discharges among children with asthma are also presented by age group, gender, race and ethnicity, and geographic region. However, for children, the rates were computed for combined years due to the small sample size of children in the BRFSS. The BRFSS data for children are only available for years 2006 through 2011, while SPARCS hospital discharge data are available beginning in 1995. In addition, 2011 BRFSS data cannot be combined with previous years of data due to a change in data collection methods and weighting that occurred for the BRFSS Core survey in 2011 (e.g., incorporation of households with cell phones and use of iterative proportional weights). Therefore, the ARR for children was calculated only for combined years 2006-2010. The ARR for asthma hospital discharges for children was calculated by dividing the average annual number of asthma hospital discharges for 2006-2010 by the average estimated number of children with current asthma in the same time period.

The 95% confidence intervals (CIs) for these estimates are provided for both children and adults. Estimates are considered statistically "significantly different" from each other when they do not have overlapping CIs.

Figure 7-16
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma, New York State, 2002-2011

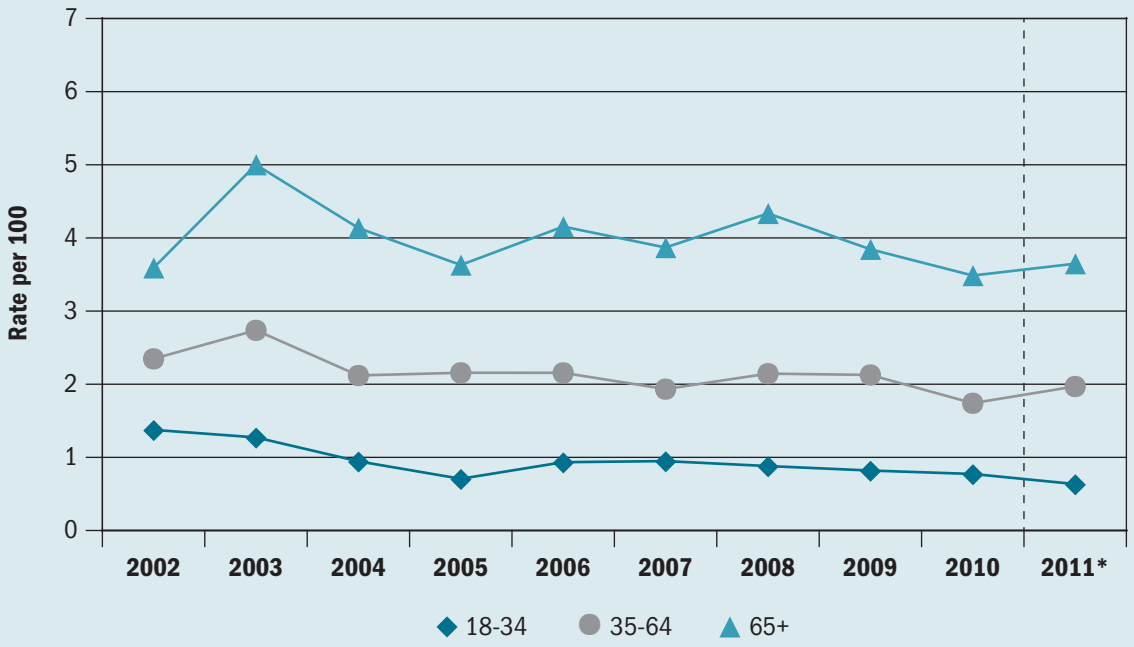


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
New York State	2.25 (2.22-2.28)	2.6 (2.52-2.58)	2.04 (2.01-2.06)	1.84 (1.82-1.87)	2.04 (2.02-2.07)	1.94 (1.91-1.96)	2.07 (2.05-2.10)	1.94 (1.92-1.96)	1.74 (1.72-1.76)	1.76 (1.74-1.78)

From 2002 to 2011, the annual ARR for asthma hospital discharges in NYS decreased from 2.25 asthma hospital discharges per 100 adults with current asthma in 2002 to 1.76 per 100 in 2011 (Figure 7-16).

Figure 7-17
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Age Group and Year, New York State, 2002-2011



*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Age Group	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
18-34 Years	1.4 (1.33-1.42)	1.3 (1.24-1.31)	0.95 (0.92-0.98)	0.7 (0.68-0.73)	0.93 (0.90-0.96)	0.95 (0.92-0.98)	0.9 (0.85-0.91)	0.8 (0.79-0.85)	0.77 (0.75-0.80)	0.63 (0.61-0.66)
35-64 Years	2.35 (2.31-2.39)	2.74 (2.70-2.78)	2.1 (2.09-2.15)	2.16 (2.12-2.19)	2.16 (2.12-2.19)	1.93 (1.90-1.97)	2.15 (2.11-2.18)	2.1 (2.09-2.16)	1.74 (1.71-1.77)	1.97 (1.94-2.00)
65+ Years	3.6 (3.50-3.68)	5.0 (4.88-5.12)	4.1 (4.04-4.23)	3.6 (3.55-3.71)	4.2 (4.06-4.25)	3.9 (3.78-3.96)	4.3 (4.24-4.43)	3.8 (3.76-3.93)	3.5 (3.41-3.56)	3.6 (3.57-3.73)

From 2002 to 2011, the 65 year and older age group consistently had the highest ARR for asthma hospital discharges compared to other adult age groups (Figure 7-17).

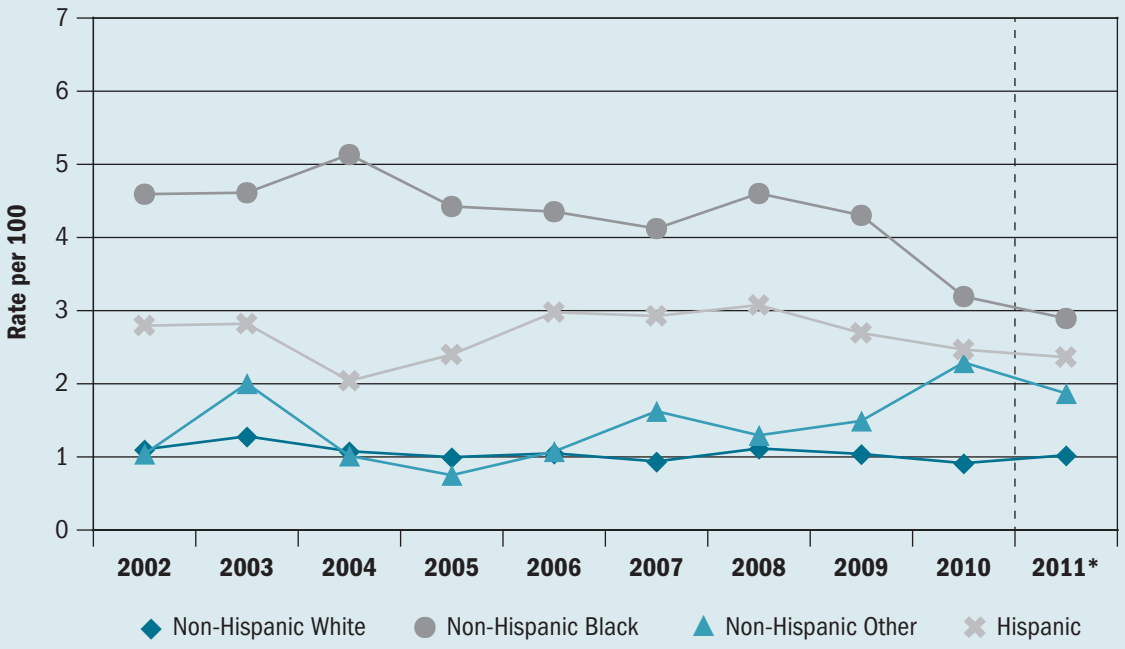
Figure 7-18
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Gender and Year, New York State, 2002-2011

*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Gender	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
Male	2.1 (2.05-2.15)	2.1 (2.03-2.12)	1.6 (1.52-1.59)	1.4 (1.38-1.44)	1.65 (1.62-1.69)	1.7 (1.64-1.71)	1.8 (1.75-1.83)	1.66 (1.62-1.69)	1.4 (1.37-1.44)	1.51 (1.48-1.55)
Female	2.3 (2.28-2.35)	2.8 (2.78-2.86)	2.34 (2.31-2.37)	2.1 (2.08-2.15)	2.27 (2.23-2.30)	2.1 (2.04-2.11)	2.2 (2.18-2.24)	2.1 (2.06-2.12)	1.93 (1.90-1.96)	1.90 (1.86-1.92)

From 2002 to 2011, among adults with current asthma in NYS, women consistently had higher ARR for asthma hospital discharges compared to men. A decreasing trend occurred for both men and women from 2003 to 2011 (Figure 7-18).

Figure 7-19
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Race/Ethnicity and Year, New York State, 2002-2011

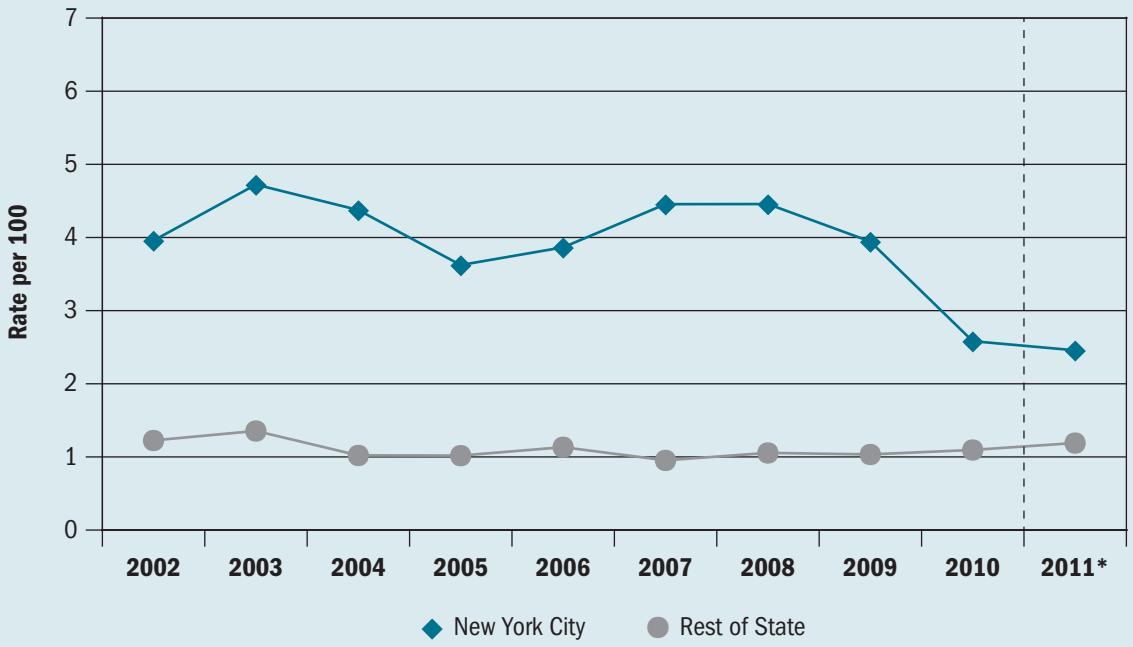


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Race/Ethnicity	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
Non-Hispanic White	1.1 (1.08-1.13)	1.3 (1.25-1.31)	1.08 (1.05-1.10)	1.0 (0.97-1.02)	1.05 (1.03-1.07)	0.94 (0.92-0.96)	1.1 (1.09-1.14)	1.04 (1.02-1.06)	0.9 (0.89-0.93)	1.02 (1.00-1.04)
Non-Hispanic Black	4.6 (4.48-4.70)	4.6 (4.51-4.72)	5.1 (5.01-5.25)	4.4 (4.32-4.53)	4.4 (4.25-4.45)	4.1 (4.02-4.22)	4.6 (4.50-4.70)	4.3 (4.21-4.40)	3.2 (3.12-3.26)	2.9 (2.83-2.96)
Non-Hispanic Other	1.0 (0.98-1.10)	2.0 (1.89-2.12)	1.0 (0.95-1.07)	0.75 (0.70-0.79)	1.1 (1.01-1.14)	1.6 (1.54-1.71)	1.3 (1.23-1.36)	1.5 (1.42-1.56)	2.3 (2.18-2.40)	1.9 (1.79-1.94)
Hispanic	2.8 (2.71-2.87)	2.8 (2.74-2.89)	2.0 (1.98-2.09)	2.4 (2.33-2.46)	3.0 (2.90-3.06)	2.9 (2.85-3.00)	3.1 (3.00-3.15)	2.7 (2.63-2.76)	2.5 (2.40-2.53)	2.4 (2.30-2.42)

From 2002 to 2011, the ARR for asthma hospital discharges among adults with current asthma varied by race and ethnicity. Non-Hispanic blacks consistently had the highest ARR for asthma hospital discharges compared to other racial and ethnic groups in NYS. This rate decreased from 4.6 per 100 in 2002 to 2.9 per 100 in 2011, with a more drastic decline beginning in 2008, which was predominantly due to a slight decrease in the number of asthma hospital discharges among non-Hispanic blacks as well as a substantial increase in the number of non-Hispanic black adults with self-reported current asthma (Figure 7-19).

Figure 7-20
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Region and Year, New York State, 2002-2011

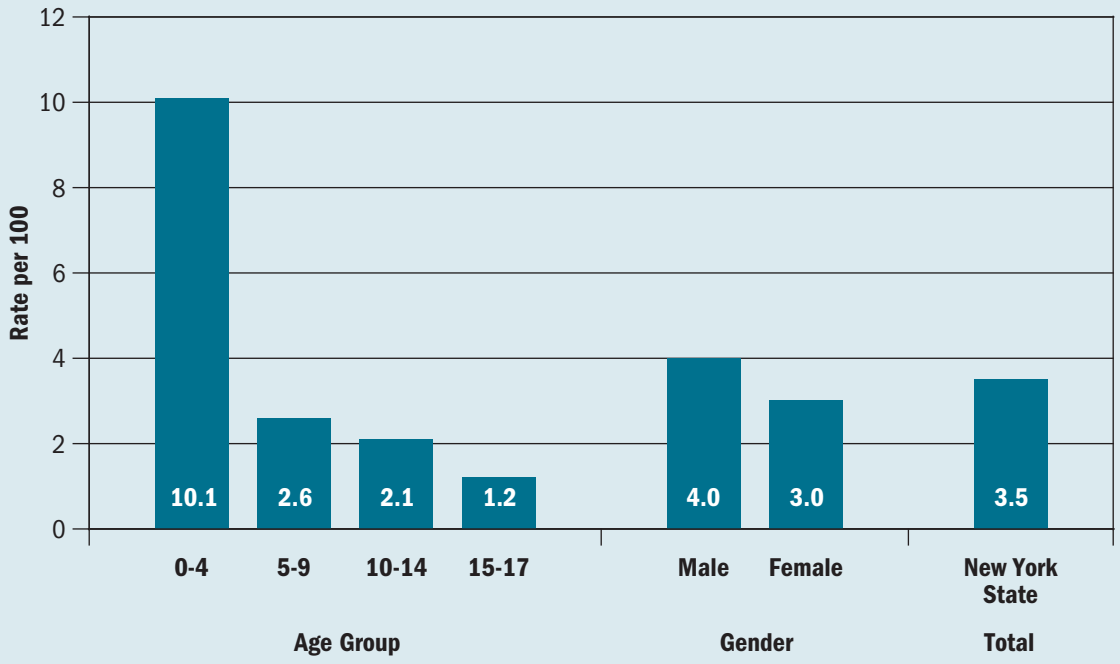


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Region	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
New York City	4.0 (3.90-4.02)	4.7 (4.66-4.79)	4.4 (4.31-4.44)	3.6 (3.57-3.68)	3.9 (3.81-3.93)	4.5 (4.39-4.53)	4.5 (4.39-4.53)	3.9 (3.89-4.00)	2.6 (2.54-2.62)	2.46 (2.42-2.50)
Rest of State	1.23 (1.20-1.25)	1.36 (1.33-1.38)	1.02 (1.00-1.04)	1.02 (1.00-1.04)	1.14 (1.11-1.16)	0.96 (0.94-0.98)	1.06 (1.04-1.08)	1.04 (1.02-1.06)	1.10 (1.07-1.12)	1.20 (1.17-1.22)

From 2002 to 2011, the ARR for asthma hospital discharges among adults with current asthma was consistently higher for residents in New York City compared to those in the Rest of State. The ARR for New York City residents decreased 39% from 4.0 in 2002 to 2.5 in 2011, with a more drastic decline beginning in 2008 which was due to a slight decrease in the number of asthma hospital discharges among New York City residents as well as a substantial increase in the number of adults living in New York City who had self-reported current asthma. The ARR from 2002 to 2011 for the Rest of State remained fairly constant (Table 7-20).

Figure 7-21
Asthma Hospital Discharge Rate per 100 Children (0-17 Years) with Current Asthma by Age Group and Gender, New York State, 2006-2011



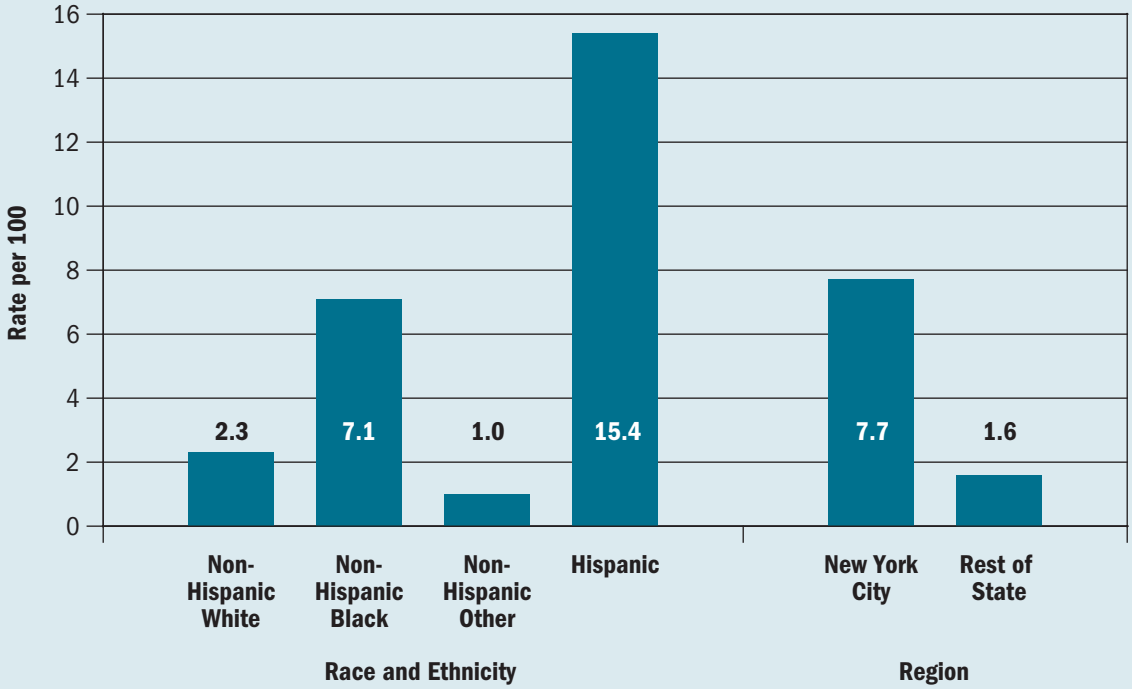
		Rate per 100 with Current Asthma	95% CI
Age Group	0-4	10.1	9.90–10.34
	5-9	2.6	2.48–2.64
	10-14	2.1	2.05–2.22
	15-17	1.2	1.11–1.26
Gender	Male	4.0	3.93–4.09
	Female	3.0	2.95–3.11
Total	*New York State*	*3.5*	*3.48–3.59*

For the 2006-2011, there were 3.5 asthma hospital discharges each year per 100 children with current asthma in New York State. This rate is nearly double the ARR seen for adults (Figure 7-16 and Figure 7-21).

Among New York State children with current asthma, the 0-4 year age group had the highest 2006-2011 ARR for asthma hospital discharges (10.1 per 100) compared to all other child age groups.

For 2006-2011, the ARR for asthma hospital discharges was higher for boys (4.0 per 100) compared to girls (3.0 per 100) (Figure 7-21), while the adult ARRs were higher for women than men (Figure 7-18).

Figure 7-22
Asthma Hospital Discharge Rate per 100 Children (0-17 Years) with Current Asthma by Race/Ethnicity and Region, New York State, 2006-2011



		Rate per 100 with Current Asthma	95% CI
Race/Ethnicity	Non-Hispanic White	2.3	2.19–2.35
	Non-Hispanic Black	7.1	6.95–7.34
	Non-Hispanic Other	1.0	0.93–1.05
	Hispanic	15.4	14.87–15.86
Region	New York City	7.7	7.56–7.86
	Rest of State	1.6	1.57–1.66

For children with current asthma in 2006-2011, Hispanic children had the highest ARR for asthma hospital discharges at 15.4 per 100, followed by non-Hispanic black children at 7.1 per 100. Non-Hispanic white children had the lowest ARR at 2.3 per 100.

The 2006-2011 ARR for asthma hospital discharges was almost five times higher for children with asthma living in New York City (7.7 per 100) compared to those living in the Rest of State (1.6 per 100) (Figure 7-22).

8

Asthma Deaths

Highlights: Asthma Deaths

- An annual average of 258 deaths was due to asthma in New York for 2009-2011, for a rate of 13.3 deaths per one million residents.
- In the past 10 years, the New York State asthma death rate decreased 24% from 17.2 per one million residents in 2002 to 13.1 per one million residents in 2011. Similar decreases were seen for residents of the Rest of State and New York City.
- Asthma deaths increased with age. New York State children aged 0-14 years had a 2009-2011 asthma death rate of 3.5 per one million residents, while New Yorkers 65 years of age and older had a death rate of 36.9 per one million residents.
- New York State women had a slightly lower 2009-2011 age-adjusted asthma death rate of 12.1 per one million residents compared to men at 12.3 per one million residents.
- For 2009-2011, non-Hispanic black (31.7 per one million) and Hispanic (22.1 per one million) New York State residents had much higher age-adjusted death rates compared to non-Hispanic white residents (6.7 per one million).
- New York City's age-adjusted asthma death rate (19.8 per one million) for 2009-2011 was more than double the rate for the Rest of State (7.2 per one million). Within New York City, Bronx County had the highest age-adjusted asthma death rate (43.5 per one million).

Asthma Death Rates for Adults with Current Asthma (At-Risk Based Rates), 2002-2011

- From 2002 to 2011, the annual at-risk based rate for asthma deaths in New York State decreased from 27.2 deaths per 100,000 adults with current asthma in 2002 to 16.7 per 100,000 in 2011. Similar decreases were seen for residents of the Rest of State and New York City.
- Asthma deaths among those with current asthma increased with age. From 2002 to 2011, the 65 year and older age group consistently had the highest at-risk based rate (42.1 per 100,000 in 2011) for asthma deaths compared to other adult age groups in New York State.
- From 2002 to 2011, the at-risk based rate (ARR) for asthma deaths decreased for both women and men. Women had the highest ARR for the asthma death rate during 2004 to 2006. However, in more recent years from 2007 through 2011, men had higher rates than women.
- From 2002 to 2011, among adults with current asthma, non-Hispanic blacks (37.3 per 100,000 in 2011) and Hispanics (18.8 per 100,000 in 2011) consistently had higher at-risk based rates for asthma deaths compared to non-Hispanic whites (10.7 per 100,000 in 2011).
- Among adults with current asthma, the 2011 at-risk based rate for asthma deaths was approximately two times higher for residents in New York City (24.5 per 100,000 in 2011) compared to those in the Rest of State (10.3 per 100,000 in 2011).

Methodology

The source of the asthma death data is the NYSDOH Bureau of Biometrics and Health Statistics death files. Until 1998, asthma deaths were defined as having a primary cause of death with an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code of 493. Since 1999, asthma deaths were defined as having a primary cause of death with ICD-10-CM of J45 to J46. Population estimates used for computing the asthma death rates were obtained from the U.S. Census Bureau.

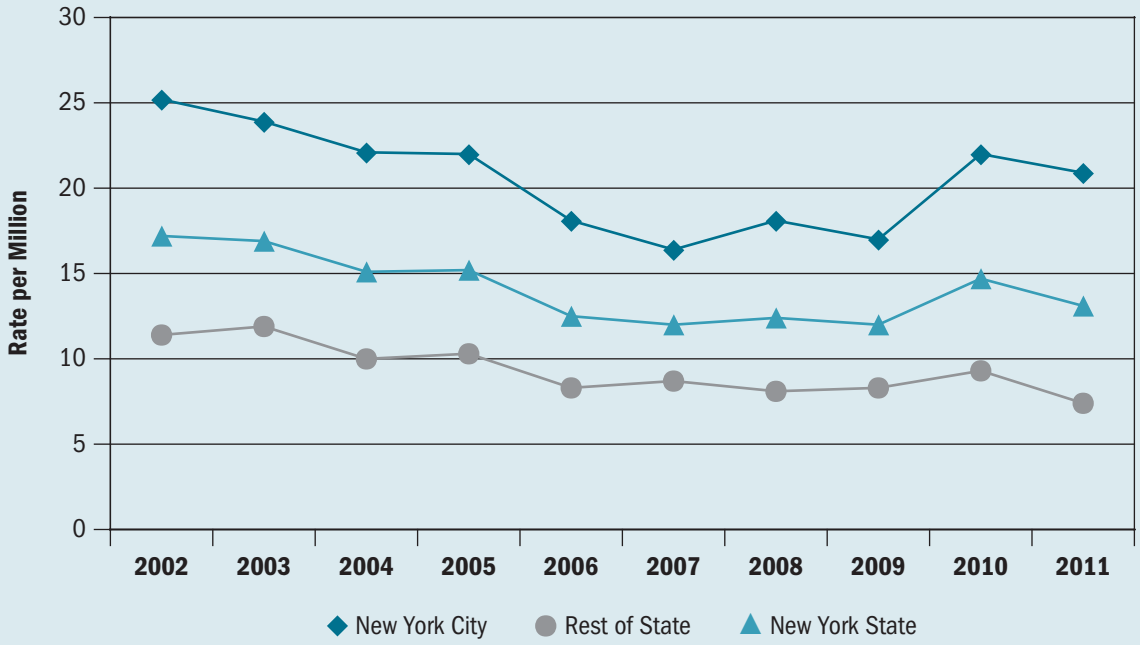
Crude and age-adjusted asthma death rates (see Appendix 1) were calculated per one million residents. The age-adjusted asthma death rates were calculated using the 2000 U.S. Standard Population (see Appendix 2).

Ten-year trend data for asthma deaths (from 2002 to 2011) are presented for the state total and geographic region (New York City and Rest of State). Asthma death rates for a specific year were calculated by dividing the number of asthma deaths by the population of that year and then multiplying by one million.

Combined years (2009-2011) of data for asthma deaths are presented by age group, gender, race and ethnicity and geographic region (New York City and Rest of State). For the period 2009-2011, the three-year average annual asthma death rates per one million residents were calculated as follows: the total number of asthma deaths for the three-year period was divided by three to get the average number of asthma deaths per year. The average number of asthma deaths was then divided by the middle year population (2010) and multiplied by one million.

Asthma death data for 2009-2011 are presented as tables, maps and graphs at the state and county level. An example of asthma death data at the county level is also presented.

Figure 8-1
Asthma Death Rate per One Million Residents by Region, New York State, 2002-2011



Region	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
New York City	25.2	23.9	22.1	22.0	18.1	16.4	18.1	17.0	22.0	20.9
Rest of State	11.4	11.9	10.0	10.3	8.3	8.7	8.1	8.3	9.3	7.4
New York State	17.2	16.9	15.1	15.2	12.5	12.0	12.4	12.0	14.7	13.1

In the past 10 years, the NYS asthma death rate decreased 24% from 17.2 per one million in 2002 to 13.1 per one million in 2011. Similar decreases were seen for residents of the Rest of State and New York City (Figure 8-1).

Asthma Deaths by Socio-demographic Characteristics

Table 8-1
Asthma Death Rate per One Million by Age Group, New York State, 2009-2011

Age Group	Number	Rate per One Million
0–14	37	3.5
15–34	87	5.3
35–64	360	15.4
65+	290	36.9
Total	*774*	*13.3*

There was an annual average of 258 deaths due to asthma in New York for 2009-2011, for a rate of 13.3 per one million residents. Asthma death rates increased with age among NYS residents.

For 2009-2011, NYS children aged 0-14 years had an asthma death rate of 3.5 per one million residents, while New Yorkers 65 years of age and older had a death rate of 36.9 per one million residents (Table 8-1).

Table 8-2
Crude and Age-Adjusted* Asthma Death Rate per One Million Residents by Gender, Race/Ethnicity and Region, New York State, 2009-2011

		Crude	Age-Adjusted*
Gender	Male	12.4	12.3
	Female	14.2	12.1
Race/Ethnicity	Non-Hispanic White	8.6	6.7
	Non-Hispanic Black	31.1	31.7
	Hispanic	16.7	22.1
Region	New York City	20.2	19.8
	Rest of State	8.3	7.2
Total	*New York State*	*13.3*	*12.2*

*Adjusted rates are age adjusted to the 2000 United States population.

For 2009-2011, the crude asthma death rate for NYS was 13.3 per one million residents and the age-adjusted death rate was 12.2 per one million.

NYS women had a slightly lower age-adjusted asthma death rate for 2009-2011(12.1 per one million residents) compared to men (12.3 per one million).

Non-Hispanic black New Yorkers had an age-adjusted death rate of 31.7 per one million, which was approximately five times the non-Hispanic white death rate (6.7 per one million).

Hispanic New Yorkers had an age-adjusted asthma death rate of 22.1 per one million, which was more than three times higher than non-Hispanic white residents.

New York City's age-adjusted asthma death rate (19.8 per one million) for 2009-2011 was almost three times the rate for the Rest of State (7.2 per one million) (Table 8-2).

Table 8-3

Crude and Age-Adjusted* Asthma Death Rate Per One Million Residents by Region and County, New York State, 2009-2011

Region/County	Deaths				Average Population 2009-2011	Crude Rate	Adjusted Rate
	2009	2010	2011	Total			
REGION 1: WESTERN NEW YORK							
Allegany	2	0	0	2	48,960	13.6**	10.8**
Cattaraugus	0	0	2	2	79,946	8.3**	6.9**
Chautauqua	2	1	3	6	134,259	14.9**	11.6**
Erie	7	10	8	25	915,438	9.1	7.8
Genesee	0	1	0	1	59,313	5.6**	4.5**
Niagara	3	7	3	13	215,679	20.1	15.7
Orleans	0	0	0	0	42,519	0.0**	0.0**
Wyoming	0	0	0	0	41,832	0.0**	0.0**
Region Total	*14*	*19*	*16*	*49*	*1,537,947*	*10.6*	*8.9*
REGION 2: FINGER LAKES							
Chemung	2	1	0	3	88,667	11.3**	9.6**
Livingston	1	0	1	2	64,445	10.3**	7.6**
Monroe	2	4	1	7	741,224	3.1**	2.8**
Ontario	0	0	0	0	107,369	0.0**	0.0**
Schuyler	0	0	0	0	18,475	0.0**	0.0**
Seneca	1	1	0	2	34,833	19.1**	14.5**
Steuben	0	0	0	0	98,192	0.0**	0.0**
Wayne	1	1	0	2	92,833	7.2**	5.3**
Yates	0	0	0	0	25,095	0.0**	0.0**
Region Total	*7*	*7*	*2*	*16*	*1,271,131*	*4.2*	*3.4*
REGION 3: CENTRAL NEW YORK							
Cayuga	0	2	0	2	79,763	8.4**	6.2**
Cortland	2	1	1	4	48,898	27.3**	27.5**
Herkimer	3	1	0	4	63,638	21.0**	15.1**
Jefferson	2	1	0	3	117,619	8.5**	9.6**
Lewis	0	0	0	0	26,772	0.0**	0.0**
Madison	0	0	0	0	72,254	0.0**	0.0**
Oneida	1	3	0	4	233,403	5.7**	3.5**
Onondaga	5	4	5	14	462,913	10.1	8.4
Oswego	0	0	1	1	121,905	2.7**	2.3**
St. Lawrence	0	0	0	0	111,116	0.0**	0.0**
Tompkins	0	0	1	1	101,689	3.3**	5.2**
Region Total	*13*	*12*	*8*	*33*	*1,439,971*	*7.6*	*6.6*

*Adjusted rates are age-adjusted to the 2000 United States population.

**Fewer than 10 events in the numerator, therefore the rate is unstable.

Table 8-3 *continued*

Crude and Age-Adjusted* Asthma Death Rate Per One Million Residents by Region and County, New York State, 2009-2011

Region/County	Deaths				Average Population 2009-2011	Crude Rate	Adjusted Rate
	2009	2010	2011	Total			
REGION 4: NEW YORK-PENNSYLVANIA							
Broome	2	6	2	10	198,087	16.8	13.8
Chenango	0	0	0	0	50,405	0.0**	0.0**
Tioga	0	0	1	1	50,744	6.6**	8.7**
Region Total	*2*	*6*	*3*	*11*	*299,236*	*12.3*	*10.8*
REGION 5: NORTHEASTERN NEW YORK							
Albany	1	6	3	10	302,018	11.0	10.2
Clinton	3	0	1	4	81,897	16.3**	16.0**
Columbia	0	2	0	2	62,421	10.7**	6.2**
Delaware	0	1	0	1	47,018	7.1**	6.2**
Essex	0	1	0	1	38,746	8.6**	7.1**
Franklin	0	0	0	0	51,141	0.0**	0.0**
Fulton	2	0	2	4	55,255	24.1**	23.4**
Greene	0	0	0	0	49,041	0.0**	0.0**
Hamilton	0	0	0	0	4,851	0.0**	0.0**
Montgomery	0	0	0	0	49,584	0.0**	0.0**
Otsego	0	0	1	1	61,926	5.4**	3.4**
Rensselaer	1	2	1	4	158,122	8.4**	6.5**
Saratoga	0	1	0	1	220,186	1.5**	1.0**
Schenectady	2	2	2	6	153,985	13.0**	11.2**
Schoharie	0	0	0	0	32,285	0.0**	0.0**
Warren	2	1	0	3	65,853	15.2**	13.0**
Washington	0	0	1	1	63,045	5.3**	4.2**
Region Total	*11*	*16*	*11*	*38*	*1,497,372*	*8.5*	*7.2*
REGION 6: HUDSON VALLEY							
Dutchess	3	2	3	8	296,350	9.0**	8.0**
Orange	4	4	4	12	377,072	10.6	10.3
Putnam	2	1	0	3	99,636	10.0**	8.3**
Rockland	6	3	4	13	309,006	14.0	12.3
Sullivan	0	0	1	1	76,758	4.3**	4.1**
Ulster	3	2	5	10	182,127	18.3	16.6
Westchester	11	10	5	26	953,658	9.1	8.4
Region Total	*29*	*22*	*22*	*73*	*2,294,607*	*10.6*	*9.5*

*Adjusted rates are age-adjusted to the 2000 United States population.

**Fewer than 10 events in the numerator, therefore the rate is unstable.

Table 8-3 *continued*

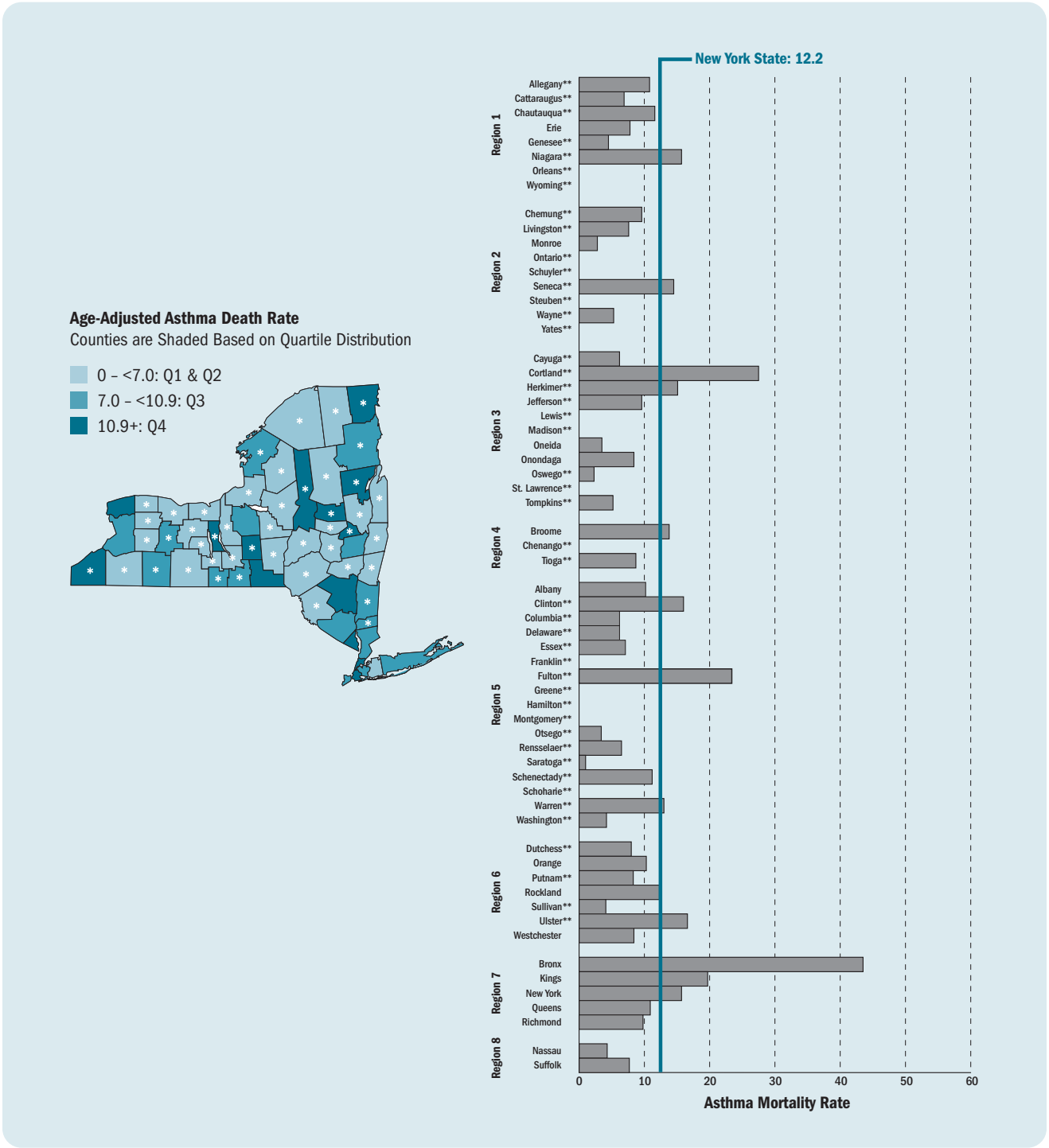
Crude and Age-Adjusted* Asthma Death Rate Per One Million Residents by Region and County, New York State, 2009-2011

Region/County	Deaths				Average Population 2009-2011	Crude Rate	Adjusted Rate
	2009	2010	2011	Total			
REGION 7: NEW YORK CITY							
Bronx	58	62	53	173	1,391,466	41.4	43.5
Kings	39	61	49	149	2,534,814	19.6	19.7
New York	24	22	33	79	1,605,625	16.4	15.7
Queens	13	33	32	78	2,261,761	11.5	10.9
Richmond	9	2	5	16	476,976	11.2	9.8
Region Total	*143*	*180*	*172*	*495*	*8,270,641*	*20.0*	*19.6*
REGION 8: NASSAU-SUFFOLK							
Nassau	6	5	11	22	1,347,132	5.4	4.3
Suffolk	10	17	10	37	1,503,547	8.2	7.7
Region Total	*16*	*22*	*21*	*59*	*2,850,679*	*6.9*	*6.0*
New York State	*235*	*284*	*255*	*774*	*19,461,584*	*13.3*	*12.2*

*Adjusted rates are age-adjusted to the 2000 United States population.

Figure 8-2

Age-Adjusted* Asthma Death Rate per One Million Residents, New York State, 2009-2011



Source: Vital Statistics

*Adjusted rates are age-adjusted to the 2000 United States population.

**Fewer than 10 events in the numerator, therefore the rate is unstable.

Table 8-3 presents the crude and age-adjusted county-specific death rate and Figure 8-2 presents the age-adjusted NYS county-specific asthma death rate for 2009-2011.

Asthma death rates varied by region and county of residence; however, some county death rates are potentially unstable because they are based on fewer than 10 asthma deaths. For example, Seneca County had an age-adjusted asthma death rate of 14.5 per one million, but this rate is based on approximately one asthma death per year. Therefore, these rates should be interpreted with caution.

The Finger Lakes region had the lowest crude (4.2 per one million) and age-adjusted (3.4 per one million) death rate. New York City had the highest crude (20.0 per one million) and age-adjusted (19.6 per one million) asthma death rate. Within New York City, Bronx County had the highest age-adjusted asthma death rate (43.5 per one million).

Figure 8-3
Albany County: Asthma Mortality Rate per One Million Residents, 2002-2011

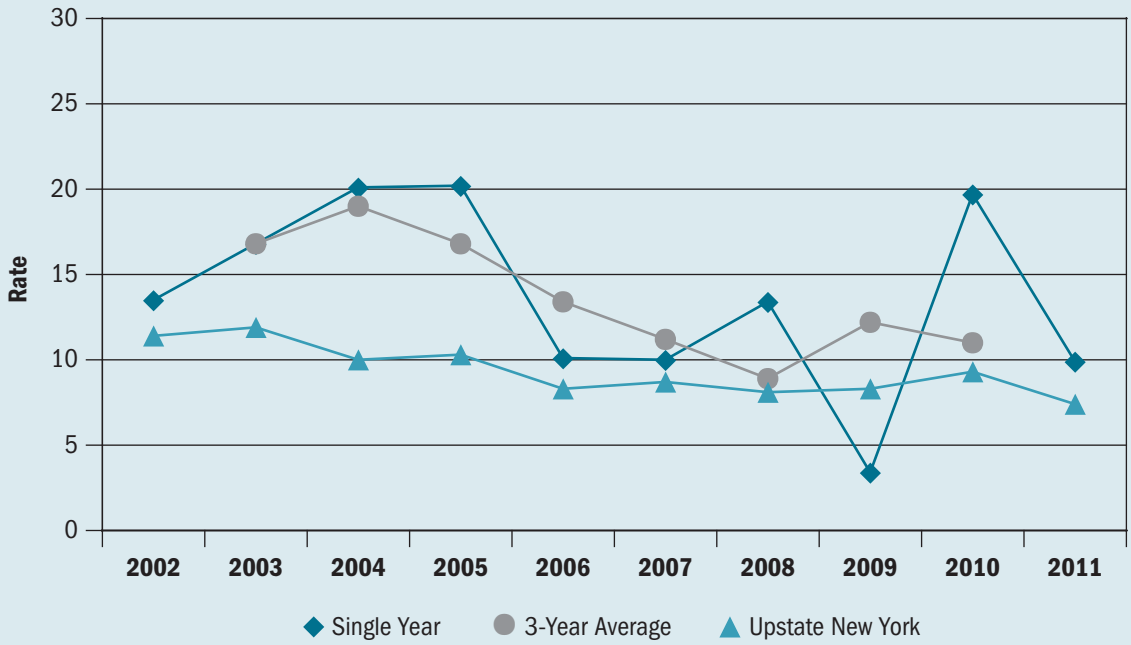


Table 8-4
Albany County: Asthma Mortality Rate per One Million Residents, 2002-2011

	Crude Rate			Age-Adjusted Rate		
Year	Single Year	3-Year Average	NYS Exc. NYC	Single Year	3-Year Average	NYS Exc. NYC
2002	13.5	–	11.4	12.0	–	10.7
2003	16.8	16.8	11.9	14.8	14.6	10.8
2004	20.1	19.0	10.0	17.3	16.6	9.1
2005	20.2	16.8	10.3	18.1	14.8	9.5
2006	10.1	13.4	8.3	8.8	12.2	7.3
2007	10.0	11.2	8.7	10.0	10.5	7.7
2008	13.4	8.9	8.1	12.6	9.0	7.1
2009	3.4	12.2	8.3	4.4	11.5	7.3
2010	19.7	11.0	9.3	17.6	10.2	7.9
2011	9.9	–	7.4	8.4	–	6.4

Figure 8-3 and Table 8-4 are examples of ten-year trend data for asthma death rates for Albany County. These data are available for every county in NYS at the NYSDOH Asthma Surveillance website (see: http://www.health.ny.gov/statistics/ny_asthma/).

At-risk Based Rates for Asthma Deaths

Methodology

At-risk based rates (ARR) for asthma deaths are the **number of asthma-related deaths among individuals with current asthma rather than for the general population**. Rates for a specific period of time were calculated by dividing the number of asthma deaths by the estimated number of people with current asthma for that time period and then multiplying by 100,000.[17-20]

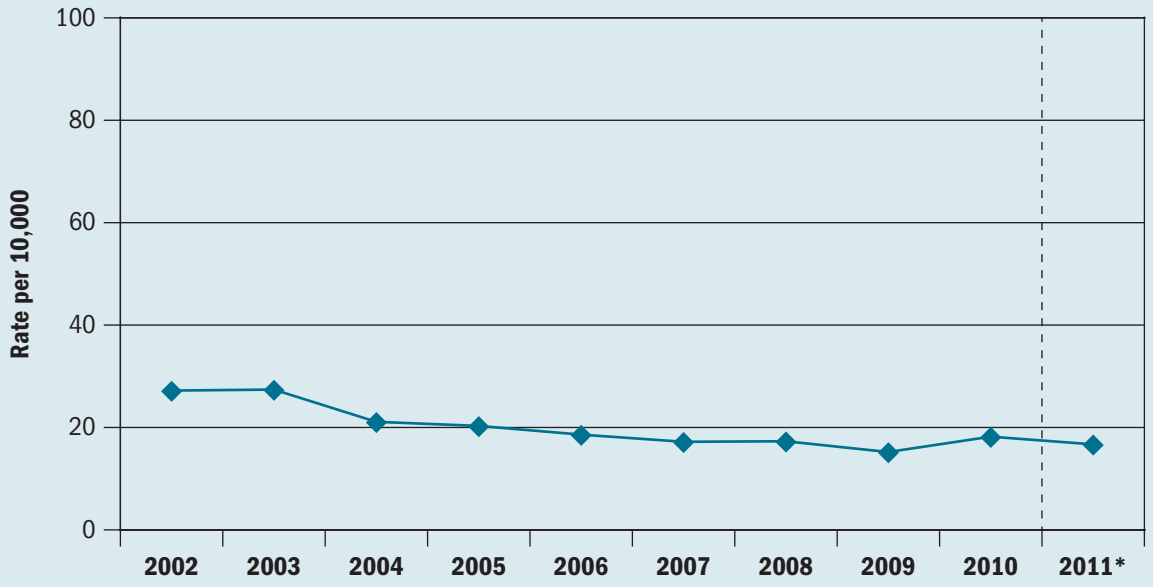
The number of asthma deaths in NYS was generated by the NYSDOH's Bureau of Biometrics and Health Statistics (BBHS) death files. (See the Methodology section on page 119 for a full description of the criteria for selection of asthma deaths.) The number of asthma deaths was the numerator for the ARR.

The Behavioral Risk Factor Surveillance System (BRFSS) data were used to estimate the number of adults (18+ years) with current asthma. (See the Methodology section on page 35 for a full description of how current asthma was defined and how current asthma prevalence was calculated). The number of people with current asthma was estimated using the weighted current asthma prevalence. The estimates were the denominator for the ARR.

Beginning in 2011, BRFSS data included data from interviews completed by people living in cell phone only households in addition to interviews completed by people living in households with landlines. The data also reflect changes in CDC's weighting methodology. Weighting ensures that the data collected are as representative of New York's population as possible. The new method of weighting ensures that the weighted results will be consistent with known distributions for more socio-demographic variables. While these two changes improve the accuracy of the BRFSS, they can result in prevalence estimates that are significantly different from those calculated previously. **Because of the differences in data collection and the weighting methodology, it is not appropriate to make comparisons of 2011 data to prior years.**

ARR for asthma deaths for adults with current asthma are presented by age group, gender, race and ethnicity, and geographic region (New York City and Rest of State) for individual years from 2002 to 2011. Child rates are not presented due to the small number of asthma deaths in this population. The 95% confidence intervals (CIs) for adult estimates are provided. Estimates are considered "significantly different" from each other when they do not have overlapping CIs.

Figure 8-4
Asthma Death Rate per 100,000 Adults (18+ Years) with Current Asthma, New York State, 2002-2011

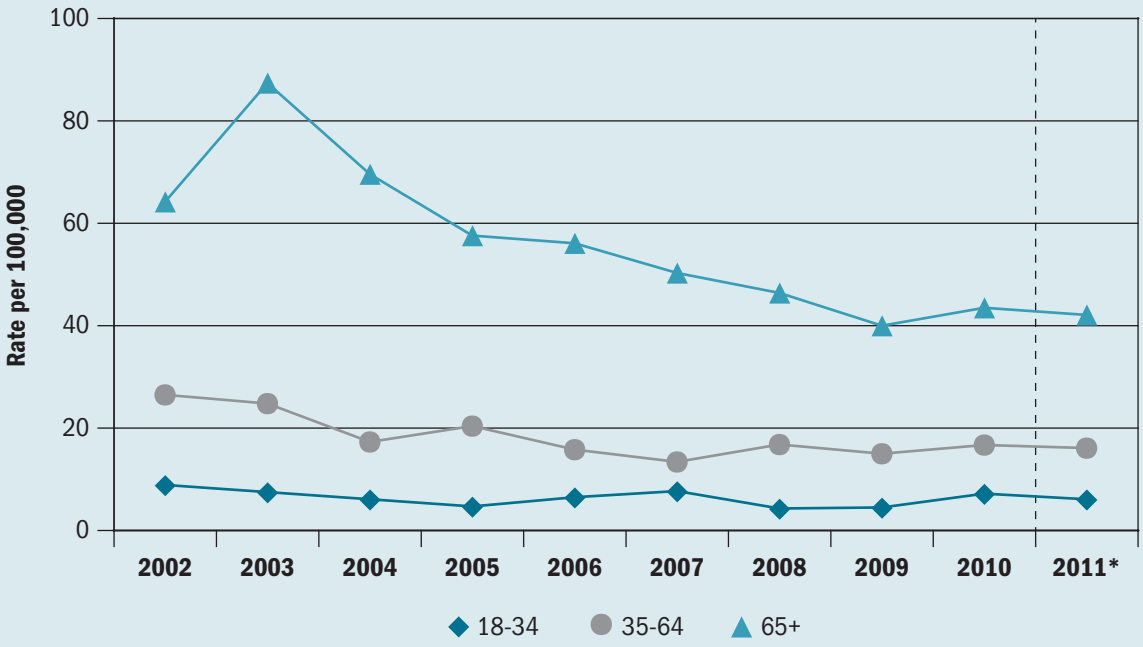


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
New York State	27.2 (24.20-30.29)	27.4 (24.31-30.47)	21.1 (18.62-23.63)	20.3 (17.92-22.70)	18.6 (16.22-21.02)	17.2 (14.98-19.51)	17.3 (15.05-19.58)	15.2 (13.21-17.23)	18.2 (16.04-20.39)	16.7 (14.57-18.78)

From 2002 to 2011, the annual ARR for asthma deaths in NYS decreased 39% from 27.2 deaths per 100,000 adults with current asthma in 2002 to 16.7 per 100,000 in 2011 (Figure 8-4).

Figure 8-5
Asthma Death Rate per 100,000 Adults (18+ Years) with Current Asthma by Age Group and Year, New York State, 2002-2011



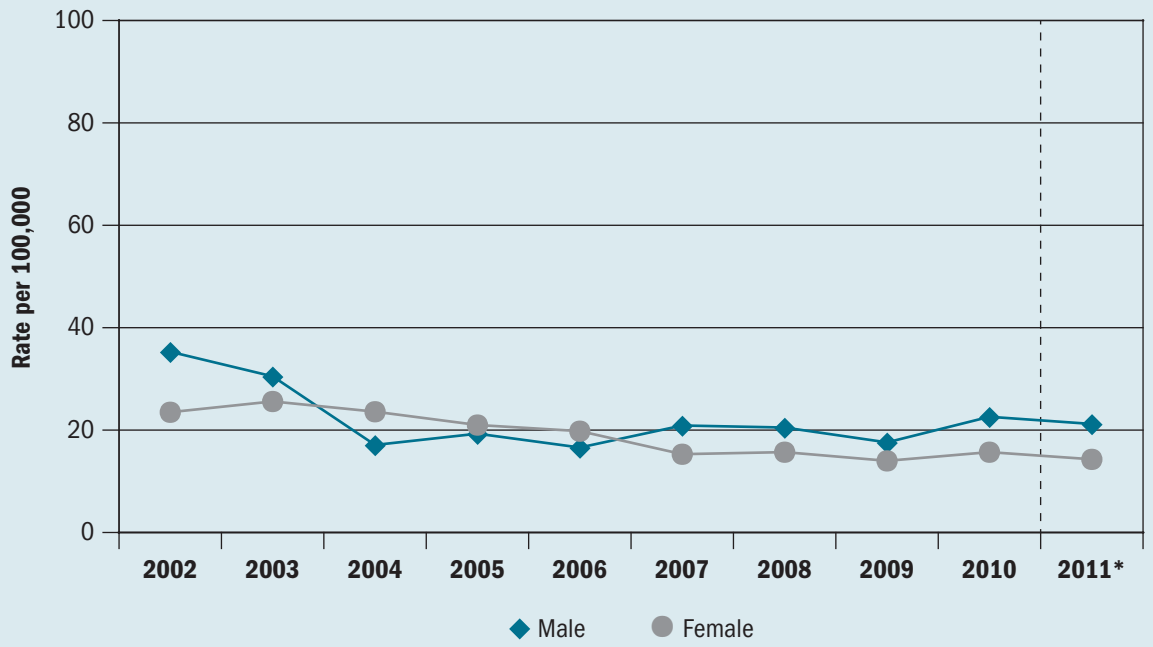
*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Age Group	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
18-34	8.9 (5.60-12.18)	7.5 (4.67-10.32)	6.1 (3.63-8.48)	4.7 (2.77-6.61)	6.5 (3.93-9.00)	7.7 (4.88-10.61)	4.3 (2.24-6.30)	4.5 (2.64-6.44)	7.2 (4.55-9.76)	6.1 (3.92-8.29)
35-64	26.5 (22.45-30.51)	24.8 (20.84-28.85)	17.3 (14.23-20.50)	20.4 (16.94-23.88)	15.8 (12.76-18.84)	13.4 (10.71-16.03)	16.8 (13.77-19.90)	15.0 (12.20-17.77)	16.7 (13.85-19.45)	16.1 (13.13-19.07)
65 +	64.2 (52.39-75.96)	87.4 (72.22-102.50)	69.6 (57.44-81.75)	57.6 (47.32-67.85)	56.1 (45.22-67.00)	50.3 (40.31-60.35)	46.4 (36.90-55.99)	40.0 (31.65-48.38)	43.5 (35.14-51.86)	42.1 (33.77-50.44)

From 2002 to 2011, the 65 year and older age group consistently had the highest ARR for asthma deaths compared to other adult age groups in NYS. Overall, the rates for the 18-34 and 35-64 year age groups fluctuated over time, while the 65 year and older age group showed a downward trend over time. At-risk based rates for all age groups showed a slight increase in 2010 which was predominantly due to an increase in the actual number of asthma deaths among NYS adults (Figure 8-5).

Figure 8-6

Asthma Death Rate per 100,000 Adults (18+ Years) with Current Asthma by Gender and Year, New York State, 2002-2011

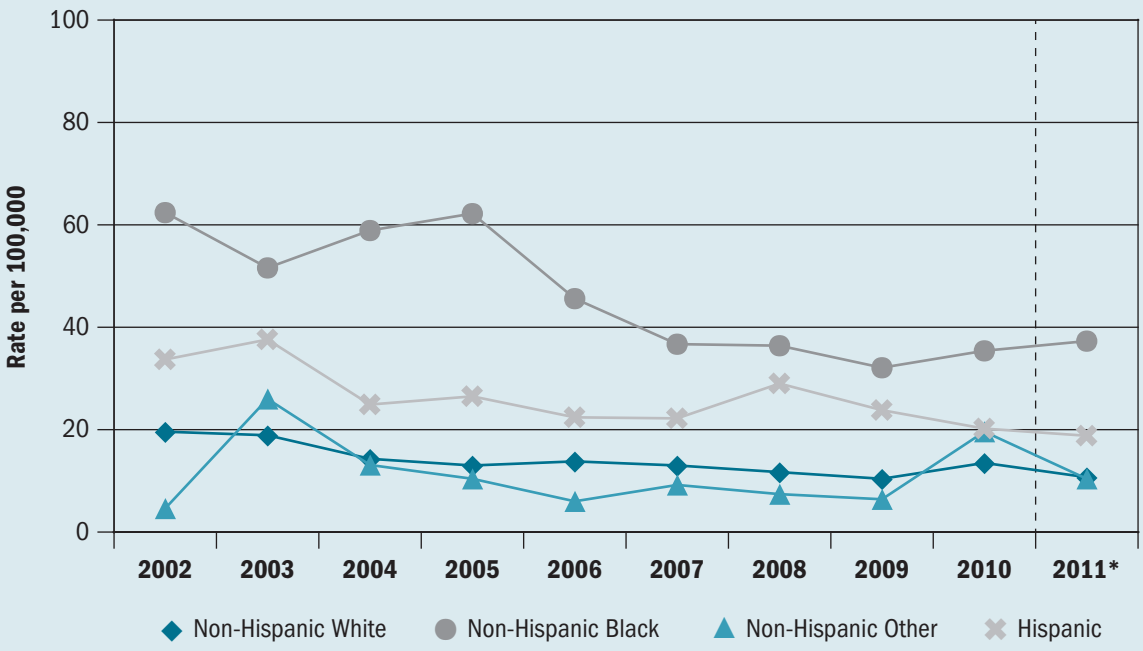


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Gender	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
Male	35.3 (29.12-41.45)	30.5 (25.05-35.87)	17.1 (13.47-20.74)	19.3 (15.51-23.03)	16.6 (12.86-20.39)	20.9 (16.69-25.15)	20.5 (16.20-24.70)	17.6 (13.92-21.23)	22.6 (18.59- 26.61)	21.2 (17.18-25.31)
Female	23.5 (20.11-26.95)	25.6 (21.91-29.38)	23.6 (20.26-27.03)	21.0 (17.86-24.06)	19.8 (16.66-22.87)	15.3 (12.63-17.92)	15.7 (13.07-18.38)	14.0 (11.58-16.34)	15.7 (13.15-18.22)	14.3 (11.90-16.71)

Overall, from 2002 to 2011, the ARR for asthma deaths decreased for both women and men. Women had the highest ARR for asthma deaths during 2004 to 2006. However, in more recent years from 2007 through 2011, men had higher rates than women (Figure 8-6).

Figure 8-7
Asthma Death Rate per 100,000 Adults (18+ Years) with Current Asthma by Race/Ethnicity and Year, New York State, 2002-2011

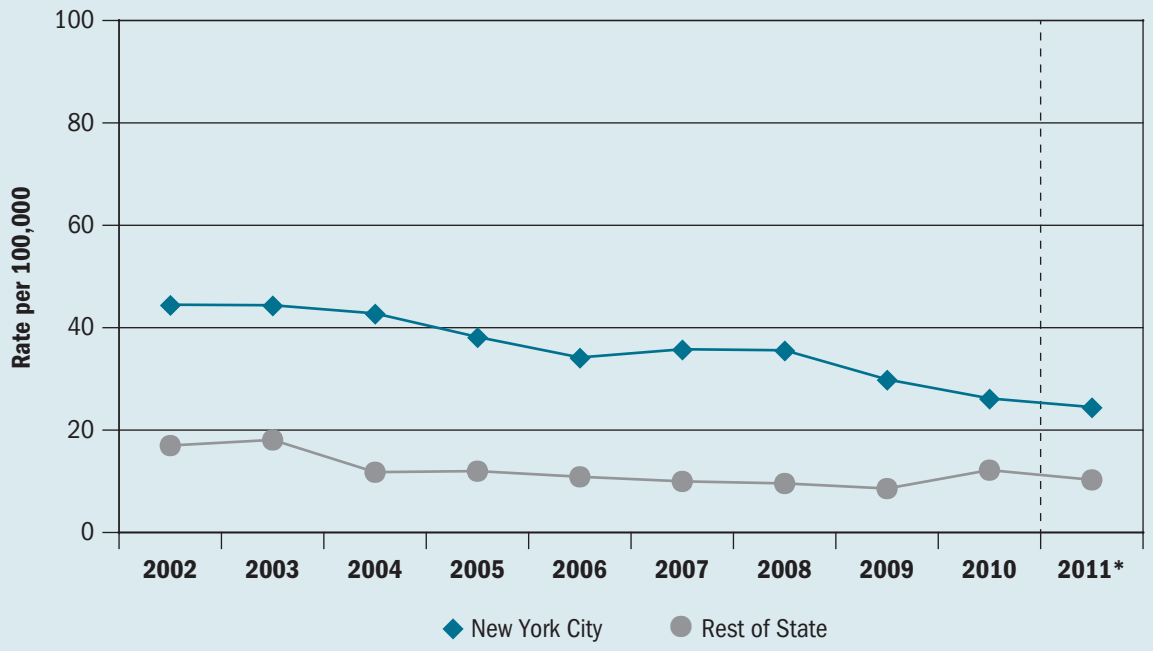


*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Race/Ethnicity	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
Non-Hispanic White	19.6 (16.23-22.90)	18.9 (15.58-22.18)	14.3 (11.60-16.96)	13.0 (10.61-15.49)	13.8 (11.20-16.40)	13.0 (10.58-15.52)	11.7 (9.29-14.13)	10.4 (8.26-12.59)	13.5 (11.05-15.94)	10.7 (8.40-12.93)
Non-Hispanic Black	62.4 (49.78-75.02)	51.6 (40.83-62.41)	58.9 (46.37-71.41)	62.2 (49.80-74.55)	45.6 (35.33-55.83)	36.7 (27.73-45.72)	36.4 (27.39-45.36)	32.1 (24.22-39.94)	35.4 (27.89-42.84)	37.3 (29.83-44.75)
Non-Hispanic Other	4.6 (0.57-8.71)	26.0 (12.82-39.10)	13.1 (6.48-19.77)	10.4 (5.13-15.64)	6.0 (1.20-10.85)	9.2 (2.82-15.58)	7.4 (2.58-12.29)	6.4 (1.65-11.09)	19.6 (9.34-29.89)	10.4 (4.74-16.02)
Hispanic	33.7 (25.26-42.18)	37.6 (29.02-46.15)	24.9 (18.83-31.05)	26.5 (19.46-33.45)	22.4 (15.53-29.24)	22.2 (15.58-28.87)	29.0 (21.77-36.19)	23.8 (17.83-29.77)	20.2 (14.68-25.64)	18.8 (13.42-24.16)

For adults with current asthma, the 2002 to 2011 ARR for asthma deaths varied by race and ethnicity. Non-Hispanic blacks consistently had the highest ARR for asthma deaths compared to other racial and ethnic groups in NYS. This rate decreased from 62.4 per 100,000 in 2002 to 37.3 per 100,000 in 2011. The ARR for asthma deaths also decreased for Hispanics and for non-Hispanic whites in NYS for 2002 to 2011. The ARR fluctuated greatly over time for non-Hispanic other adults, with a markedly large peak in 2010. This was due to an increase in the number of asthma deaths as well as a substantial decrease in the number of adults with self-reported current asthma who were categorized in the non-Hispanic other racial-ethnic group in 2010 (Figure 8-7).

Figure 8-8
Asthma Death Rate per 100,000 Adults (18+ Years) with Current Asthma by Region and Year, New York State, 2002-2011



*2011 data should not be compared to data from prior years because of the differences in BRFSS data collection and weighting methodology.

Region	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)	2008 Rate (95% CI)	2009 Rate (95% CI)	2010 Rate (95% CI)	2011* Rate (95% CI)
New York City	44.5 (38.10-50.82)	44.4 (37.78-50.97)	42.8 (36.28-49.25)	38.2 (32.41-44.08)	34.2 (28.52-39.80)	35.8 (29.61-41.97)	35.6 (29.60-41.51)	29.9 (24.84-34.93)	26.2 (22.21-30.15)	24.5 (20.72-28.35)
Rest of State	17.0 (13.92-19.99)	18.1 (14.95-21.18)	11.8 (9.52-14.00)	12.0 (9.79-14.24)	10.9 (8.63-13.12)	10.0 (7.99-12.07)	9.6 (7.57-11.59)	8.6 (6.78-10.42)	12.2 (9.80-14.52)	10.3 (8.06-12.51)

For adults with current asthma, the 2011 ARR for asthma deaths was more than two times higher for residents in New York City compared to those in the Rest of State. During 2002 to 2011, the rate decreased from 44.5 per 100,000 in 2002 to 24.5 per 100,000 in 2011 for New York City residents and from 17.0 per 100,000 in 2002 to 10.3 per 100,000 in 2011 for those in the Rest of State (Figure 8-8).

9

Program-Based Asthma Surveillance

The information in this section describes New York State (NYS) residents served by the Medicaid managed care (MMC) program. The majority of Medicaid enrollees are enrolled in MMC. Enrollees have access to preventive and primary care, inpatient care, eye care, as well as additional health services.

Information obtained from program-based surveillance is not representative of the general population, since only about 16% of the NYS population is served by Medicaid managed care programs. However, these data provide useful information about those who have asthma, including the burden of asthma and the use of health care services and medications prescribed for this population.

This section describes prevalence and health care utilization data for two asthma groups:

1. MMC enrollees in the **asthma universe** population
2. MMC enrollees in the **persistent asthma** population

Definitions for the asthma universe and persistent asthma groups are based on the technical specifications established by the National Committee for Quality Assurance (NCQA) for the Healthcare Effectiveness Data and Information Set (HEDIS®) 2011.[21]

Asthma Universe: Individuals are identified as being in the asthma universe of patients if they had **at least**:

- One outpatient visit with asthma (ICD-9 code 493.XX) as one of the listed diagnoses during a specified 12-month period; or
- One emergency department (ED) visit with asthma (ICD-9 code 493.XX) as the principal diagnosis during a specified 12-month period; or
- One acute inpatient discharge with asthma (ICD-9 code 493.XX) as the principal diagnosis during a specified 12-month period; or
- Four asthma medication dispensing events* (i.e., an asthma medication was dispensed on four occasions) during a specified 12-month period.

Persistent Asthma: Individuals are identified as persistent asthma patients if they **met at least one of the criteria below during both 2009 and 2010** (criteria need not be the same across years):

- Four outpatient visits with asthma (ICD-9 code 493.XX) as one of the listed diagnoses and at least two asthma medication dispensing events during a specified 12-month period; or
- One ED visit with asthma (ICD-9 code 493.XX) as the principal diagnosis during a specified 12-month period; or
- One acute inpatient discharge with asthma (ICD-9 code 493.XX) as the principal diagnosis during a specified 12-month period; or
- Four asthma medication dispensing events* (i.e., an asthma medication was dispensed on four occasions) during a specified 12-month period.

*A dispensing event is one prescription of an amount lasting 30 days or less; multiple inhalers of the same medication filled on the same date of service should be counted as one dispensing event. There is also a restriction regarding leukotriene dispensing events: for an individual identified as an asthma universe or persistent asthma because of at least four asthma medication dispensing events, and leukotriene modifiers were the sole asthma medication dispensed, the member must meet any one of the other three criteria for inclusion in the asthma universe or persistent asthma population, or have at least one diagnosis of asthma in any setting.

Asthma Universe Prevalence Among the Medicaid Managed Care Population, 2006-2010

- There were 249,350 (11.5%) Medicaid managed care enrollees classified as asthma universe in 2010.
- Overall, asthma universe prevalence for Medicaid managed care enrollees increased between 2006 and 2010 for all age groups. In 2010, enrollees aged 5-11 years had the highest prevalence rate of asthma universe (15.1%), followed by enrollees aged 0-4 years (13.8%). Adult enrollees aged 12-50 years had the lowest prevalence rate at 9.2%.
- The asthma universe prevalence rate increased from 2006 to 2009 for females (19%) and males (9%), followed by a slight decrease beginning in 2010 for males.
- Overall, the asthma universe prevalence for Medicaid managed care enrollees increased between 2006 and 2010 for all racial and ethnic groups. Hispanics consistently had the highest prevalence rate of asthma universe, and in 2010 that prevalence was 13.5%, followed closely by non-Hispanic black enrollees at 13.1%.
- Prevalence of asthma increased for New York City and Rest of State regions from 2006 to 2010. In 2010, Rest of State residents had a higher prevalence rate of asthma universe (12.6%) compared to New York City residents (11.0%).
- Prevalence of asthma universe among Medicaid managed care enrollees varied by county. For 2010, enrollees from Columbia County (17.4%) and Sullivan County (17.2%) had the highest asthma universe prevalence rate, while enrollees from Wyoming County had the lowest prevalence rate (6.2%).

Persistent Asthma Prevalence Among the Medicaid Managed Care Population, 2009-2010

- There were 70,275 (4.9%) and 80,586 (5.2%) Medicaid managed care enrollees classified as persistent asthma in 2009 and 2010 respectively.
- Persistent asthma prevalence among Medicaid managed care enrollees varied by age. Enrollees aged 51-64 years had the highest prevalence rate of persistent asthma in 2009 (7.8%) and in 2010 (8.9%).
- Females had a slightly higher prevalence rate of persistent asthma (5.0% in 2009 and 5.4% in 2010) compared to males (4.7% in 2009 and 4.9% in 2010).
- Persistent asthma prevalence among Medicaid managed care enrollees was similar by region. For 2010, persistent asthma prevalence was 5.3% for Rest of State residents and 5.1% for those who reside in New York City.
- Persistent asthma prevalence in Medicaid managed care enrollees varied by race and ethnicity. Hispanic enrollees had the highest prevalence rate of persistent asthma (6.2% in 2009 and 6.4% in 2010), followed by non-Hispanic black enrollees (5.8% in 2009 and 6.2% in 2010).

Utilization of Health Services by the Medicaid Managed Care Asthma Universe Population, 2009-2010

- Overall, there were 392,379 outpatient asthma visits in 2009 and 408,517 in 2010; 38,590 asthma emergency department visits in 2009 and 37,488 in 2010; and 8,910 asthma hospitalizations in 2009 and 7,762 in 2010 among the asthma universe population. For the same time period, more than 1.5 million asthma-related pharmacy dispensing events occurred.
- The highest rate of outpatient visits was seen among children aged 0-4 years (203.9 visits per 100 Medicaid managed care asthma universe enrollees in 2009 and 202.9 per 100 in 2010).
- Asthma emergency department visit rates varied by age group with the highest rate among children aged 0-4 years (22.5 per 100 Medicaid managed care asthma universe enrollees in 2009 and 20.9 per 100 in 2010).
- Hospitalization rates due to asthma were highest among young children aged 0-4 years (6.4 per 100 Medicaid managed care asthma universe enrollees in 2009 and 5.2 per 100 in 2010).
- Asthma-related pharmacy dispensing rates increased with age. The highest rate was among adults aged 51-64 years (1,107.0 and 1,174.6 dispensing

events per 100 Medicaid managed care asthma universe enrollees in 2009 and 2010, respectively).

- Medicaid managed care asthma universe female enrollees had a lower outpatient visit rate (165.6 per 100 asthma universe enrollees in 2009 and 161.9 per 100 in 2010). Rates of emergency department visits were also lower for female universe enrollees with asthma (15.9 per 100 in 2009 and 14.2 per 100 in 2010).
- Asthma hospitalizations among Medicaid managed care asthma universe female enrollees were similar in 2009 to the rate for males (3.9 and 3.7 per 100 asthma universe enrollees) and in 2010 (3.1 per 100). Asthma-related pharmacy dispensing rates for Medicaid managed care asthma universe female enrollees (699.9 per 100 asthma universe enrollees in 2009 and 735.9 per 100 in 2010) were higher the rates for male enrollees (603.5 per 100 in 2009 and 636.6 per 100 in 2010).
- Medicaid managed care asthma universe non-Hispanic other enrollees had the lowest outpatient visit rate in 2009 (148.4 per 100 asthma universe enrollees) whereas non-Hispanic white had the lowest outpatient visit rate in 2010 (142.6 per 100). Hispanic enrollees had a highest outpatient visit rate (180.0 per 100 in 2009 and 177.7 per 100 in 2010).
- Asthma emergency department visit rates varied by race and ethnicity, with the highest rate among non-Hispanic black (25.0 per 100 Medicaid managed care asthma universe enrollees in 2009 and 23.3 per 100 in 2010) and the lowest rate among Non-Hispanic white (8.3 per 100 in 2009 and 7.6 per 100 in 2010).
- Hospitalizations due to asthma were also highest among non-Hispanic black (5.6 per 100 Medicaid managed care asthma universe enrollees in 2009 and 4.6 per 100 in 2010).
- Asthma-related pharmacy dispensing rates also varied by race and ethnicity. The highest rate of asthma-related pharmacy dispensing events was among Hispanic (705.3 dispensing events per 100 Medicaid managed care asthma universe enrollees in 2009 and 738.8 dispensing events per 100 in 2010).
- Medicaid managed care asthma universe enrollees in New York City had a lower outpatient visit rate (165.9 per 100 asthma universe enrollees in 2009 and 162.8 per 100 in 2010) than Medicaid managed care asthma universe enrollees from the Rest of State (173.8 per 100 in 2009 and 166.1 per 100 in 2010).
- Rates of asthma emergency department visits were higher for Medicaid managed care enrollees with asthma who reside in New York City (18.2 per 100 in 2009 and 16.8 per 100 in 2010) compared to those in the Rest of State (12.4 per 100 in 2009 and 11.0 per 100 in 2010).
- Asthma hospitalizations among Medicaid managed care enrollees were also slightly higher for those living in New York City (4.2 per 100 asthma universe enrollees in 2009 and 3.5 per 100 in 2010) than in the Rest of State (2.8 per 100 in 2009 and 2.1 per 100 in 2010).
- Asthma-related pharmacy dispensing rates for Medicaid managed care asthma universe enrollees were higher for those living in New York City (693.3 per 100 asthma universe enrollees in 2009 and 734.6 per 100 in 2010) than for those living in the Rest of State (566.6 per 100 in 2009 and 598.4 per 100 in 2010).
- Persistent asthma prevalence among Medicaid managed care enrollees varied by county. For 2010, enrollees from Columbia, Cattaraugus and Tompkins counties had the highest persistent asthma prevalence at 7.3%, 7.2% and 7.1%, respectively.

Asthma Universe Prevalence Among the Child Health Plus Population, 2010

- There were 23,553 (10.4%) Child Health Plus enrollees (0-18 years) classified as asthma universe in 2010.
- In 2010, the asthma universe prevalence rate was highest among the 0-4 age category (12.9%), and the 5-11 year age category (12.8%). The highest asthma universe prevalence rate by gender, race and ethnicity, region and county was observed among male enrollees (11.7%); non-Hispanic black enrollees (11.5%); residents of the Rest of State (11.6%); and residents of Livingston County (16.4%), respectively.

Persistent Asthma Prevalence Among the Child Health Plus Population, 2010

- In 2010, there were 9,320 (6.4%) Child Health Plus enrollees that were classified as having persistent asthma.
- The highest persistent asthma prevalence was seen among those aged 5-11 years (8.3%), male enrollees (7.4%), non-Hispanic black enrollees (7.4%), Rest of State residents (7.4%), and residents of St. Lawrence County (10.6%).

Utilization of Health Services by the Child Health Plus Asthma Universe Population, 2010

- In 2010, there were 35,899 outpatient visits; 2,218 emergency department visits; and 537 hospitalizations due to asthma among the asthma universe population for Child Health Plus enrollees. In addition, 104,046 asthma-related dispensing events occurred in 2010.
- The highest rate of outpatient visits was seen among children aged 0-4 years (182.6 visits per 100 Child Health Plus asthma universe enrollees).
- Asthma emergency department visit rates varied by age group with the highest rate among children aged 0-4 years (14.5 per 100 Child Health Plus asthma universe enrollees).
- Hospitalization rates due to asthma were highest among young children aged 0-4 years (5.8 per 100 Child Health Plus asthma universe enrollees).
- Asthma-related pharmacy dispensing rates varied by age group. The highest rate was among the 5-11 year old age group (478.6 dispensing events per 100 Child Health Plus asthma universe enrollees).
- Child Health Plus asthma universe female enrollees had the lowest outpatient visit rate (148.5 per 100 asthma universe enrollees). Rates of emergency department visits were also lowest for Child Heath Plus female enrollees with asthma (8.7 per 100).
- Asthma hospitalizations were the same for males as they were for females in 2010 (2.3 per 100 Child Health Plus asthma universe enrollees). There were fewer asthma-related pharmacy dispensing events for Child Health Plus asthma universe female enrollees (422.1 per 100 Child Health Plus asthma universe enrollees) than male enrollees (456.3 per 100).
- Child Health Plus asthma universe non-Hispanic black enrollees had the lowest outpatient visit rate (147.7 per 100 Child Health Plus asthma universe enrollees). Non-Hispanic white and Hispanic enrollees had the highest outpatient visit rate (154.4 and 154.2 per 100, respectively).
- Asthma emergency department visit rates varied by race and ethnicity, with the highest rate among non-Hispanic black enrollees (16.6 per 100 Child Health Plus asthma universe enrollees) and the lowest rate among non-Hispanic other enrollees (5.8 per 100).
- Hospitalizations due to asthma were also highest among non-Hispanic black enrollees (4.7 per 100 Child Health Plus asthma universe enrollees).
- Asthma-related pharmacy dispensing rates also varied by race and ethnicity. The highest rate of asthma-related pharmacy dispensing events was among Hispanic and non-Hispanic other enrollees (406.6 and 407.9 dispensing events per 100 Child Health Plus asthma universe enrollees, respectively).
- Child Health Plus asthma universe enrollees in New York City had a lower outpatient visit rate (143.3 per 100 asthma universe enrollees) than Child Health Plus asthma universe enrollees from the Rest of State (156.7 per 100).
- Rates of asthma emergency department visits were higher for Child Health Plus enrollees with asthma who reside in New York City (13.3 per 100 asthma universe enrollees) compared to those in the Rest of State (7.6 per 100).
- Asthma hospitalizations among Child Health Plus enrollees were also slightly higher for those living in New York City (2.8 per 100 asthma universe enrollees) than in the Rest of State (2.1 per 100).
- Asthma-related pharmacy dispensing rates for Child Health Plus asthma universe enrollees where higher for those living in the Rest of State (465.0 per 100 asthma universe enrollees) than those living in New York City (392.3 per 100).

Managed Care Quality Assurance Reporting Requirement Asthma-Specific Indicator

- Among children aged 5-11 who had persistent asthma, 96% of enrollees of Commercial health plans and 95% of enrollees of Child Health Plus plans received appropriate medications for asthma, compared to 92% for children with persistent asthma enrolled in Medicaid managed care plans.
- In 2010, Commercial HMO plans showed a slightly higher proportion of enrollees individuals aged 12-50 years with persistent asthma receiving appropriate medications (91%) compared to the percentages among enrollees in Medicaid (88%) or Commercial PPO (82%) plans.
- In 2010, children aged 5-11 years with persistent asthma who were enrolled in Commercial health plans (82%) and Child Health Plus (81%) were more likely to have three or more controller medications dispensed in the past year compared to those enrolled in Medicaid health plans (76%).
- In 2010, a higher proportion of individuals aged 12-50 years with persistent asthma who were enrolled in Commercial health plans had three or more controller medications dispensed in the past year (81%) compared to those enrolled in Medicaid managed care plans (77%).
- In 2010, among individuals aged 5-50 years with persistent asthma, Orleans County had the lowest percentage of individuals (less than 80%) who received appropriate medications to control their asthma.
- In 2010, among children aged 5-11 years with persistent asthma, children in Orleans and Genesee counties had the lowest percentage of children (less than 70%) who had three or more controller medication dispensing events in the past year.

Prevention Quality Indicators and Pediatric Quality Indicators for the Medicaid Managed Care Asthma Universe Population

- In 2010, among the asthma universe population aged 2-17 years, 44.2% of asthma hospital admissions in NYS could potentially have been avoided through more effective outpatient care. Preventable asthma hospital admissions were nearly two times higher for children (0-17 years) than adults (18-39 and 40+ years).
- In 2010, among the asthma universe population aged 18-39 years, 22.5% of asthma hospital admissions in NYS could potentially have been avoided through more effective outpatient care.
- In 2010, among the asthma universe population aged 40 years and older, 23.7% of asthma hospital admissions in NYS could potentially have been avoided through more effective outpatient care.

Methodology

Asthma MMC information was obtained from the NYSDOH Office of Health Insurance Programs Data Mart.

This report provides prevalence data for the asthma universe and for people with persistent asthma in the MMC population. Asthma universe and persistent asthma prevalence rates are presented for the total population, and stratified by age group, gender, race and ethnicity, county of residence, and geographic region (New York City and Rest of State).

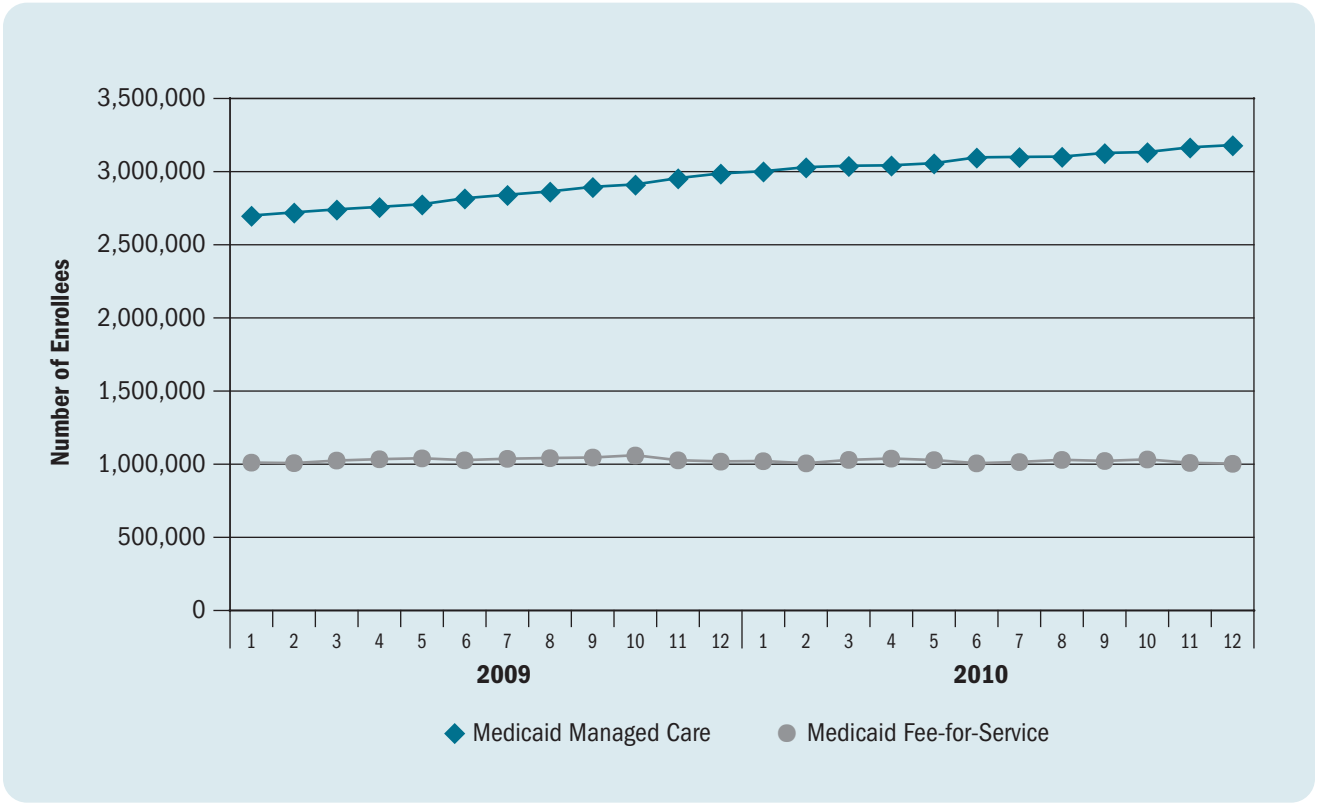
Asthma universe prevalence rates were generated for individuals aged 0 to 64 years who were continuously enrolled in a MMC health plan (Health Maintenance Organization (HMO) or Prepaid Health Services Plan (PHSP)) for **12 or more months**, as of each reporting year.

Asthma universe prevalence rates were generated for single years (i.e., 2009 and 2010) by county of residence and as a five-year trend from 2006 to 2010 for the MMC asthma universe population by age group, gender, race and ethnicity and geographic region (New York City and Rest of State).

Persistent asthma prevalence was generated for individuals aged 0 to 64 years who were continuously enrolled in a MMC health plan (HMO or PHSP) for **24 or more** months, as of December 2010.

For consistency, the same methodology, based on HEDIS® 2011 specifications (see page 133 for additional information), was applied to all years.

Figure 9-1
New York State Medicaid Managed Care* and Medicaid Fee-for-Service Enrollees Aged 0-64 Years by Month, January 2009–December 2010



* Medicaid managed care enrollees exclude special populations such as AIDS special needs plans and long-term care plans.

In presenting asthma surveillance information for MMC, it is important to recognize the trend of enrollment for this population as well as for the Medicaid Fee-for-Service (FFS) population. Figure 9-1 presents the number of enrollees by month for MMC and Medicaid FFS from January 2009 to December 2010. There was an increasing trend in enrollment in the Medicaid MMC program over these two years. During this time period, the MMC population increased from approximately 2.7 million to nearly 3.2 million, while the Medicaid FFS population remained stable at about 1 million enrollees per month (Figure 9-1).

Asthma Universe Prevalence Among the Medicaid Managed Care Population

Asthma Universe Prevalence by Socio-demographic Characteristics, 2006-2010

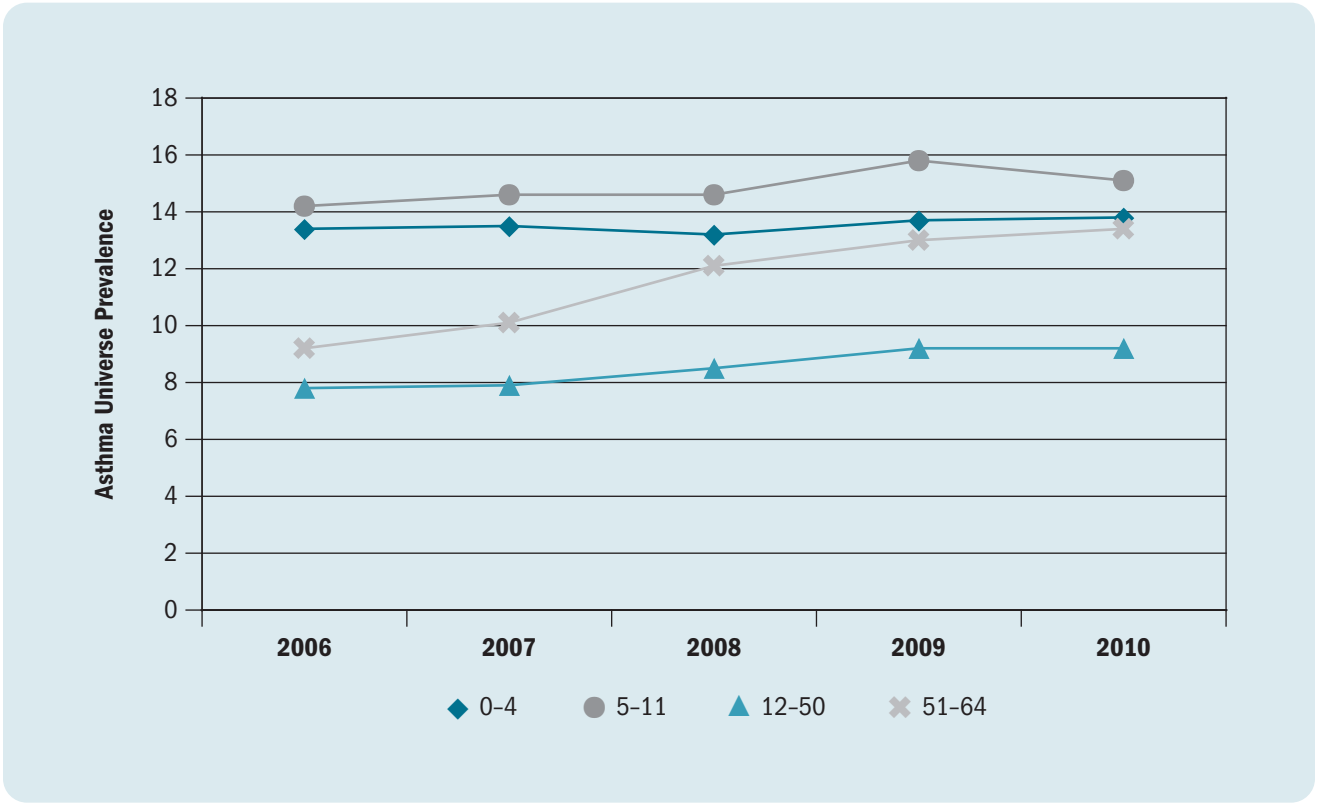
Table 9-1
Number of Asthma Universe and Medicaid Managed Care Enrollees* by Age Group, New York State, 2009-2010

	Asthma Universe		Medicaid Managed Care Enrollees		Asthma Universe Prevalence Rate per 100	
Age Group	2009	2010	2009	2010	2009	2010
0–4	39,446	41,450	283,968	301,446	13.9	13.8
5–11	58,348	59,508	368,708	392,975	15.8	15.1
12–50	101,306	109,793	1,096,890	1,193,806	9.2	9.2
51–64	34,267	38,599	264,523	288,006	13.0	13.4
Total	*233,367*	*249,350*	*2,014,089*	*2,176,233*	*11.6*	*11.5*

*12 months continuous enrollment.

There were 249,350 (11.5%) individuals who met the asthma universe definition among the nearly 2.2 million MMC enrollees in 2010 (Table 9-1).

Figure 9-2
Asthma Universe Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2006-2010



*12 months continuous enrollment.

Table 9-2
Asthma Universe Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2006-2010

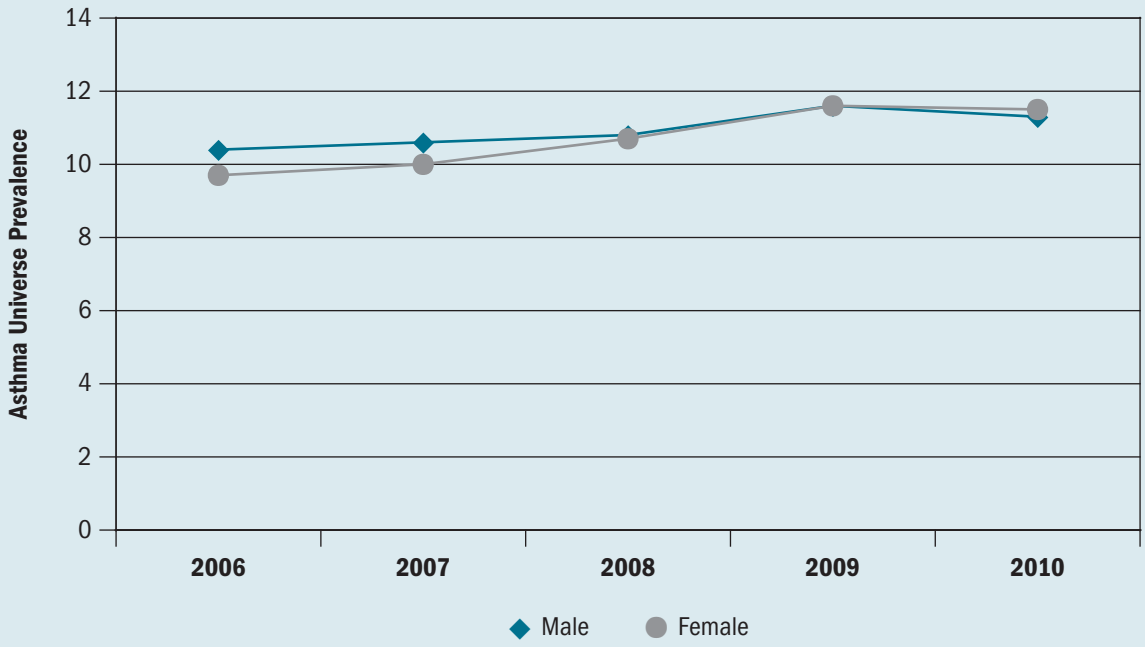
Age Group	2006	2007	2008	2009	2010
0–4	13.4	13.5	13.2	13.7	13.8
5–11	14.2	14.6	14.6	15.8	15.1
12–50	7.8	7.9	8.5	9.2	9.2
51–64	9.2	10.1	12.1	13.0	13.4
Total	*10.0*	*10.3*	*10.8*	*11.6*	*11.5*

*12 months continuous enrollment.

Overall, asthma universe prevalence for MMC enrollees increased between 2006 and 2010 for all age groups. The asthma prevalence for the 5-11 age group was consistently the highest, and 12-50 age group consistently the lowest over the 2006-2010 time period.

Asthma universe prevalence among MMC enrollees varied by age. For the year 2010, enrollees aged 5-11 years had the highest prevalence rate of asthma universe (15.1%), followed by enrollees aged 0-4 years (13.8%). Adult enrollees aged 12-50 years had the lowest prevalence rate at 9.2% in 2010. (Figure 9-2, Table 9-2).

Figure 9-3
Asthma Universe Prevalence* by Gender, Medicaid Managed Care Population, New York State, 2006-2010



*12 months continuous enrollment.

Table 9-3
Asthma Universe Prevalence* by Gender, Medicaid Managed Care Population, New York State, 2006-2010

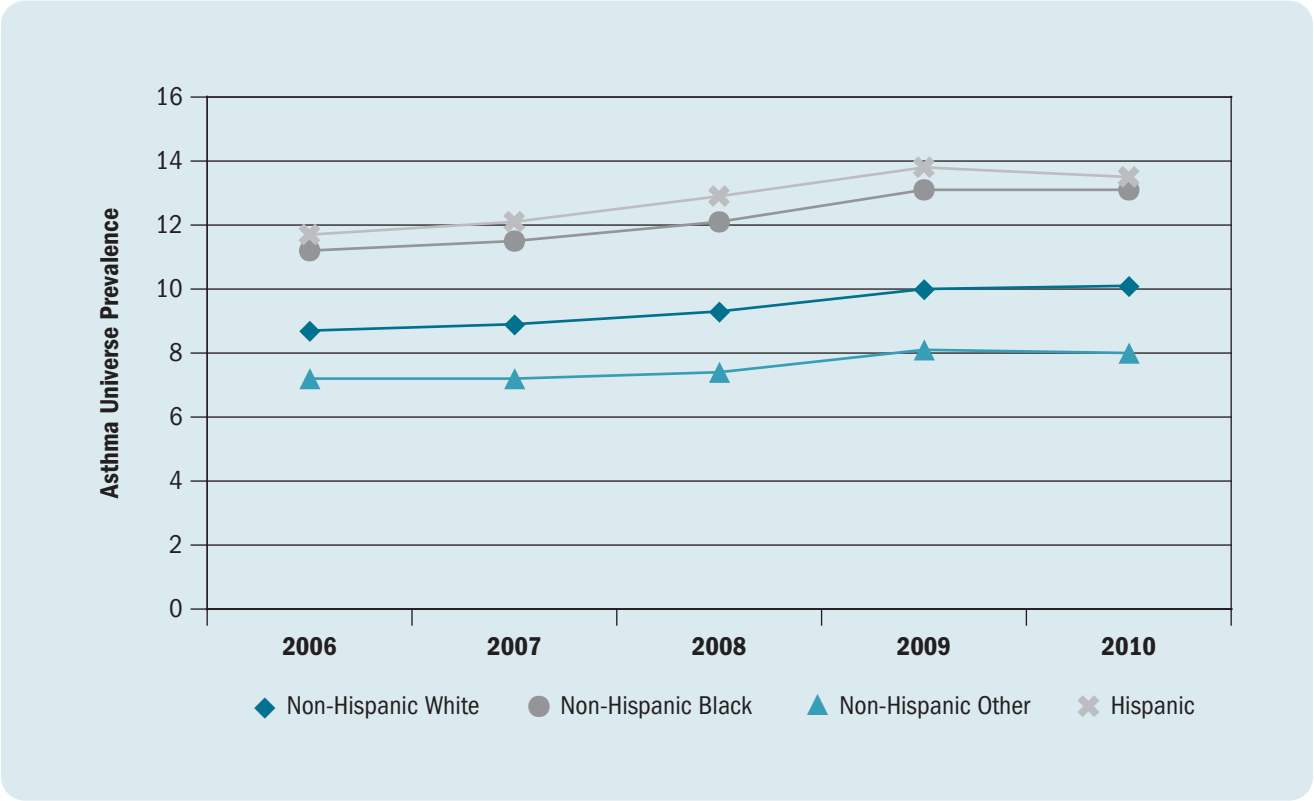
Gender	2006	2007	2008	2009	2010
Male	10.4	10.6	10.8	11.6	11.3
Female	9.7	10.0	10.7	11.6	11.5

*12 months continuous enrollment.

The asthma universe prevalence rate increased from 2006 to 2009 for females (19%) and males (9%), followed by a slight decrease beginning in 2010 for males (Figure 9-3, Table 9-3).

Figure 9-4

Asthma Universe Prevalence* by Race/Ethnicity,** Medicaid Managed Care Population, New York State, 2006-2010



*12 months continuous enrollment.

**Excludes enrollees with missing race/ethnicity.

***Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

Table 9-4

Asthma Universe Prevalence* by Race/Ethnicity,** Medicaid Managed Care Population, New York State, 2006-2010

Age Group	2006	2007	2008	2009	2010
Non-Hispanic White	8.7	8.9	9.3	10.0	10.1
Non-Hispanic Black	11.2	11.5	12.1	13.1	13.1
Non-Hispanic Other**	7.2	7.2	7.4	8.1	8.0
Hispanic	11.7	12.1	12.9	13.8	13.5

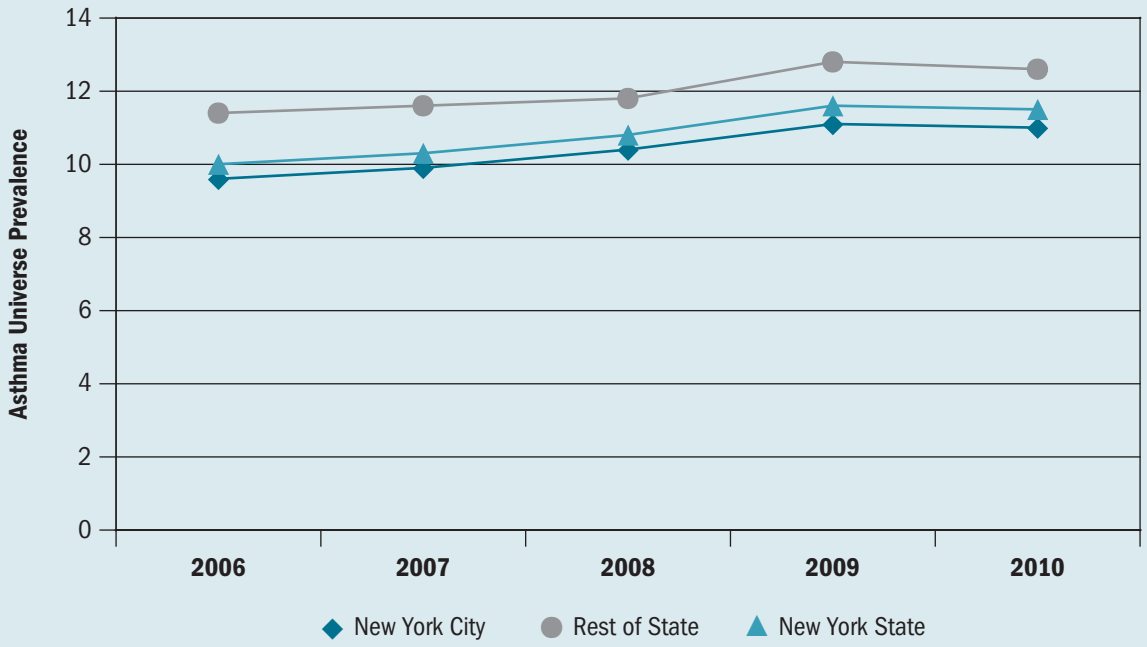
*12 months continuous enrollment.

**Excludes enrollees with missing race/ethnicity.

***Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

From 2006 to 2010, asthma universe prevalence among MMC enrollees varied by race and ethnicity. Hispanics consistently had the highest prevalence rate of asthma universe (13.5% in 2010), followed closely by non-Hispanic black enrollees (13.1% in 2010). Non-Hispanic other enrollees had the lowest prevalence rate at 8.0% in 2010. Overall, the asthma universe prevalence for MMC enrollees increased for all racial and ethnic groups during this time (Figure 9-4, Table 9-4).

Figure 9-5
Asthma Universe Prevalence* by Region, Medicaid Managed Care Population, New York State, 2006-2010



*12 months continuous enrollment.

Table 9-5
Asthma Universe Prevalence* by Region, Medicaid Managed Care Population, New York State, 2006-2010

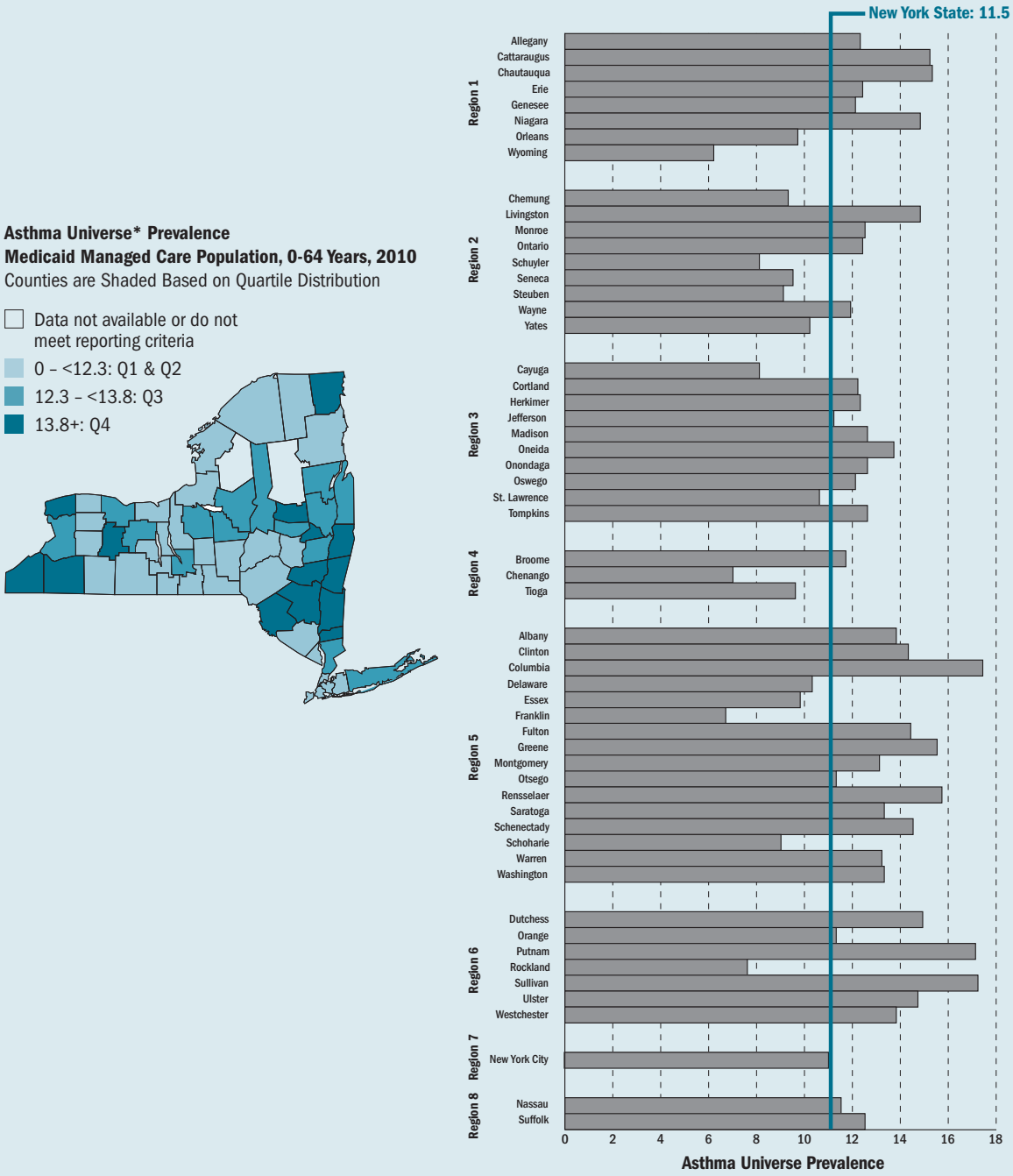
Region	2006	2007	2008	2009	2010
New York City	9.6	9.9	10.4	11.1	11.0
Rest of State	11.4	11.6	11.8	12.8	12.6
New York State	10.0	10.3	10.8	11.6	11.5

*12 months continuous enrollment.

From 2006 to 2010, asthma universe prevalence among MMC enrollees varied by region. Rest of State residents had a higher prevalence rate of asthma universe (12.6% in 2010) compared to New York City residents (11.0% in 2010). Prevalence of asthma universe increased in both regions during this period (Figure 9-5, Table 9-5).

Figure 9-6

Asthma Universe Prevalence* by County, Medicaid Managed Care Population, New York State, 2010



Source: Office of Health Insurance Programs Data Mart

*12 months continuous enrollment.

Table 9-6

Asthma Universe Prevalence* by County, Medicaid Managed Care Population, New York State, 2009-2010

County	Asthma Universe		Medicaid Managed Care Enrollees		Asthma Universe Prevalence Rate per 100	
	2009	2010	2009	2010	2009	2010
Albany	2,049	2,275	14,287	16,437	14.3	13.8
Allegany	329	389	2,788	3,154	11.8	12.3
Broome	1,138	1,549	9,721	13,252	11.7	11.7
Cattaraugus	704	821	4,813	5,406	14.6	15.2
Cayuga	42	64	404	792	10.4	8.1
Chautauqua	1,812	2,044	11,836	13,389	15.3	15.3
Chemung	45	56	494	603	9.1	9.3
Chenango	23	32	256	457	9.0	7.0
Clinton	143	211	1,035	1,473	13.8	14.3
Columbia	389	530	2,334	3,044	16.7	17.4
Cortland	458	502	3,286	4,113	13.9	12.2
Delaware	23	29	201	282	11.4	10.3
Dutchess	1,289	1,646	8,794	11,026	14.7	14.9
Erie	7,202	8,033	57,248	64,639	12.6	12.4
Essex	54	71	582	727	9.3	9.8
Franklin	24	15	239	225	10.0	6.7
Fulton	681	741	4,238	5,137	16.1	14.4
Genesee	387	382	3,064	3,155	12.6	12.1
Greene	396	472	2,444	3,051	16.2	15.5
Hamilton	**	**	**	**	**	**
Herkimer	565	668	4,567	5,419	12.4	12.3
Jefferson	50	71	584	635	8.6	11.2
Lewis	**	**	124	**	**	**
Livingston	390	457	2,530	3,078	15.4	14.8
Madison	34	84	360	667	9.4	12.6
Monroe	7,133	7,985	55,297	63,740	12.9	12.5
Montgomery	503	676	4,235	5,177	11.9	13.1
Nassau	3,795	4,991	29,572	43,540	12.8	11.5
Niagara	2,064	2,478	14,081	16,710	14.7	14.8
Oneida	2,573	2,962	18,432	21,668	14.0	13.7
Onondaga	3,847	4,350	28,478	34,388	13.5	12.6
Ontario	540	666	4,391	5,371	12.3	12.4
Orange	2,962	3,202	24,442	28,286	12.1	11.3

*12 months continuous enrollment.

**Data are suppressed for confidentiality purposes if there are fewer than 10 MMC enrollees that meet the criteria for asthma universe or when the number of MMC enrollees (denominator) is less than 50.

Table 9-6 *continued*

Asthma Universe Prevalence* by County, Medicaid Managed Care Population, New York State, 2009-2010

County	Asthma Universe		Medicaid Managed Care Enrollees		Asthma Universe Prevalence Rate per 100	
	2009	2010	2009	2010	2009	2010
Orleans	349	356	3,153	3,670	11.1	9.7
Oswego	1,213	1,396	9,951	11,562	12.2	12.1
Otsego	285	366	2,520	3,233	11.3	11.3
Putnam	173	248	1,269	1,449	13.6	17.1
Rensselaer	1,389	1,601	8,822	10,202	15.7	15.7
Rockland	2,535	2,717	31,410	35,859	8.1	7.6
St. Lawrence	44	55	514	521	8.6	10.6
Saratoga	768	1,022	5,989	7,712	12.8	13.3
Schenectady	1,060	1,283	6,985	8,861	15.2	14.5
Schoharie	47	52	410	576	11.5	9.0
Schuyler	**	11	99	136	**	8.1
Seneca	163	187	1,693	1,963	9.6	9.5
Steuben	24	42	395	464	6.1	9.1
Suffolk	7,364	8,316	56,907	66,670	12.9	12.5
Sullivan	667	857	4,564	4,977	14.6	17.2
Tioga	48	54	572	561	8.4	9.6
Tompkins	324	352	2,107	2,784	15.4	12.6
Ulster	1,242	1,490	8,445	10,105	14.7	14.7
Warren	155	178	1,041	1,352	14.9	13.2
Washington	350	450	2,637	3,372	13.3	13.3
Wayne	324	406	2,667	3,401	12.1	11.9
Westchester	5,297	6,682	40,998	48,467	12.9	13.8
Wyoming	12	13	192	209	6.3	6.2
Yates	169	183	1,579	1,789	10.7	10.2
New York City***	167,700	172,567	1,503,969	1,567,108	11.2	11.0

*12 months continuous enrollment.

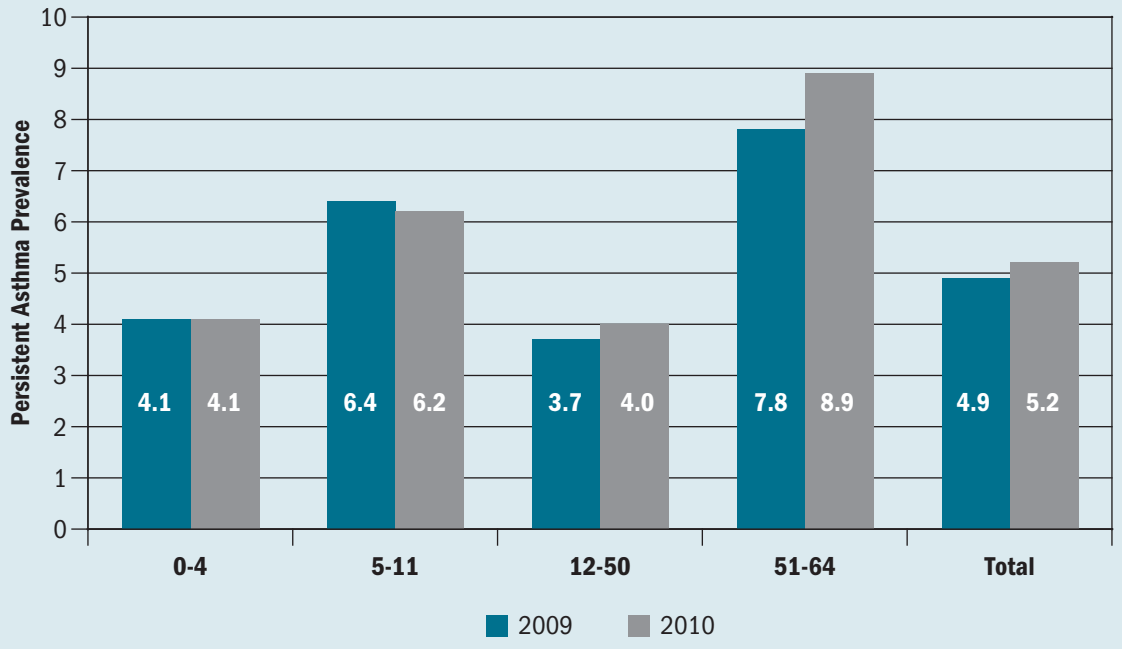
**Data are suppressed for confidentiality purposes if there are fewer than 10 MMC enrollees that meet the criteria for asthma universe or when the number of MMC enrollees (denominator) is less than 50.

***Data for the five boroughs of New York City are combined.

Prevalence of asthma universe among MMC enrollees varied by county. For 2010, enrollees from Columbia County (17.4%) and Sullivan County (17.2%) had the highest asthma universe prevalence rates, while enrollees from Wyoming County had the lowest prevalence rate (6.2%). New York City had an asthma universe prevalence rate of 11.0% in 2010 (Figure 9-6, Table 9-6).

Persistent Asthma Prevalence by Socio-demographic Characteristics, 2009-2010

Figure 9-7
Persistent Asthma Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2009-2010



*24 months continuous enrollment.

Table 9-7
Persistent Asthma Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2009-2010

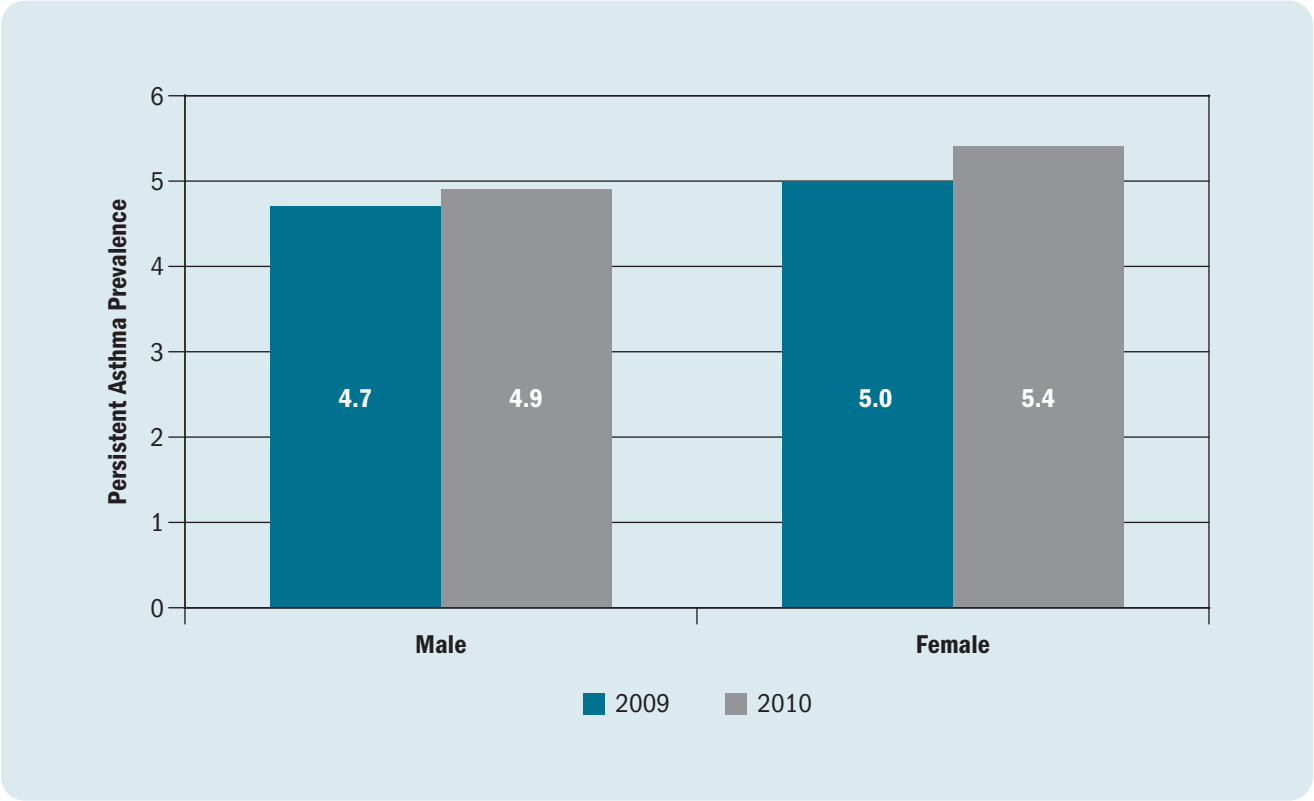
	Number with Persistent Asthma		Medicaid Managed Care Enrollees		Persistent Asthma Prevalence Rate per 100	
Age Group	2009	2010	2009	2010	2009	2010
0–4	6,625	7,155	160,058	173,364	4.1	4.1
5–11	18,611	19,462	292,416	311,500	6.4	6.2
12–50	29,023	33,913	788,724	842,776	3.7	4.0
51–64	16,016	20,056	205,968	224,772	7.8	8.9
Total	*70,275*	*80,586*	*1,447,166*	*1,552,412*	*4.9*	*5.2*

*24 months continuous enrollment.

Among the MMC enrollees with 24 months continuous enrollment by the end of 2009 or 2010, respectively, 70,275 (4.9%) and 80,586 (5.2%) met the definition of persistent asthma.

Persistent asthma prevalence among MMC enrollees varied by age. Enrollees aged 51-64 years had the highest prevalence rate of persistent asthma (7.8% in 2009 and 8.9% in 2010). Enrollees aged 12-50 years had the lowest prevalence rate at 3.7% in 2009 and 4.0% in 2010 (Figure 9-7, Table 9-7).

Figure 9-8
Persistent Asthma Prevalence* by Gender, Medicaid Managed Care Population, New York State, 2009-2010



*24 months continuous enrollment.

Table 9-8
Persistent Asthma Prevalence* by Gender, Medicaid Managed Care Population, New York State, 2009-2010

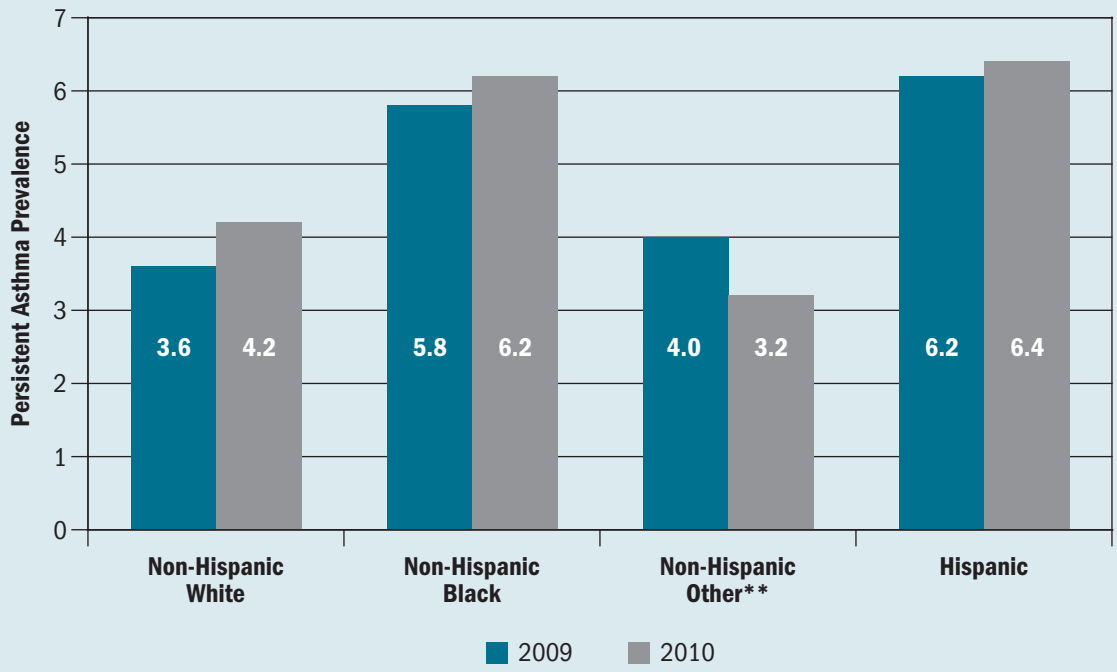
	Number with Persistent Asthma		Medicaid Managed Care Enrollees		Persistent Asthma Prevalence Rate per 100	
Age Group	2009	2010	2009	2010	2009	2010
Male	29,307	33,006	627,374	675,098	4.7	4.9
Female	40,968	47,580	819,792	877,314	5.0	5.4

*24 months continuous enrollment.

Prevalence of persistent asthma among MMC enrollees varied by gender. Females had a slightly higher prevalence rate of persistent asthma (5.0% in 2009 and 5.4% in 2010) compared to males (4.7% in 2009 and 4.9% in 2010) (Figure 9-8, Table 9-8).

Figure 9-9

Persistent Asthma Prevalence* by Race/Ethnicity,** Medicaid Managed Care Population, New York State, 2009-2010



*24 months continuous enrollment.

**Excludes enrollees with missing race/ethnicity.

***Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

Table 9-9

Persistent Asthma Prevalence* by Race/Ethnicity,** Medicaid Managed Care Population, New York State, 2009-2010

	Number with Persistent Asthma		Medicaid Managed Care Enrollees		Persistent Asthma Prevalence Rate per 100	
Race/Ethnicity**	2009	2010	2009	2010	2009	2010
Non-Hispanic White	12,436	15,459	342,444	371,546	3.6	4.2
Non-Hispanic Black	17,303	19,281	296,161	311,560	5.8	6.2
Non-Hispanic Other***	3,732	10,141	93,044	317,680	4.0	3.2
Hispanic	30,965	34,577	499,630	537,498	6.2	6.4

*24 months continuous enrollment.

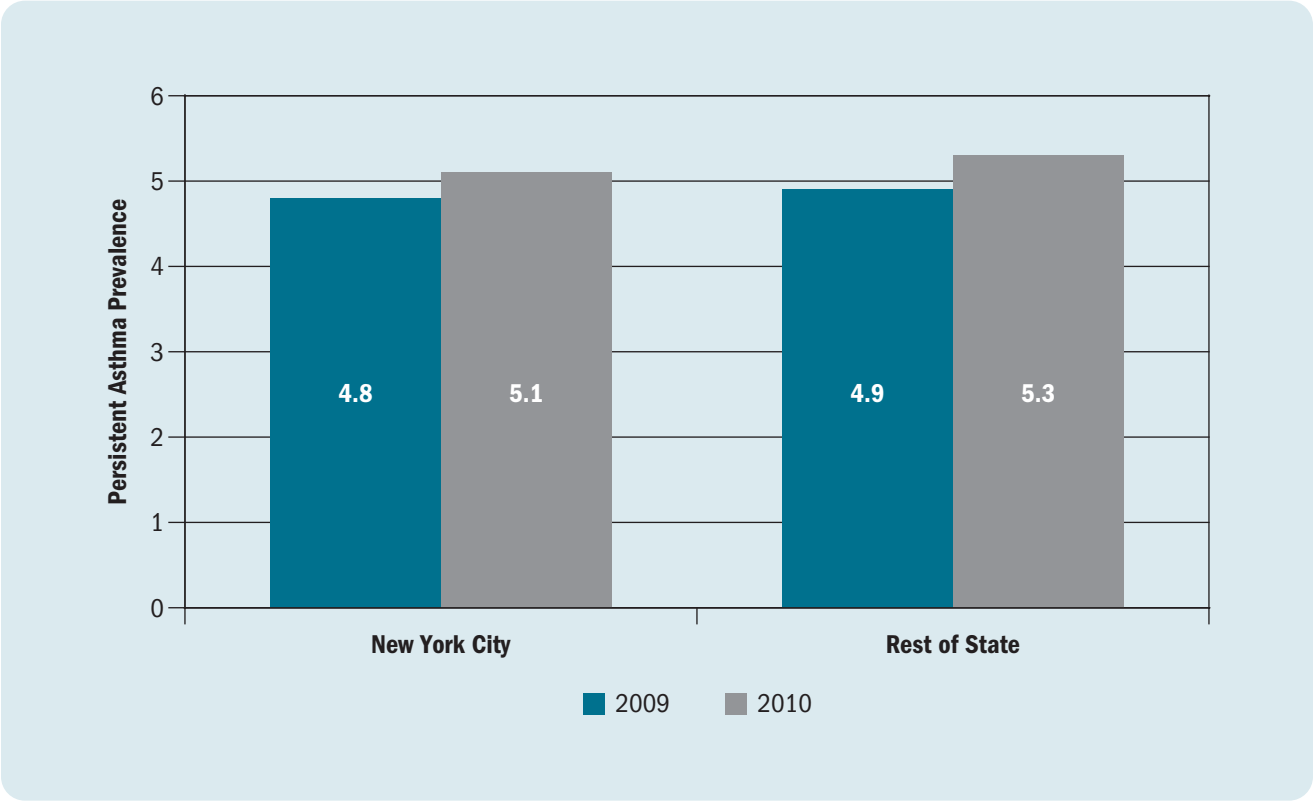
**Excludes enrollees with missing race/ethnicity.

***Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

Persistent asthma prevalence in MMC enrollees varied by race and ethnicity.

Hispanic enrollees had the highest prevalence rate of persistent asthma (6.2% in 2009 and 6.4% in 2010), followed by non-Hispanic black enrollees (5.8% in 2009 and 6.2% in 2010). Non-Hispanic other enrollees had the lowest prevalence rate in 2010 at 3.2% (Figure 9-9, Table 9-9).

Figure 9-10
Persistent Asthma Prevalence* by Region, Medicaid Managed Care Population, New York State, 2009-2010



*24 months continuous enrollment.

Table 9-10
Persistent Asthma Prevalence* by Region, Medicaid Managed Care Population, New York State, 2009-2010

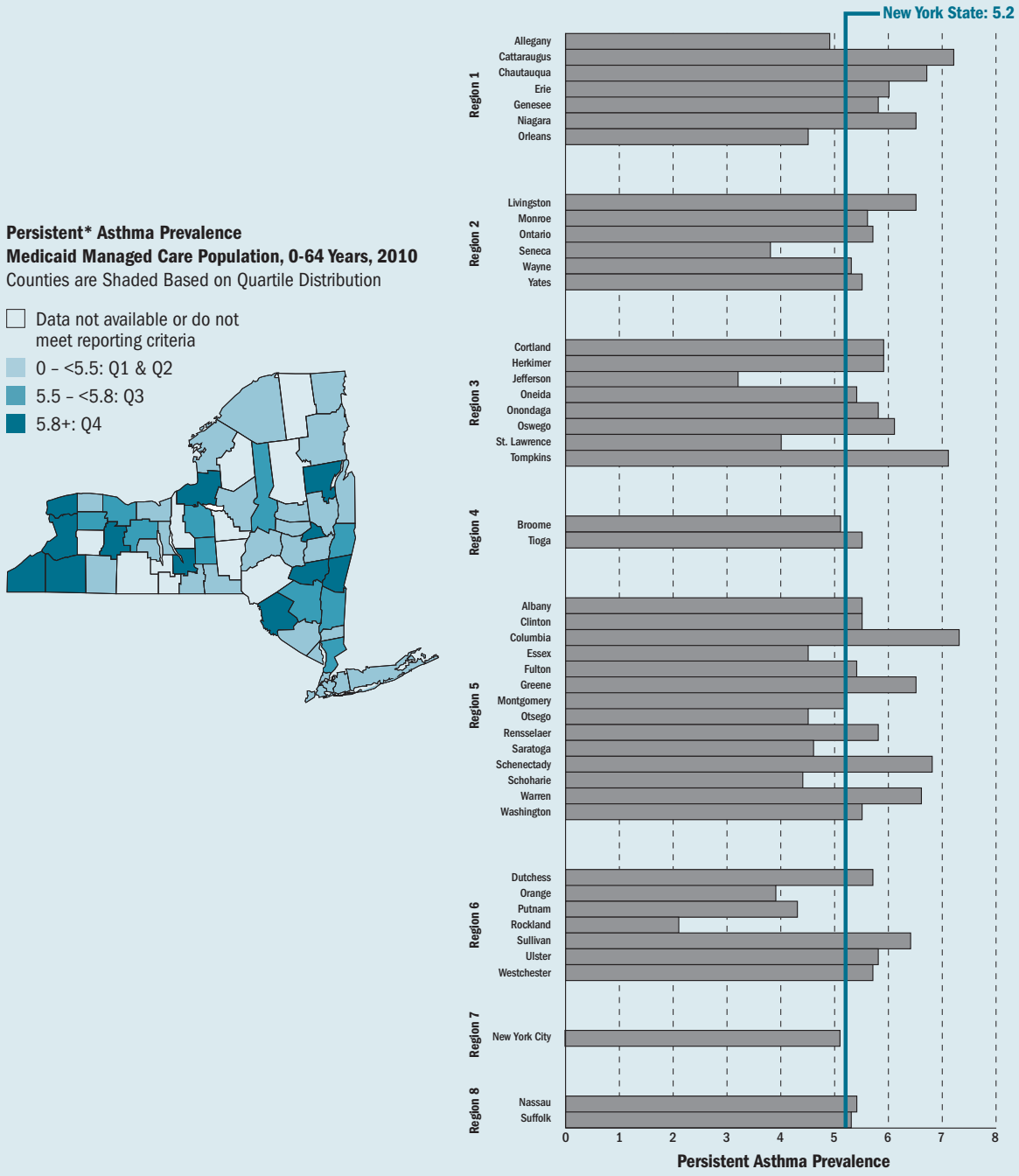
Region	Number with Persistent Asthma		Medicaid Managed Care Enrollees		Persistent Asthma Prevalence Rate per 100	
	2009	2010	2009	2010	2009	2010
New York City	54,690	60,307	1,127,915	1,171,827	4.8	5.1
Rest of State	15,585	20,279	319,251	380,585	4.9	5.3

*24 months continuous enrollment.

Persistent asthma prevalence among MMC enrollees was similar by region. For 2010, persistent asthma prevalence was 5.3% for Rest of State residents and 5.1% for those who reside in New York City (Figure 9-10, Table 9-10).

Figure 9-11

Persistent* Asthma Prevalence by County, Medicaid Managed Care Population, New York State, 2010



Source: Office of Health Insurance Programs Data Mart

*24 months continuous enrollment.

Table 9-11

Persistent Asthma Prevalence* by County, Medicaid Managed Care Population, New York State, 2009-2010

County	Persistent Asthma		Medicaid Managed Care Enrollees		Persistent Asthma Prevalence Rate per 100	
	2009	2010	2009	2010	2009	2010
Albany	401	535	8,469	9,755	4.7	5.5
Allegany	60	98	1,634	2,004	3.7	4.9
Broome	210	358	5,080	7,001	4.1	5.1
Cattaraugus	191	246	2,980	3,402	6.4	7.2
Cayuga	**	**	181	**	**	**
Chautauqua	498	610	7,716	9,142	6.5	6.7
Chemung	**	**	264	**	**	**
Chenango	**	**	139	**	**	**
Clinton	14	36	465	656	3.0	5.5
Columbia	101	127	1,380	1,747	7.3	7.3
Cortland	101	143	1,730	2,443	5.8	5.9
Delaware	**	**	102	**	**	**
Dutchess	280	366	5,332	6,464	5.3	5.7
Erie	1,953	2,430	35,547	40,377	5.5	6.0
Essex	**	17	250	378	**	4.5
Franklin	0	**	109	**	0.0	**
Fulton	113	166	2,310	3,099	4.9	5.4
Genesee	104	122	2,063	2,109	5.0	5.8
Greene	76	110	1,460	1,699	5.2	6.5
Hamilton	0	**	**	**	**	**
Herkimer	162	205	3,064	3,504	5.3	5.9
Jefferson	**	10	273	314	**	3.2
Lewis	**	**	60	**	**	**
Livingston	88	122	1,501	1,879	5.9	6.5
Madison	**	**	184	**	**	**
Monroe	1,901	2,426	37,630	43,635	5.1	5.6
Montgomery	104	164	2,221	3,162	4.7	5.2
Nassau	809	1,150	16,620	21,236	4.9	5.4
Niagara	561	689	9,507	10,676	5.9	6.5
Oneida	659	768	12,102	14,250	5.4	5.4
Onondaga	1,010	1,277	18,106	21,905	5.6	5.8
Ontario	143	194	2,747	3,410	5.2	5.7
Orange	605	734	16,290	19,046	3.7	3.9

*24 months continuous enrollment.

**Data are suppressed for confidentiality purposes if there are fewer than 10 MMC enrollees that meet the criteria for asthma universe or when the number of MMC enrollees (denominator) is less than 50.

Table 9-11 *continued*

Persistent Asthma Prevalence* by County, Medicaid Managed Care Population, New York State, 2009-2010

County	Persistent Asthma		Medicaid Managed Care Enrollees		Persistent Asthma Prevalence Rate per 100	
	2009	2010	2009	2010	2009	2010
Orleans	73	112	2,030	2,465	3.6	4.5
Oswego	344	437	6,329	7,213	5.4	6.1
Otsego	42	78	1,151	1,732	3.6	4.5
Putnam	26	34	632	792	4.1	4.3
Rensselaer	296	361	5,269	6,198	5.6	5.8
Rockland	451	574	24,906	27,633	1.8	2.1
St. Lawrence	**	10	270	252	**	4.0
Saratoga	139	202	3,472	4,360	4.0	4.6
Schenectady	231	321	3,680	4,753	6.3	6.8
Schoharie	**	14	241	321	**	4.4
Schuyler	**	**	46	**	**	**
Seneca	35	45	1,025	1,199	3.4	3.8
Steuben	**	**	218	**	**	**
Suffolk	1,597	2,185	33,405	41,081	4.8	5.3
Sullivan	162	198	2,759	3,072	5.9	6.4
Tioga	**	21	338	380	**	5.5
Tompkins	75	110	1,014	1,540	7.4	7.1
Ulster	286	356	5,060	6,177	5.7	5.8
Warren	28	47	530	708	5.3	6.6
Washington	61	99	1,276	1,815	4.8	5.5
Wayne	91	110	1,674	2,063	5.4	5.3
Westchester	1,396	1,743	25,250	30,768	5.5	5.7
Wyoming	0	**	105	**	0.0	**
Yates	52	65	1,029	1,186	5.1	5.5
New York City***	54,690	60,307	1,127,915	1,171,827	4.8	5.1

*24 months continuous enrollment.

**Data are suppressed for confidentiality purposes if there are fewer than 10 MMC enrollees that meet the criteria for asthma universe or when the number of MMC enrollees (denominator) is less than 50.

***Data for the five boroughs of New York City are combined.

Prevalence of persistent asthma among MMC enrollees varied by county. For 2010, enrollees from Columbia, Cattaraugus and Tompkins counties had the highest persistent asthma prevalence at 7.3%, 7.2%, and 7.1%, respectively. Enrollees from Rockland County had the lowest prevalence rate at 2.1%. New York City had a persistent asthma prevalence rate of 5.1% in 2010 (Figure 9-11, Table 9-11).

Methodology

Health service utilization data were generated for NYS MMC enrollees in the asthma universe population (see definition on page 133), aged 0-64 years, who were continuously enrolled in a MMC health plan (Health Maintenance Organization [HMO] or Prepaid Health Services Plan [PHSP]) for **12 or more months** as of December 2010.

Encounter (i.e., face-to-face) records were considered to be asthma-related if they had a primary diagnosis code of asthma (International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9 CM) code of 493.XX). Asthma-related pharmacy dispensing events were identified using the National Drug Codes specified in the HEDIS® 2011[21] guidelines indicative of asthma.

For the purpose of these health utilization analyses, services were divided into outpatient, emergency department, hospitalization, and pharmacy dispensing events. A hierarchical approach was taken to categorize the services. All hospitalization records were identified first, followed by emergency department services, pharmacy dispensing events and finally outpatient services. Because all records that were not identified as hospitalization, emergency room, or pharmacy were considered as outpatient services, this category may contain additional areas besides physician and clinic services (e.g., case management, community and rehabilitation services, dentist and dental services and hospice care).

The number and rate of these services and dispensing events per 100 asthma universe population is provided in the following tables. Results are presented for the total population, and stratified by age group, gender, race and ethnicity, and geographic region (New York City and Rest of State).

Table 9-12
Asthma-Related Utilization by Type of Health Care Service and Age Group,
Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Age Group	Asthma Universe	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	0–4	39,446	80,437	8,893	2,509	158,598
	5–11	58,348	107,185	9,586	1,736	330,014
	12–50	101,306	153,715	16,755	2,949	666,834
	51–64	34,267	51,042	3,356	1,716	379,351
	Total	*233,367*	*392,379*	*38,590*	*8,910*	*1,534,797*
2010	0–4	41,450	84,084	8,677	2,153	177,062
	5–11	59,508	106,470	9,184	1,373	347,408
	12–50	109,793	160,484	16,088	2,505	749,376
	51–64	38,599	57,479	3,539	1,731	453,403
	Total	*249,350*	*408,517*	*37,488*	*7,762*	*1,727,249*

Overall, there were 392,379 outpatient visits in 2009 and 408,517 in 2010; 38,590 ED visits in 2009 and 37,488 ED visits in 2010; and 8,910 hospitalizations in 2009 and 7,762 in 2010 due to asthma among the asthma universe population. In addition, 1,534,797 asthma-related pharmacy dispensing events occurred in 2009 and 1,727,249 occurred in 2010 (Table 9-12).

Table 9-13
Asthma-Related Utilization Rate (per 100 Asthma Universe Enrollees) by Type of Health Care Service and Age Group, Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Age Group	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	0-4	203.9	22.5	6.4	402.1
	5-11	183.7	16.4	3.0	565.6
	12-50	151.7	16.5	2.9	658.2
	51-64	149.0	9.8	5.0	1,107.0
	Total	*168.1*	*16.5*	*3.8*	*657.7*
2010	0-4	202.9	20.9	5.2	427.2
	5-11	178.9	15.4	2.3	583.8
	12-50	146.2	14.7	2.3	682.5
	51-64	148.9	9.2	4.5	1,174.6
	Total	*163.8*	*15.0*	*3.1*	*692.7*

The service and pharmacy-dispensing rates per 100 asthma universe individuals in each service category varied by age.

Asthma outpatient visit rates were higher for younger age groups. The overall rate of outpatient visits was 168.1 and 163.8 visits per 100 asthma universe individuals in 2009 and 2010, respectively.

Asthma ED visit rates varied by age group, with the highest rate among children aged 0-4 years (22.5 per 100 MMC asthma universe enrollees in 2009 and 20.9 per 100 in 2010) and the lowest rate among adults aged 51-64 years (9.8 per 100 in 2009 and 9.2 per 100 in 2010).

Hospitalizations due to asthma were also highest among young children aged 0-4 years (6.4 per 100 MMC asthma universe enrollees in 2009 and 5.2 in 2010).

Asthma-related pharmacy dispensing rates increased with age group. The pharmacy dispensing rate was highest among adults aged 51-64 years (1,107 pharmacy dispensing events per 100 MMC asthma universe enrollees in 2009 and 1,175 pharmacy dispensing events per 100 in 2010) (Table 9-13).

Table 9-14
Asthma-Related Utilization by Type of Health Care Service and Gender,
Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Age Group	Asthma Universe	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	Male	102,177	175,112	17,794	3,801	616,594
	Female	131,190	217,267	20,796	5,109	918,203
	Total	*233,367*	*392,379*	*38,590*	*8,910*	*1,534,797*
2010	Male	108,428	180,412	17,483	3,360	690,244
	Female	140,922	228,105	20,005	4,402	1,037,005
	Total	*249,350*	*408,517*	*37,488*	*7,762*	*1,727,249*

For females, there were 217,267 outpatient visits in 2009 and 228,105 in 2010; 20,796 ED visits in 2009 and 20,005 in 2010; 5,109 hospitalizations in 2009 and 4,402 in 2010 due to asthma among the asthma universe population. In addition, 918,203 asthma-related pharmacy dispensing events occurred in 2009 and 1,037,005 occurred in 2010.

For males, there were 175,112 outpatient visits in 2009 and 180,412 in 2010; 17,794 ED visits in 2009 and 17,483 in 2010; 3,801 hospitalizations in 2009 and 3,360 in 2010 due to asthma among the asthma universe population. In addition, 616,594 asthma-related pharmacy dispensing events occurred in 2009 and 690,244 occurred in 2010 (Table 9-14).

Table 9-15
Asthma-Related Utilization Rate (per 100 Asthma Universe Enrollees) by Type of Health Care Service and Gender,
Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Age Group	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	Male	171.4	17.4	3.7	603.5
	Female	165.6	15.9	3.9	699.9
2010	Male	166.4	16.1	3.1	636.6
	Female	161.9	14.2	3.1	735.9

The service or pharmacy-dispensing rates per 100 asthma universe individuals in each service category varied by gender.

MMC asthma universe female enrollees had a lower outpatient visit rate (165.6 per 100 MMC asthma universe enrollees in 2009 and 161.9 per 100 in 2010) than MMC asthma universe male enrollees (171.4 per 100 in 2009 and 166.4 per 100 in 2010). In addition, rates of ED visits were also lower for MMC female enrollees with asthma (15.9 per 100 in 2009 and 14.2 per 100 in 2010) compared to male enrollees with asthma (17.4 per 100 in 2009 and 16.1 per 100 in 2010).

Asthma hospitalizations among MMC female enrollees were similar to male enrollees (3.9 and 3.7 per 100 MMC asthma universe enrollees in 2009 respectively and 3.1 per 100 in 2010). MMC asthma universe female enrollees had higher asthma-related pharmacy dispensing rates (699.9 pharmacy dispensing events per 100 in 2009 and 735.9 per 100 in 2010) than male enrollees (603.5 per 100 in 2009 and 636.6 per 100 in 2010) (Table 9-15).

Table 9-16
Asthma-Related Utilization by Type of Health Care Service and Race/Ethnicity,*
Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Race/ Ethnicity*	Asthma Universe	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	Non-Hispanic White	48,679	73,154	4,045	1,059	299,486
	Non-Hispanic Black	55,887	97,174	13,965	3,112	359,918
	Non-Hispanic Other**	31,507	46,757	2,875	622	184,215
	Hispanic	93,832	168,943	17,168	3,955	661,833
2010	Non-Hispanic White	54,137	77,179	4,110	844	356,117
	Non-Hispanic Black	58,668	99,764	13,695	2,693	400,371
	Non-Hispanic Other**	34,714	50,625	3,143	610	213,371
	Hispanic	99,381	176,629	16,217	3,509	734,254

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

MMC asthma universe non-Hispanic white enrollees had 73,154 outpatient visits in 2009 and 77,179 outpatient visits in 2010; non-Hispanic black enrollees had 97,174 outpatient visits in 2009 and 99,764 outpatient visits in 2010; non-Hispanic other enrollees had 46,757 outpatient visits in 2009 and 50,625 outpatient visits in 2010 and Hispanic enrollees had 168,943 outpatient visits in 2009 and 176,629 outpatient visits in 2010.

There were 4,045 ED visits in 2009 and 4,110 ED visits in 2010 for non-Hispanic white enrollees; 13,965 ED visits in 2009 and 13,695 ED visits in 2010 for non-Hispanic black enrollees; 2,875 ED visits in 2009 and 3,143 ED visits in 2010 for non-Hispanic other enrollees and 17,168 ED visits in 2009 and 16,217 ED visits in 2010 for Hispanic enrollees.

Asthma hospitalizations among MMC non-Hispanic white enrollees were 1,059 in 2009 and 844 in 2010; for non-Hispanic black enrollees there were 3,112 in 2009 and 2,693 in 2010; for non-Hispanic other enrollees there were 622 in 2009 and 610 in 2010 and for Hispanic enrollees there were 3,955 in 2009 and 3,509 in 2010.

In addition, 299,486 asthma-related pharmacy dispensing events occurred in 2009 and 356,117 occurred in 2010 for non-Hispanic white enrollees; 359,918 occurred in 2009 and 400,371 occurred in 2010 for non-Hispanic black enrollees; 184,215 occurred in 2009 and 213,371 occurred in 2010 for non-Hispanic other enrollees and 661,833 occurred in 2009 and 734,254 occurred in 2010 for Hispanic enrollees (Table 9-16).

Table 9-17

Asthma-Related Utilization Rate (per 100 Asthma Universe Enrollees) by Type of Health Care Service and Race/Ethnicity,* Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Race/ Ethnicity*	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	Non-Hispanic White	150.3	8.3	2.2	615.2
	Non-Hispanic Black	173.9	25.0	5.6	644.0
	Non-Hispanic Other**	148.4	9.1	2.0	584.7
	Hispanic	180.0	18.3	4.2	705.3
2010	Non-Hispanic White	142.6	7.6	1.6	657.8
	Non-Hispanic Black	170.0	23.3	4.6	682.4
	Non-Hispanic Other**	145.8	9.1	1.8	614.7
	Hispanic	177.7	16.3	3.5	738.8

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

The service or pharmacy-dispensing rates per 100 asthma universe individuals in each service category varied by race and ethnicity.

Regarding asthma-related outpatient visits, MMC asthma universe Hispanic enrollees had the highest outpatient visit rate (180.0 per 100 MMC asthma universe enrollees in 2009 and 177.7 per 100 in 2010) while non-Hispanic other enrollees had the lowest outpatient visit rate (148.4 per 100 in 2009 and 145.8 per 100 in 2010).

Asthma ED visit rates varied by race and ethnicity, with the highest rate among non-Hispanic black MMC universe enrollees (25.0 per 100 MMC asthma universe enrollees in 2009 and 23.3 per 100 in 2010) and the lowest rate among non-Hispanic white enrollees (8.3 per 100 in 2009 and 7.6 per 100 in 2010). Hospitalizations due to asthma were also highest among non-Hispanic black enrollees (4.6 per 100 in 2010), and lowest among non-Hispanic white enrollees (1.6 in 2010).

Asthma-related pharmacy dispensing rates among MMC universe enrollees were highest for Hispanics (705.3 pharmacy dispensing events per 100 MMC asthma universe enrollees in 2009 and 738.8 pharmacy dispensing events per 100 in 2010) and lowest among non-Hispanic other enrollees in 2009 (584.7 per 100) and 2010 (614.7 per 100) (Table 9-17).

Table 9-18
Asthma-Related Utilization by Type of Health Care Service and Region,
Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Region	Asthma Universe	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	New York City	167,700	278,243	30,464	7,072	1,162,700
	Rest of State	65,667	114,136	8,126	1,838	372,097
2010	New York City	172,567	281,000	29,043	6,118	1,267,760
	Rest of State	76,783	127,517	8,445	1,644	459,489

MMC asthma universe enrollees in New York City had 278,243 outpatient visits in 2009 and 281,000 outpatient visits in 2010. MMC asthma universe enrollees from the Rest of State had 114,136 outpatient visits in 2009 and 127,517 outpatient visits in 2010.

In addition, there were 30,464 ED visits for MMC enrollees with asthma who resided in New York City in 2009 and 29,043 ED visits in 2010. There were 8,126 ED visits in 2009 and 8,445 ED visits in 2010 for those in the Rest of State.

Asthma hospitalizations among MMC enrollees living in New York City were 7,072 in 2009 and 6,118 in 2010; for enrollees living in the Rest of State there were 1,838 in 2009 and 1,644 in 2010.

In addition, 1,162,700 asthma-related pharmacy dispensing events occurred in 2009 and 1,267,760 occurred in 2010 for those living in New York City; 372,097 occurred in 2009 and 459,489 occurred in 2010 for those in the Rest of State (Table 9-18).

Table 9-19
Asthma-Related Utilization Rate (per 100 Asthma Universe Enrollees) by Type of Health Service and Region,
Medicaid Managed Care Asthma Universe Population, New York State, 2009-2010

	Region	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
2009	New York City	165.9	18.2	4.2	693.3
	Rest of State	173.8	12.4	2.8	566.6
2010	New York City	162.8	16.8	3.5	734.6
	Rest of State	166.1	11.0	2.1	598.4

The service and pharmacy-dispensing rates per 100 asthma universe individuals in each service category varied by region.

MMC asthma universe enrollees in New York City had a lower outpatient visit rate (165.9 per 100 MMC asthma universe enrollees in 2009 and 162.8 per 100 in 2010) than MMC asthma universe enrollees from the Rest of State (173.8 per 100 in 2009 and 166.1 per 100 in 2010).

Conversely, rates of ED visits were also higher for MMC enrollees with asthma who reside in New York City (18.2 per 100 MMC asthma universe enrollees in 2009 and 16.8 per 100 in 2010) compared to those in the Rest of State (12.4 per 100 in 2009 and 11.0 per 100 in 2010).

Asthma hospitalizations among MMC enrollees were also higher for those living in New York City (4.2 per 100 MMC asthma universe enrollees in 2009 and 3.5 per 100 in 2010) than in the Rest of State (2.8 per 100 in 2009 and 2.1 per 100 in 2010).

There were differences in asthma-related pharmacy dispensing rates for MMC asthma universe enrollees when comparing New York City (693.3 pharmacy dispensing events per 100 in 2009 and 734.6 per 100 in 2010) and Rest of State residents (566.6 per 100 in 2009 and 598.4 per 100 in 2010) (Table 9-19).

Asthma Prevalence Among the Child Health Plus Population

Methodology

This section presents prevalence data for New York State (NYS) residents enrolled in the Child Health Plus (CHP) program. CHP is a health insurance program for uninsured NYS residents under the age of 19. (For detailed information, please refer to NYSDOH's website at www.health.ny.gov/health_care/child_health_plus.

Asthma universe and persistent asthma prevalence data for the CHP population, aged 0-18 years, with continuous CHP enrollment of **12 or more months** as of December 2010, are presented. Prevalence data are shown for the total population, and stratified by age group, gender, race and ethnicity, county of residence, and geographic region (New York City and Rest of State).

Asthma Universe Prevalence Among the Child Health Plus Population

Asthma Universe Prevalence by Socio-demographic Characteristics

Table 9-20
Asthma Universe Prevalence by Age Group, Child Health Plus Population, New York State, 2010

Age Group	Asthma Universe	Child Health Plus Enrollees	Asthma Universe Prevalence Rate per 100
0–4	2,581	20,035	12.9
5–11	11,341	88,306	12.8
12–18	9,631	117,678	8.2
Total	*23,553*	*226,019*	*10.4*

There were 23,553 (10.4%) children who met the asthma universe definition among approximately 226,000 CHP enrollees.

Asthma universe prevalence among CHP enrollees varied by age. In 2010, enrollees aged 0-4 and 5-11 years had the highest prevalence rate of asthma universe (12.9% and 12.8%, respectively) (Table 9-20).

Table 9-21
Asthma Universe Prevalence by Gender, Child Health Plus Population, New York State, 2010

Gender	Asthma Universe	Child Health Plus Enrollees	Asthma Universe Prevalence Rate per 100
Male	13,535	116,078	11.7
Female	10,018	109,941	9.1

Asthma universe prevalence among CHP enrollees varied by gender. In 2010, boys had a higher prevalence rate of asthma universe (11.7%) compared to girls (9.1%) (Table 9-21).

Table 9-22
Asthma Universe Prevalence by Race/Ethnicity*, Child Health Plus Population, New York State, 2010

Race/Ethnicity*	Asthma Universe	Child Health Plus Enrollees	Asthma Universe Prevalence Rate per 100
Non-Hispanic White	7,601	71,306	10.7
Non-Hispanic Black	2,565	22,382	11.5
Non-Hispanic Other**	1,818	19,568	9.3
Hispanic	6,061	58,462	10.4

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

Asthma universe prevalence among CHP enrollees varied by race and ethnicity. Non-Hispanic black enrollees had the highest prevalence rate of asthma universe (11.5%), followed by non-Hispanic white enrollees (10.7%). Non-Hispanic other enrollees had the lowest rate of asthma universe prevalence (9.3%) (Table 9-22).

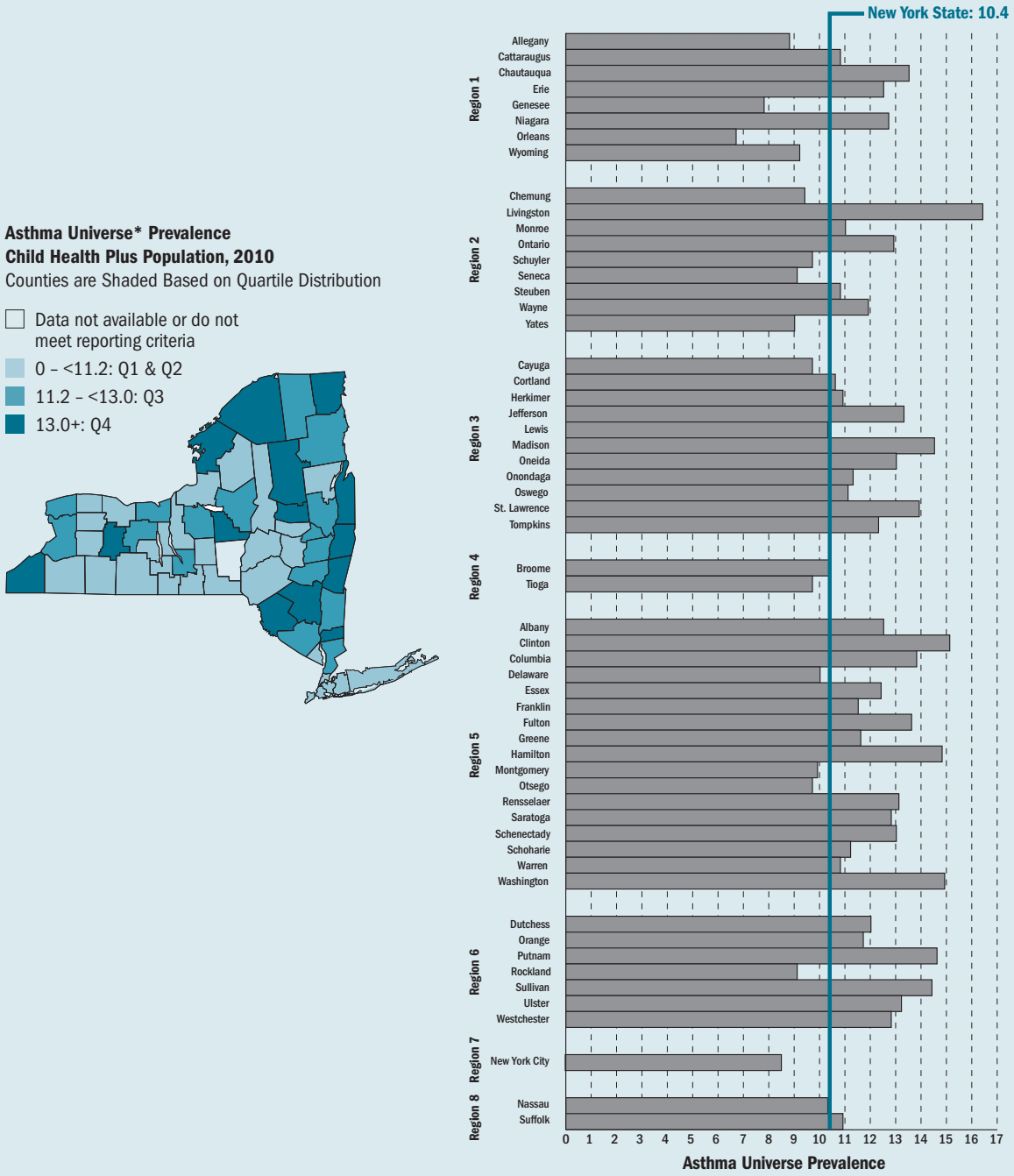
Table 9-23
Asthma Universe Prevalence by Region, Child Health Plus Population, New York State, 2010

Region	Asthma Universe	Child Health Plus Enrollees	Asthma Universe Prevalence Rate per 100
New York City	7,526	88,092	8.5
Rest of State	16,027	137,927	11.6

Asthma universe prevalence among CHP enrollees varied by region. In 2010, Rest of State residents had a higher prevalence rate of asthma universe (11.6%) compared to New York City residents (8.5%) (Table 9-23).

Figure 9-12

Asthma Universe Prevalence* by County, Child Health Plus Population, New York State, 2010



Source: Office of Health Insurance Programs Data Mart

*12 months continuous enrollment.

**Data for the five boroughs of New York City are combined.

Table 9-24

Asthma Universe Prevalence* by County, Child Health Plus Population, New York State, 2010

County	Asthma Universe	Child Health Plus Enrollees	Asthma Universe Prevalence Rate per 100
Albany	389	3,123	12.5
Allegany	44	502	8.8
Broome	230	2,213	10.4
Cattaraugus	106	979	10.8
Cayuga	114	1,172	9.7
Chautauqua	204	1,512	13.5
Chemung	61	648	9.4
Chenango	**	**	**
Clinton	114	754	15.1
Columbia	143	1,037	13.8
Cortland	45	423	10.6
Delaware	32	321	10.0
Dutchess	337	2,811	12.0
Erie	1,223	9,759	12.5
Essex	59	476	12.4
Franklin	54	468	11.5
Fulton	128	944	13.6
Genesee	52	668	7.8
Greene	76	653	11.6
Hamilton	13	88	14.8
Herkimer	164	1,502	10.9
Jefferson	199	1,495	13.3
Lewis	56	543	10.3
Livingston	104	635	16.4
Madison	131	901	14.5
Monroe	1,004	9,139	11.0
Montgomery	95	964	9.9
Nassau	1,584	15,316	10.3
Niagara	327	2,581	12.7
Oneida	501	3,844	13.0
Onondaga	715	6,351	11.3
Ontario	178	1,376	12.9
Orange	515	4,392	11.7

*12 months continuous enrollment.

**Data are suppressed for confidentiality purposes if there are fewer than 10 CHP enrollees that meet the criteria for asthma universe or when the number of CHP enrollees (denominator) is less than 50.

Table 9-24 *continued*
Asthma Universe Prevalence* by County, Child Health Plus Population, New York State, 2010

County	Asthma Universe	Child Health Plus Enrollees	Asthma Universe Prevalence Rate per 100
Orleans	41	615	6.7
Oswego	281	2,539	11.1
Otsego	58	600	9.7
Putnam	20	137	14.6
Rensselaer	251	1,917	13.1
Rockland	367	4,032	9.1
St. Lawrence	186	1,336	13.9
Saratoga	329	2,562	12.8
Schenectady	341	2,622	13.0
Schoharie	59	529	11.2
Schuyler	22	226	9.7
Seneca	36	396	9.1
Steuben	128	1,185	10.8
Suffolk	2,264	20,809	10.9
Sullivan	195	1,358	14.4
Tioga	50	514	9.7
Tompkins	108	881	12.3
Ulster	230	1,741	13.2
Warren	67	618	10.8
Washington	167	1,123	14.9
Wayne	177	1,483	11.9
Westchester	1,580	12,319	12.8
Wyoming	40	436	9.2
Yates	32	354	9.0
New York City***	7,526	88,092	8.5
Total	*23,552*	*226,014*	*10.4*

*12 months continuous enrollment.

***Data for the five boroughs of New York City are combined.

Prevalence of asthma universe among CHP enrollees varied by county. For 2010, among counties in the Rest of State, enrollees from Livingston County had the highest asthma universe prevalence rate (16.4%), while enrollees from Orleans County had the lowest prevalence rate (6.7%). New York City had an asthma universe prevalence rate of 8.5% in 2010 (Figure 9-12, Table 9-24).

Persistent Asthma Prevalence Among the Child Health Plus Population

Persistent Asthma Prevalence by Socio-demographic Characteristics

Table 9-25
Persistent Asthma Prevalence by Age Group, Child Health Plus Population, New York State, 2010

Age Group	Persistent Asthma Prevalence	Child Health Plus Enrollees	Persistent Asthma Prevalence Rate per 100
0–4	576	8,088	7.1
5–11	4,633	55,654	8.3
12–18	4,111	81,440	5.0
Total	*9,320*	*145,182*	*6.4*

Among the CHP enrollees with 24 months continuous enrollment by the end of 2010, 9,320 individuals (6.4%) met the definition of persistent asthma.

Persistent asthma prevalence among CHP enrollees varied by age. For 2010, CHP enrollees aged 5-11 years had the highest prevalence rate of persistent asthma (8.3%), followed by enrollees aged 0-4 years (7.1%). CHP enrollees aged 12-18 years had the lowest prevalence rate at 5.0% (Table 9-25).

Table 9-26
Persistent Asthma Prevalence by Gender, Child Health Plus Population, New York State, 2010

Gender	Persistent Asthma Universe	Child Health Plus Enrollees 2010	Persistent Asthma Prevalence Rate per 100
Male	5,504	74,826	7.4
Female	3,816	70,356	5.4

Persistent asthma prevalence in CHP enrollees varied by gender. Boys had a higher prevalence rate of persistent asthma (7.4%) compared to girls (5.4%) (Figure 9-26).

Table 9-27
Persistent Asthma Prevalence by Race/Ethnicity*, Child Health Plus Population, New York State, 2010

Race/Ethnicity*	Persistent Asthma Prevalence	Child Health Plus Enrollees	Persistent Asthma Prevalence Rate per 100
Non-Hispanic White	3,099	46,072	6.7
Non-Hispanic Black	910	12,339	7.4
Non-Hispanic Other**	694	12,951	5.4
Hispanic	2,359	38,045	6.2

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

Persistent asthma prevalence in CHP enrollees varied by race and ethnicity.

Non-Hispanic black CHP enrollees had the highest prevalence rate of persistent asthma at 7.4%. Non-Hispanic other enrollees had the lowest prevalence rate in 2010 at 5.4% (Figure 9-27).

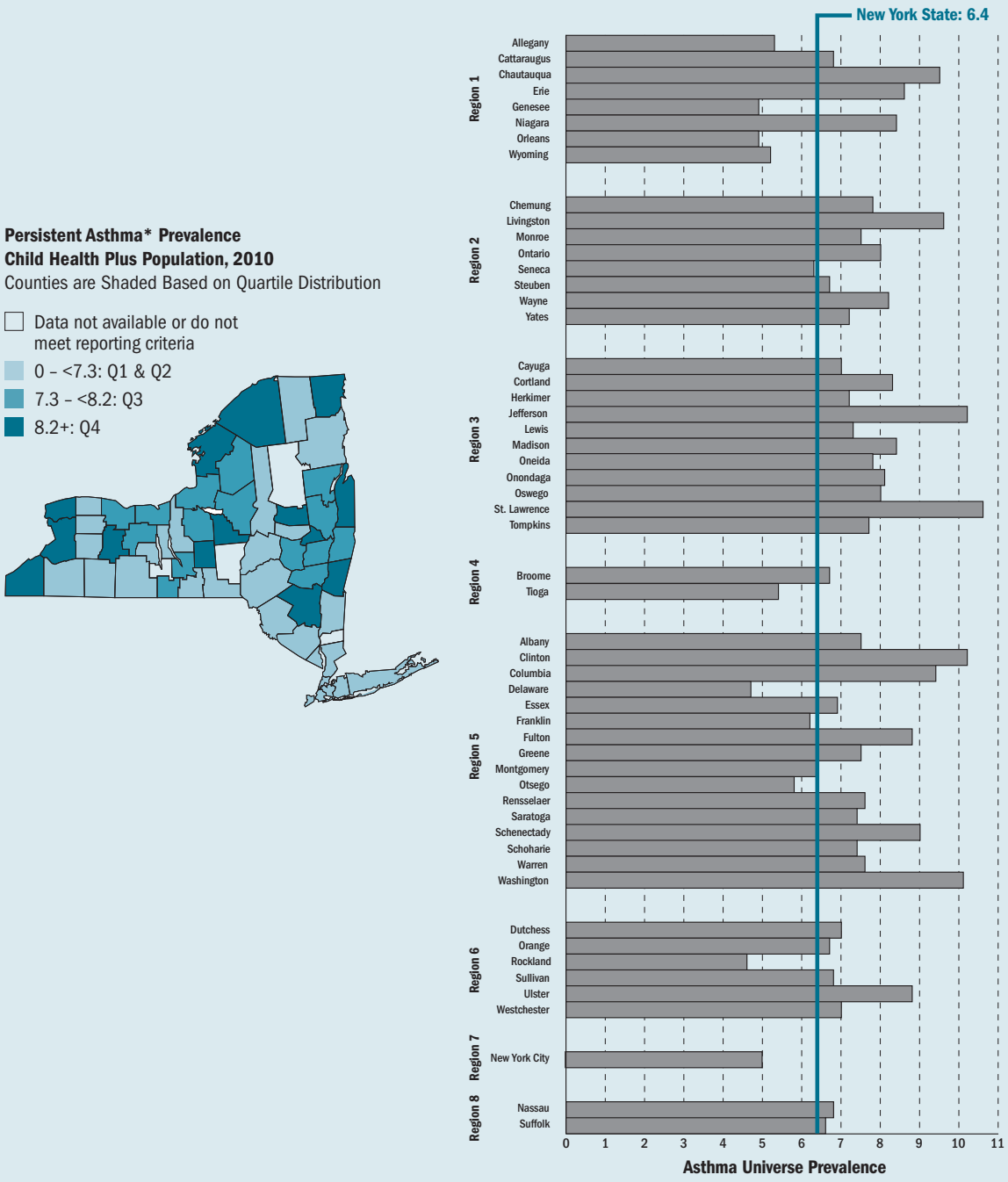
Table 9-28
Persistent Asthma Prevalence by Region, Child Health Plus Population, New York State, 2010

Region	Persistent Asthma Prevalence	Child Health Plus Enrollees	Persistent Asthma Prevalence Rate per 100
New York City	2,920	58,186	5.0
Rest of State	6,400	86,996	7.4

Persistent asthma prevalence among CHP enrollees varied by region. For 2010, persistent asthma prevalence was higher for Rest of State residents (7.4%) compared to CHP enrollees who reside in New York City (5.0%) (Figure 9-28).

Figure 9-13

Persistent Asthma Prevalence* by County, Child Health Plus Population, New York State, 2010



Source: Office of Health Insurance Programs Data Mart

*24 months continuous enrollment.

**Data for the five boroughs of New York City are combined.

Table 9-29

Persistent Asthma Prevalence* by County, Child Health Plus Population, New York State, 2010

County	Persistent Asthma Prevalence	Child Health Plus Enrollees	Persistent Asthma Prevalence Rate per 100
Albany	145	1,933	7.5
Allegany	17	321	5.3
Broome	85	1,275	6.7
Cattaraugus	41	603	6.8
Cayuga	50	719	7.0
Chautauqua	93	974	9.5
Chemung	32	408	7.8
Chenango	**	**	**
Clinton	46	450	10.2
Columbia	58	617	9.4
Cortland	17	205	8.3
Delaware	10	213	4.7
Dutchess	112	1,603	7.0
Erie	538	6,233	8.6
Essex	21	305	6.9
Franklin	18	289	6.2
Fulton	52	588	8.8
Genesee	21	425	4.9
Greene	32	428	7.5
Hamilton	**	**	**
Herkimer	74	1,032	7.2
Jefferson	94	919	10.2
Lewis	26	357	7.3
Livingston	37	385	9.6
Madison	45	536	8.4
Monroe	417	5,581	7.5
Montgomery	40	626	6.4
Nassau	636	9,351	6.8
Niagara	133	1,583	8.4
Oneida	201	2,568	7.8
Onondaga	328	4,046	8.1
Ontario	68	854	8.0
Orange	176	2,639	6.7

*12 months continuous enrollment.

**Data are suppressed for confidentiality purposes if there are fewer than 10 CHP enrollees that meet the criteria for asthma universe or when the number of CHP enrollees (denominator) is less than 50.

Table 9-29 *continued*

Asthma Universe Prevalence* by County, Child Health Plus Population, New York State, 2010

County	Persistent Asthma Prevalence	Child Health Plus Enrollees	Persistent Asthma Prevalence Rate per 100
Orleans	18	369	4.9
Oswego	136	1,702	8.0
Otsego	21	364	5.8
Putnam	**	**	**
Rensselaer	92	1,215	7.6
Rockland	116	2,499	4.6
St. Lawrence	92	869	10.6
Saratoga	121	1,638	7.4
Schenectady	157	1,747	9.0
Schoharie	25	338	7.4
Schuyler	**	**	**
Seneca	16	256	6.3
Steuben	47	705	6.7
Suffolk	893	13,478	6.6
Sullivan	59	863	6.8
Tioga	16	297	5.4
Tompkins	43	555	7.7
Ulster	85	964	8.8
Warren	31	408	7.6
Washington	73	725	10.1
Wayne	74	903	8.2
Westchester	578	8,293	7.0
Wyoming	15	287	5.2
Yates	15	208	7.2
New York City***	2,920	58,186	5.0
Total	*9,306*	*144,935*	*6.4*

*24 months continuous enrollment.

**Data are suppressed for confidentiality purposes if there are fewer than 10 CHP enrollees that meet the criteria for asthma universe or when the number of CHP enrollees (denominator) is less than 50.

***Data for the five boroughs of New York City are combined.

Persistent asthma prevalence among CHP enrollees varied by county. For 2010, among counties in the Rest of State, enrollees from St. Lawrence County, Clinton and Jefferson counties had the highest persistent asthma prevalence at 10.6%, 10.2%, and 10.2%, respectively. Enrollees from Rockland County and Delaware County had the lowest prevalence rate at 4.6% and 4.7%, respectively. New York City had a persistent asthma prevalence rate of 5.0% in 2010 (Figure 9-13, Table 9-29).

Methodology

This section presents health service utilization data for New York State (NYS) residents enrolled in the Child Health Plus (CHP) program. CHP is a health insurance program for uninsured NYS residents under the age of 19. (For detailed information, please refer to NYSDOH's website at www.health.ny.gov/health_care/child_health_plus).

Health service utilization data were generated for NYS CHP enrollees in the asthma universe (see definition on page 133), aged 0-18 years, who were continuously enrolled in CHP for **12 or more months** as of December 2010.

Encounter records were considered to be asthma-related if they were submitted with a primary diagnosis code of asthma (International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9 CM) code of 493.XX. Asthma-related pharmacy fillings were identified using the National Drug Codes specified in the HEDIS® 2011[21] guidelines indicative of asthma.

For the purpose of these health utilization analyses, services were divided into inpatient, emergency department, outpatient, and pharmacy services. A hierarchical approach was taken to categorize the services. All inpatient records were identified first, followed by emergency department services, pharmacy records and finally outpatient services. Because all records that were not identified as inpatient, emergency room, or pharmacy were considered as outpatient services, this category may contain additional areas besides physician and clinic services.

The number of these services per 100 asthma universe population is also provided. Results are presented for total population, and stratified by age group, gender, race and ethnicity, and geographic region (New York City and Rest of State).

Asthma-Related Health Care Service Utilization by Socio-demographic Characteristics

Table 9-30
Asthma-Related Health Care Service Utilization by Age Group, Child Health Plus Population, New York State, 2010

Age Group	Asthma Universe	Outpatient Visits	ED Visits	Hospitali-zations	Pharmacy Dispensing Events
0–4	2,581	4,714	375	149	9,697
5–11	11,341	18,634	1,096	248	54,282
12–18	9,631	12,551	747	140	40,067
Total	23,553	35,899	2,218	537	104,046

In 2010, there were 35,899 outpatient visits; 2,218 ED visits; and 537 hospitalizations due to asthma among the asthma universe population for CHP enrollees. In addition, 104,046 asthma-related pharmacy dispensing events occurred in 2010 (Table 9-30).

Table 9-31
Asthma-Related Health Care Service Utilization per 100 Asthma Universe Enrollees by Age Group, Child Health Plus Population, New York State, 2010

Age Group	Outpatient Visits	ED Visits	Hospitali-zations	Pharmacy Dispensing Events
0–4	182.6	14.5	5.8	375.7
5–11	164.3	9.7	2.2	478.6
12–18	130.3	7.8	1.5	416.0
Total	*152.4*	*9.4*	*2.3*	*441.8*

For 2010, the service or pharmacy-dispensing rates per 100 asthma universe individuals in each service category varied by age. Asthma outpatient visit rates were higher for younger age groups. The overall rate of outpatient visits was 152.4 per 100 CHP asthma universe individuals in 2010. Asthma ED visit rates varied by age group, with the highest rate among children aged 0-4 years (15 per 100) and the lowest rate among children aged 12-18 years (8 per 100). Hospitalizations due to asthma were also highest among young children aged 0-4 years (6 per 100). Asthma-related pharmacy dispensing rates were highest among the 5-11 year-old age group (479 dispensing events per 100) (Table 9-31).

Table 9-32
Asthma-Related Health Care Service Utilization by Gender, Child Health Plus Population, New York State, 2010

Gender	Asthma Universe	Outpatient Visits	Hospitalizations	ED Visits	Pharmacy Dispensing Events
Male	13,535	21,020	1,347	310	61,759
Female	10,018	14,879	871	227	42,287

In 2010, for girls enrolled in CHP, there were 14,879 outpatient visits; 871 ED visits; and 227 hospitalizations due to asthma among the asthma universe population. In addition, 42,287 asthma-related pharmacy dispensing events occurred in 2010.

For boys enrolled in CHP, there were 21,020 outpatient visits; 1,347 ED visits; and 310 hospitalizations due to asthma among the asthma universe population. In addition, 61,759 asthma-related dispensing events occurred in 2010 (Table 9-32).

Table 9-33
Asthma-Related Health Care Service Utilization per 100 Asthma Universe Enrollees by Gender, Child Health Plus Population, New York State, 2010

Gender	Outpatient Visits	ED Visits	Hospitalizations	Pharmacy Dispensing Events
Male	155.3	10.0	2.3	456.3
Female	148.5	8.7	2.3	422.1

The service or pharmacy-dispensing rates per 100 asthma universe individuals in each service category varied by gender.

In 2010, CHP asthma universe female enrollees had a lower outpatient visit rate (148.5 per 100 CHP asthma universe enrollees) than CHP asthma universe male enrollees (155.3 per 100). In addition, rates of ED visits were also lower for MMC female enrollees with asthma (8.7 per 100) compared to male enrollees with asthma (10.0 per 100).

The rate of asthma hospitalizations among CHP female enrollees was the same as male enrollees (2.3 per 100 CHP asthma universe enrollees). Boys enrolled in CHP had higher asthma-related pharmacy dispensing rates (456.3 pharmacy dispensing events per 100) than girls who were enrolled in CHP (422.1 per 100) (Table 9-33).

Table 9-34
Asthma-Related Health Service Utilization by Race/Ethnicity,* Child Health Plus Population, New York State, 2010

Race/Ethnicity*	Asthma Universe	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
Non-Hispanic White	7,601	11,737	499	106	34,678
Non-Hispanic Black	2,565	3,789	427	121	12,141
Non-Hispanic Other**	1,818	2,752	105	25	7,416
Hispanic	6,061	9,346	714	167	24,644

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

In 2010, CHP asthma universe non-Hispanic white enrollees had 11,737 outpatient visits; non-Hispanic black enrollees had 3,789 outpatient visits; Hispanic enrollees had 9,346 outpatient visits and non-Hispanic other enrollees had 2,752 outpatient visits.

There were 499 ED visits in 2010 for non-Hispanic white enrollees; 427 ED visits in for non-Hispanic black enrollees; 714 ED visits for Hispanic enrollees; and 105 ED visits in 2010 for non-Hispanic other CHP enrollees.

There were 106 asthma hospitalizations among CHP non-Hispanic white enrollees in 2010. There were 167 hospitalizations for Hispanic CHP enrollees and 121 asthma hospitalizations among non-Hispanic black children enrolled in CHP.

In addition, 78,879 asthma-related pharmacy dispensing events occurred in 2010; 12,141 were filled for non-Hispanic black CHP enrollees and 24,644 were filled for Hispanic children enrolled in CHP (Table 9-34).

Table 9-35
Asthma-Related Health Care Service Utilization per 100 Asthma Universe Enrollees by Race/Ethnicity,*
Child Health Plus Population, New York State, 2010

Race/Ethnicity*	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Dispensing Events
Non-Hispanic White	154.4	6.6	1.4	456.2
Non-Hispanic Black	147.7	16.6	4.7	473.3
Non-Hispanic Other**	151.4	5.8	1.4	407.9
Hispanic	154.2	11.8	2.8	406.6

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

The service or pharmacy-dispensing rates per 100 CHP asthma universe individuals in each service category varied by race and ethnicity.

In 2010, CHP asthma universe non-Hispanic white and Hispanic enrollees had the highest outpatient visit rate (154.4 per 100 CHP asthma universe enrollees) while non-Hispanic black enrollees had the lowest outpatient visit rate (147.7 per 100).

Asthma ED visit rates varied by race and ethnicity, with the highest rate among non-Hispanic black CHP universe enrollees (16.6 per 100 CHP asthma universe enrollees) and the lowest rate among non-Hispanic other enrollees (5.8 per 100). Hospitalizations due to asthma were also highest among non-Hispanic black enrollees (4.7 per 100).

Asthma-related pharmacy dispensing rates among CHP universe enrollees were also higher for non-Hispanic black children (473.3 pharmacy dispensing events per 100 CHP asthma universe enrollees) (Table 9-35).

Table 9-36
Asthma-Related Health Service Utilization by Region, Child Health Plus Population, New York State, 2010

Region	Asthma Universe	Outpatient Visits	Hospitalizations	ED Visits	Pharmacy Dispensing Events
New York City	7,526	10,781	999	207	29,528
Rest of State	16,027	25,118	1,219	330	74,518

CHP asthma universe enrollees in New York City had 10,781 outpatient visits in 2010. CHP asthma universe enrollees from the Rest of State had 25,118 outpatient visits in 2010.

For 2010, there were 999 ED visits for CHP enrollees with asthma who resided in New York City. There were 1,219 ED for children enrolled in CHP living in the Rest of State.

Asthma hospitalizations among CHP enrollees living in New York City were 207; there were 330 in 2010 for those living in the Rest of State.

In addition, 29,528 asthma-related pharmacy dispensing events occurred in 2010 for residents of New York City; 74,518 were filled for those in the Rest of State (Table 9-36).

Table 9-37
Asthma-Related Health Care Service Utilization per 100 Asthma Universe Enrollees by Region, Child Health Plus Population, New York State, 2010

Region	Outpatient Visits	ED Visits	Hospitalizations	Pharmacy Dispensing Events
New York City	143.3	13.3	2.8	392.3
Rest of State	156.7	7.6	2.1	465.0

The service utilization or pharmacy-dispensing rates per 100 asthma universe individuals in each service category varied by region.

For 2010, CHP asthma universe enrollees in New York City had a lower outpatient visit rate (143.3 per 100) than CHP asthma universe enrollees from the Rest of State (156.7 per 100).

Rates of ED visits were higher for CHP enrollees with asthma who reside in New York City (13.3 per 100 CHP asthma universe enrollees) compared to those in the Rest of State (7.6 per 100).

Asthma hospitalizations among CHP enrollees were slightly higher for those living in New York City (2.8 per 100 CHP asthma universe enrollees) than in the Rest of State (2.1 per 100).

There were also differences in asthma-related pharmacy dispensing rates for CHP asthma universe enrollees when comparing New York City (392.3 dispensing events per 100 CHP asthma universe enrollees) and the Rest of State (465.0 dispensing events per 100) (Table 9-37).

Managed Care Quality Assurance Reporting Requirement Asthma-Specific Indicators

Methodology

Quality Assurance Reporting Requirements (QARR) consist of measures from the National Committee for Quality Assurance's (NCQA) Health Plan Effectiveness Data and Information Set (HEDIS®) 2010[22] and NYS-specific measures. This report presents 2010 data for "Use of Appropriate Medications for People with Asthma" and "Appropriate Asthma Medications – 3+ Controllers," which are two measures for asthma (see: www.health.ny.gov/health_care/managed_care/qarrfull/qarr_2011/docs/qarr2011.pdf). The QARR measures for asthma care are defined as follows:

Measure	Description
Use of Appropriate Medications for People with Asthma	The percentage of enrollees (ages 5-50 years) with persistent asthma who have received appropriate medications (i.e., at least one prescription for inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers or methylxanthines). This measure was generated for the Medicaid, Child Health Plus and Commercial insurance populations that were enrolled continuously for a 24-month period by December 2009 and 2010.
Appropriate Asthma Medications – 3+ Controllers	The percentage of enrollees (ages 5-50 years) with persistent asthma who had three or more controller medication dispensing events in the last year. This measure was generated for the Medicaid, Child Health Plus and Commercial insurance populations that were enrolled continuously for a 24-month period by December 2009 and 2010.

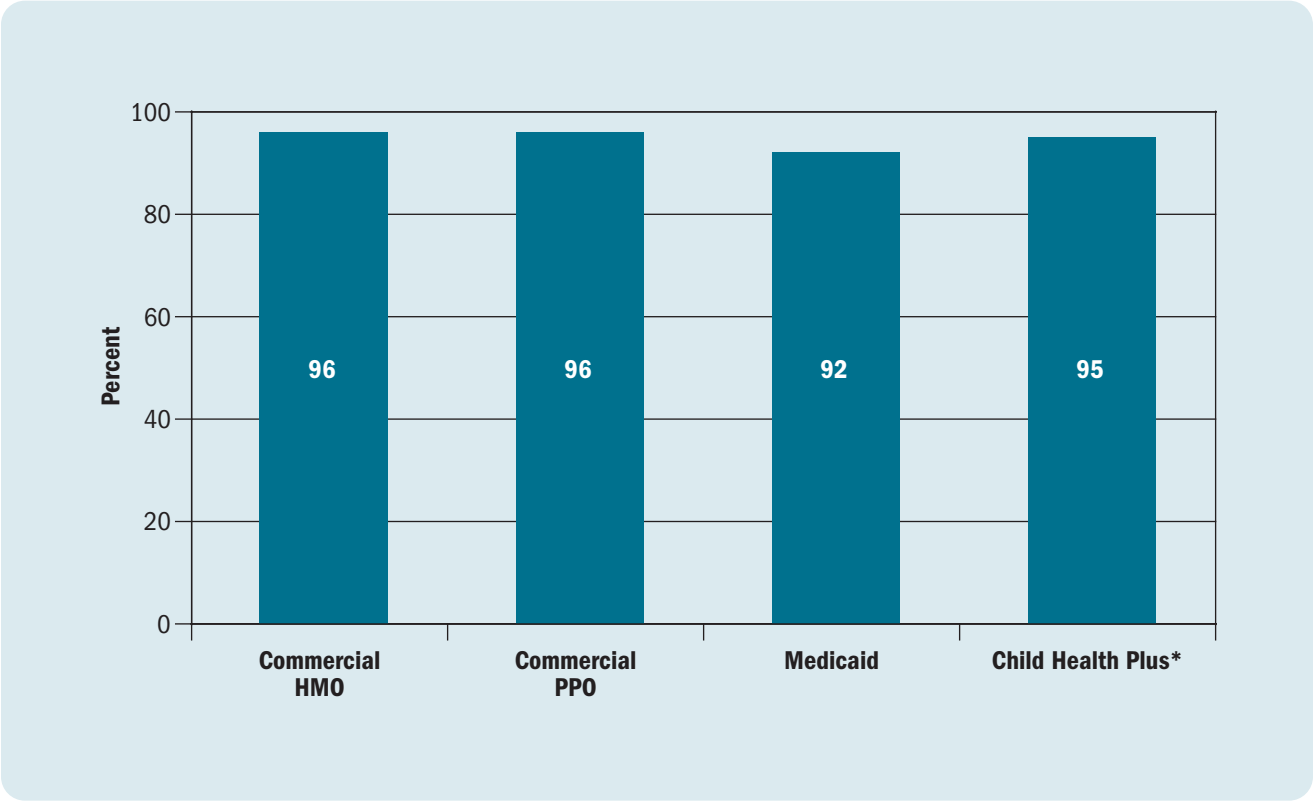
The QARR measure for asthma in this report summarizes information about care received during 2010 from 27 health plans. Twelve plans reported data about their Commercial enrollees; 18 plans reported on their Medicaid enrollees; and 19 plans reported on Child Health Plus enrollees. Child Health Plus data for one plan are not included in the report due to small sample size. Eleven plans reported data on their Preferred Provider Organization (PPO) membership for year 2010.

The measures were generated for children aged 5-11 years and adults aged 12-50 years by type of plan.

In addition, demographic variation is presented in maps for the following measures and age groups:

- "Use of Appropriate Medications for People with Asthma" measure for ages 5-50 years (see: www.health.ny.gov/health_care/managed_care/reports/docs/demographic_variation_2011.pdf);
- "Appropriate Asthma Medications – 3+ Controllers" for ages 5-11 years (see: www.health.ny.gov/health_care/managed_care/qarrfull/qarr_2011/docs/qarr2011.pdf).

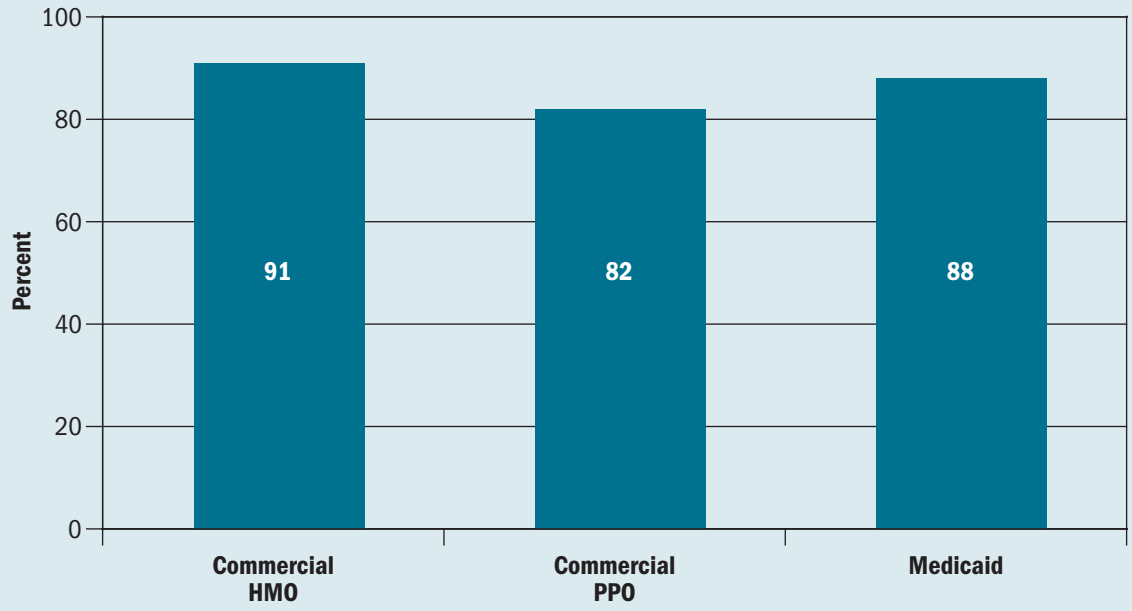
Figure 9-14
Percentages of Children (5-11 Years) with Persistent Asthma Who Received Appropriate Medications by Type of Plan, New York State, 2010



*Child Health Plus data includes children aged 5-18 years.

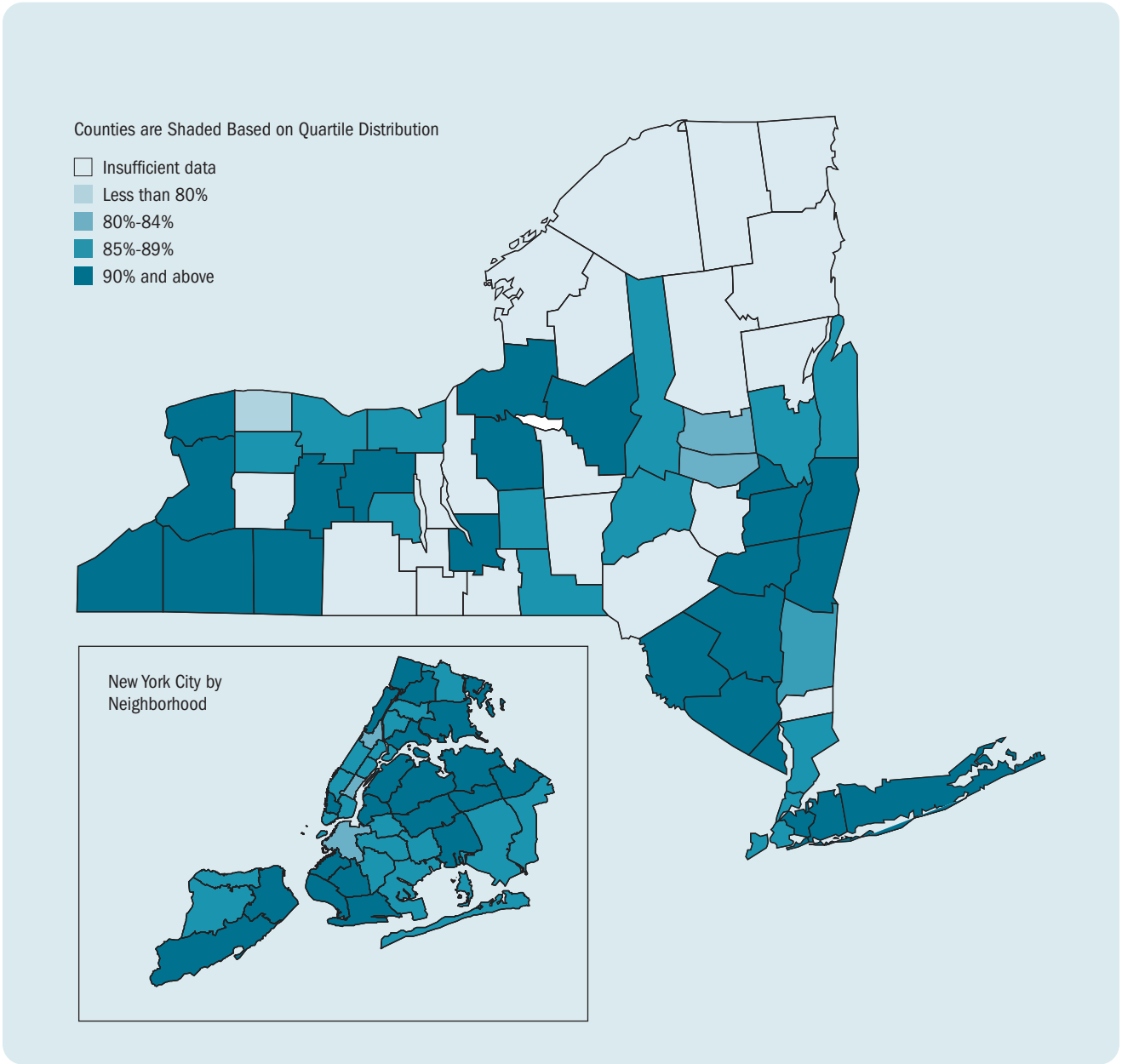
In 2010, children aged 5-11 years with persistent asthma who were enrolled in Commercial HMO (96%) and PPO (96%) plans showed a slightly higher proportion receiving appropriate medications compared to those enrolled in Medicaid managed care (MMC) (92%) and the Child Health Plus plan (95%) (Figure 9-14).

Figure 9-15
Percentages of Individuals (12-50 Years) with Persistent Asthma Who Received Appropriate Medications by Type of Plan, New York State, 2010



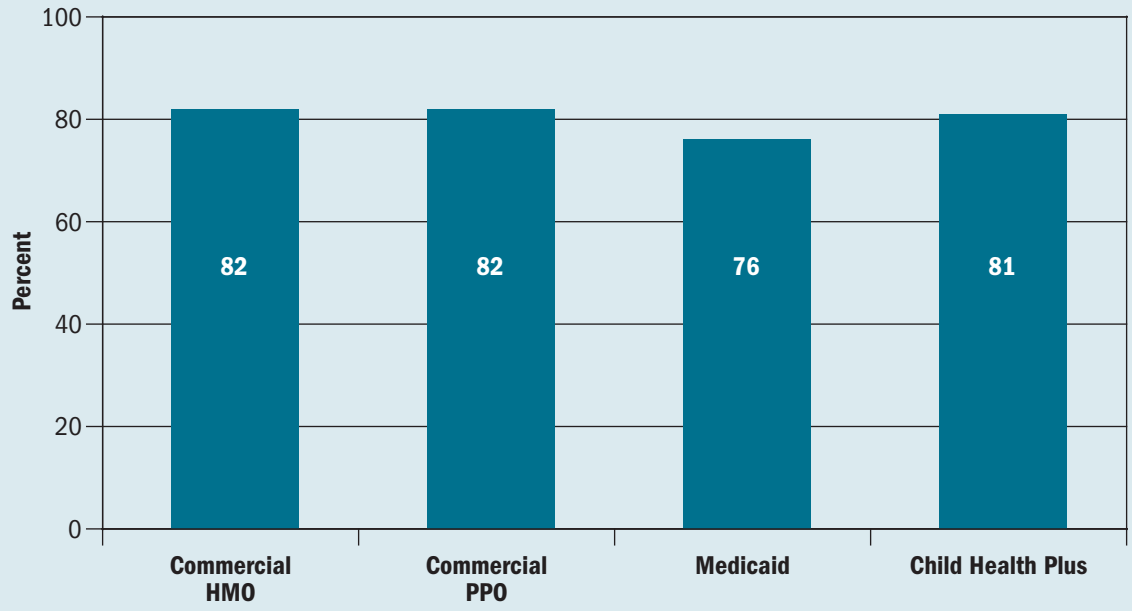
In 2010, Commercial HMO plans showed a slightly higher proportion of enrollees aged 12-50 years with persistent asthma receiving appropriate medications (91%) compared to the percentages among enrollees in Medicaid (88%) or Commercial PPO (82%) plans (Figure 9-15).

Figure 9-16
Percentages of Individuals (5-50 Years) with Persistent Asthma Who Received Appropriate Medications by County, New York State, 2010



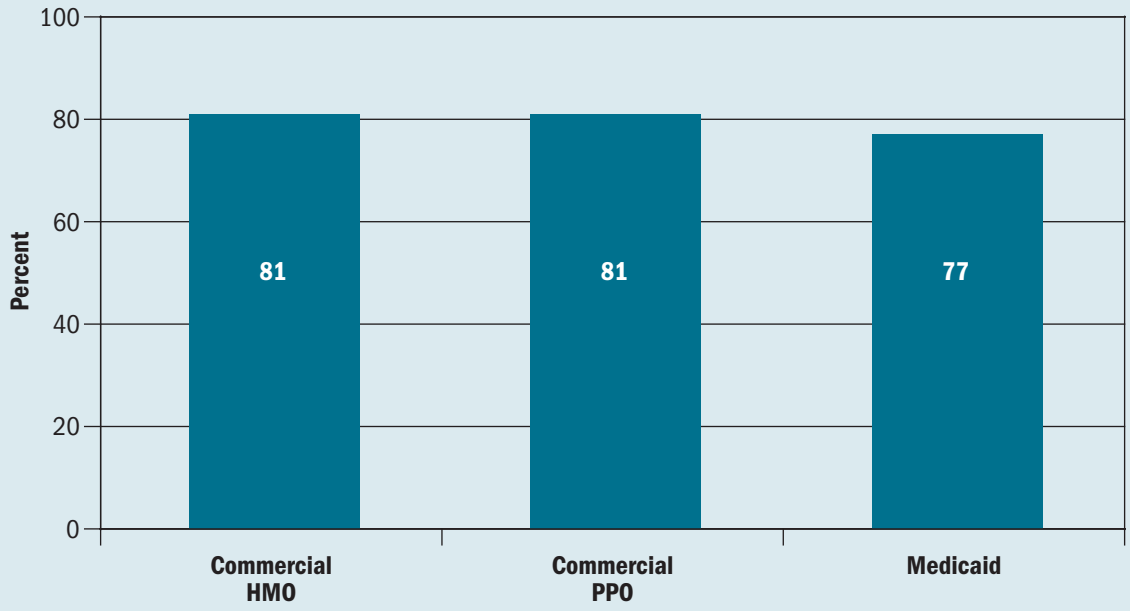
In 2010, among individuals aged 5-50 years with persistent asthma, there was variation by county regarding ongoing use of appropriate medications to control their asthma. Orleans County had the lowest percentage of individuals with persistent asthma (less than 80%) who received appropriate medications (Figure 9-16).

Figure 9-17
Percentages of Children (5-11 Years) with Persistent Asthma Who Had Three or More Controller Medication Dispensing Events in the Past Year by Type of Plan, New York State, 2010



In 2010, children aged 5-11 years with persistent asthma who were enrolled in Commercial (82%) health plans and Child Health Plus (81%) were more likely to have three or more controller medications dispensed in the past year compared to those enrolled in MMC (76%) (Figure 9-17).

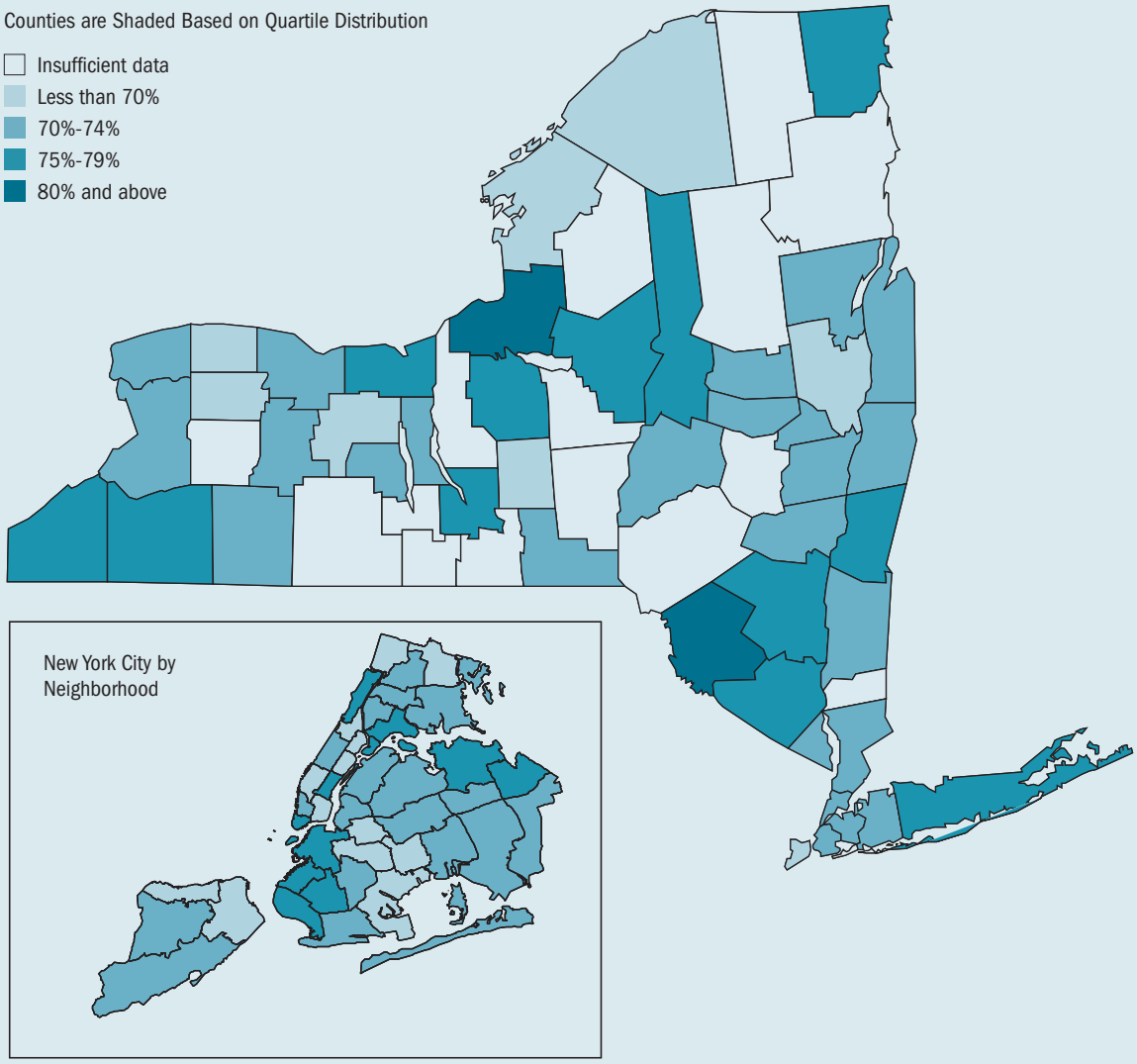
Figure 9-18
Percentages of Individuals (12-50 Years) with Persistent Asthma Who Had Three or More Controller Medications Dispensing Events in the Past Year by Type of Plan, New York State, 2010



In 2010, a higher proportion of individuals aged 12-50 years with persistent asthma who were enrolled in Commercial health plans had three or more controller medications dispensed in the past year (81%) compared to those enrolled in MMC plans (77%) (Figure 9-18).

Figure 9-19

Percentages of Children* (5-11 Years) with Persistent Asthma Who Had Three or More Controller Medication Dispensing Events in the Past Year by County, New York State, 2010



*These results represent children in Medicaid managed care and Child Health Plus combined. The child's county of residence was used for this analysis. For areas in NYC, neighborhoods were used instead of counties for more localized results.

In 2010, among children aged 5-11 years with persistent asthma, there was variation by county regarding use of appropriate medications to control their asthma as defined by having three or more asthma controller medications dispensed during the past year. Oswego and Sullivan counties had the highest percentage of children (85% and above) who had three or more controller medication dispensing events in the past year while children in Orleans and Genesee counties had the lowest percentages (less than 70%) (Figure 9-19).

Methodology

The Agency for Healthcare Research and Quality (AHRQ) has created a set of Quality Indicators (QIs) that use hospital inpatient discharge data to assess the quality of asthma care as well as other conditions (see: www.qualityindicators.ahrq.gov/). QIs are grouped into two modules: Prevention Quality Indicators (PQIs) and Pediatric Quality Indicators (PDIs).

Even though these indicators are based on hospital inpatient data, they provide insights about the community health care system or services outside the hospital setting. For example, patients with asthma may be hospitalized for asthma complications if their conditions are not adequately monitored or if they do not receive the patient education needed for appropriate self-management.

The PQIs/PDIs can be used as a "screening tool" to help flag potential health care quality problem areas that need further investigation and provide a quick check on primary care access or outpatient services in a community by using patient data found in a typical hospital discharge abstract. The information can also help public health agencies, State data organizations, health care systems and others interested in improving health care quality in their communities.

The receipt of high-quality, community-based primary care can often prevent hospitalizations for these illnesses. Admittedly, other factors outside the direct control of the health care system, such as poor environmental conditions or lack of patient adherence to treatment recommendations, can result in hospitalization. However, the PQIs/PDIs provide a good starting point for assessing quality of health services in the community.

Two adult asthma-related PQI measures and one child asthma-related PDI measure were generated for the NYS MMC asthma universe population aged 2-64 years, who were continuously enrolled in a MMC health plan (Health Maintenance Organization [HMO] or Prepaid Health Services Plan [PHSP]) for 24 or more months as of December 2010.

The QI rates are presented for the total population, and stratified by gender, race/ethnicity, and geographic region (New York City and Rest of State). Because the PQIs/PDIs estimate the number of potentially avoidable hospital admissions**, a lower rate is desirable**.

Hospital inpatient discharge data from 2010 were used to calculate the following three measures:

Pediatric Quality Indicator #14 – Asthma Admission Rate

- **Numerator:** All discharges of children aged 2-17 years with ICD-9-CM principal diagnosis code of asthma.
- **Denominator:** All discharges ages 2-17 years for the asthma universe population, excluding transfers into the hospital, discharges for MDC 14 (pregnancy, childbirth and puerperium), or any discharge with a diagnosis code for cystic fibrosis or anomalies of the respiratory system.

Prevention Quality Indicator #15 – Asthma in Younger Adults Admission Rate

- **Numerator:** All discharges of adults aged 18-39 years with ICD-9-CM principal diagnosis code of asthma.
- **Denominator:** All discharges of adults aged 18-39 years for the asthma universe population, excluding transfers into the hospital, discharges for MDC 14 (pregnancy, childbirth and puerperium), or any discharge with a diagnosis code for cystic fibrosis or anomalies of the respiratory system.

Prevention Quality Indicator #5 – Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate

- **Numerator:** All discharges of adults aged 40 years and older with ICD-9-CM principal diagnosis code for COPD or asthma.
- **Denominator:** All discharges of adults aged 40 years and older for the asthma universe population, excluding transfers into the hospital or discharges for MDC 14 (pregnancy, childbirth and puerperium).

Table 9-38

Preventable Hospital Admissions for Asthma Among Medicaid Managed Care Asthma Universe Population, Children (2-17 Years), New York State, 2010

		Asthma Hospitalizations	Asthma Universe	Prevention Quality Indicator Rate per 100
Gender	Male	1,093	2,403	45.5
	Female	638	1,515	42.1
Race/Ethnicity*	Non-Hispanic White	99	346	28.6
	Non-Hispanic Black	676	1,367	49.5
	Non-Hispanic Other**	132	336	39.3
	Hispanic	808	1,822	44.3
Region	New York City	1,452	3,158	46.0
	Rest of State	279	760	36.7
	NYS Total	*1,731*	*3,918*	*44.2*

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

In 2010, among the asthma universe population aged 2-17 years, 44.2% of asthma hospital admissions in NYS could potentially have been avoided through more effective outpatient care. Preventable asthma hospital admissions were nearly two times higher for children (0-17 years) than adults (18-39 and 40+ years) (Table 9-38, 9-39 and 9-40).

Among the asthma universe population aged 2-17 years, the percentage of asthma hospital admissions that were potentially avoidable was higher for boys (45.5 %) than girls (42.1%).

Among the asthma universe population aged 2-17 years, non-Hispanic black (49.5 %) and Hispanic (44.3 %) children had the highest percentage of asthma hospital admissions that were potentially avoidable; non-Hispanic white (28.6 %) children had the lowest percentage.

Among the asthma universe population aged 2-17 years, the percentage of asthma hospital admissions that were potentially avoidable was higher for New York City residents (46.0 %) than those living in the Rest of State (36.7 %) (Table 9-38).

Table 9-39

Preventable Hospital Admissions for Asthma Among Medicaid Managed Care Asthma Universe Population, Adults (18-39 Years), New York State, 2010

		Asthma Hospitalizations	Asthma Universe	Prevention Quality Indicator Rate per 100
Gender	Male	97	468	20.7
	Female	397	1,726	23.0
Race/Ethnicity*	Non-Hispanic White	65	505	12.9
	Non-Hispanic Black	179	688	26.0
	Non-Hispanic Other**	28	160	17.5
	Hispanic	219	818	26.8
Region	New York City	382	1,486	25.7
	Rest of State	112	708	15.8
	NYS Total	*494*	*2,194*	*22.5*

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

In 2010, among the asthma universe population aged 18-39 years, 22.5% of asthma hospital admissions in NYS could potentially have been avoided through more effective outpatient care.

Among the asthma universe population aged 18-39 years, the percentage of asthma hospital admissions that were potentially avoidable was higher for females (23.0%) than males (20.7%).

Among the asthma universe population aged 18-39 years, the percentage of asthma hospital admissions that were potentially avoidable was two times higher for Hispanic (26.8 %) and non-Hispanic black adults (26.0%) when compared to non-Hispanic white (12.9%) adults.

Among the asthma universe population aged 18-39 years, the percentage of asthma hospital admissions that were potentially avoidable was higher for New York City residents (25.7%) than those living in the Rest of State (15.8%) (Table 9-39).

Table 9-40

Preventable Hospital Admission Rate for Chronic Obstructive Pulmonary Disease/Asthma, Medicaid Managed Care Asthma Universe Population, Older Adults (40+ Years), New York State, 2010

		Asthma Hospitalizations	Asthma Universe	Prevention Quality Indicator Rate per 100
Gender	Male	561	2,538	22.1
	Female	1,895	7,808	24.3
Race/Ethnicity*	Non-Hispanic White	448	2,225	20.1
	Non-Hispanic Black	755	3,032	24.9
	Non-Hispanic Other**	158	685	23.1
	Hispanic	1,026	4,133	24.8
Region	New York City	1,866	7,502	24.9
	Rest of State	590	2,844	20.7
	NYS Total	*2,456*	*10,346*	*23.7*

*Excludes enrollees with missing race/ethnicity.

**Non-Hispanic Other race included American Indian/Alaskan Native, Asian, and Pacific Islander.

In 2010, among the asthma universe population aged 40 years and older, 23.7% of asthma hospital admissions in NYS could potentially have been avoided through more effective outpatient care.

Among the asthma universe population aged 40 years and older, the percentage of asthma hospital admissions that were potentially avoidable was higher for females (24.3%) than males (22.1%).

Among the asthma universe population aged 40 years and older, non-Hispanic black (24.9%) and Hispanic (24.8%) adults had the highest percentage of asthma hospital admissions that were potentially avoidable; non-Hispanic white (20.1%) adults had the lowest percentage.

Among the asthma universe population aged 40 years and older, the percentage of asthma hospital admissions that were potentially avoidable was higher for New York City residents (24.9%) than those living in the Rest of State (20.7%) (Table 9-40).

10

Work-Related Asthma

Work-related asthma (WRA) is a term used to describe asthma that has a temporal association between asthma symptoms and the work environment.[23, 24] It can be a new condition or it can be work-aggravated asthma. It has been estimated that approximately 36% to 48% of adult asthma is caused or made worse by workplace exposures, which translates to approximately 8.6 million adults in the United States.[25-27] However, work-related asthma continues to be underdiagnosed. Diagnosis of WRA is complicated by the difficulty in distinguishing it from non-WRA. Physicians must be willing and able to recognize and document the workplace exposures contributing to asthma, which involves taking occupational histories and asking questions to determine a temporal association between asthma and work. It is important that physicians consider the possibility of workplace exposure when treating an adult patient with either adult-onset asthma or worsening of current asthma. While the process may be complex, there is guidance available for physicians in the diagnosis and management of WRA.[28]

If diagnosed early, the workers' prognosis can improve if exposures can be identified and properly stopped or controlled.[24] There have been more than 350 substances identified as causing asthma or making asthma worse by triggering symptoms. The most effective approach is to identify the substances causing the asthma or triggering the asthma symptoms, and to avoid or modify exposure. This can be accomplished by eliminating use of the substance and substituting safer materials whenever possible. If this is not possible, engineering controls should be used such as ventilation, or use of personal protective equipment such as respirators, gloves, and goggles.

Highlights: Work-Related Asthma

Work-Related Asthma Emergency Department Visits

- The number of work-related asthma emergency department visits showed a 24% increase from 240 in 2005 to 297 in 2010 with a peak at 304 in 2006.

Work-Related Asthma Hospital Discharges

- For 2001 to 2010, the number of work-related asthma hospitalizations among NYS residents decreased approximately 26% from 74 to 55 with a peak at 90 in 2003.
- Over the last 10 years, the length of stay for a work-related asthma hospitalization ranged from 3.7 to 4.5 days, with a mean of 3.9 days.
- The average cost for a work-related asthma hospitalization was more than 2.5 times higher in 2010 ($19,729) than in 2001 ($7,410).
- In 2010, the total cost of work-related asthma hospitalizations in New York State exceeded $1 million.

Work-Related Asthma Incidence

New York State Occupational Health Clinic Network

- The number of definite or possible work-related asthma patients seen by the New York State Occupational Health Clinic Network in the past 10 years, by year of first visit, ranged from 78 in 2010 to 329 in 2004.

New York State Occupational Lung Disease Registry

- The number of work-related asthma cases reported to the New York State Occupational Lung Disease Registry during 2001 to 2008, by year of first report, ranged from 51 in 2008 to 157 in 2005.

Methodology

Asthma emergency department (ED) visit information from the Statewide Planning and Research Cooperative System (SPARCS) was reviewed for years 2005 to 2010 to identify ED visits related to WRA. These data were generated from two mutually exclusive databases within SPARCS: the Hospital Inpatient Database and the Outpatient Database.

The SPARCS Hospital Inpatient Database collects information on all hospital discharges from acute care and rehabilitation hospitals in NYS. The database includes records for patients who are admitted to the hospital directly from the ED and for those who are hospitalized without first utilizing the ED. It is possible that the same patient may be hospitalized for asthma multiple times and, as a result, could be counted more than once in these data.

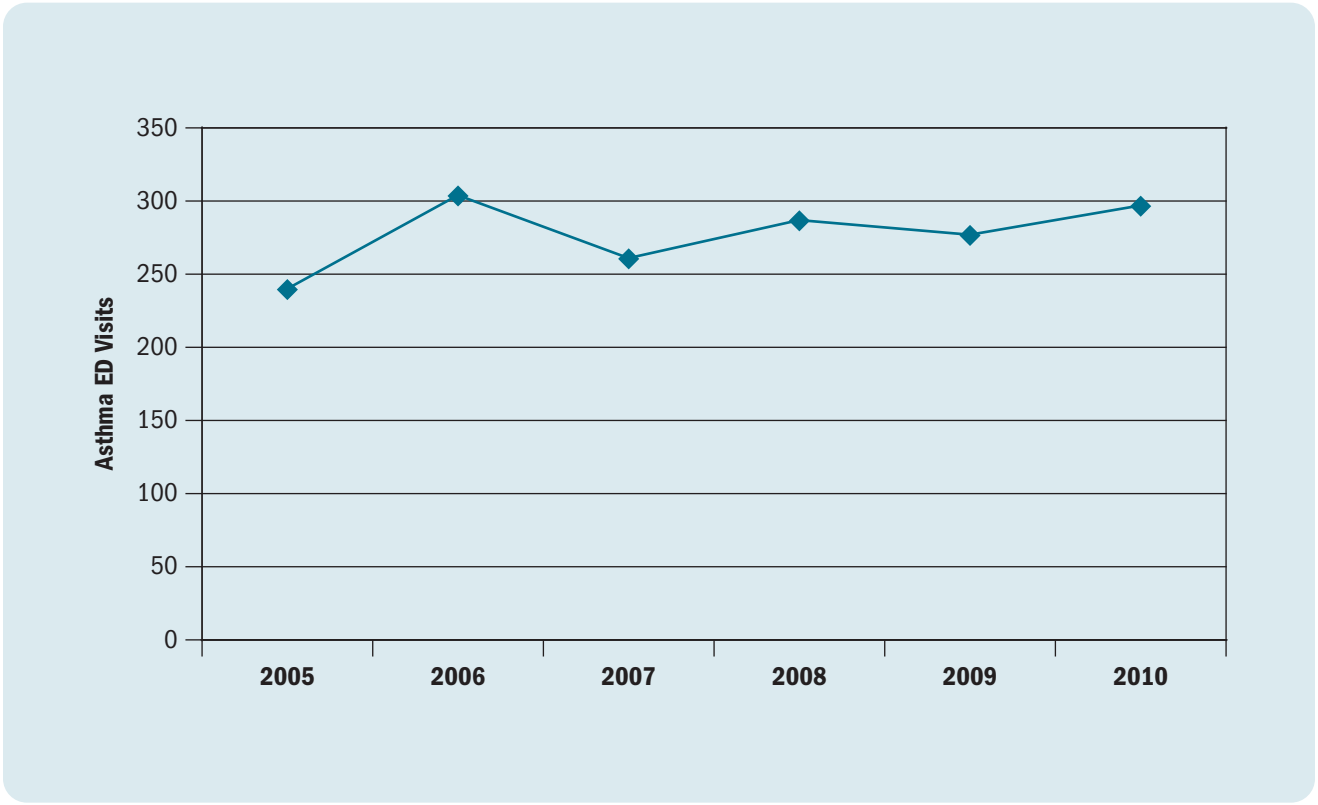
The SPARCS Outpatient Database contains information on ED visits for patients who visited the ED but were not hospitalized. The ED data reporting began on a voluntary basis in September 2003, and was mandated beginning in January 2005.

For the SPARCS Hospital Inpatient Database, a WRA ED visit was defined as having been admitted to the hospital directly from the ED and having a **discharge diagnosis** with an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code of 493 as well as the expected principal reimbursement or the primary source of payment code of Workers' Compensation.

For the SPARCS Outpatient Database, a WRA ED visit was defined as having a **principal diagnosis** with an ICD-9-CM code of 493 and the expected principal reimbursement or the primary source of payment code of Workers' Compensation.

The majority of individuals with work-related illnesses do not file for Workers' Compensation. Additionally, self-employed individuals such as farmers, independent contractors, federal employees, and railroad, longshore and maritime workers are not covered by state Workers' Compensation systems. Therefore, the data are considered to be an under-representation of the actual number of individuals visiting an ED with WRA.

Figure 10-1
Annual Work-Related Asthma Emergency Department Visits, New York State, 2005-2010



	2005	2006	2007	2008	2009	2010
Asthma ED Visits	240	304	261	287	277	297

The number of annual WRA emergency department visits among NYS residents increased approximately 24% from 240 in 2005 to 297 in 2010 with a peak at 304 in 2006 (Figure 10-1).

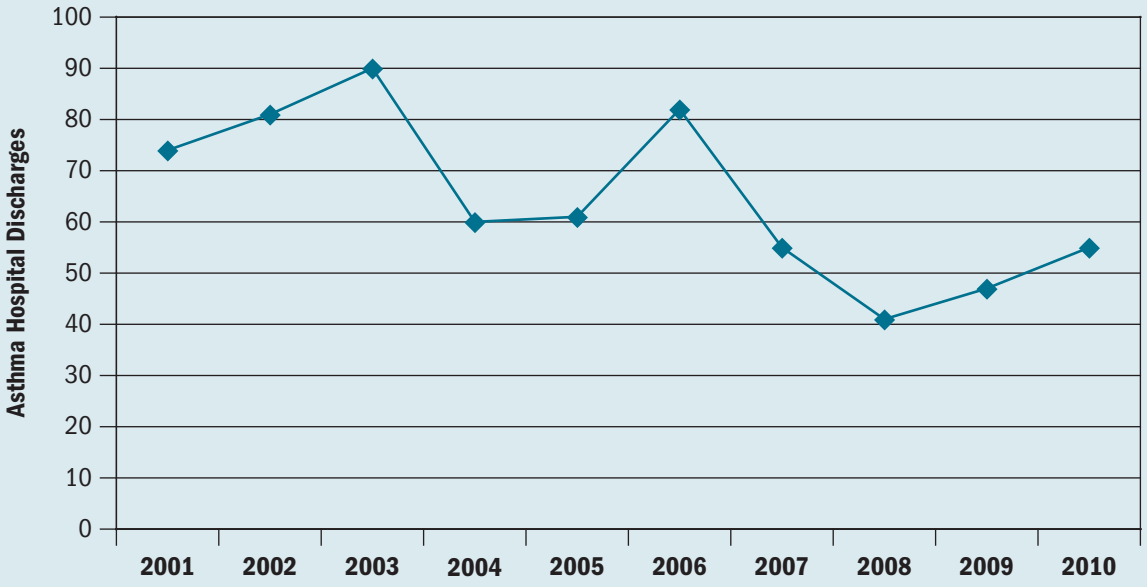
Methodology

Hospital discharge information from the Statewide Planning and Research Cooperative System (SPARCS) was reviewed for years 2001 through 2010 to identify hospitalizations related to WRA.

A WRA hospital discharge was defined as having a principal diagnosis with an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code of 493 and the expected principal reimbursement or the primary source of payment code of Workers' Compensation. It is possible that the same patient may be hospitalized for asthma multiple times and, as a result, could be counted more than once in these data.

The majority of individuals with work-related illnesses do not file for Workers' Compensation. Additionally, self-employed individuals such as farmers, independent contractors, federal employees, and railroad, long shore and maritime workers are not covered by state Workers' Compensation systems. Therefore, the data are considered an under-representation of the actual number of individuals hospitalized with WRA.

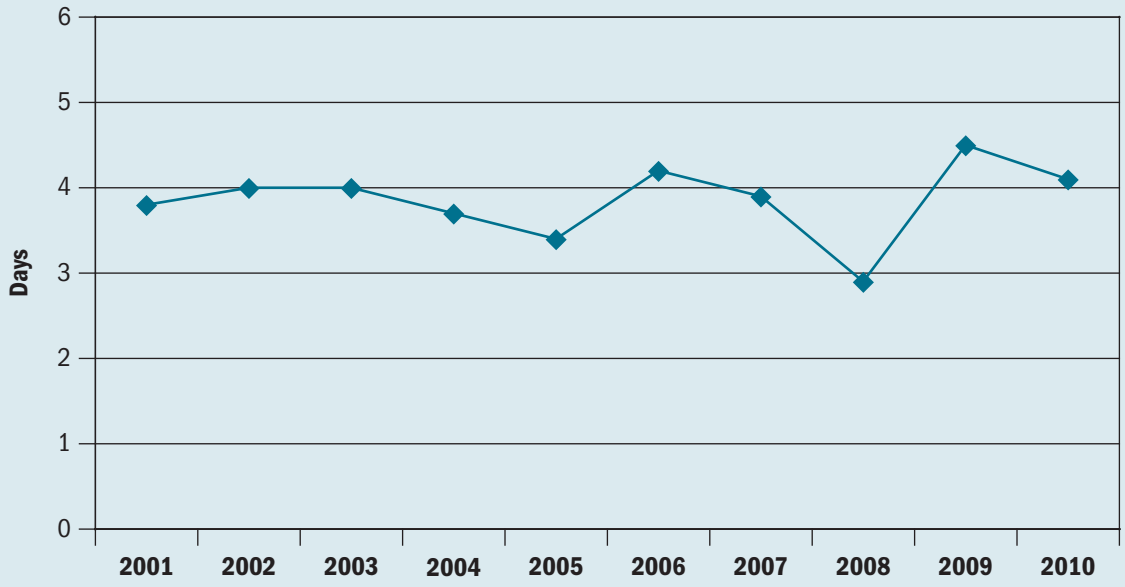
Figure 10-2
Annual Work-Related Asthma Hospital Discharges, New York State, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Asthma Hospital Discharges	74	81	90	60	61	82	55	41	47	55

From 2001 to 2010, the number of annual WRA hospitalizations among NYS residents decreased approximately 26% from 74 to 55 with a peak at 90 in 2003 (Figure 10-2).

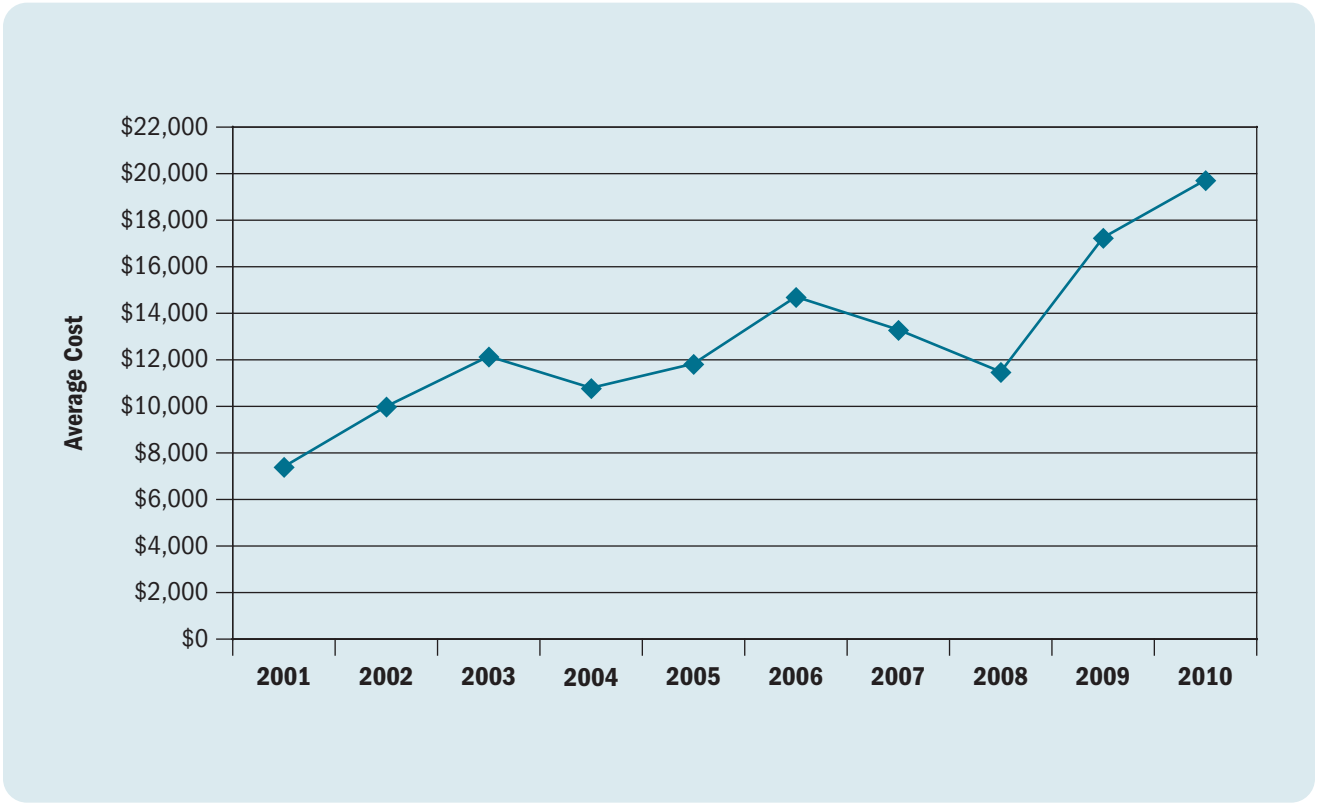
Figure 10-3
Average Length of Stay for Work-Related Asthma Hospitalizations, New York State, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Average Length of Stay (Days)	3.8	4.0	4.0	3.7	3.4	4.2	3.9	2.9	4.5	4.1

From 2001 to 2010, the average length of stay for a WRA hospitalization increased from 3.8 days in 2001 to 4.1 days in 2010 with a low of 2.9 in 2008 (Figure 10-3).

Figure 10-4
Average Cost of Work-Related Asthma Hospitalizations, New York State, 2001-2010

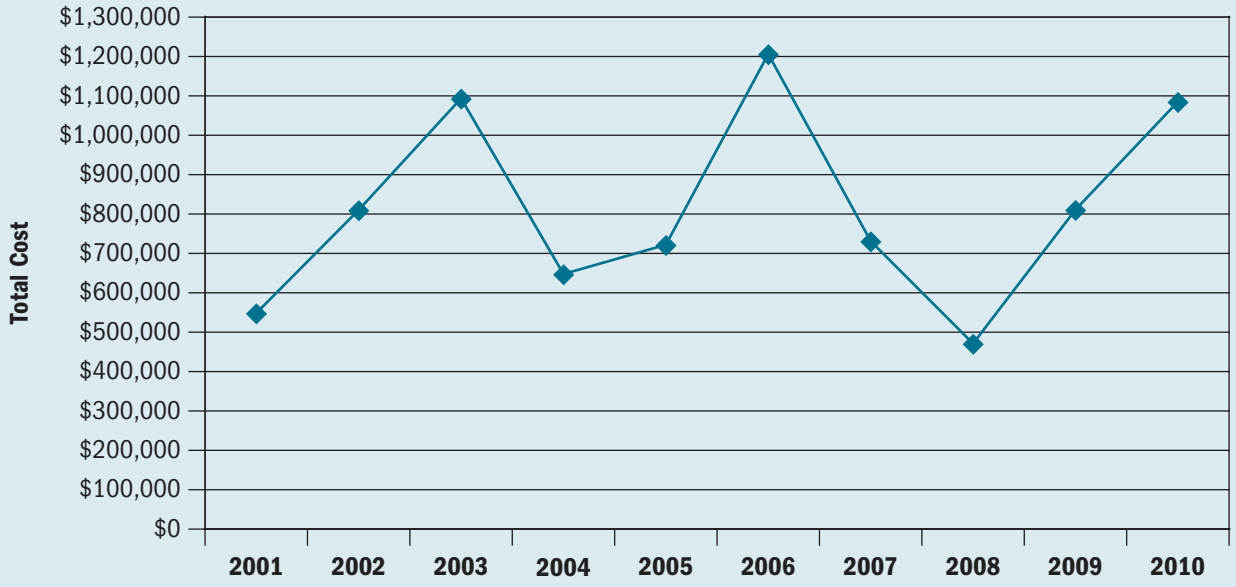


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Average Cost	$7,410	$10,001	$12,151	$10,794	$11,834	$14,710	$13,295	$11,488	$17,253	$19,729

The average cost of a WRA hospitalization increased 166%, from $7,410 in 2001 to $19,729 in 2010.

Because the average cost for a WRA hospitalization was not adjusted for inflation, comparisons across years should be made with caution (Figure 10-4).

Figure 10-5
Total Cost of Work-Related Asthma Hospitalizations, New York State, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total Cost	$548,383	$810,160	$1,093,618	$647,641	$721,888	$1,206,232	$731,277	$471,031	$810,891	$1,085,133

The total annual cost of WRA hospitalizations increased 98% from $548,383 in 2001 to $1,085,133 in 2010, with a peak at $1,206,232 in 2006.

Because the total cost of WRA hospitalizations was not adjusted for inflation, comparisons across years should be made with caution (Figure 10-5).

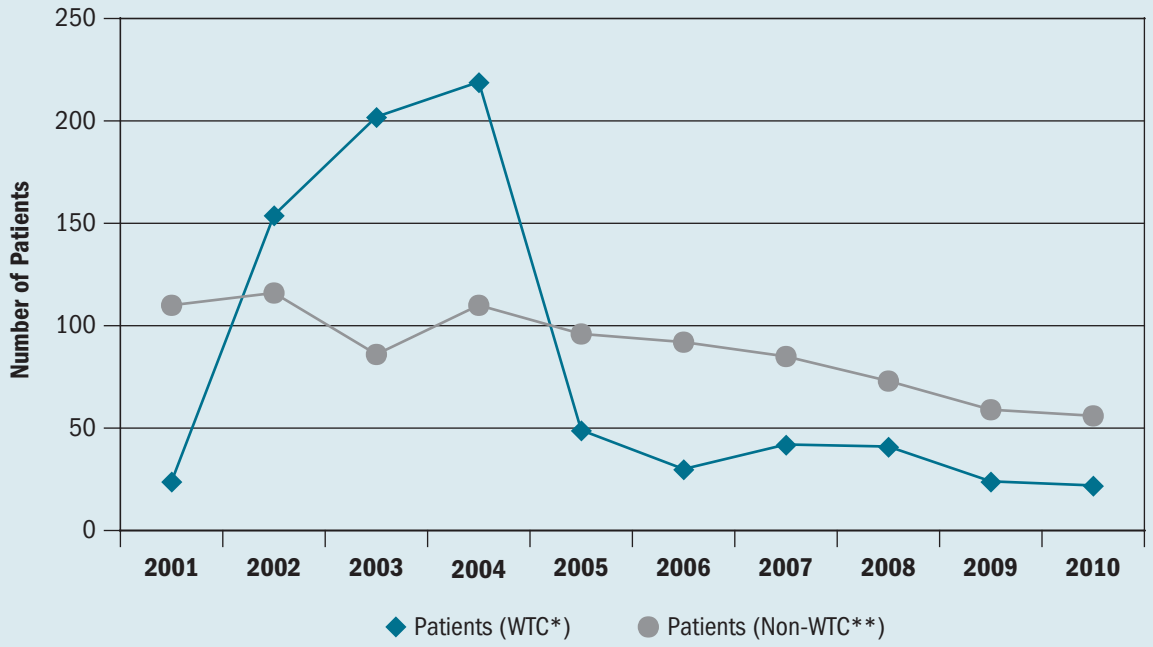
Methodology

The NYS Occupational Health Clinic Network (OHCN) is the nation's only state-based occupational health clinic network that includes a clinic specializing in farm worker health and safety. Each clinic is run independently with partial funding from the State. The clinics are mandated to: provide an objective diagnosis of suspected work-related medical problems; conduct medical screenings for groups of workers who are at increased risk of occupational illness; make referrals for treatment to other medical specialists, if necessary; perform industrial hygiene evaluations of work-places of concern; and provide education and prevention programs. In aggregate, the clinics see approximately 5,000 workers each year from hundreds of workplaces. All the clinics use the same patient data software. Patient data are collected and maintained in a central database in the NYSDOH Bureau of Occupational Health.

A WRA case was defined if the patient record had a diagnosis of asthma that was determined to be definitely or possibly work-related according to the clinician. Each clinic independently determined whether the visit was related to the World Trade Center (WTC) disaster. Many of the WTC patients are being seen in specialty clinics that are not a part of the OHCN, and therefore are not reflected in this database. This report presents the number of cases seen in the clinics for 2001 to 2010 by year of the patient's first visit.

It is recognized that clinic-based reporting suffers from problems with referral bias (i.e., individuals with a particular exposure or adverse health outcome are more likely to choose certain physicians or health clinics than those who are not similarly affected. Therefore, it is unknown whether the patients seen by the clinic network are representative of the state's employed population.

Figure 10-6
Number of Work-Related Asthma Patients Seen by the New York State Occupational Health Clinic Network, by Year of First Visit, 2001-2010



*Patients whose asthma resulted from the World Trade Center disaster.

**Patients whose asthma did not result from the World Trade Center disaster.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Patients (WTC*)	24	154	202	219	49	30	42	41	24	22
Patients (Non-WTC**)	110	116	86	110	96	92	85	73	59	56
Total Patients	134	270	288	329	145	122	127	114	83	78

The number of patients with a diagnosis of asthma that was definitely or possibly associated with their work environment who were seen by the NYS OHCN, by year of first visit, decreased 42% from 134 in 2001 to 78 in 2010, with a peak of 329 in 2004. The large increase in the number of patients seen for the first time, between 2002 and 2004, resulted from the World Trade Center disaster (Figure 10-6).

Work-Related Asthma Incidence – New York State Occupational Lung Disease Registry

Methodology

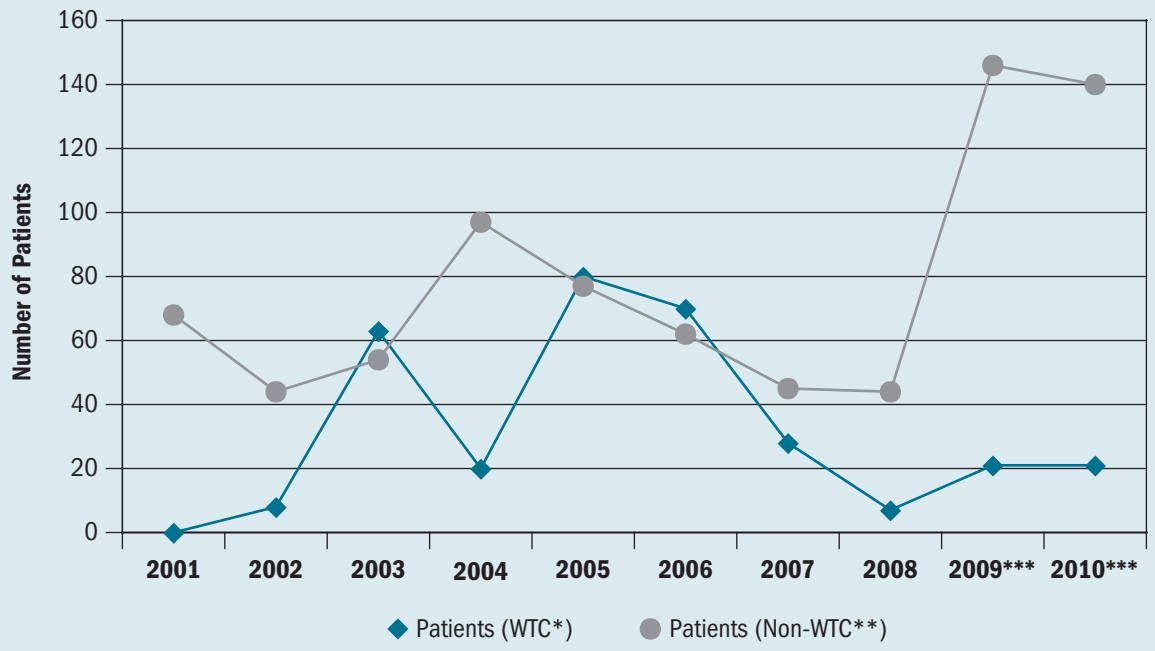
The New York State Occupational Lung Disease Registry (OLDR) was established in 1981 to assist with the reduction of the morbidity and mortality of New York residents due to exposure to respirable toxic materials in the work environment. All physicians, health facilities and laboratories are required to report all cases of occupational lung disease to NYSDOH.

This section provides the number of work-related asthma patients reported to the OLDR by year of first report for 2001 to 2010. These patients may also have been counted as hospital discharges or NYS OHCN visits.

The data represents reports of work-related asthma in the OLDR and is not a complete accounting of all occurrences of work-related asthma in New York State. Work-related asthma is under reported for several reasons including 1) individuals not recognizing the workplace exposures causing or contributing to their asthma; 2) health care providers not making a distinction between WRA and non-WRA and 3) health care providers' failure to report patients to public health authorities.

In 2010, NYSDOH received a grant from the National Institute of Occupational Safety and Health to support surveillance of work-related asthma. As part of this grant, cases of suspected work-related asthma reported to the OLDR are confirmed by medical record review and patient follow-up. In addition, more active case ascertainment activities were initiated. This endeavor began with 2009 cases, and only data on confirmed cases are included from 2009 forward. There are additional reports where case confirmation could not occur. Data from 2009 forward should not be compared to data from prior years.

Figure 10-7
Number of Suspected or Confirmed Work-Related Asthma Patients Reported to the New York State Occupational Lung Disease Registry by Year of First Report, 2001-2010



*Patients whose asthma resulted from the World Trade Center disaster.

**Patients whose asthma did not result from the World Trade Center disaster.

***It is not appropriate to make comparisons of 2009 and 2010 data to data from prior years because of the methodology differences for case ascertainment.

	2001	2002	2003	2004	2005	2006	2007	2008	2009***	2010***
Patients (WTC*)	0	8	63	20	80	70	28	7	21	21
Patients (Non-WTC**)	68	44	54	97	77	62	45	44	146	140
Total Patients	68	52	117	117	157	132	73	51	167	161

The number of WRA patients reported to the OLDR decreased 25% from 68 in 2001 to 51 in 2008, with a peak at 157 in 2005. Thirty-six percent of the cases reported to the OLDR from 2002 to 2008 have resulted from the World Trade Center disaster. The number of WRA patients reported to the OLDR was 167 in 2009 and 161 in 2010 (Figure 10-7).

11

Asthma Costs

Highlights: Asthma Costs

Asthma Hospitalization Costs

- The total cost of asthma hospitalizations in New York State for 2011 was approximately $660 million, a 61% increase in the cost since 2002 ($409 million). The Consumer Price Index-adjusted asthma hospitalization cost increased 19% from the 2002 adjusted cost of $556 million.
- The average cost per asthma hospitalization increased 78% from $10,080 in 2002 to $17,954 in 2011. The average adjusted asthma hospitalization cost increased 27% over this time period. This occurred despite the average length of stay for an asthma hospitalization decreasing 5% from 3.8 days to 3.6 days for the same time period.
- The average cost per asthma hospitalization increased with age. The 2011 average costs ranged from $10,308 for the 0-4 year age group to $26,459 for those aged 65 years and older.
- Females had consistently higher average asthma hospitalization costs compared to males throughout 2002 to 2011. Females had a 2011 average cost of $19,611 compared to $15,371 for their male counterparts.
- Residents of New York City had consistently higher average costs per asthma hospitalization than residents from the Rest of State from 2002 to 2010. However, in 2011, Rest of State residents had a higher average cost of $18,670 compared to those living in New York City ($17,556).
- Medicare had the highest average cost of $25,227 among all sources of payment for 2011 asthma hospitalizations. This was followed by other third party or private insurance ($16,725), Medicaid ($14,633), and self-pay ($11,382).
- For 2009-2011, Medicaid accounted for 41% of the total asthma hospitalizations and incurred 35% of the total asthma hospitalization costs. Medicare accounted for 26% of the total asthma hospitalizations and incurred 37% of the total asthma hospitalization costs.

Asthma Medicaid Managed Care Costs

- An estimated total of more than $276 million was spent on more than 249,350 asthma universe individuals for asthma-related services in 2010 (an average cost of $1,109 per enrollee). This accounted for 14% of the Medicaid managed care dollars for all health care services ($2 billion) that were spent on the asthma universe population.
- In 2010, hospitalizations comprised 19% of the total asthma-related costs, with an average cost of $6,866 per hospitalization and $8,677 per enrollee among the asthma universe population. Pharmacy costs comprised 64% of the total costs, with an average of $102 per claim and $817 per enrollee.
- An average of $1,109 was spent per asthma patient among the Medicaid managed care population in 2010. The average asthma-related service cost was highest for patients aged 51-64 ($1,864) and lowest for patients aged 5-11 ($901).
- The average asthma-related service cost was highest for female patients ($1,159) than for male patients ($1,044).
- The average asthma-related service cost among the MMC asthma universe population was highest for non-Hispanic black and Hispanic patients ($1,187 and $1,182, respectively) and lowest for non-Hispanic other patients ($955).

- The average asthma-related service cost among the MMC asthma universe population was highest for patients who reside in New York City ($1,191) than for patients who live in the Rest of State ($924).
- New York City accounted for 74% of the total New York State Medicaid managed care asthma-related costs while serving 69% of the asthma universe population.
- For 2010, about 69% of Medicaid managed care asthma-related costs were spent on pharmacy in the Rest of State and 62% of the asthma-related costs were spent on pharmacy in New York City. The proportion of cost due to asthma hospitalizations was more than 1.5 times higher for New York City compared to the Rest of State.

Asthma Hospitalization Costs

Methodology

Asthma hospitalization cost information was generated from the Statewide Planning and Research Cooperative System (SPARCS) database. The cost information from SPARCS represents billing data that were submitted by hospitals in New York State (NYS). An asthma hospitalization was defined as having a principal diagnosis with an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code of 493.

The total asthma hospitalization costs included the accommodation charge and the ancillary charge for all patients hospitalized within a given year. The accommodation charge is defined as the accommodation rate charged per day for a specific type of accommodation multiplied by the length of stay in days. The rate charged per day depends on type of room (e.g., private, semi-private or within a ward), type of care (e.g., general, medical, rehabilitation, etc.) and level of care. The ancillary charge is the sum of all ancillary costs, such as nursing, pharmacy, laboratory, respiratory therapy, pulmonary function, etc.

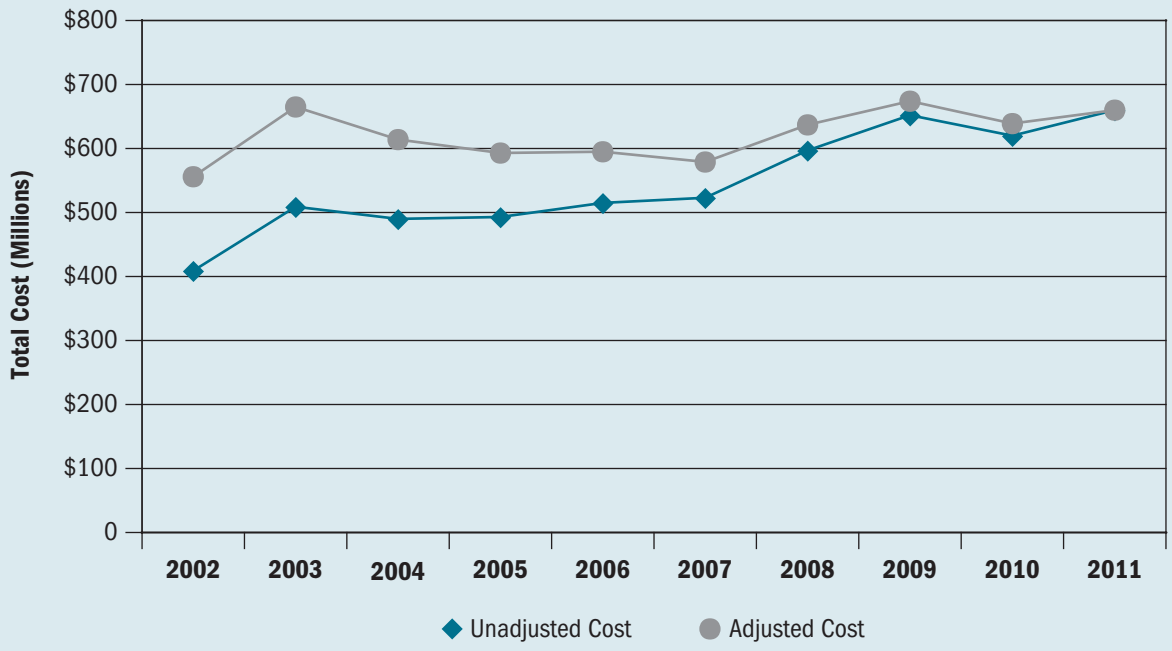
The crude and Consumer Price Index (CPI)-adjusted asthma hospitalization costs and average asthma hospitalization costs were calculated. Adjusted asthma hospitalization costs were calculated using the 2011 CPI[29] to adjust for inflation (see Appendix 2).

This report provides 10-year trends from 2002 to 2011 for asthma hospitalization cost information: total cost, average cost per asthma hospitalization, and average length of stay per hospitalization. The trends for average cost information were generated by age group, gender, source of payment and geographic region (New York City and Rest of State).

Pie charts that compare the number of asthma hospitalizations to the cost incurred for NYS residents for 2009-2011 are presented by age group, gender, source of payment and geographic region (New York City and Rest of State).

The SPARCS database reflects billing information; therefore the hospitalization costs may overestimate the actual costs that are reimbursed.

Figure 11-1
Total Crude and Adjusted* Cost of Asthma Hospitalizations, New York State, 2002-2011

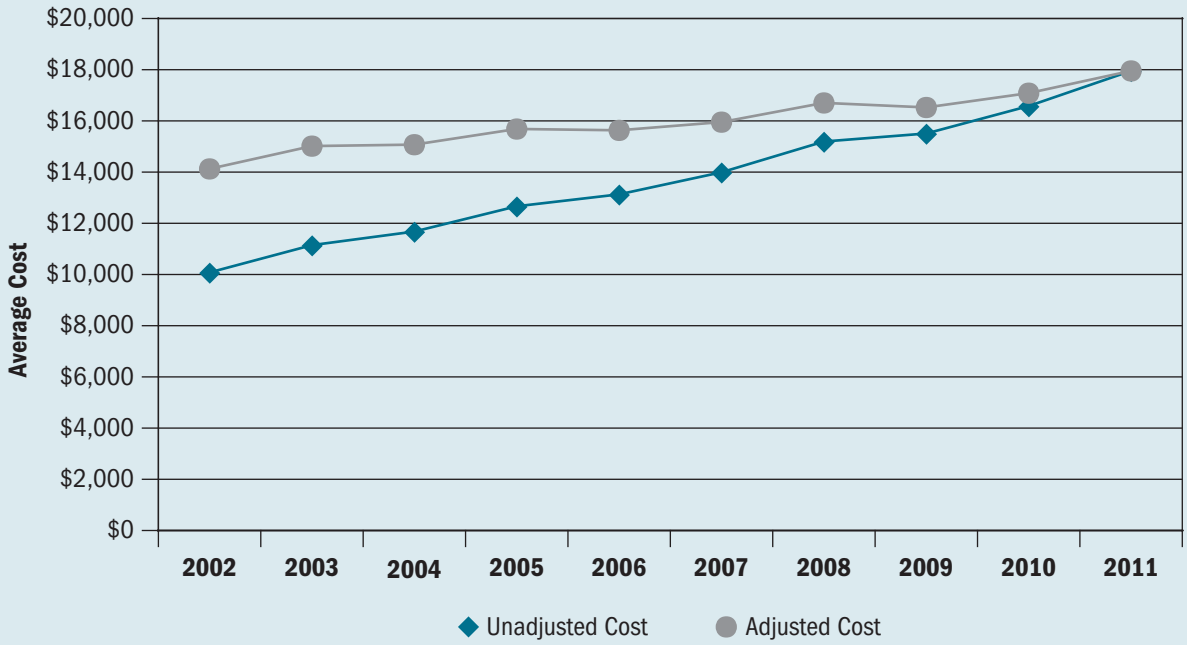


*Cost-adjusted using the 2011 Consumer Price Index.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total Cost (Millions)	$409	$509	$490	$493	$515	$523	$597	$652	$620	$660
Adjusted Total Cost (Millions)	$556	$665	$614	$593	$595	$579	$637	$674	$639	$660

There were increasing trends for both the crude and adjusted total cost of asthma hospitalizations from 2002 to 2011. The crude total cost of asthma hospitalizations increased 61% from $409 million in 2002 to $660 million in 2011. The adjusted total cost of asthma hospitalizations increased 19% from $556 million in 2002 to $660 million in 2011 (Figure11-1).

Figure 11-2
Average Crude and Adjusted* Cost per Asthma Hospitalization, New York State, 2002-2011

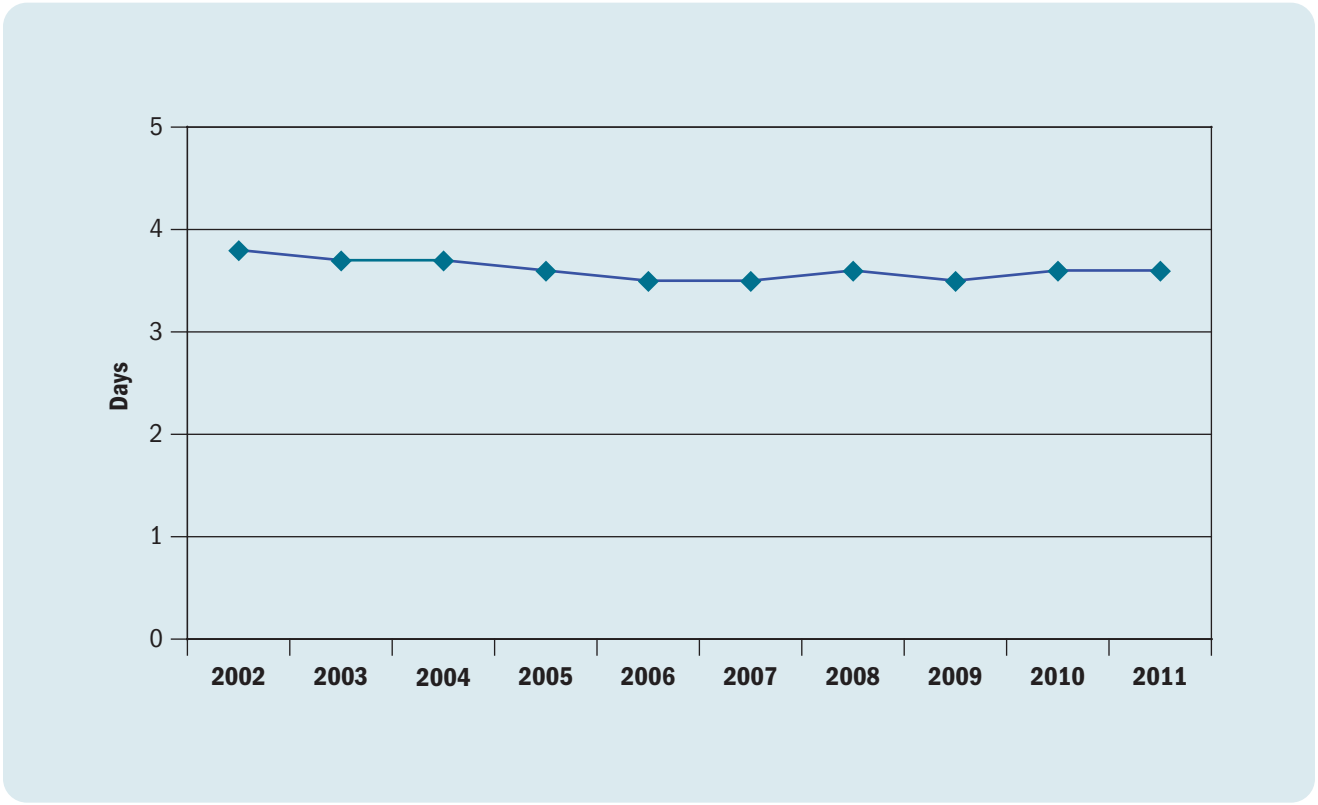


*Cost-adjusted using the 2011 Consumer Price Index.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Average Cost (Thousands)	$10,080	$11,147	$11,678	$12,665	$13,131	$13,993	$15,194	$15,508	$16,580	$17,954
Adjusted Average Cost (Thousands)	$14,127	$15,017	$15,073	$15,685	$15,633	$15,954	$16,704	$16,526	$17,085	$17,954

Increasing trends for both crude and adjusted average cost per asthma hospitalization were seen from 2002 to 2011. The average cost per asthma hospitalization increased 78% from $10,080 in 2002 to $17,954 in 2011. The adjusted average cost per asthma hospitalization increased 27% from $14,127 in 2002 to $17,954 in 2011 (Figure 11-2).

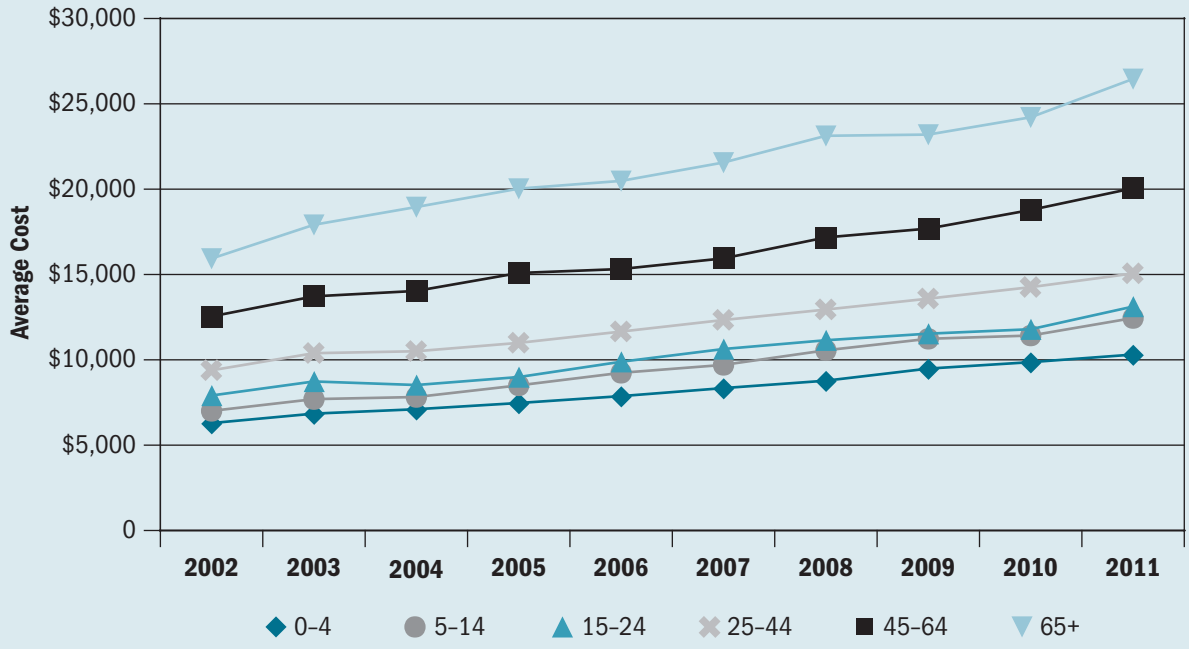
Figure 11-3
Average Length of Stay for Asthma Hospitalizations, New York State, 2002-2011



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Average Length of Stay (Days)	3.8	3.7	3.7	3.6	3.5	3.5	3.6	3.5	3.6	3.6

For 2002 to 2011, the average length of stay for an asthma hospitalization decreased 5% from 3.8 days in 2002 to 3.6 days in 2011 (Figure11-3).

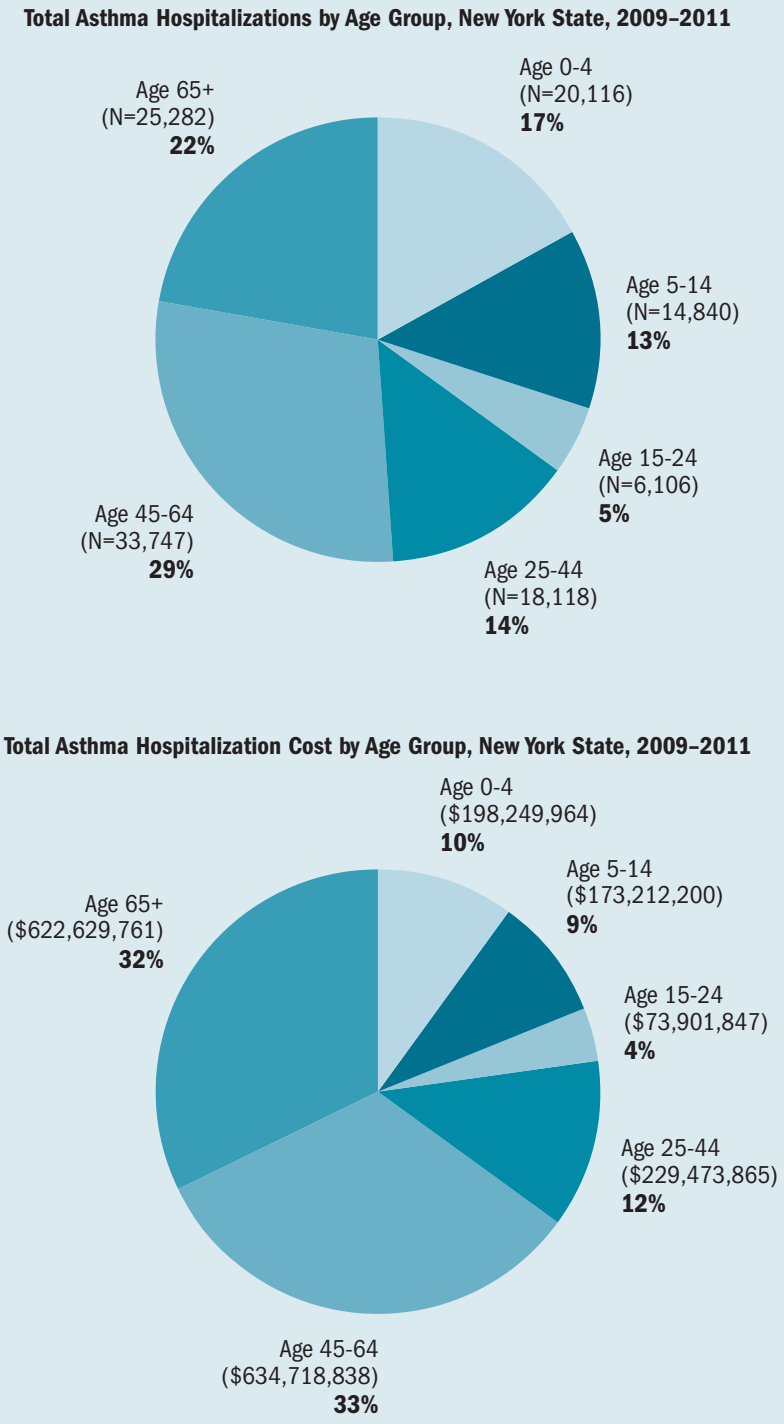
Figure 11-4
Average Cost per Asthma Hospitalization by Age Group, New York State, 2002-2011



Age Group	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0–4	$ 6,293	$ 6,848	$ 7,105	$ 7,470	$ 7,873	$ 8,343	$ 8,777	$ 9,486	$ 9,863	$10,308
5–14	$ 7,008	$ 7,697	$ 7,820	$ 8,503	$ 9,239	$ 9,703	$10,558	$11,232	$11,423	$12,448
15–24	$ 7,910	$ 8,732	$ 8,524	$ 8,991	$ 9,886	$10,633	$11,147	$11,532	$11,792	$13,121
25–44	$ 9,385	$10,389	$10,502	$10,993	$11,655	$12,333	$12,945	$13,583	$14,258	$15,061
45–64	$12,542	$13,719	$14,037	$15,087	$15,320	$15,945	$17,172	$17,691	$18,780	$20,053
65+	$15,935	$17,914	$18,955	$20,030	$20,484	$21,562	$23,127	$23,198	$24,212	$26,459

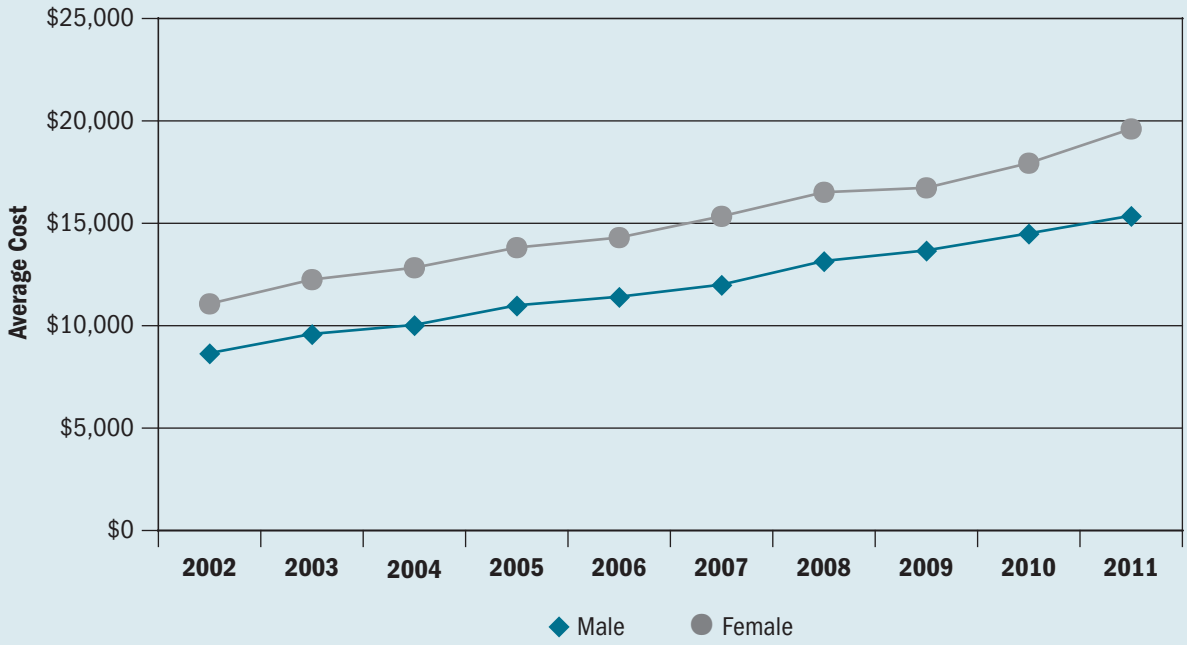
Average cost per asthma hospitalization for all age groups increased between 2002 and 2011 with the increases being greatest among older age groups. In addition, the average cost per asthma hospitalization increased with age in any given year. In 2011, the average cost for those aged 0-4 years was $10,308; the 65 year and older age group had an average cost of $26,459 (Figure 11-4).

Figure 11-5
Comparison of Number of Asthma Hospitalizations to Cost Incurred by Age Group, New York State, 2009-2011



For 2009-2011, asthma hospital discharges for the 0-4 year age group comprised 17% of all discharges, yet contributed only 10% to the total cost. Conversely, the 65 and older age group comprised 22% of the hospitalizations, yet accounted for 32% of the total cost (Figure 11-5).

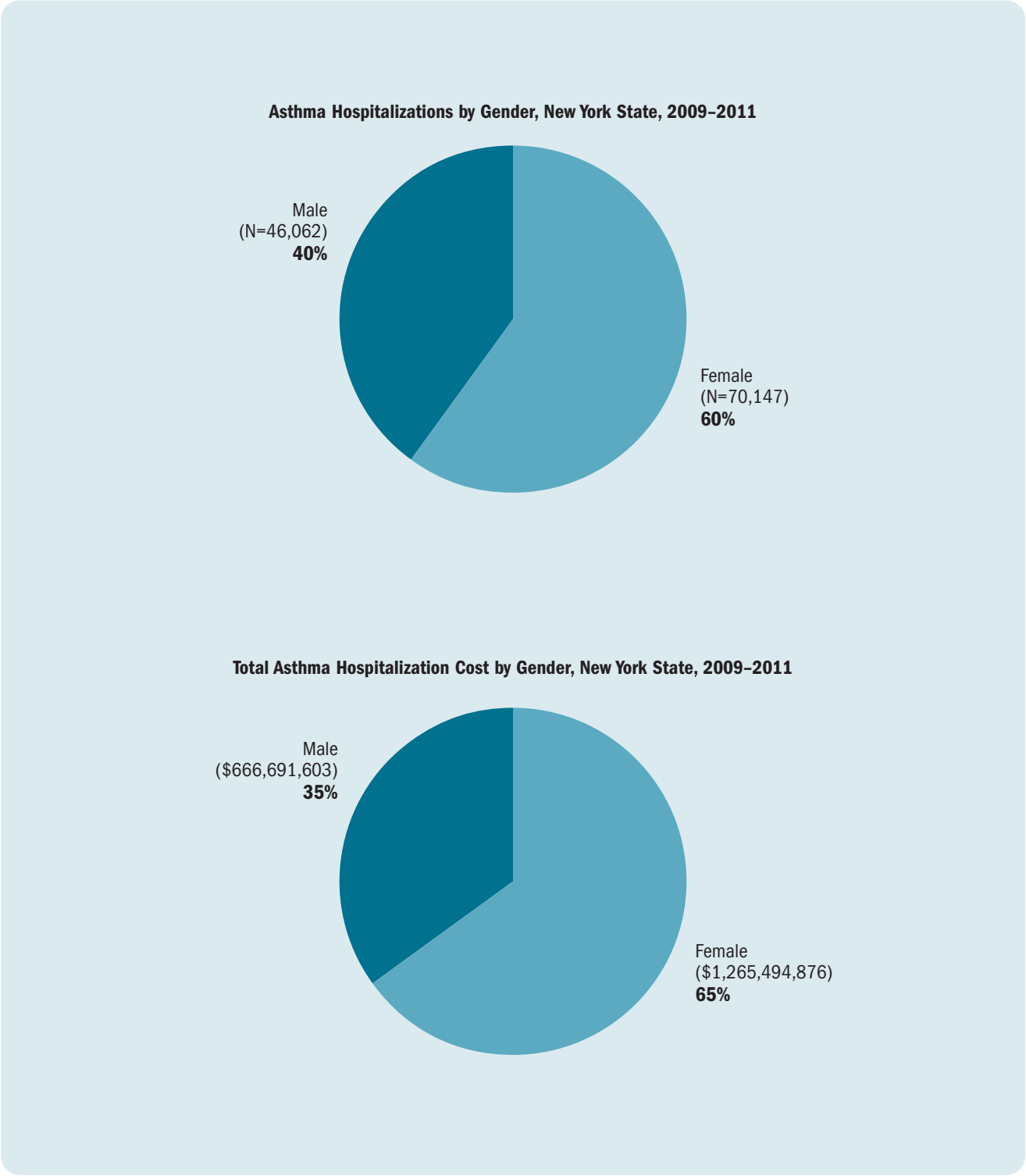
Figure 11-6
Average Cost per Asthma Hospitalization by Gender, New York State, 2002-2011



Gender	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Male	$ 8,661	$ 9,599	$10,038	$10,995	$11,416	$12,005	$13,161	$13,678	$14,508	$15,371
Female	$11,070	$12,253	$12,833	$13,815	$14,306	$15,343	$16,518	$16,734	$17,939	$19,611

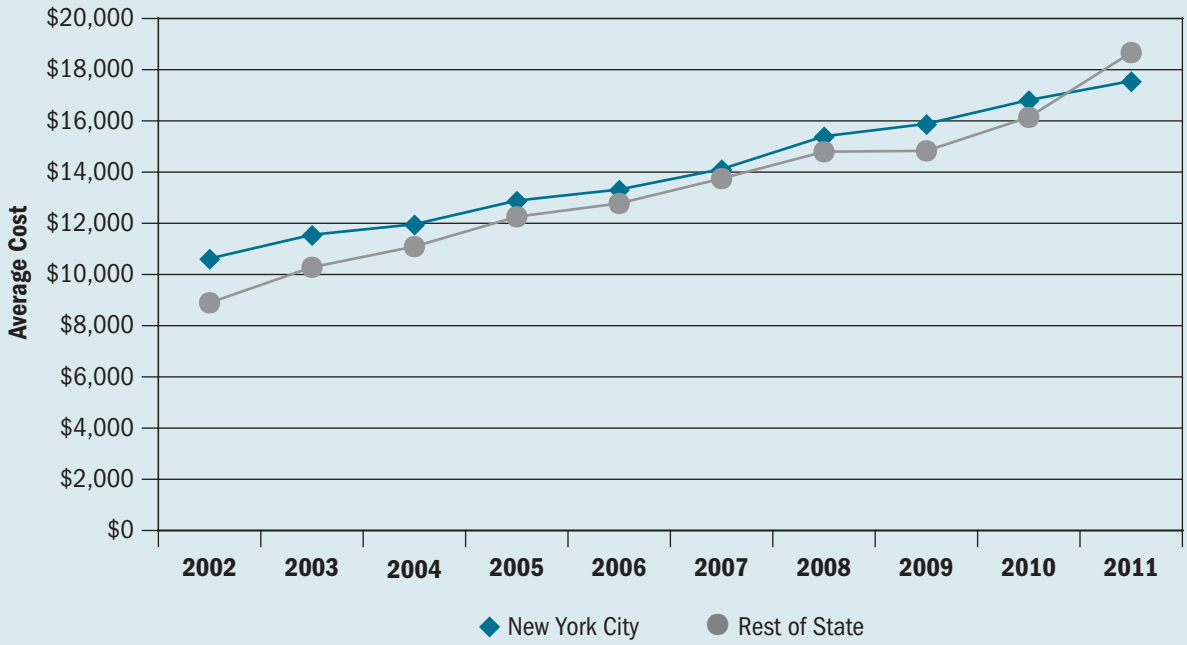
For 2002 to 2011, females had consistently higher average asthma hospitalization costs compared to males. In 2011, the average female asthma hospitalization cost of $19,611 was 28% higher than the male average cost of $15,371 (Figure 11-6).

Figure 11-7
Comparison of Number of Asthma Hospitalizations to Cost Incurred by Gender, New York State, 2009-2011



For 2009-2011, females comprised 60% of the asthma hospitalizations and incurred 65% of the total hospitalization costs (Figure 11-7).

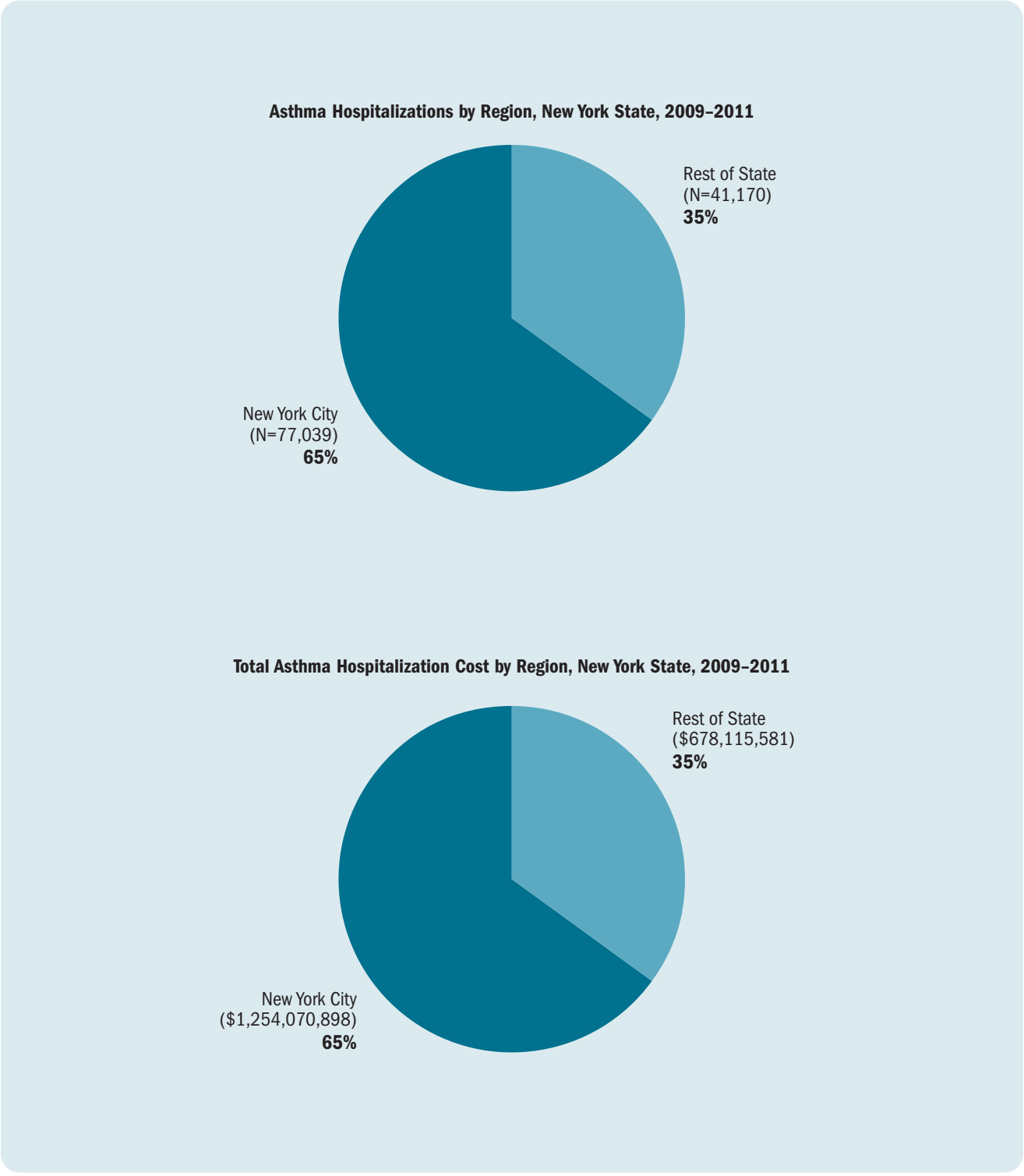
Figure 11-8
Average Cost per Asthma Hospitalization by Region, New York State, 2002-2011



Region	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
New York City	$10,624	$11,552	$11,962	$12,887	$13,320	$14,117	$15,399	$15,884	$16,814	$17,556
Rest of State	$ 8,897	$10,284	$11,093	$12,257	$12,778	$13,748	$14,796	$14,830	$16,142	$18,670

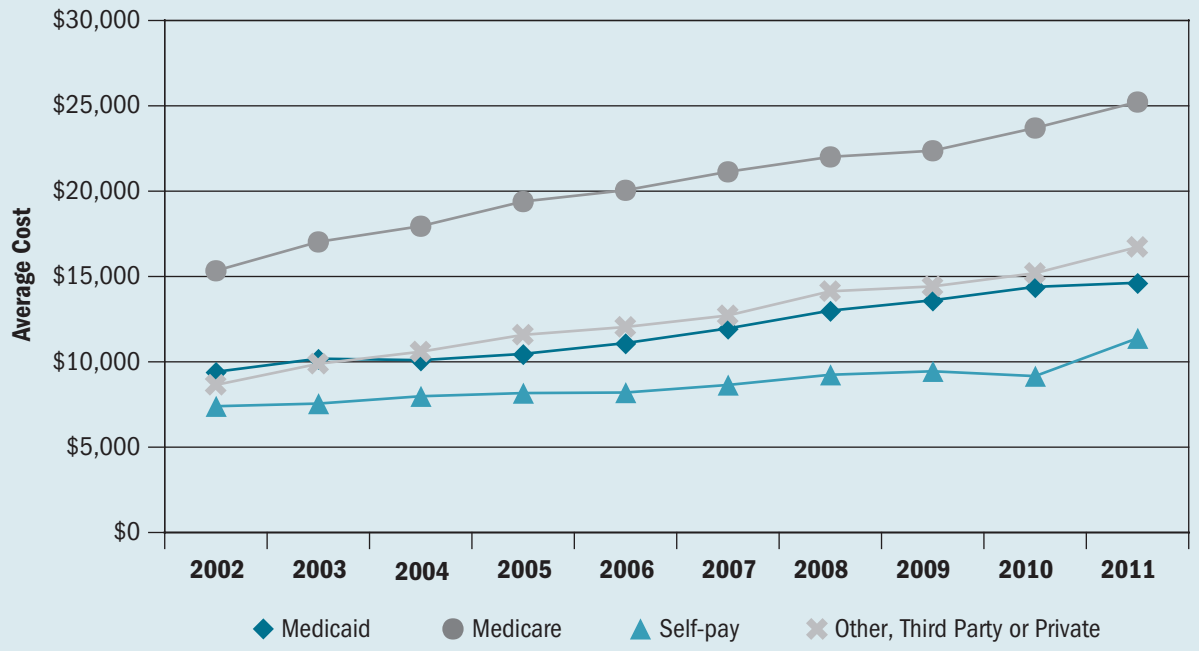
For 2002 through 2010, the average costs per asthma hospitalization were consistently higher for New York City ($16,814 in 2010) than the Rest of State ($16,142). However, in 2011, the average costs per asthma hospitalization were 6% higher for Rest of State residents than for those living in New York City (Figure 11-8).

Figure 11-9
Comparison of Number of Asthma Hospitalizations to Cost Incurred by Region, New York State, 2009-2011



For 2009-2011, New York City contributed 65% of the total number of asthma hospitalizations and incurred 65% of the asthma hospitalization costs (Figure 11-9).

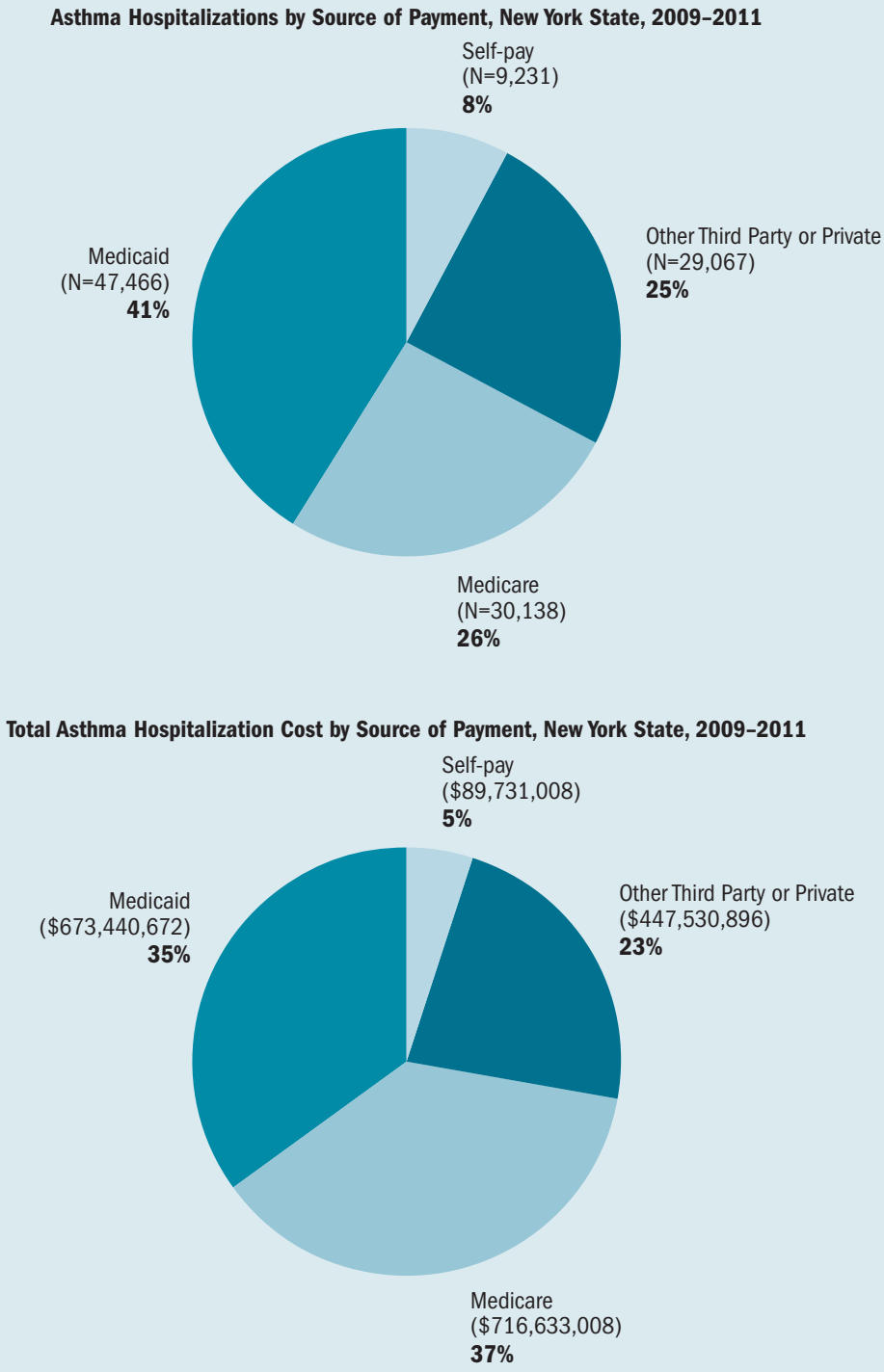
Figure 11-10
Average Cost per Asthma Hospitalization by Source of Payment, New York State, 2002-2011



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Medicaid	$ 9,415	$10,185	$10,097	$10,464	$11,097	$11,957	$13,001	$13,608	$14,392	$14,633
Medicare	$15,339	$17,030	$17,950	$19,394	$20,055	$21,137	$22,011	$22,372	$23,704	$25,227
Self-pay	$ 7,398	$ 7,554	$ 7,983	$ 8,169	$ 8,201	$ 8,644	$ 9,242	$ 9,446	$ 9,163	$11,382
Other, Third Party or Private	$ 8,648	$ 9,884	$10,593	$11,580	$12,041	$12,716	$14,133	$14,420	$15,196	$16,725

The average asthma hospitalization costs were consistently the highest for the Medicare population. Between 2002 and 2011, the increase in average cost ranged from 54% for self-pay patients to 93% for other, third party or private patients (Figure 11-10).

Figure 11-11
Comparison of Number of Asthma Hospitalizations to Cost Incurred by Source of Payment, New York State, 2009-2011



For 2009-2011, Medicaid accounted for 41% of the total asthma hospitalizations and incurred 35% of the total asthma hospitalization costs. Medicare accounted for 26% of the total asthma hospitalizations and incurred 37% of the total asthma hospitalization costs (Figure 11-11).

Methodology

Payment for Medicaid managed care (MMC) services is provided through a combination of capitation payments (See Appendix 1) and fee-for-service claim expenditures.

Services not covered under capitation are paid by Medicaid on a fee-for-service claim basis (e.g., pharmacy* and mental health). Fee-for-service claim data represent true expenditures.

Services covered under the MMC benefit package and associated costs are reported by managed care plans as encounter records. Reported costs on encounter records are then standardized by the State to estimate the true cost of services provided under the capitated benefit (either as a "proxy cost" of a covered benefit, or as a within plan claim expenditure).

Costs for asthma-related services provided for the asthma universe enrollees (see page 133 for definition of asthma universe) among the MMC population were estimated by adding the actual expenditures paid on asthma-related claims together with the standardized "proxy" costs for services reported on encounter records for the calendar year 2010 service period.

Encounter records were considered to be asthma-related if they were submitted with a primary diagnosis code of asthma (International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9 CM) code of 493.XX). Asthma-related pharmacy claims were identified using the National Drug Codes specified in the HEDIS® 2010[22] guidelines indicative of asthma.

All members of the MMC asthma universe population had 12 continuous months of enrollment in a MMC health plan (Health Maintenance Organization [HMO], Prepaid Health Services Plans [PHSP], Partial Capitation plans) in 2010. Cost information, however, was only included in analyses if the cost occurred while enrolled for at least one month in either and HMO or PHSP. Therefore, people who were enrolled exclusively in a Partial Capitation plan for the entire 12-month period of 2010 were removed from the denominator (asthma universe population), and no costs acquired for the enrollment period in a Partial Capitation plan were included.

For the purpose of these cost analyses, services were divided into inpatient/hospitalization, emergency department, outpatient, and pharmacy services. A hierarchical approach was taken to categorize the services. All inpatient records were identified first, followed by emergency department services, pharmacy records and finally outpatient services. Because all records that were not identified as inpatient, emergency room, or pharmacy fell into outpatient, this category contains additional areas beyond physician and clinic services, including categories such as case management, community and rehabilitation services, dentist and dental services and hospice care.

This report provides 2010 estimated MMC cost information for asthma-related services including: total cost, average cost per asthma-related service, and average cost per asthma universe enrollee. The average cost per enrollee was generated by age group, gender, race and ethnicity, and region. The distribution of total costs for asthma-related services was analyzed by geographic region (New York City and Rest of State).

*As of October 1, 2011, pharmacy benefits for Medicaid managed care enrollees were provided by health plans.

Table 11-1
Medicaid Managed Care Costs for the Asthma Universe* Population, New York State, 2009-2010

Year	Number of Universe Asthmatics	Asthma-Related Cost	Total Cost (Asthma-Related and Unrelated Services)	Percent of Total Cost	Asthma-Related Cost per Member per Year
2009	233,367	$262,510,571	$1,683,732,342	16%	$1,125
2010	249,350	$276,571,675	$1,929,029,077	14%	$1,109

*12 months continuous enrollment.

When interpreting MMC asthma costs, it is important to recognize that the majority of the cost information was estimated based on Medicaid encounter data for different service categories. Also, cost information was generated for enrollees aged 0-64 years.

It was estimated that more than $260 million was spent on more than 233,000 asthma universe individuals for asthma-related services in 2009 (an average cost of $1,125 per enrollee). This accounted for 16% of the MMC dollars for all health care services ($1 billion) that were spent on the asthma universe population.

In 2010, it was estimated that more than $276 million was spent on approximately 249,350 asthma universe individuals for asthma-related services (an average cost of $1,109 per enrollee). This accounted for 14% of the MMC dollars for all health care services (almost $2 billion) that were spent on the asthma universe population (Table 11-1).

Table 11-2
Medicaid Managed Care Total Cost, Average Cost per Service and Average Cost per Enrollee by Type of Asthma-Related Service for the Asthma Universe* Population, New York State, 2010

Asthma-Related Service	Total Costs	Percent Total	Number of Services	Average Cost per Service	Number of Enrollees	Average Cost per Enrollee
Outpatient Visit	$ 39,694,849	14.4%	408,517	$ 97	149,810	$ 265
ED Visit	$ 6,732,135	2.4%	37,488	$ 180	26,937	$ 250
Hospitalization	$ 53,295,721	19.3%	7,762	$6,866	6,149	$8,667
Pharmacy	$176,848,970	63.9%	1,727,249	$ 102	216,556	$ 817

*12 months continuous enrollment.

In 2010, hospitalizations comprised 19% of the total asthma-related costs, with an average cost of $6,866 per hospitalization and $8,667 per enrollee among the asthma universe population. Pharmacy costs comprised 64% of the total costs, with an average of $102 per claim and $817 per enrollee (Table 11-2).

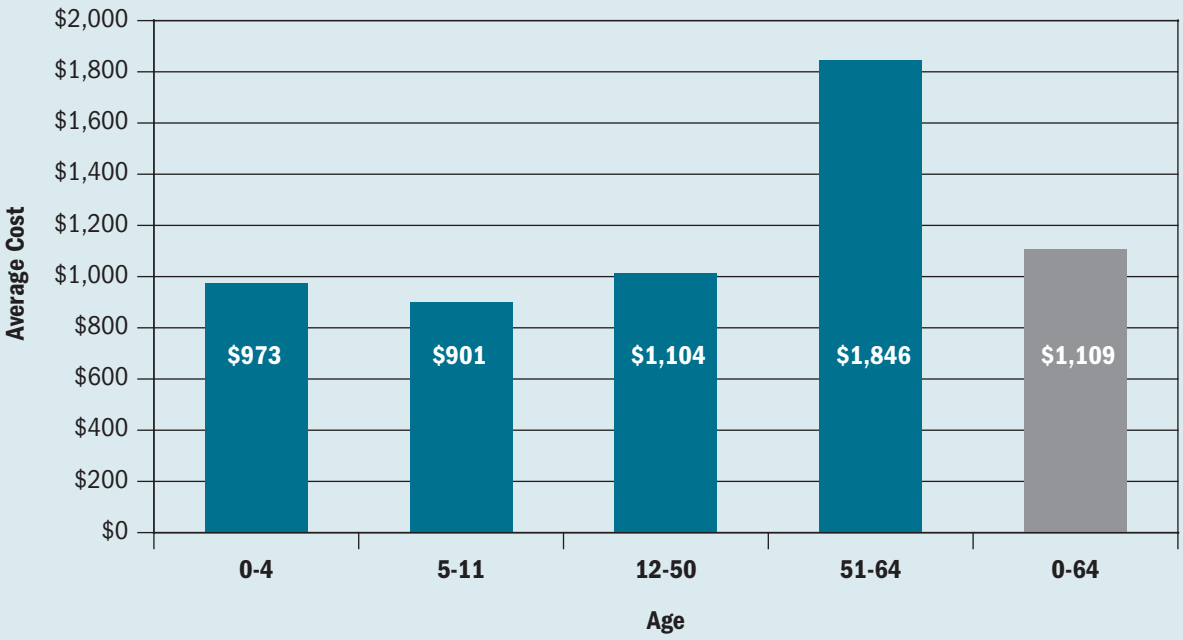
Table 11-3
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee by Age Group and Type of Asthma-Related Service for the Asthma Universe* Population, New York State, 2010

Asthma-Related Service	0–4	5–11	12–50	51–64
Outpatient Visit	$ 249	$ 245	$ 260	$ 355
ED Visit	$ 238	$ 235	$ 260	$ 278
Hospitalization	$7,404	$7,481	$9,045	$11,063
Pharmacy	$ 498	$ 641	$ 803	$ 1,433

*12 months continuous enrollment.

There was great variation among age groups in the average asthma hospitalization and pharmacy cost per enrollee in the MMC asthma universe population. The average asthma hospitalization costs increased more than 49%, from $7,404 in the 0-4 year age group to $11,063 in the 51-64 year age group. The average asthma pharmacy costs increased almost three times, from $498 in the 0-4 year age group to $1,433 for adults with asthma aged 51-64 years. The average asthma costs per enrollee for outpatient visits increased with age. The average asthma costs per enrollee for ED visits also increased slightly as age increased (Table 11-3).

Figure 11-12
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee by Age Group for the Asthma Universe* Population, New York State, 2010



*12 months continuous enrollment.

Overall, an average of $1,109 was spent per asthma universe patient among the MMC population in 2010. The average cost was highest for patients aged 51-64 ($1,846) and lowest for patients aged 5-11 ($901) (Figure 11-12).

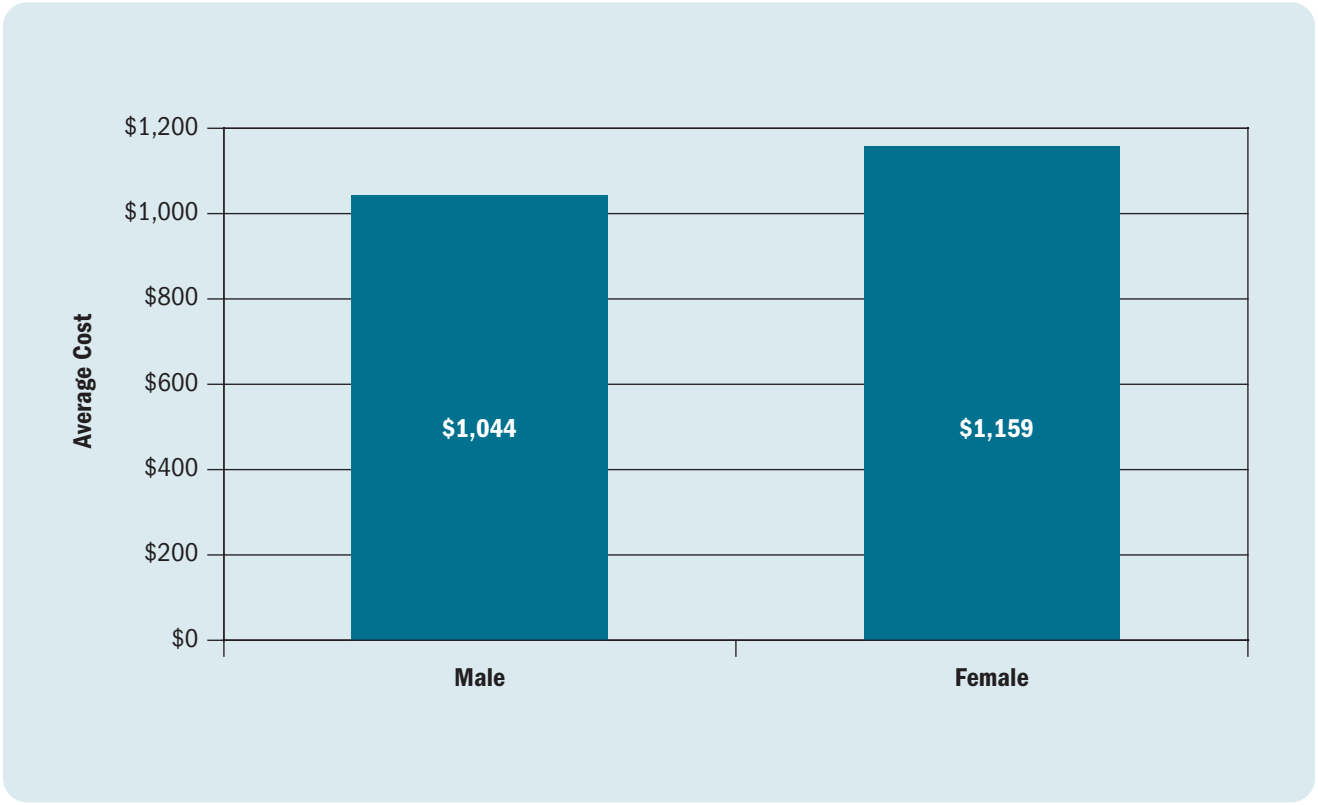
Table 11-4
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee by Gender and Type of Asthma-Related Service for the Asthma Universe* Population, New York State, 2010

Asthma-Related Service	Male	Female
Outpatient Visit	$ 257	$ 272
ED Visit	$ 251	$ 249
Hospitalization	$8,257	$8,992
Pharmacy	$ 749	$ 869

*12 months continuous enrollment.

There was slight variation among gender groups in the average asthma-related service cost per enrollee in the MMC asthma universe population. The average asthma costs per enrollee among females for outpatient visits ($272), hospitalizations ($8,992), and pharmacy costs ($869) were greater than those among males ($257, $8,257, and $869 respectively). The average asthma costs per enrollee for ED visits were similar for male ($251) and female enrollees ($249) (Table 11-4).

Figure 11-13
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee by Gender for the Asthma Universe* Population, New York State, 2010



*12 months continuous enrollment.

Overall, the average asthma-related service cost among the MMC asthma universe population was higher for female patients ($1,159) than male patients ($1,044) (Figure 11-13).

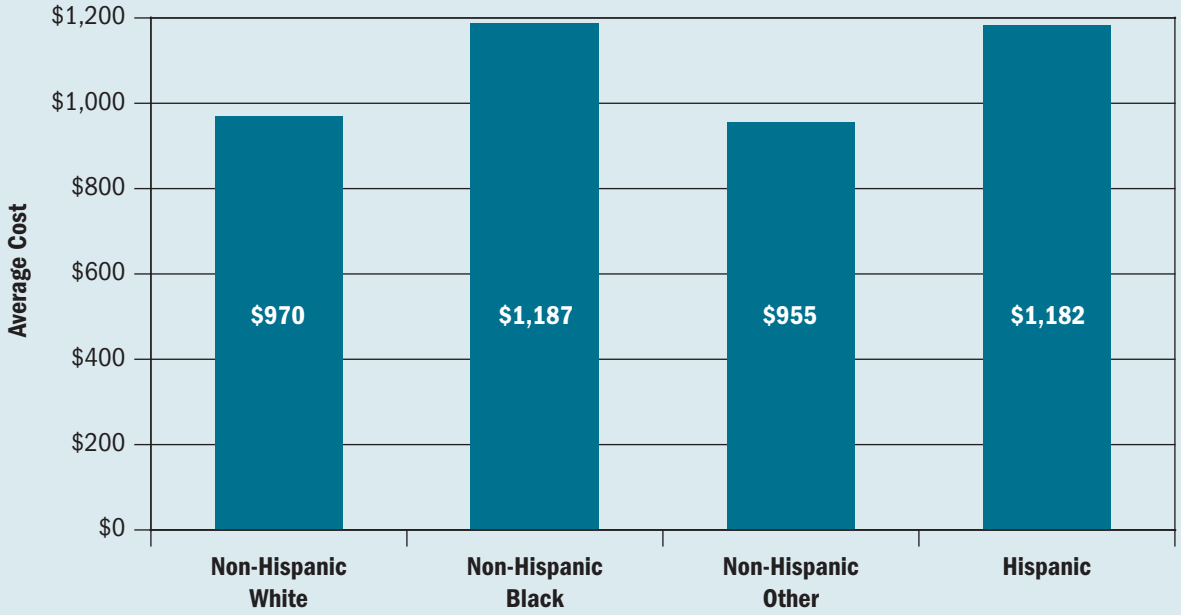
Table 11-5
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee by Race/Ethnicity and Type of Asthma-Related Service for the Asthma Universe* Population, New York State, 2010

Asthma-Related Service	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other	Hispanic
Outpatient Visit	$ 238	$ 269	$ 231	$ 286
ED Visit	$ 248	$ 262	$ 232	$ 244
Hospitalization	$6,948	$9,230	$8,117	$8,778
Pharmacy	$ 845	$ 763	$ 786	$ 836

*12 months continuous enrollment.

There was variation among racial-ethnic groups in the average asthma-related service cost per enrollee in the MMC asthma universe population. The highest average asthma costs for outpatient visits ($269), ED visits ($262), and hospitalization costs ($9,230) were found among non-Hispanic black enrollees in the MMC asthma universe population. Average pharmacy costs were highest among non-Hispanic white enrollees ($845) (Table 11-5).

Figure 11-14
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee by Race/Ethnicity for the Asthma Universe* Population, New York State, 2010



*12 months continuous enrollment.

Overall, the average asthma-related service cost among the MMC asthma universe population was highest for non-Hispanic black and Hispanic patients ($1,187 and $1,182, respectively) and lowest for non-Hispanic other patients ($955) (Figure 11-14).

Table 11-6
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee by Region and Type of Asthma-Related Service for the Asthma Universe* Population, New York State, 2010

Service Catagory	New York City	Rest of State
Outpatient Visit	$ 27,995,711	$11,699,139
ED Visit	$ 4,958,698	$ 1,773,437
Hospitalization	$ 44,815,220	$ 8,480,501
Pharmacy	$127,831,649	$49,017,321

*12 months continuous enrollment.

New York City had the highest average asthma costs per enrollee within the MMC asthma universe population for all service categories. Average cost was approximately five times higher than the Rest of State average for asthma hospitalization costs, 2.5 times higher for outpatient visits and pharmacy costs, and nearly three times higher for ED visits. Of all service categories, average asthma pharmacy costs were the highest for both regions (Table 11-6).

Figure 11-15
Medicaid Managed Care Average Asthma-Related Service Cost per Enrollee Among the Asthma Universe* Population by Region, New York State, 2010

*12 months continuous enrollment.

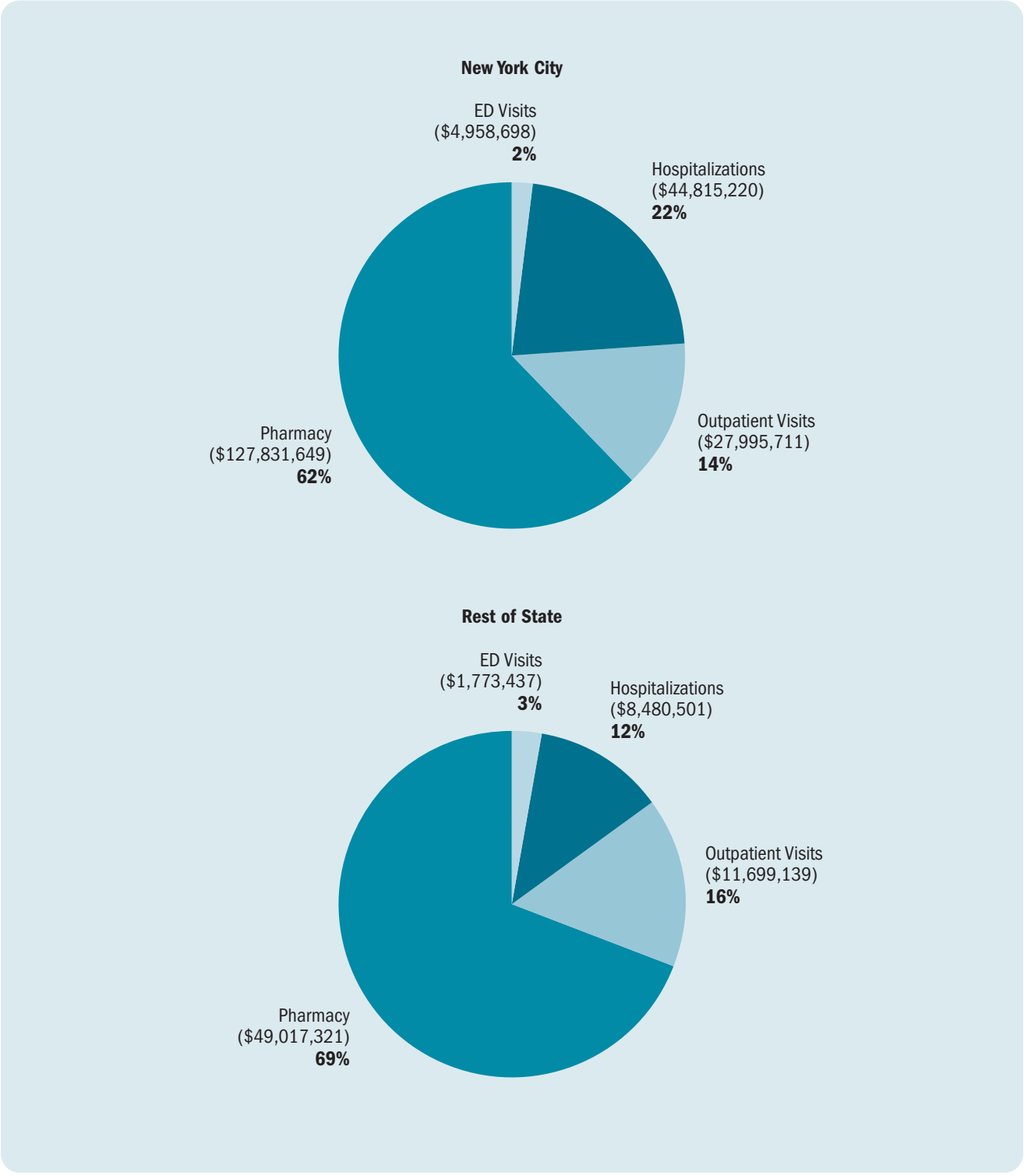
Overall, the average asthma-related service cost among the MMC asthma universe population was higher for patients who reside in New York City ($1,191) than patients who live in the Rest of State ($924) (Figure 11-15).

Table 11-7
Medicaid Managed Care Total Asthma-Related Service Cost and Number of Enrollees by Region for the Asthma Universe* Population, New York State, 2010

	New York City	Rest of State	New York State
Asthma-Related Cost	$205,601,278 (74%)	$70,970,398 (26%)	$276,571,676
Number of Enrollees	172,567 (69%)	76,783 (31%)	249,350

New York City accounted for 74% of the total NYS MMC asthma-related cost while serving 69% of the asthma universe population (Table 11-7).

Figure 11-16
Distribution of Asthma Medicaid Managed Care Costs Among the Asthma Universe* Population by Region, New York State, 2010



*12 months continuous enrollment.

There were regional differences in patterns of asthma-related cost by type of service among the asthma universe population. For 2010, about 62% of MMC asthma-related costs were spent on pharmacy in New York City, and 69% of the asthma-related costs were spent on pharmacy in the Rest of State. The proportion of costs due to asthma hospitalizations was almost twice for New York City compared to the Rest of State (22% vs. 12%, respectively) (Figure 11-16).

12

Asthma and the Environment

The New York State Department of Health's (NYSDOH's) environmental efforts to address asthma are focused on understanding which environmental factors are important contributors to asthma development and morbidity. That information is used to develop public health programs aimed at reducing or eliminating exposure to these factors in and around homes, schools and workplaces. Because asthma is a respiratory disease, indoor and outdoor air quality are of particular interest. Contaminants in indoor or outdoor air that are related to asthma include environmental tobacco smoke; animal dander; allergens produced by dust mites, rodents and cockroaches; cleaning chemicals; pollen; mold; ozone; sulfur dioxide and fine particles. Exposure to many of these can trigger allergic reactions or cause respiratory irritation that exacerbates symptoms in those with existing asthma. Exposure to many indoor and outdoor pollutants – such as dust mite and cockroach allergens, environmental tobacco smoke, ozone and fine particles – have also been associated, in some studies, with asthma development.[30-37]

Many asthma triggers vary with season, geography and other factors. Climate change may affect many environmental factors that contribute to asthma.[38, 39] For example, a warmer and wetter climate in New York could extend the seasons for pollen and mold-spore production and increase dust mite populations. Tracking changes in climate and in concentrations of or exposure to specific triggers over time will improve our understanding of these relationships and help public health professionals plan and prioritize resources (e.g., to areas of the state most likely to be affected or to address specific triggers).

Outdoor pollutants such as ozone, sulfur dioxide and fine particles vary seasonally or with changes in meteorological conditions such as temperature. In the northeastern United States, summer ozone pollution has been associated with 10% to 20% of summertime respiratory hospital visits and admissions.[40] In U.S. and Canadian studies, the ozone-associated increase in daily respiratory hospital admissions ranged from 2% to 30%, with daily ozone increments in the warm season that ranged from 20-40 parts per billion (ppb) for different ozone averaging times.[40] The association between ambient air particulate matter (PM) concentrations and asthma, including increased hospital admissions, is well documented.[41, 42] Models demonstrate 5% to 15% increases in daily respiratory-related hospital admissions per 25 $\mu g/m^3$ (micrograms per cubic meter of air) daily increment of fine particles, with the largest effect on asthma admissions.[43]

The NYS Department of Environmental Conservation operates a network of air monitors throughout NYS. This statewide network provides real-time information about levels of important air pollutants.[44] This pollutant information, combined with weather forecasts, is used to issue Air Quality Health Advisories (see www.dec.ny.gov/cfmx/extapps/aqi/aqi_forecast.cfm). These advisories inform people to take precautions to reduce exposure on days with expected high pollutant levels. Data gathered from the monitoring network are also used to track pollutant levels over time. NYSDOH's Environmental Public Health Tracking Program uses air pollution data to generate public health indicators, including county-level data and indicators that take into account the size of the population potentially exposed to high levels of ozone or fine particles (see https://apps.nyhealth.gov/statistics/environmental/public_health_tracking/tracker/air/mapaction.map)

Pollen is another important outdoor trigger for many people with asthma. Pollen is produced by coniferous and flowering plants (trees, grasses and weeds) during the spring, summer or fall. Like outdoor air pollutants, pollen levels and types vary with season, location and weather. Insects and animals often spread pollen grains from plant to plant, but many grass, tree and weed species depend on the wind to spread their pollen through the air. Some people with asthma are sensitized to pollen from trees, grasses or weeds and can have their asthma aggravated by pollen in the air. Studies have found that as pollen levels rise, asthma medication use and asthma-related emergency department (ED) visits may also increase.[45-49] Some studies have also observed that higher fine particulate levels in outdoor air further increase the number of pollen-related ED visits, suggesting that more people may experience asthma symptoms when both triggers are present.[47, 49]

The National Allergy Bureau (NAB), a section of the American Academy of Allergy, Asthma and Immunology's

Aeroallergen Network, oversees a pollen monitoring network and certifies pollen counters who operate counting stations across the United States. Currently, there are six NAB counting stations in New York State that provide information about daily mold spore and tree, grass and weed pollen counts. The NAB stations use pollen counts to report pollen levels as low, medium, high or very high. The pollen reports are available through the NAB website (see www.aaaai.org/global/nab-pollen-counts.aspx), the Weather Channel and some local news media.

*There are many actions individuals and communities can take to reduce exposure to indoor and outdoor air pollutants (see www.health.ny.gov/diseases/asthma/links.htm#trig for information, ideas and resources). Additionally, there are many actions individuals can take to reduce outdoor air pollution (see www.dec.ny.gov/public/43563.html).

Highlights: Asthma and the Environment

School Indoor Air Quality

2010 NYS School Building Condition Survey

- The NYS Building Condition Survey (BCS) tracks conditions in NYS public schools that may affect school indoor air quality (IAQ).
- Although relatively few school buildings reported having noticeable moldy odors (3.8%) in 2010, about 35% reported at least one type of moisture or humidity problem, which can indicate the potential for mold growth.
- Various ventilation-related problems, which can affect indoor air quality, were reported by schools in 2010. About one-fifth of schools reported inadequate outside air intake, about 13% reported problems with malfunctioning dampers, and about 10% reported potential diesel intrusion, blocked air intakes and dirt or dust near or in the system.
- About 5% of buildings reported rodents, cockroaches, wood-eating insects or other pests in 2010.

Outdoor Air Quality

Ozone and $PM_{2.5}$

- For 2007-2009, there were a number of unhealthy ozone days each year at several locations across the state. Elevated ozone levels occurred most commonly near and downwind of major cities. Unhealthy ozone days mainly occur from May through September. The frequency of unhealthy ozone days per year tended to decline from 2000 to 2009.
- For 2007-2009, the number of days when fine particle concentrations were unhealthy for sensitive groups, such as people with asthma, was greatest in the New York City area, less in the smaller-sized cities, and lowest in rural areas. The frequency of unhealthy fine particle days per year tended to decline from 2000 to 2009.

Pollen

- The duration, intensity and season of tree, grass and weed pollen varies across the state and between years.
- Tree pollen season typically begins in the spring and ends in early summer. For 2003 to 2010 the average percentage of days in late March to mid-June when tree pollen counts were at or above the national threshold for a "high" pollen count ranged from 49% to 84%.
- Grass pollen season typically begins later in the spring and continues through late summer or early fall. For 2003 to 2010 the average percentage of days in late April to mid-September when grass pollen counts were at or above the national threshold for a "high" pollen count ranged from 3% to 67%.
- Weed pollen season typically begins mid to late summer and continues through the fall. For 2003 to 2010 the average percentage of days in late May to early October when weed pollen counts were at or above the national threshold for a "high" pollen count ranged from zero to 37%.

Methodology

Children and staff spend a considerable proportion of their time in and around school buildings, where they may be exposed to conditions that exacerbate asthma. Poor condition of the school infrastructure and improper practices can promote the existence of asthma triggers and thus impact students and staff with asthma. However, there are many things that schools can do to minimize the presence of environmental asthma triggers in the school setting, including proper maintenance of buildings and grounds and management of other factors that can impact indoor air quality (IAQ). Therefore, it is important to assess conditions in schools that can promote the existence of these asthma triggers.

The Building Condition Survey (BCS) is a physical inspection of NYS public school buildings that is performed every five years. It is conducted by a licensed engineer and/or an architect. This inspection is mandated by a 1999 regulation issued by the Commissioner of Education. The BCS is useful to track environmental conditions in NYS public schools over time. The first BCS was completed in 2000, and revised versions were conducted in 2005 and 2010.

For each building or facility, inspectors rate the overall building condition, as well as the condition of 53 individual building systems, such as roof, plumbing and windows. In addition, NYSDOH worked with the NYS Education Department (NYSED) to incorporate a section pertaining to school IAQ beginning in 2005. The results of the inspection for each school are documented using a standardized form. Following review by the school board, completed forms for each school are submitted to NYSED, which maintains a database of all BCS records. This section describes an analysis of some results from the IAQ section of the 2005 BCS which addresses specific conditions that can affect school IAQ, including ventilation system problems, visible mold, moisture or humidity problems, and the presence of vermin.

1. Problems in the ventilation system.

A well-functioning ventilation system brings in enough fresh air to dilute any allergens or irritants that may be present in the school, avoids the intrusion of outdoor pollutants and is not a reservoir for dirt or debris. Schools answered whether the following problems exist:

Ventilation System Problem	Building Condition Survey Question(s)
Potential diesel exhaust intrusion	Are there fresh air intakes near the following: • Near the bus loading areas? • Near the truck delivery areas? • Near the garbage storage/disposal areas?
Dirt and debris	Is there accumulated dirt, dust or debris around fresh air intakes? Is accumulated dirt, dust or debris in ductwork?
Fresh air unable to freely enter system	Are fresh air intakes free of blockage? Are dampers functioning as designed?
Not enough fresh air	Is outside air adequate for occupant load?

2. Moisture/humidity problems.

Excessive moisture or humidity in a building can lead to the growth of mold, and odors can indicate the possibility of mold in visibly inaccessible places. Schools were asked whether the following types of moisture or mold problems exist:

- Visible stains, mold or water damage
- Noticeable moldy odors
- Active leaks in roof
- Active leaks in plumbing
- Moisture condensation

3. Vermin or pests.

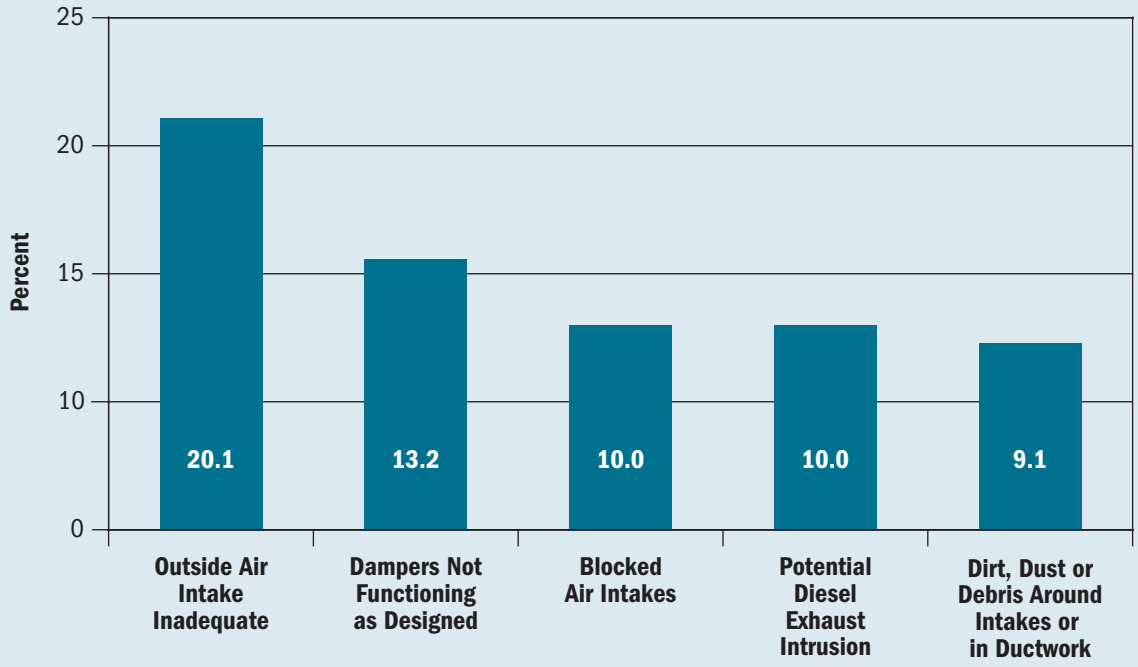
Certain pests, most notably rodents and cockroaches, produce allergens that can trigger asthma attacks or allergic reactions in building occupants. Schools were asked whether there was evidence of active infestations of:

- Rodents
- Cockroaches
- Wood-boring or wood-eating insects
- Other vermin

For the purpose of this analysis, only buildings used for instructing children were included. These buildings were selected based on building type (e.g., instructional, administrative) and on pre-kindergarten-12th grade enrollment for daytime classes. Information for 3,021 NYS school buildings located outside of New York City (in 697 school districts, representing more than 98% of all non-New York City public school districts) were available for the analysis of the BCS IAQ section. This survey provides information for non-New York City schools because information for school buildings in New York City was not available at the time of analysis. Efforts to obtain information on school building conditions in New York City are under way.

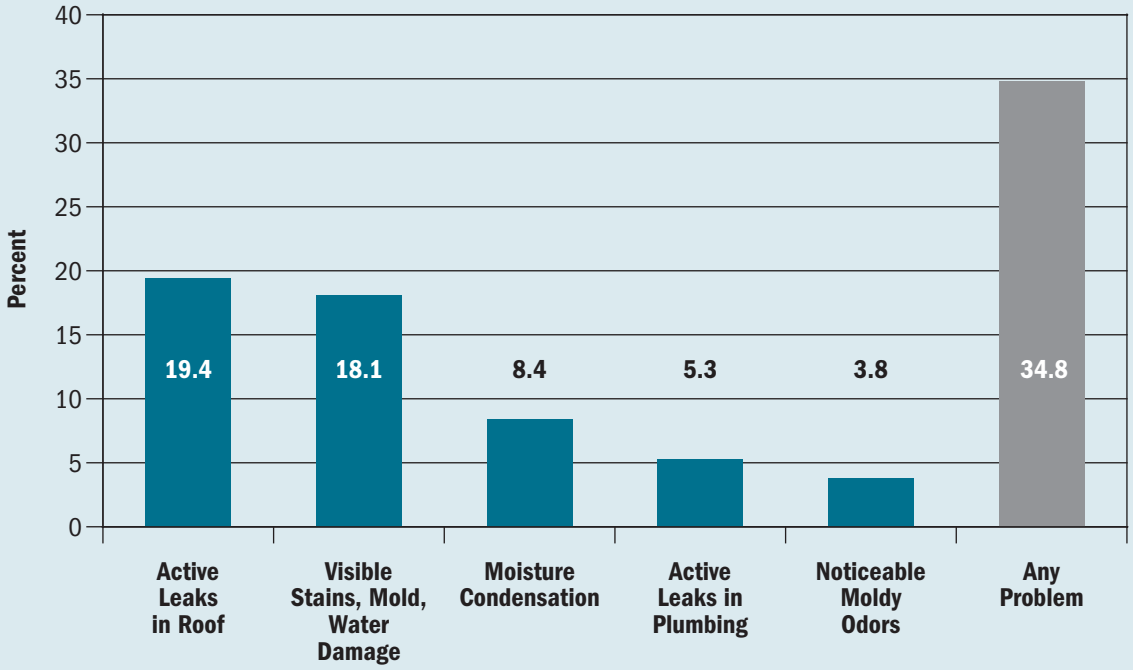
The BCS serves as a useful assessment of building and environmental conditions that have the potential to impact students and staff with asthma, but it is not a direct measurement of exposure to environmental conditions. Rather, the BCS tracks environmental conditions that have the potential to impact the health of students and staff. This relatively new tool is likely to become more useful over time as methods are more consistently applied and data are available to analyze trends over time.

Figure 12-1
Percentage of Public School Buildings Reporting Ventilation System Problems, New York State (Excluding New York City), 2010 (N=3,021)



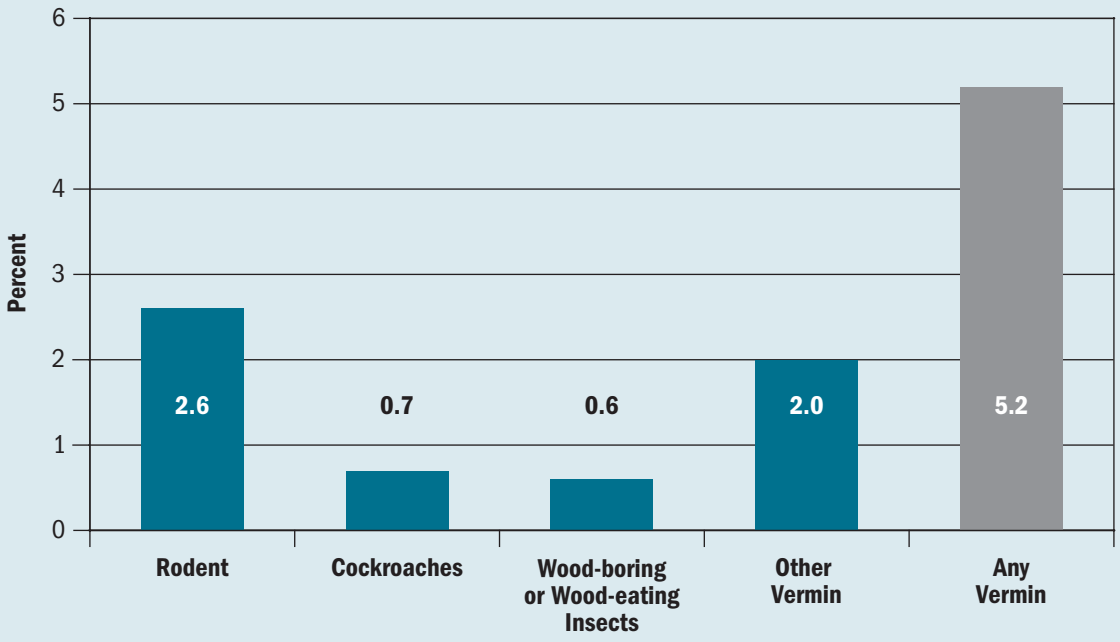
Schools answered questions about the presence of several different problems related to the ventilation system. The most commonly reported problem was inadequate fresh air (20.1% of school buildings). The next most common problem reported was malfunctioning dampers (13.2% of school buildings). Dampers regulate the flow of fresh air into the building. Blocked air intakes, which limit or prevent fresh air from entering the building, was reported in 10% of buildings. Potential diesel exhaust intrusion into the building, reported in 10% of buildings, was assessed by asking whether fresh air intakes were near sources of diesel pollution, including school bus loading areas, truck delivery areas or garbage storage/disposal areas. Dust, dirt or debris near fresh air intakes or ductwork was reported in 9.1% of buildings (Figure 12-1).

Figure 12-2
Percentage of Public School Buildings Reporting Mold or Moisture Problems, New York State (Excluding New York City), 2010 (N=3,021)



Almost 35% of schools reported at least one type of mold or moisture problem in the building. Active roof leaks (19.4% of buildings), and visible stains, mold or water damage (18.1% of buildings) were the most commonly reported problems, followed by moisture condensation (8.4% of buildings) and active plumbing leaks (5.3% of buildings). Moldy odors were noticed in 3.8% of buildings. These conditions can indicate past or present problems (Figure 12-2).

Figure 12-3
Percentage of Public School Buildings Reporting Active Infestations of Vermin, New York State (Excluding New York City), 2010 (N=3,021)



Schools indicated whether there was evidence of active infestations of various types of vermin or pests. About 5.2% reported one or more types of infestation. Rodent infestations were the most commonly reported (2.6%), followed by cockroaches (0.7%), and wood-boring or wood-eating insects (0.6%). Other types of vermin were reported in 2.0% of buildings (Figure 12-3).

Methodology

Outdoor Air Pollutants

Two important outdoor air pollutants that can trigger asthma attacks are ozone and fine particulate matter ($PM_{2.5}$). Scientific studies have linked exposure to these pollutants with health effects, including eye and respiratory tract irritation, coughing, shortness of breath, reduced lung function, heart attack and premature death.[40, 43]

- *Ozone*, the principal component of smog, is produced by the reaction of sunlight on air contaminants from automobile exhausts, other combustion sources and industrial emissions. Ozone levels are most likely to be elevated on hot, sunny afternoons. Ozone concentrations are measured in parts per million (ppm).
- *Particulate Matter* ($PM_{2.5}$), also called fine particulate matter, is particles or droplets in the air that are less than 2.5 microns wide (or about 30 times smaller than width of a human hair). Outdoor sources of $PM_{2.5}$ primarily come from combustion sources, such as motor vehicle exhausts, power plants and wildfires, and from the reaction of gases in the atmosphere. Indoor sources include tobacco smoke, cooking, fireplaces and candles. Fine particulates are measured in micrograms per cubic meter of air or $\mu g/m^3$.

National Air Quality Standards

The U.S. Environmental Protection Agency (EPA) regulates the levels of both pollutants through National Ambient Air Quality Standards (NAAQS) designed to protect public health and welfare. Under the federal Clean Air Act, primary NAAQS are set by the EPA at levels "requisite to protect the public health." The current level of the ozone NAAQS is 0.075 ppm (ppm, equivalent to 75 parts per billion) measured as a maximum daily eight-hour rolling average. The current level of the daily $PM_{2.5}$ NAAQS is 35 $\mu g/m^3$ calculated as a 24-hour average. These values are used in this chapter to summarize trends in NYS air quality in terms of potential public health effects. NAAQS have an indicator (e.g. $PM_{2.5}$), an averaging time (e.g. 24 hours), a form (e.g., average of the 98th percentile value for each year in a three-year period) and a level (e.g. 35 $\mu g/m^3$). All these factors have to be considered in comparing air quality to a NAAQS and determining whether an area meets a NAAQS standard. The summaries presented in this chapter are not intended to address regulatory issues of standards attainment or implementation.

Measuring Air Quality in New York State

The NYS Department of Environmental Conservation (NYSDEC) measures air pollutants using a network of monitors across the state to track air quality. The locations of the monitoring sites are selected to measure ambient (outdoor) concentrations in populated areas statewide. These locations provide ambient concentration data representative of outdoor air where the majority of the state's population lives. A few additional monitors are located in sparsely populated areas to determine background levels and the amount of pollution that comes into an area from sources upwind. The monitoring network and full details of monitoring methods for each pollutant, as well as information on regulatory aspects of NAAQS implementation and attainment, are described on the NYSDEC web site (see www.dec.ny.gov/chemical/8406.html).

Data were only included for monitors when >75% of their potential results for a year were available. This avoided potential bias if too much of a monitor's sampling record was missing. Because of this selection criterion and changes in the operation of the monitoring network, the number of monitors used to create data summaries can change over time (www.dec.ny.gov/chemical/8540.html).

Ozone Data

To summarize recent spatial variability in high daily ozone across NYS, a map is presented to show the location of ozone monitors and the average number of days per year from 2007 to 2009 when ambient ozone levels exceeded the current eight-hour NAAQS of 0.075 ppm at each monitor. The NAAQS for eight-hour ozone was reduced from 0.08 ppm to 0.075 ppm in 2008.* Concentrations above the NAAQS level are considered unhealthy for sensitive groups. The revised ozone NAAQS was used to identify unhealthy days for all years.

To summarize temporal trends in the number of unhealthy ozone days among all monitoring locations, data were analyzed from the ozone monitors that had valid data for at least 75% of all observations from 1997 to 2009. These data are presented in figures with the temperature data from the same time period for New York City and for NYS excluding New York City (Rest of State). For each year, the number of days that ambient ozone levels were unhealthy for people with asthma (0.075 ppm or higher) at each monitor was determined. The averages over all monitors in New York City and the Rest of State for each year are presented. The average summer temperatures for

*Because of differences in rounding procedures, the previous standard was effectively 0.084 ppm (equivalent to 84 parts per billion).

New York City and Rest of State were calculated using data from June-August each year at 10 NYSDEC weather monitors in NYS, as reported to the EPA's Air Quality System (AQS).[50]

Fine Particulate Matter ($PM_{2.5}$) Data

To summarize recent spatial variability in high daily fine particulate levels across NYS, a map is presented to show the locations of fine particle monitors and the average number of days per year from 2007 to 2009 that exceeded the current daily average NAAQS of 35 $\mu g/m^3$ at each monitor. Ambient air concentrations above this level are considered unhealthy for sensitive groups, such as people with asthma. Most $PM_{2.5}$ monitors collect data on a schedule of once every three days. For those monitors, the number of unhealthy days per year was multiplied by three to *estimate* the expected total number of days in a year that $PM_{2.5}$ levels would have been unhealthy for sensitive groups.** Data from $PM_{2.5}$ monitors that collect samples every day were not modified. There were 12 locations that measured $PM_{2.5}$ once every three days and two locations (one in NYC and one rural background location outside of NYC) that measured $PM_{2.5}$ every day.

To summarize temporal trends in the number of unhealthy fine particulate days among all monitoring locations, data were analyzed from particulate monitors that had valid data for at least 75% of all observations from 2002 to 2009. These data are presented in a figure showing the trend in New York City and the Rest of State. For each year, the number of days that ambient fine particulate levels were unhealthy for people with asthma at each monitor is determined, by estimating the expected total for the every-third-day monitors as described above or by using the entire set of observations for the continuous monitors. A weighted average over all monitors was used to plot the time trend in New York City.*** For the time trend in the Rest of State, a simple arithmetic average of all monitors is presented to avoid over-weighting the one continuous monitor outside New York City, which is sited to reflect rural background air quality.

Air Quality Health Advisories

The NYSDEC and NYSDOH issue "Air Quality Health Advisories" when air pollutant concentrations are forecast to increase above levels that pose health risks to sensitive groups, such as people with asthma. These levels are based on the NAAQS for eight-hour ozone and daily $PM_{2.5}$ concentrations. Air quality health advisories for ozone and $PM_{2.5}$ can occur on the same day, but this has been uncommon.

High ozone levels are usually confined to the summer season, while high particle days can occur at any time of year. On unhealthy ozone days, people with asthma can reduce symptoms by limiting their strenuous outdoor activity during afternoon hours when ozone levels are likely to be the highest, and carefully following their asthma management plan.

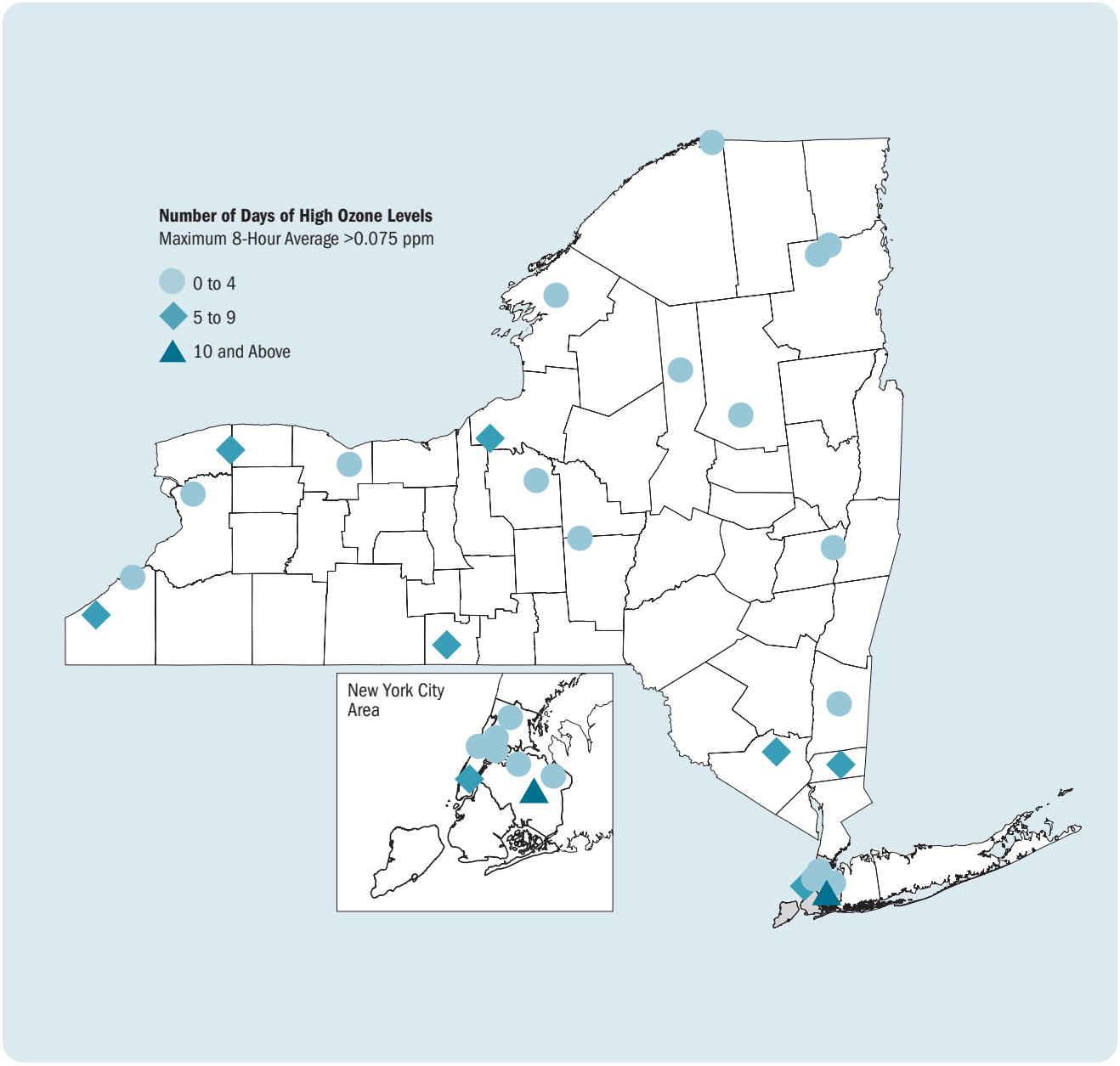
On unhealthy fine particle days, staying indoors may reduce exposure, although some outdoor particles will come indoors. If there are significant indoor sources of particles, levels inside may not be lower than outside. People with asthma can reduce symptoms by limiting indoor and outdoor activities that produce fine particles and avoiding strenuous activity in areas where fine particles are high.

More information about the health effects of air pollution is available at: www.health.ny.gov/environmental/air_quality. Air pollution forecasts and monitoring results are posted at www.dec.ny.gov/chemical/34985.html).

**This procedure was used to compare monitors with different sampling schedules, but it is not used to evaluate whether a monitoring location is in compliance with the PM2.5 NAAQS.

***For each year, the average number of unhealthy days per monitor in New York City is a weighted mean of estimated numbers of days from the every-third-day monitors (N=4) and the observed numbers of days from the continuous monitor (N=1), where the weights are the number of sampling days per year at each location.

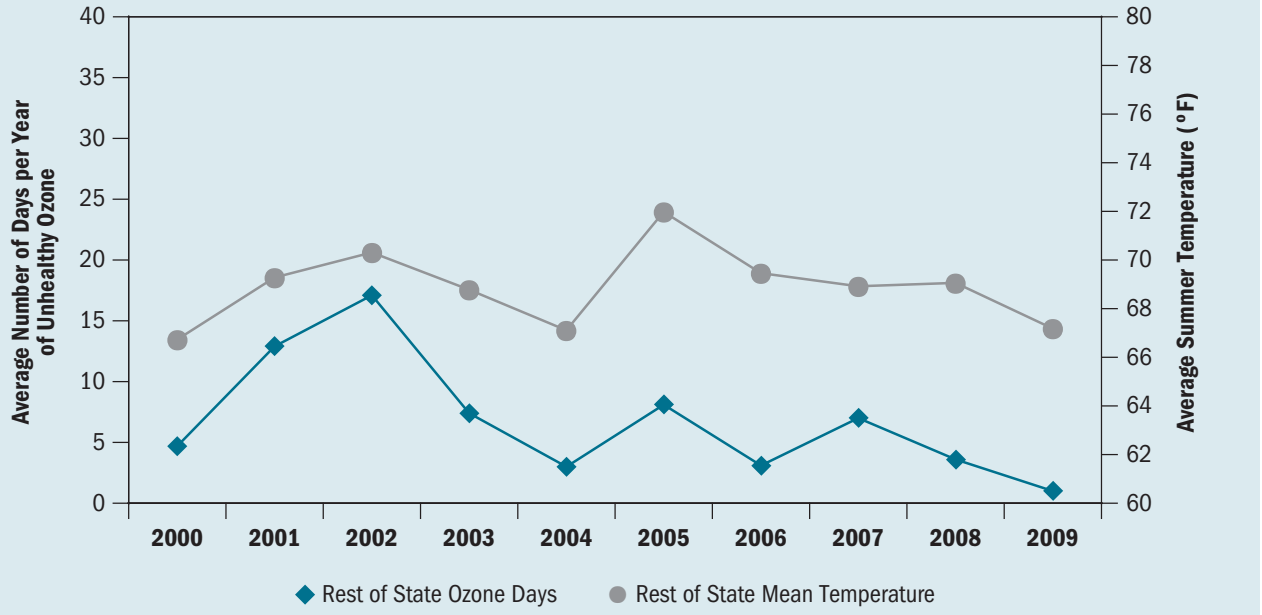
Figure 12-4
Average Number of Days per Year That Ambient Ozone Levels Were Unhealthy for People with Asthma, New York State, 2007-2009



Note: The National Ambient Air Quality Standard (NAAQS) for eight-hour ozone was reduced from 0.08 parts per million to 0.075 parts per million in 2008. The revised NAAQS was used for all years.

Unhealthy ozone days occurred each year at several locations across the state. Elevated ozone levels occurred most commonly near and downwind of major cities. Ozone pollution was also found in remote locations because pollutants that are factors in ozone formation and ozone itself are carried by the wind, hundreds of miles from their sources (Figure 12-4). Unhealthy ozone days mainly occur during May through September.

Figure 12-5
Trends in Average Summer Temperature and Average Number of Days per Year that Ambient Ozone Levels Were Unhealthy for People with Asthma, New York State (excluding New York City), 2000-2009

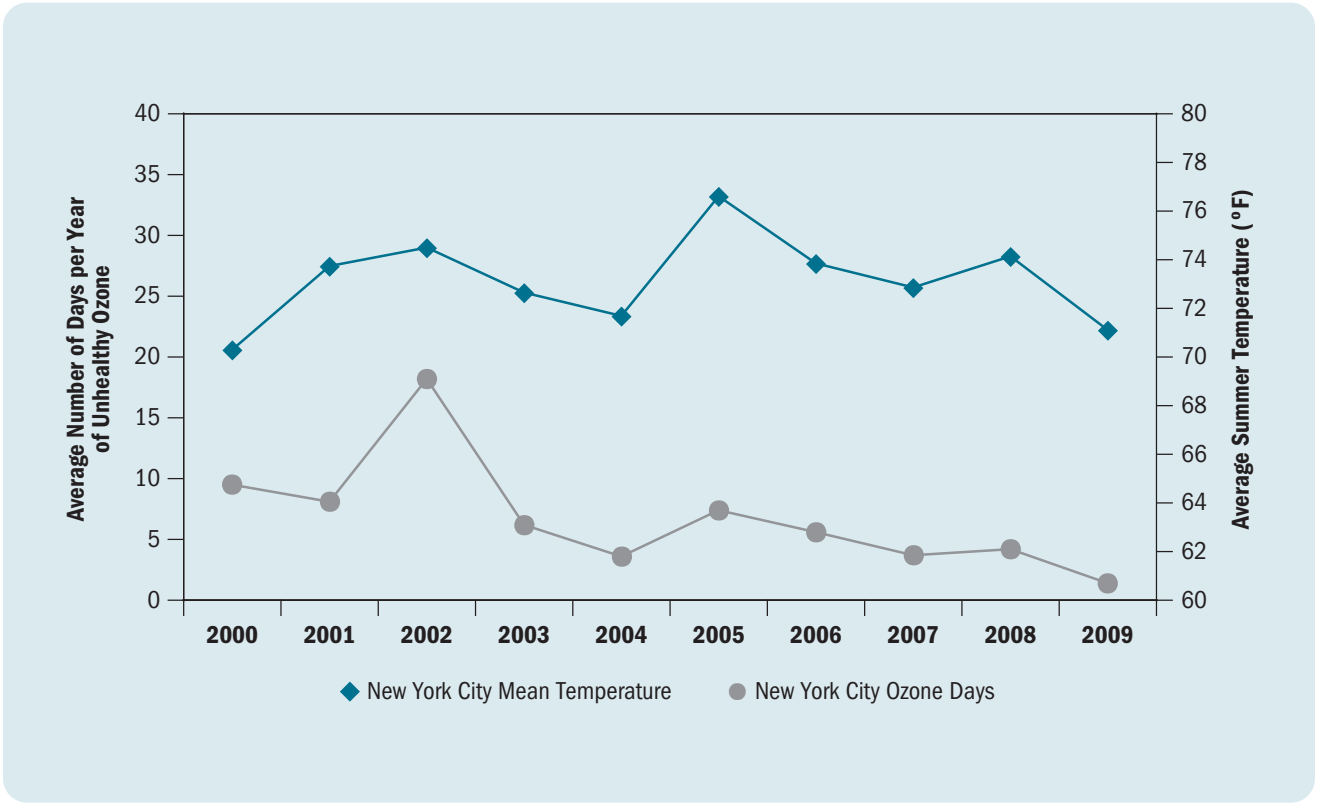


Note: The National Ambient Air Quality Standard (NAAQS) for eight-hour ozone was reduced from 0.08 parts per million to 0.075 parts per million in 2008. The revised NAAQS was used for all years.

From 2000 to 2009, the average number of unhealthy ozone days per year averaged across monitors in the Rest of State ranged from 1 to 17. There are generally more unhealthy ozone days in years with hotter summers (Figure 12-5).

Figure 12-6

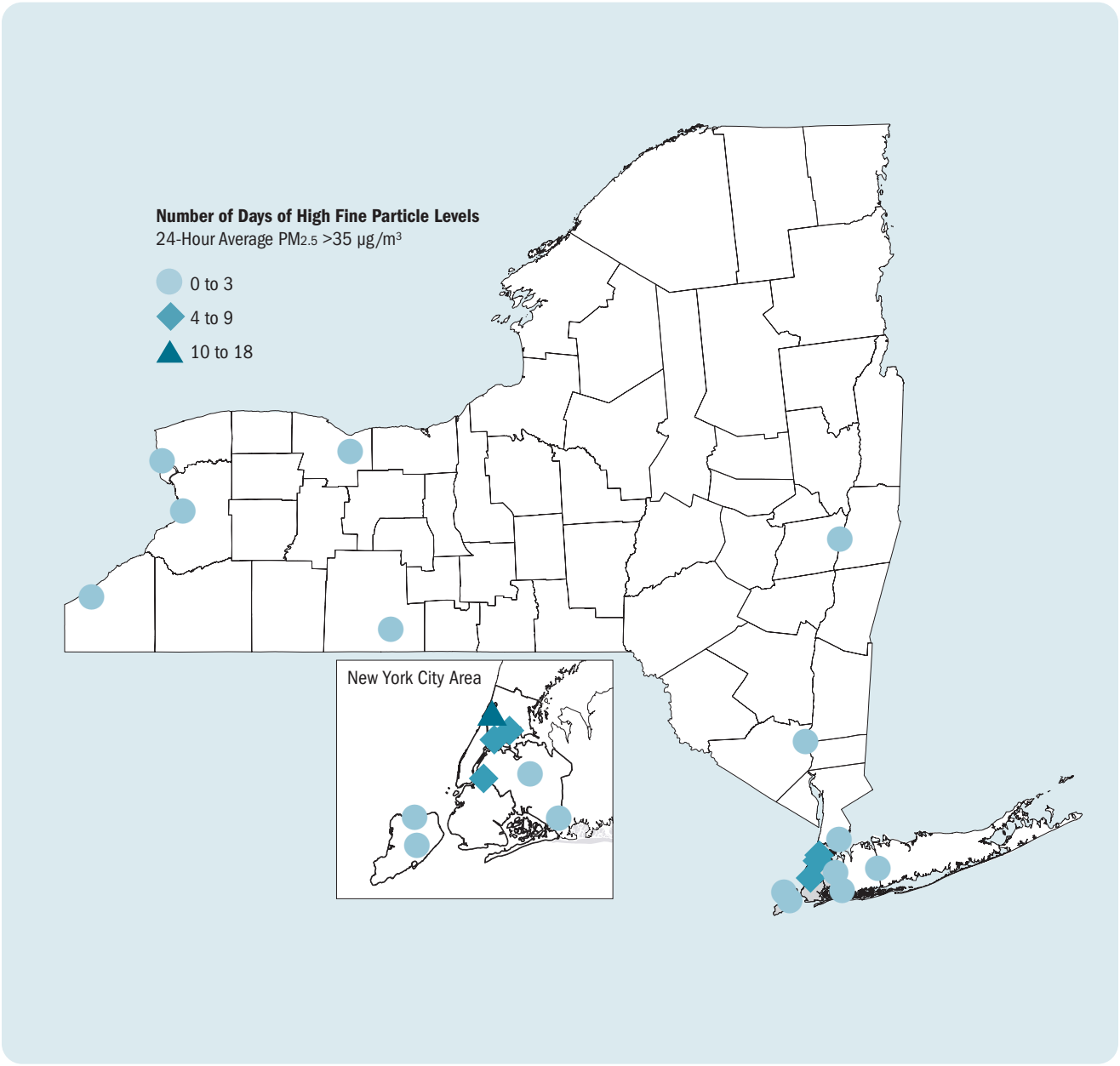
Trends in Average Summer Temperature and Average Number of Days per Year that Ambient Ozone Levels Were Unhealthy for People with Asthma, New York City, 2000-2009



Note: The National Ambient Air Quality Standard (NAAQS) for eight-hour ozone was reduced from 0.08 parts per million to 0.075 parts per million in 2008. The revised NAAQS was used for all years.

From 2000 to 2009, the average number of unhealthy ozone days per year averaged across monitors in New York City ranged from 1 to 18. While there are generally more unhealthy ozone days in years with hotter summers, the average number of unhealthy ozone days per year in New York City declined over the time period (Figure 12-6).

Figure 12-7
Estimated Average Number of Days per Year that Fine Particles Were Unhealthy for People with Asthma, New York State, 2007-2009



Note: The National Ambient Air Quality Standard (NAAQS) for daily fine particles was reduced from 65 µg/m^3 to 35 µg/m^3 in December 2006. The revised NAAQS was used for all years.

The average number of days per year when fine particle concentrations exceeded 35 µg/m^3 was greatest at monitors in the New York City area, less in the smaller-sized cities, and lowest in rural areas (Figure 12-7).

Figure 12-8
Trends in Estimated Average Number of Days per Year that Fine Particles Were Unhealthy for People with Asthma by Region and Year, New York State, 2000-2009

Note: The National Ambient Air Quality Standard (NAAQS) for daily fine particles was reduced from 65 µg/m^3 to 35 µg/m^3 in December 2006. The revised NAAQS was used for all years.

From 2000 to 2009, the average number of days per year that fine particles were unhealthy for people with asthma ranged from two to 18 across monitors in New York City, and from zero to eight days across monitors in the Rest of State (Figure 12-8). The average number of unhealthy days per year has tended to decline over the period.

Methodology

Pollen is an important outdoor trigger for some people with asthma. Pollen in the air outside can cause a wide range of allergic and respiratory symptoms, including worsening asthma, for people who are sensitized to pollen from trees, grasses or weeds.[51, 52] Studies have found that as pollen levels rise, asthma medication use and asthma-related hospital and emergency department visits also increase.[45-50] Some studies have also observed that higher fine particulate levels in outdoor air further increase the number of pollen-related hospitalizations, suggesting that more people may experience asthma symptoms when both triggers are present.[47, 50]

Pollen is produced by many plants (e.g., trees, grasses and weeds) during the spring, summer or fall. Like outdoor air pollutants, pollen levels and types vary with season, location and weather. Insects and animals often spread pollen grains from plant to plant, but many grass, tree and weed species depend on the wind to spread their pollen through the air.

Pollen Monitoring Network

New York State government agencies do not currently operate a pollen monitoring program*; however, the American Academy of Allergy, Asthma and Immunology (AAAAI) certifies volunteer pollen counters who operate counting stations across the United States as part of the National Allergy Bureau (NAB). Currently, there are six NAB counting stations in New York State. Because the location of the stations is based on the availability of certified volunteer counters, the network may not be representative of NYS as a whole. Certified stations are required to collect samples at least three days per week using approved samplers. Additional information about the certification process and sampling process is available on the NAB website (see www.aaaai.org/global/nab-pollen-counts/counting-stations.aspx). Pollen counts are reported as the number of pollen grains per cubic meter of air (m^3).

The NAB stations use pollen counts to report daily pollen levels as low, medium, high or very high for trees, grasses and weeds (Table 12-1). These levels are derived from ecological measurements from counting stations across the United States and are not based on potential health effects.

Table 12-1
NAB Levels Based on Concentration (Grains per Cubic Meter of Air)

	Absent	Low	Moderate	High	Very High
Tree	0	1-14	15-89	90-1499	>1500
Grass	0	1-4	5-19	20-199	>200
Weed	0	1-9	10-49	50-499	>500

Low levels: Concentrations that are less than the median or 50th percentile nationally.

Moderate levels: Concentrations between the 50th and 75th percentile nationally.

High levels: Between the 75th and 99th percentile nationally.

Very high levels: Above the 99th percentile nationally.

Pollen Categories

Pollen counts for individual species of trees, grasses and weeds were collapsed into three pollen categories: all trees, all grasses and all weeds. Pollen counts for each category included the following types of pollen:

- **All trees:** *Acer* (Maple), *Alnus* (Alder), *Betula* (Birch), *Carpinus/Ostrya* (Hornbeam-hardwood tree), *Carya* (Hickory), *Celtis* (Hackberry), *Corylus* (Hazel), *Cupressaceae* (Cypress-Juniper and Redwoods), *Fagus* (Beech), *Fraxinus* (Ash), *Juglans* (Walnut), *Ligustrum* (evergreen shrubs-privets), *Liquidambar* (Sweetgum tree), *Morus* (Mullberry tree), *Myrica* (Bayberry tree), *Olea* (Olive tree), *Pinaceae* (Cedars, Pine, Spruce), *Platanus* (Sycamore), *Populus* (Poplar, Aspen, Cottonwood), *Pseudotsuga* (Douglass Fir), *Quercus* (Oak), *Salix* (Willow), *Tilia* (Linden), *Tsuga* (Hemlock), *Ulmus* (Elm), *Other tree pollen*

- **All grasses:** *Cyperaceae* (Sedges), *Gramineae/Poaceae* (flowering plants, Bamboo-grasses), *Typha* (Cat Tail), *Other grass pollen*
- **All weeds:** *Ambrosia* (Ragweed-bitterweeds, Bloodweeds), *Artemisia* (Sagebush, Wormwood, Mugworts), *Asteraceae* (excluding Ambrosia and Artemisia) (Daisy, Sunflower, Chrysanthemums), *Chenopodiaceae/Amaranthaceae* (Goosefoot family, Spinach, Beets, Chard, Quinoa, Pigweed, Lambsquarters), *Plantago* (Plantains-english, sharp, and elephant), *Rumex* (buckwheat, sheep sorrel, docks), *Urticaceae* (Nettles, Ramie, Mamaki, Ajlai), *Other weed pollen*

These pollen categories were used to characterize the pollen season in NYS, including duration and intensity of the tree, grass and weed pollen seasons, but this approach may mask important differences in which species are contributing to the total pollen count for each category and at different counting stations.

Pollen Season

The pollen season was defined using the 90% method.[53] This method identifies the pollen season based on the middle 90% of the total pollen count for the year. Using the 90% method, the start date is defined as the date when 5% of the seasonal cumulative pollen has been counted and the end date as the date when 95% of the seasonal cumulative pollen has been counted. The average start and end dates are reported for each pollen category and by counting station along with the range of start and end dates (earliest and latest start and end dates).

Duration of Pollen Season

The number of days between the start date and end date provides an estimated duration of the pollen season each year. The duration of the pollen season was calculated for each pollen category (trees, grasses, weeds) and by counting station. The average duration over the 2003 to 2010 reporting period is shown along with the range (minimum and maximum duration). The variation from year to year is represented by the grey bars next to each reporting station.

Intensity of Pollen Season

The intensity of the pollen season was calculated as the mean daily pollen count (the total pollen count in grains/m^3 divided by the number of observations during the pollen season). Intensity was calculated for each pollen category (trees, grasses, weeds) and by counting station. The average intensity over the 2003 to 2010 reporting period is shown along with the range (minimum, maximum and annual mean between 2003 and 2010). The variation from year to year for each counting is represented by the dark blue bars and the red line indicates the NAB threshold for a "high" level of each type of pollen.

The average percentage of days at or above the NAB threshold for "high" pollen concentration was calculated by dividing the total number of days during the season that exceeded the appropriate NAB threshold (90 grains/m^3 for trees, 20 grains/m^3 for grass, 50 grains/m^3 for weeds) by the number of observed days. The average percentage of days exceeding the NAB threshold was calculated for each pollen category and by counting station.

Data Exclusions

Data for counting stations with fewer than four years of data were excluded from this report. As a result, data were excluded for one counting station based in New York City. Additionally, for specific pollen categories (tree, grass or weed), data for a reporting year were excluded if a counting station did not begin counting until after the average start date of the appropriate pollen season.

Daily Pollen Reports

Daily pollen reports are available through the NAB website (see www.aaaai.org/global/nab-pollen-counts.aspx), the Weather Channel and some local news media. For tips on how to reduce exposure to tree, grass and weed pollen, see the NAB's *Outdoor Allergens: Tips to Remember* (see www.aaaai.org/conditions-and-treatments/library/allergy-library/outdoor-allergens.aspx) or visit the National Institute of Environmental Health Science website (see www.niehs.nih.gov/health/topics/conditions/asthma/allergens/pollen/index.cfm).

*From 1949 through 1975, New York State government agencies operated a monitoring program for ragweed pollen, a species of weed known to trigger allergy and asthma symptoms.

Figure 12-9
National Allergy Bureau Certified Pollen Counting Stations With High Concentrations of Pollen, New York State, 2003-2010

For tree pollen, all pollen counting stations in NYS reported that the annual mean daily concentrations met or exceeded the National Allergy Bureau (NAB) threshold for high concentration of pollen on 25% or more days per season. For grass and weed pollen, pollen counting stations in Albany and Rochester reported that the annual mean daily concentrations met or exceeded the NAB threshold for high concentration of pollen on 25% or more days per season (Figure 12-9).

Table 12-2

Average Duration, Intensity and Start Date of Tree Pollen Season for All Trees, New York State, 2003-2010

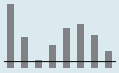
Station	Duration: Mean Length of Season in Days — 2003-2010 (▮ = Duration [Days] for One Year)	Duration: Mean Length of Season in Days — Mean Length of Season in Days (Range)	Intensity: Annual Mean Daily Pollen Count for All Trees — 2003-2010 (— = NAB High Level, ▮ = Mean Daily Concentration for One Year)	Intensity: Annual Mean Daily Pollen Count for All Trees — Mean Daily Concentration (Grains/m³) (Range of Annual Daily Mean)	Intensity: Annual Mean Daily Pollen Count for All Trees — Mean Percent of Observed Days at or Above NAB High (Range of Annual Mean Percent of Observed Days)	Season — Mean Start Date (Range)	Season — Mean End Date (Range)
Albany		56 (47-65)		507 (137-840)	76 (22-94)	Apr 13 (Apr 2–Apr 23)	Jun 7 (May 30-Jun 17)
Armonk		53 (40-74)		1088 (273-2165)	83 (56-100)	Apr 10 (Mar 31–Apr 23)	May 31 (May 18-Jun 12)
Brooklyn*		41 (30-47)		183 (104-275)	49 (25-64)	Apr 11 (Mar 23–Apr 25)	May 22 (May 7-May 27)
Olean		50 (14-78)		311 (90-1269)	53 (21-86)	Apr 11 (Mar 26–Apr 30)	May 30 (May 11-Jun 17)
Rochester		65 (56-77)		367 (197-658)	84 (65-94)	Apr 2 (Mar 26–Apr 14)	Jun 7 (May 26-Jun 12)

*2003 data is not available for Brooklyn.

From 2003-2010, the tree pollen season generally began in April and ended by mid-June at the National Allergy Bureau pollen counting stations in NYS. The mean duration of the pollen season ranged from 41 days in Brooklyn to 65 days in Rochester. The mean daily count (intensity) ranged from 183 grains/m^3 in Brooklyn to 1,088 grains/m^3 in Armonk. The mean daily count was at or above counts considered high nationally (≥ 90 grains/m^3) for all pollen counting stations in NYS (Table 12-2).

Table 12-3

Average Duration, Intensity and Start Date of Grass Pollen Season for All Grasses, New York State, 2003-2010

Station	Duration: Mean Length of Season in Days		Intensity: Annual Mean Daily Pollen Count for All Grasses			Season	
	2003-2010 (▮ = Duration [Days] for One Year)	**Mean Length of Season in Days** (Range)	**2003-2010** (—— = NAB High Level, ▮ = Mean Daily Concentration for One Year)	**Mean Daily Concentration** (Grains/m³) (Range of Annual Daily Mean)	**Mean Percent of Observed Days at or Above NAB High** (Range of Annual Mean Percent of Observed Days)	**Mean Start Date** (Range)	**Mean End Date** (Range)
Albany		80 (53-109)		100 (25-198)	67 (31-92)	May 26 (May 12-Jun 8)	Aug 13 (Jul 23-Sep 8)
Armonk		129 (116-144)		4 (3-6)	3 (1-6)	May 8 (Apr 27-May 17)	Sep 13 (Sep 3–Sep 18)
Brooklyn*		127 (97-156)		4 (2-9)	4 (0-14)	Apr 24 (Mar 31-May 12)	Aug 28 (Aug 4-Sep 21)
Olean		58 (24-86)		12 (5-22)	20 (3-40)	May 25 (May 12-Jun 6)	Jul 20 (Jun 27-Aug 18)
Rochester		58 (41-71)		37 (20-57)	51 (29-69)	May 24 (May 14-Jun 2)	Jul 20 (Jul 8-Aug 11)

*2003 data is not available for Brooklyn. 2004 data for Brooklyn begins after the start of the grass and tree pollen season.

From 2003-2010, the grass pollen season generally began in late April or May and ended by late August to mid-September at the National Allergy Bureau pollen counting stations in NYS. The mean duration of the pollen season ranged from 58 days in Olean and Rochester to 129 days in Armonk. The mean daily count (intensity) ranged from 4 grains/m^3 in Armonk and Brooklyn to 100 grains/m^3 in Albany. In Albany and Rochester, the mean daily concentration was at or above the concentration considered high nationally (≥ 20 grains/m^3), but the mean daily concentration was below this level for all other pollen counting stations (Table 12-3).

It is important to note that individual days may exceed the threshold for a high concentration at these stations, even if the mean daily concentration does not. For instance, the mean daily concentration in Olean was below the NAB high level for grasses, but on average 20% of days still met or exceeded this threshold.

Table 12-4

Average Duration, Intensity and Start Date of Weed Pollen Season for All Weeds, New York State, 2003-2010

Station	Duration: Mean Length of Season in Days — 2003-2010 (▮ = Duration [Days] for One Year)	Duration: Mean Length of Season in Days — Mean Length of Season in Days (Range)	Intensity: Annual Mean Daily Pollen Count for All Weeds — 2003-2010 (— = NAB High Level, ▮ = Mean Daily Concentration for One Year)	Intensity: Annual Mean Daily Pollen Count for All Weeds — Mean Daily Concentration (Grains/m³) (Range of Annual Daily Mean)	Intensity: Annual Mean Daily Pollen Count for All Weeds — Mean Percent of Observed Days at or Above NAB High (Range of Annual Mean Percent of Observed Days)	Season — Mean Start Date (Range)	Season — Mean End Date (Range)
Albany		30 (26-39)		40 (14-76)	28 (5-59)	Aug 14 (Aug 11-Aug 20)	Sep 12 (Sep 8-Sep 18)
Armonk		120 (93-144)		11 (6-15)	3 (0-9)	May 28 (May 12-Jun 15)	Sep 24 (Sep 15-Oct 8)
Brooklyn*		52 (44-66)		6 (4-9)	0 (0-0)	Aug 16 (Aug 11-Aug 20)	Oct 6 (Sep 28-Oct 21)
Olean		111 (92-156)		6 (2-10)	1 (0-3)	Jun 13 (May 25-Jun 27)	Sep 30 (Sep 19-Oct 27)
Rochester		74 (50-99)		71 (18-134)	37 (5-64)	Jul 11 (Jun 26-Aug 2)	Sep 21 (Sep 16-Oct 2)

*2003 data is not available for Brooklyn. 2004 data for Brooklyn begins after the start of the grass and tree pollen season.

From 2003-2010, the start of the weed season varied by location but typically ended by mid-September to early October at the National Allergy Bureau pollen counting stations in NYS. The mean duration of the weed pollen season ranged from 30 days in Albany to 120 days in Armonk. The mean daily count (intensity) ranged from 6 grains/m^3 in Brooklyn and Olean to 71 grains/m^3 in Rochester. In Albany and Rochester, the mean daily concentration was at or above the concentration considered high nationally (≥ 50 grains/m^3), but the mean daily concentration was below this level for all other pollen counting stations (Table 12-4).

It is important to note that individual days may exceed the threshold for a high concentration at these stations, even if the mean daily concentration does not. For instance, the mean daily concentration in Armonk was below the NAB high level for grasses, but on average 3% of days still met or exceeded this threshold.

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Appendices

Appendix 1: Glossary of Terms

Age-adjustment

A statistical process applied to rates of asthma emergency department visits, hospitalizations, deaths, disease, or other health outcomes which allows areas with different age structures to be compared (see Technical Notes).

Asthma

A lung disease characterized by airway constriction, mucus secretion, and chronic inflammation, resulting in reduced airflow and wheezing, coughing, chest tightness, and difficulty breathing.

At-risk Based Rate (ARR) for Asthma Emergency Department (ED) Visits

ARR for asthma ED visits are the number of asthma ED visits divided by the estimated number of people with current asthma in the population.

At-risk Based Rate (ARR) for Asthma Hospital Discharges

ARR for asthma hospital discharges are the number of asthma hospital discharges divided by the estimated number of people with current asthma in the population.

At-risk Based Rate (ARR) for Asthma Mortality

ARR for asthma mortality are the number of deaths due to asthma divided by the estimated number of people with current asthma in the population.

Capitation

A flat monthly fee that a health plan pays to a provider (doctor, hospital, lab, etc.) to take care of a patient's needs. Capitation is part of the provider-reimbursement mechanism (see www.sutterhealth.org/facilities/healthplan/healthplans_glossary.html).

Confidence Interval (95%)

Range where the true prevalence is likely to fall with a 95% degree of assurance.

Cost-adjustment

A statistical process applied to the actual costs of a type of health service to adjust for financial inflation over time. This allows cost data from different years to be compared (see Technical Notes).

Emergency Department (ED) Visit Rate, Crude

Total number of ED visits per 10,000 population for a specified period. The crude ED visit rate represents the average chance of visiting the ED during a specified period for persons for the entire population.

Emergency Department (ED) Visit, Age-adjusted

The ED visit rate used to make comparisons of relative risk of visiting the ED across groups and over time. This rate should be viewed as a construct or an index rather than as direct or actual measure of risk of visiting the ED. Statistically, it is a weighted average of the age-specific ED visit rates, where the weights represent the fixed population proportions by age.

Environmental Justice Community

Environmental justice communities are commonly identified as those where residents are predominantly minorities or low-income; where residents have been excluded from the environmental policy setting or decision-making process; where they are subject to a disproportionate impact from one or more environmental hazards; and where residents experience disparate implementation of environmental regulations, requirements, practices and activities in their communities. Environmental justice efforts attempt to address the inequities of environmental protection in these communities (see www.energy.ca.gov/public_adviser/environmental_justice_faq.html).

HEDIS

The Health Plan Effectiveness Data and Information Set is the set of measures used by the nation's health plans to measure and report on their performance.

Hospital Discharge Rate, Crude

Total number of hospital discharges per 10,000 population for a specified period. The crude hospital discharge rate represents the average chance of being hospitalized during a specified period for persons for the entire population.

Hospital Discharge Rate, Age-adjusted

The hospital discharge rate is used to make comparisons of relative risk for being hospitalized across groups and over time. This rate should be viewed as a construct or an index rather than as direct or actual measure of risk of being hospitalized. Statistically, it is a weighted average of the age-specific hospital discharge rates, where the weights represent the fixed population proportions by age.

Incidence Rate

A measure of new cases of a disease/condition that occur in a population in a given time period.

$$\frac{\text{Number of new individuals developing disease/condition in given time period}}{\text{Population at risk during the same time period}}$$

Morbidity

General term used to refer to illness due to the disease/condition in question.

Mortality

General term used to refer to death due to the disease/condition in question.

Mortality Rate, Crude

Total number of deaths per 1million population for a specified period. The crude mortality rate represents the average chance of dying during a specified period for persons for the entire population.

Mortality Rate, Age-adjusted

The death rate used to make comparisons of relative mortality risks across groups and over time. This rate should be viewed as a construct or an index rather than as direct or actual measure of mortality risk. Statistically, it is a weighted average of the age-specific death rates, where the weights represent the fixed population proportions by age.

New York City

Includes the five counties of Bronx, Kings, New York, Queens and Richmond.

Prevalence

A measure of all cases of a disease/condition at a given point of time. The term "prevalence rate" is often used interchangeably with "prevalence," although by strict definition, prevalence is a proportion, not a rate. The prevalence proportion is the proportion of people in a population that has a disease.

$$\frac{\text{Number of individuals with disease/condition in given time period}}{\text{Population at risk for the same time period}}$$

Referral Bias

Individuals with a particular exposure or adverse health outcome are more likely to choose certain physicians or health clinics than those who are not similarly affected.

Rest of State

Refers to the 57 counties of New York State exclusive of New York City.

Surveillance

The ongoing, systematic collection, analysis and interpretation of health-related data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those responsible for prevention and control (such as the federal Centers for Disease Control and Prevention).

Weighted Estimate

Results that have been adjusted to account for the survey design (including over-sampling), survey non-response and post-stratification. The weighted estimate represents the population from which the sample was drawn.

Appendix 2: Technical Notes

Age-adjustment

Age-adjustment is a statistical process applied to rates of emergency department visits, hospitalizations, deaths, disease or other health outcomes which allows areas with different age structures to be compared. Age confounding occurs when the two populations being compared have different age distributions, and the risk of the outcome varies across age groups. The process of age adjustment (Direct Method) used in this report changes the amount that each age group contributes to the average rate in each area, so that the overall rates are based on the same age structure. Rates based on the same age distribution can be compared to each other without the presence of confounding by age. Adjustment was accomplished by first multiplying the age-specific rates of death or hospitalization by age-specific weights. The weights used in the age adjustment of asthma data are the proportion of the Standard Population (the U.S. population as enumerated by the Bureau of the Census, 2000) within each age group. The weighted rates are then summed across the age groups to give the age-adjusted rate.

Cost-adjustment

Cost-adjustment is a statistical process applied to the actual costs of hospitalizations to adjust for financial inflation over time. This allows cost data from different years to be compared. Data for the Medical Care category (1998-2011) from the Consumer Price Index (CPI) for All Urban Consumers were obtained from the U.S. Department of Labor (see www.bls.gov/cpi/cpi_dr.htm#2013) to use in this adjustment procedure. The 2011 annual average CPI for the Medical Care category was used as the reference year. The cost adjustment factors were calculated by dividing the 2011 annual average CPI by the annual average CPI for each previous year. The cost adjustment factor was then multiplied by the actual hospitalization cost to obtain the CPI-adjusted hospitalization cost for each year.

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