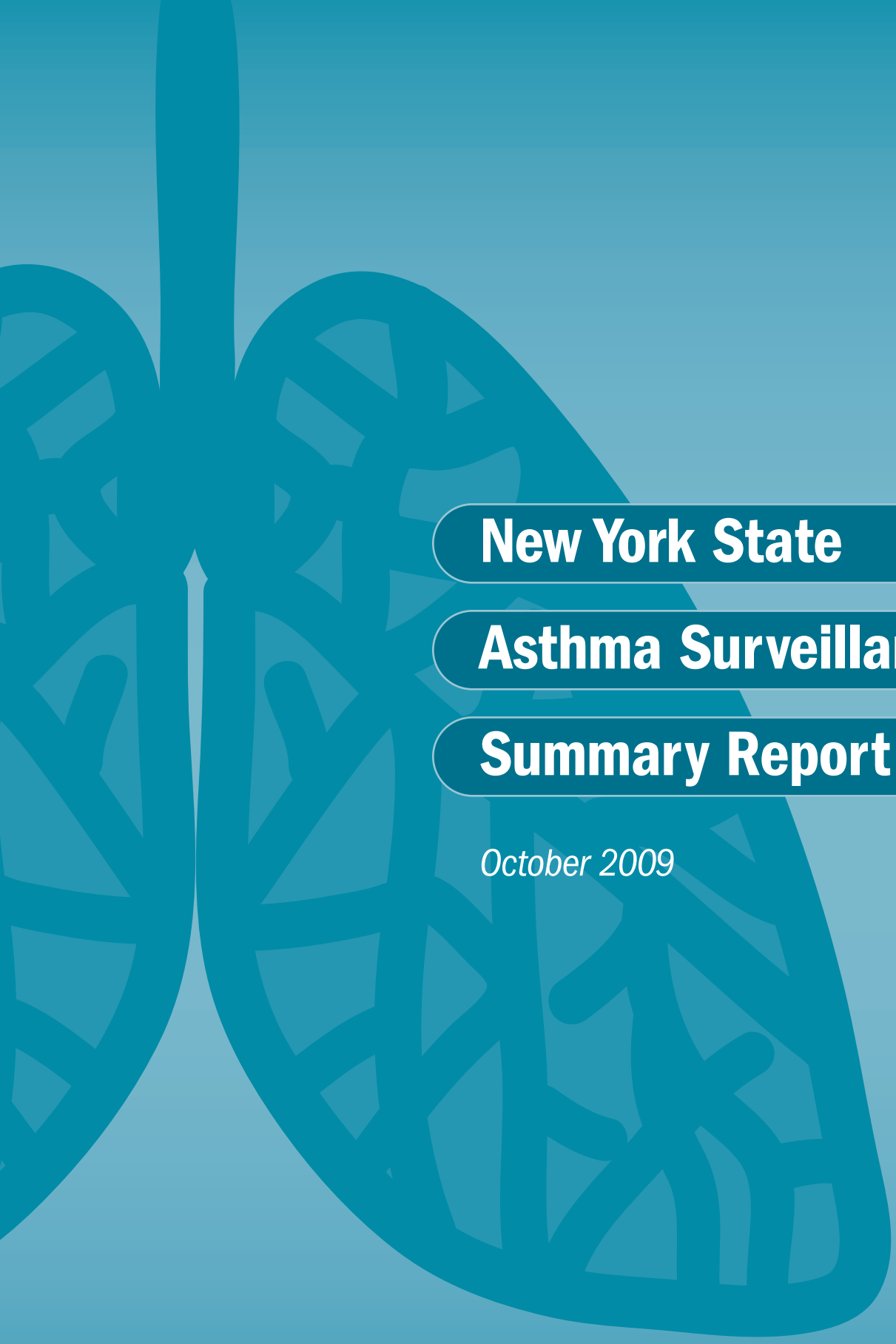

New York State Asthma Surveillance Summary Report

October 2009

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

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1 Introduction

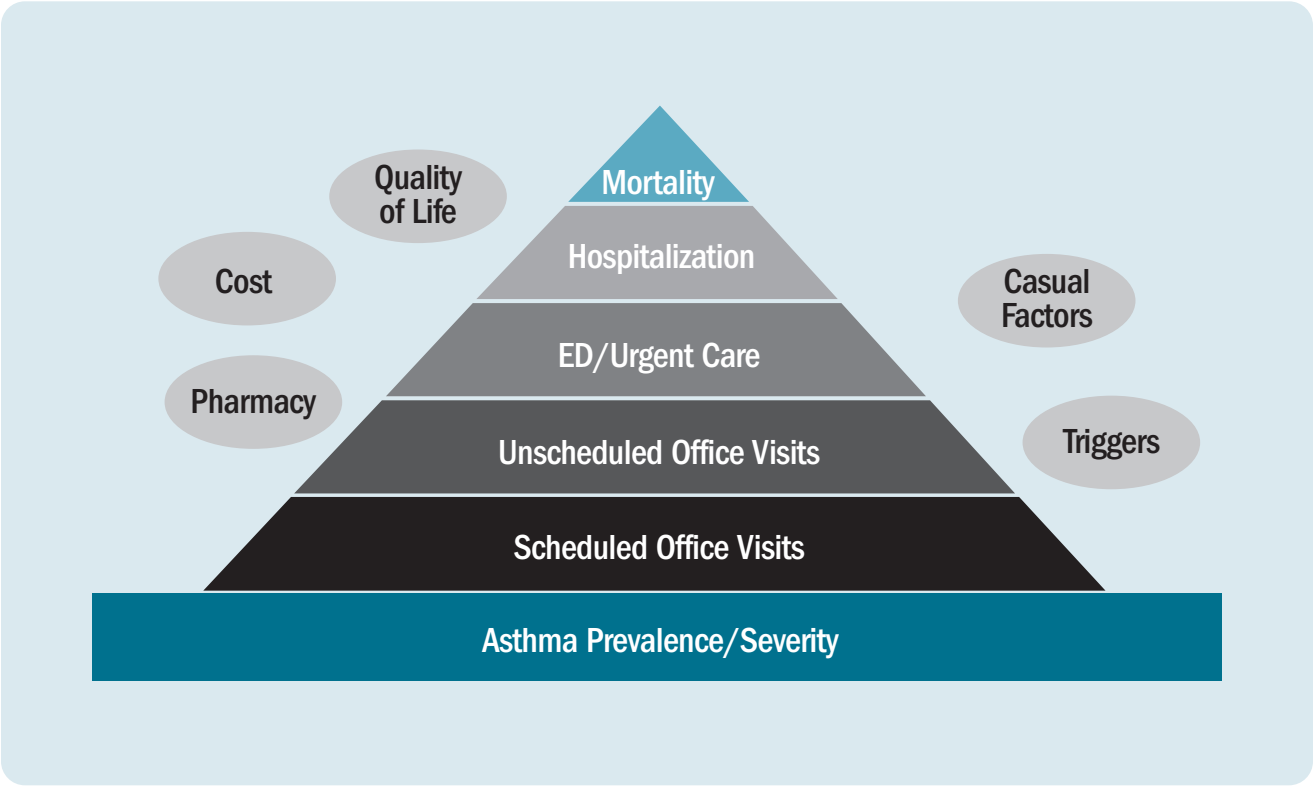
Asthma has emerged as a significant chronic disease over the past 25 years and continues to be a major public health problem in the United States (U.S.). In 2007, approximately 18.6 million (8.2%) adults and 6.7 million (9.1%) children indicated that they currently had asthma.[1, 2] The prevalence for adults and children remained relatively stable throughout 2001-2004.[3, 4] In 2004, there were 1.8 million asthma emergency department (ED) visits nationally for a rate of 64 per 10,000.[5] Asthma hospitalization and death rates in the U.S. decreased from 2000 to 2004.[3, 4] However, there were still 444,000 asthma hospitalizations nationally for a rate of 14.9 per 10,000 and 3,613 deaths due to asthma in the U.S. for a rate of 1.2 per 100,000.[6, 7] In 2004, more than 14 million school days and 14.5 million work days were missed due to asthma.[8] The estimated annual costs associated with asthma are nearly $19.7 billion, including nearly $10 billion in direct health care costs (mostly for hospitalizations) and $8 billion for indirect costs such as lost earnings due to illness or death.[9]

Asthma remains a major problem in New York State (NYS) with significant public health and financial consequences. In 2008, an estimated 1.3 million adults and 475,000 children had current asthma. Current asthma prevalence among adults increased from 6.3% in 1999 to 8.7% in 2008. Asthma prevalence in NYS has been higher than the national average since 2002. Current asthma prevalence for children (0-17 years) was 11% for the time period 2006-2008. There were more than 165,000 ED visits and over 39,000 hospitalizations per year due to asthma for the time period 2005 to 2007. NYS asthma ED visit and hospitalization rates were higher than the national rates for all age groups and exceeded the Healthy People 2010 objectives. For 2005-2007, an average of 255 deaths due to asthma occurred per year in NYS, which is an age-adjusted asthma mortality rate of 12.5 per one million residents. NYS children missed more than 1.9 million days of daycare, pre-school or school due to asthma each year.[10] Adults with asthma reported approximately 7.6 million days within the past year when they were unable to work or carry out usual activities because of asthma.[10] The total cost of asthma hospitalizations in NYS in 2007 was approximately $535 million. Additionally, only 30% of New Yorkers have an asthma self-management plan to help control their asthma.[10]

To better understand the burden of asthma in NYS, the *New York State Asthma Surveillance Summary Report* was first developed in 2005 and is updated every two years. Information is presented on a statewide level and, where appropriate, at the county level, to assist public health programs, policy makers and healthcare providers in their efforts to identify 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; asthma-related information for the Medicaid managed care population; work-related asthma; asthma-associated costs; and asthma and the environment.

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." Various databases are utilized for surveillance of asthma in NYS, as shown on pages 12 and 13. The NYSDOH is striving to acquire information on all aspects of asthma as depicted in the surveillance pyramid.

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

Scheduled and Unscheduled Office Visits

Information about asthma-related outpatient visits for the Medicaid managed care population is obtained from the New York State Department of Health (NYSDOH), Office of Health Insurance Programs (OHIP), Medicaid Encounter Data System (MEDS). The BRFSS Asthma Call-Back Survey also has information on scheduled and unscheduled office visits.

Emergency Department and Urgent Care

Information about asthma-related emergency department (ED) visits is obtained from data that hospitals are required to report via the Statewide Planning and Research Cooperative System (SPARCS) Outpatient Database, as well as from the Medicaid managed care data that include ED visits. The BRFSS Asthma Call-Back Survey also has self-reported information on ED and urgent care visits.

Hospital Discharges

Asthma hospital discharge data are available through the SPARCS Hospital Inpatient Database. Medicaid managed care 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 was used to assess the self-reported quality of life among adults suffering from asthma. Currently, 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 estimated cost information for asthma-related ED visits, hospitalizations, office visits and pharmacy.

Pharmacy

Medicaid managed care has detailed information about filled prescriptions 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 home environments of people with asthma. 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 are available from the NYS School Building Condition Survey (BCS). The Environmental Protection Agency Air Quality System (EPA AQS) collects information on daily levels of ozone and particulate matter ($PM_{2.5}$) in NYS.

Summary of Indicators and Data Sources in This Report

The data presented in this report are useful in characterizing the NYS 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)	BRFSS	2008
	YRBS	2007
	YTS	2008
Asthma Prevalence in Adults (18+ Years)	BRFSS	2008
Asthma ED Visits	SPARCS – Hospital Inpatient and Outpatient Databases	2007
Asthma Hospital Discharges	SPARCS – Hospital Inpatient Database	2007
Asthma Mortality	Vital Records	2007
Asthma Prevalence Among Medicaid Managed Care Enrollees Asthma-Related Healthcare Utilization Among Medicaid Managed Care Asthma Universe Enrollees: • Asthma outpatient visits • ED visits • Hospitalizations • Pharmacy	NYSDOH OHIP MEDS	2007

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

Indicator Type	Source	Most Recent Year of Data
Quality of Asthma Care: Appropriate Use of Asthma Medication Among People with Persistent Asthma	NYSDOH OHIP MEDS NYS Commercial Insurance Data Child Health Plus Data	2007 2007 2007
Asthma-Related Healthcare Costs Among Medicaid Managed Care Asthma Universe Enrollees • Asthma outpatient visits • ED visits • Hospitalizations • Pharmacy	NYSDOH OHIP MEDS	2007
Asthma Hospitalization Costs	SPARCS – Hospital Inpatient Database	2007
WRA Hospital Discharges	SPARCS – Hospital Inpatient Database	2007
WRA Incidence	NYS OHCN NYS OLDR	2007 2007
School Indoor Air Quality • Problems in the ventilation system • Visible mold • Moisture/humidity problems • Vermin/pests	NYS School BCS	2005
Outdoor Air Quality • Ozone • Particulate Matter ($PM_{2.5}$)	EPA AQS	2007

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Executive Summary

The *New York State Asthma Surveillance Summary Report (October 2009)* examines the prevalence and impact of asthma in NYS, and compares NYS asthma data to United States data for 2004-2006 and to the Healthy People 2010 asthma-specific objectives. In addition, this report provides detailed information regarding asthma prevalence in children and adults through 2008, 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 2007.

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 2005 through 2007 are indicated as 2005-2007). Refer to individual chapters for detailed asthma-related information.

Key Findings

- One in 11 children and adults 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 1999 through 2008. New York State asthma prevalence has also been higher than the national average.
- The asthma hospital discharge rate in New York State decreased approximately 13% from 1998 to 2007. In addition, New York State's asthma mortality rate decreased 42% in the past ten years.
- 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 two times higher than the levels targeted in Healthy People 2010.
- Disparities among certain age groups exist. Children aged 5-9 years in New York State had the highest current asthma prevalence in 2006-2008. During 2005-2007, 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 lower current asthma prevalence for 2007-2008, but had higher age-adjusted asthma emergency department visit, hospital discharge, and mortality rates in 2005-2007 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 2005-2007, with the highest rates in the Bronx.
- Disparities among racial and ethnic groups still persist. Non-Hispanic Black adults and children experience some of the highest asthma prevalence rates in New York State. Non-Hispanic White adults and high school students and Hispanic middle school students also experience higher asthma prevalence rates when compared to all other racial and ethnic groups. In addition, for 2005-2007, 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 2007 was approximately $535 million, a 70% increase since 1998. The average cost per hospitalization was $14,107 in 2007, a 31% increase from 1998. Among the New York State Medicaid managed care asthmatic population, more than $170 million were spent for asthma-related services; the average cost was $1,069 per asthma enrollee in 2007.

Tracking Healthy People 2010 Asthma-Specific Objectives in New York State

- Compared to the nation, New York State asthma emergency department visit rates for combined three year data (2005-2007) were higher for all age groups. New York State asthma emergency department visit rates were higher than the Healthy People 2010 objectives for all age groups, especially among children aged 0-4 years.
- Compared to the 1999-2001 time period, 2005-2007 New York State asthma hospital discharge rates showed a reduction (11-20%) for all age groups with the exception of the population aged 65 years and older. However, New York State asthma hospital discharge rates were higher than the United States rates for all age groups. New York rates were roughly two to three times higher than the Healthy People 2010 objectives for each age group.
- Compared to the 1999-2001 time period, 2005-2007 New York State asthma mortality rates showed a decrease for all age groups, ranging from 23% to 37%, with the exception of the population aged 0-4 years. However, compared to the nation, New York State asthma mortality rates were higher for those aged 5-64 years. New York State met the Healthy People 2010 objective for the 65 year and older age group. New York State mortality rates, however, were two to four times higher than the Healthy People 2010 objective for all other age groups.

Prevalence and Risk Behavior Information, New York State Asthma Survey Data, 1999-2008

Current Asthma Prevalence and Risk Behaviors in Adults (BRFSS), 1999-2008

- There has been an upward trend in the prevalence of current asthma among New York State residents from 1999 through 2008.
- In 2008, approximately 1.3 million adult New Yorkers (8.8%) had self-reported current diagnosed asthma.
- Current asthma prevalence was consistently higher for females than males. The 2007-2008 prevalence of current asthma among New York State women (11.0%) was 75% higher than the prevalence in men (6.3%).
- Current asthma prevalence in New York State for 2007-2008 was inversely related to annual household income and educational attainment.
- Adults who live outside New York City (the Rest of State) had a higher current asthma prevalence (9.4%) compared to adults who lived in New York City (7.6%) in 2007-2008.
- In 2007-2008, the percent of current smoking was higher for adult New Yorkers with asthma (19.9%) compared to those without asthma (17.6%).
- The prevalence of obesity in 2007-2008 was higher among adults with asthma (39.1%) compared to non-asthmatic adult New Yorkers (23.8%).

Current Asthma Prevalence in Children (BRFSS), 2006–2008

- For 2006-2008, approximately 491,000 (11%) 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 (7.5%) in 2006-2008, while children aged 5-9 years had the highest current asthma prevalence (14.3%).
- In 2006-2008, the current asthma prevalence among boys (11.4%) in New York State was higher than the prevalence among girls (10.5%).
- There was no difference in current asthma prevalence when comparing children living in New York City (11.2%) to those in the Rest of State (10.9%) for 2006-2008.
- The prevalence of current asthma was much higher among non-Hispanic Black children (17.3%) in 2006-2008 compared to non-Hispanic White (8.7%) and Hispanic (11.1%) children.
- In 2006-2008, New York children from households with annual incomes less than $25,000 had much higher current asthma prevalence (approximately 16%) compared to children from families with annual household incomes of greater than $75,000 (8.4%).

Asthma Emergency Department Visits, 2005-2007

- The annual number of asthma emergency department visits among New York State residents was 159,572 in 2005, 164,116 in 2006, and 161,200 in 2007.
- The annual asthma emergency department visit rate in New York State was similar for 2005-2007. In 2007, the asthma emergency department visit rate was 83.5 per 10,000.
- Overall, asthma emergency department visits showed a seasonal pattern with peaks in the spring and fall, and declines in the summer.
- For 2005-2007, children aged 0-4 years had the highest emergency department visit rate compared to all other ages. The asthma emergency department visit rate decreased in older age groups.
- For 2005-2007, female New Yorkers had higher crude and age-adjusted asthma emergency department visit rates (crude rate: 86.6 per 10,000; adjusted rate: 89.8 per 10,000) compared to males (80.6 per 10,000; 81.8 per 10,000).
- Non-Hispanic Black New Yorkers had crude and age-adjusted asthma emergency department visit rates (crude rate: 192.0 per 10,000; adjusted rate: 187.0 per 10,000) that were more than six times higher than White New Yorkers (29.9 per 10,000; 32.0 per 10,000).
- New York City residents had crude and age-adjusted asthma emergency department visit rates (crude rate: 128.0 per 10,000; adjusted rate: 130.0 per 10,000) in 2005-2007 that were approximately 2.5 times higher than residents in the Rest of State (50.8 per 10,000; 53.2 per 10,000).
- Asthma emergency department visit rates at the county level varied across New York State for 2005-2007. Residents of the Bronx had the highest age-adjusted emergency department visit rate of 246.8 per 10,000 residents.

Asthma Emergency Department Visit Rates for Adults with Current Asthma (At-Risk Based Rates), 2005-2007

- The annual at-risk based rate for asthma emergency department visits in New York State increased from 7.4 asthma emergency department visits per 100 adults with current asthma in 2005, to 8.2 per 100 in 2006. The rate decreased to 7.4 per 100 in 2007.
- Although the at-risk based rate for asthma emergency department visits showed a decreasing trend among non-Hispanic Blacks for 2005-2007, the rate was much higher (19.6 visits per 100 in 2007) compared to non-Hispanic Whites (2.8 per 100 in 2007) in New York State.
- For 2005-2007, adults with current asthma in New York City consistently had a higher at-risk based rate for asthma emergency department visits compared to those in the Rest of State (16.7 and 3.8 per 100 in 2007, respectively). The New York City rate increased from 14.8 per 100 in 2005 to 16.7 per 100 in 2007.

Asthma Emergency Department Visit Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2007

- For 2006-2007, there were approximately 13 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 2006-2007, the 0-4 year age group had the highest at-risk based rate for asthma emergency department visits (27.1 per 100) compared to all other age groups.
- The at-risk based rate for asthma emergency department visits for 2006-2007 was higher among boys (14.8 per 100) compared to girls (11.0 per 100).
- For 2006-2007, the at-risk based rate for asthma emergency department visits for non-Hispanic Black children with current asthma (19.9 per 100) was more than three times higher compared to non-Hispanic White children (5.4 per 100). Hispanic children also had a higher at-risk based rate for asthma emergency department visits (13.0 per 100) compared to non-Hispanic White children.
- The at-risk based rate for asthma emergency department visits for 2006-2007 was 4.6 times higher for children with current asthma living in New York City (27.0 per 100) compared to those living in the Rest of State (5.9 per 100).

Asthma Hospital Discharges, 1998-2007

- The number of hospital discharges in New York State due to asthma decreased approximately 11% in the past ten years from 42,557 in 1998 to 37,950 in 2007.
- Asthma hospital discharge rates showed a 13% decline from 22.7 per 10,000 residents in 1998 to 19.7 per 10,000 in 2007.
- Overall, asthma hospital discharges showed a seasonal pattern with peaks in the spring and fall and a decline in the summer.
- For 1998-2007, 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 2005-2007, the crude and age-adjusted asthma hospital discharge rates for female New Yorkers (23.8 per 10,000; 23.1 per 10,000) were higher compared to males (17.2 per 10,000; 17.6 per 10,000).
- For the time period 2005-2007, non-Hispanic Black (41.7 per 10,000; 42.3 per 10,000) and Hispanic (37.4 per 10,000; 41.4 per 10,000) New York State residents had crude and age-adjusted asthma hospital discharge rates that were almost five times higher than non-Hispanic White residents (9.3 per 10,000; 8.9 per 10,000).
- New York City residents had crude and age-adjusted asthma hospital discharge rates (31.5 per 10,000; 31.7 per 0,000) in 2005-2007 that were more than 2.5 times higher than residents in the Rest of State (12.1 per 10,000; 12.1 per 10,000).
- Asthma hospital discharge rates for 2005-2007 varied across New York State, with the highest rate in the Bronx (63.9 per 10,000).

Asthma Hospital Discharge Rates for Adults with Current Asthma (At-Risk Based Rates), 2001-2007

- For 2001-2007, the annual at-risk based rate for asthma hospital discharges in New York State decreased from 2.3 asthma hospital discharges per 100 adults with current asthma in 2001 to 2.0 per 100 in 2007.
- Asthma hospital discharges among those with current asthma increased with age. The 65 year and older age group (3.9 per 100 in 2007) consistently had the highest at-risk based rate for asthma hospital discharges compared to other adult age groups in New York State.
- For 2001-2007, among adults with current asthma in New York State, women consistently had higher at-risk based rates for asthma hospital discharges compared to men (2.1 versus 1.7 per 100 in 2007, respectively). Over this time period, the rate decreased for both women and men.
- For 2001-2007, among adults with current asthma, non-Hispanic Blacks (4.3 per 100 in 2007) and Hispanics (3.0 per 100 in 2007) consistently had higher at-risk based rates for asthma hospital discharges compared to non-Hispanic Whites (0.9 per 100 in 2007) in New York State.
- For 2001-2007, the at-risk based rate for hospital discharges among adults with current asthma living in New York City was much higher compared to those in the Rest of State (4.6 versus 1.0 per 100 in 2007).

Asthma Hospital Discharge Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2007

- For 2006-2007, there were 2.6 asthma hospital discharges each year per 100 children with current asthma in New York State.
- Among New York State children with current asthma, the 0-4 year age group had the highest 2006-2007 at-risk based rate for asthma hospital discharges (7.1 per 100) compared to all other age groups.
- The at-risk based rate for asthma hospital discharges for 2006-2007 was higher among boys (3.0 per 100) compared to girls (2.2 per 100).
- For 2006-2007, the at-risk based rate for asthma hospital discharges was highest among non-Hispanic Black children with current asthma (4.0 per 100) compared to Hispanics (2.6 per 100) and non-Hispanic Whites (1.3 per 100).
- The at-risk based rate for asthma hospital discharges for 2006-2007 was more than four times higher for children with current asthma living in New York City (5.4 per 100) compared to those living in the Rest of State (1.2 per 100).

Asthma Mortality, 1998-2007

- An annual average of 255 deaths were due to asthma in New York for 2005-2007, for a rate of 13.2 deaths per 1 million residents.
- In the past ten years, New York State's asthma mortality rate decreased 42% from 20.7 per 1 million residents in 1998 to 12.0 per 1million residents in 2007. Similar decreases were seen for residents of the Rest of State and New York City.
- New York State women had a higher 2005-2007 age-adjusted asthma mortality rate (13.7 per 1,000,000) compared to men (10.7 per 1,000,000).
- Non-Hispanic Black (31.1 per 1,000,000) and Hispanic (19.8 per 1,000,000) New York State residents had much higher age-adjusted mortality rates compared to non-Hispanic White residents (7.4 per 1,000,000).
- For 2005-2007, New York City's age-adjusted asthma mortality rate (18.5 per 1,000,000) was more than double the rate for the Rest of State (8.2 per 1,000,000).

Asthma Mortality Rates for Adults with Current Asthma (At-Risk Based Rates), 2001-2007

- For 2001-2007, the annual at-risk based rate for asthma mortality in New York State decreased from 30.1 asthma deaths per 100,000 adults with current asthma in 2001 to 17.2 per 100,000 in 2007. Similar decreases were seen for residents of the Rest of State and New York City.
- For 2001-2007, the at-risk based rate for asthma mortality among women with current asthma showed a downward trend over time while the rates for men fluctuated.
- For 2001-2007, among adults with current asthma, non-Hispanic Blacks (36.7 per 100,000 in 2007) and Hispanics (21.2 per 100,000 in 2007) consistently had higher at-risk based rates for asthma mortality compared to non-Hispanic Whites (12.9 per 100,000 in 2007).
- Among adults with current asthma, the 2007 at-risk based rate for asthma mortality was approximately four times higher for residents with current asthma in New York City compared to those in the Rest of State (38.0 versus 9.2 per 100,000).

Program-Based Asthma Surveillance

Asthma Prevalence Among the Medicaid Population, 2006-2007

- There were 162,204 (10.1%) and 161,763 (10.4%) Medicaid managed care enrollees that were classified as asthma universe in 2006 and 2007, respectively.
- There was a slight increase in asthma universe prevalence for Medicaid managed care enrollees across all age groups and race/ethnic groups between 2006 and 2007.
- The highest prevalence rate of asthma universe among Medicaid managed care enrollees was observed among the 0-4 year and 5-9 year age groups, Hispanics and non-Hispanic Blacks, and residents in the Rest of State.
- There were 50,327 (4.6%) and 49,210 (4.7%) Medicaid managed care enrollees that were classified as persistent asthmatics in 2006 and 2007, respectively.
- The highest persistent asthmatic prevalence was seen among those aged 57-64 years, Hispanic enrollees, and enrollees in the Rest of State.

Utilization of Health Services by the Medicaid Managed Care Asthma Universe Population, 2006-2007

- Overall, there were more than 170,000 physician visits each year for 2006 and 2007; 57,392 outpatient clinic visits in 2006 and 51,042 in 2007; 34,555 and 33,583 ED visits; and 8,094 and 6,201 hospitalizations due to asthma among the asthma universe population in 2006 and 2007, respectively. For the same time period, more than 1.1 million asthma-related pharmacy claims were filled each year.
- The highest rate of physician visits was seen among children aged 0-4 years and 5-9 years (116 visits per 100 asthma universe enrollees in 2006 and 118 per 100 in 2007).
- The overall asthma outpatient clinic visit rate was 35 and 32 visits per 100 asthma universe individuals in 2006 and 2007, respectively.

- Asthma emergency department visit rates varied by age group with the highest rate among children aged 0-4 years (26 per 100 in 2006 and 2007).
- Hospitalization rates due to asthma were highest among very young children aged 0-4 years (9 per 100 in 2006 and 6 per 100 in 2007).
- Asthma-related pharmacy claim rates increased with age. The highest rate was among adults aged 57-64 years (1,095 and 1,146 claims per 100 in 2006 and 2007, respectively).
- Physician visit rates were higher for Medicaid managed care asthma universe enrollees in the Rest of State compared to those in New York City.
- Rates of outpatient clinic visits, asthma emergency department visits, and hospitalizations were higher among Medicaid managed care enrollees with asthma who reside in New York City compared to those in the Rest of State.

Managed Care Quality Assurance Reporting Requirement Asthma-Specific Indicator, 2005-2007

- Among Commercial insurance, Child Health Plus and Medicaid managed care plans, the proportion of children aged 5–17 years with persistent asthma who received appropriate medications increased slightly from 2005 to 2007.
- For 2005-2007, the proportion of persistent asthmatic adults (18-56 years) who received appropriate medications for asthma increased slightly for both Commercial insurance and Medicaid managed care plans.
- In 2007, among Commercial and Child Health Plus plans, 95% of children with persistent asthma received appropriate medications for asthma, compared to 92% for children with persistent asthma in Medicaid managed care plans.
- In 2007, the proportion of adults with persistent asthma receiving appropriate asthma medications was slightly higher among Commercial than Medicaid managed care plan enrollees (92% and 90%, respectively).

Work-Related Asthma, 1998-2007

- For 2005, approximately 11.4% 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 1998-2007, work-related asthma hospital discharges ranged from 47 to 72 per year in New York State.
- The average length of stay for a work-related asthma hospitalization decreased over time from 4.3 to 4.0 days while the average cost increased for the 1998-2007 time period. The cost of a work-related asthma hospitalization in 2007 was approximately $630,000.

Asthma Costs, 1998-2007

- The total cost of asthma hospitalizations in New York State for 2007 was approximately $535 million, a 70% increase in cost since 1998 ($315 million). The Consumer Price Index-adjusted asthma hospitalization cost increased 17% from the 1998 adjusted cost of $457 million.
- The average cost per asthma hospitalization increased 91% from $7,399 in 1998 to $14,107 in 2007. The average adjusted asthma hospitalization cost increased 31% over this time period. This occurred despite the average length of stay for an asthma hospitalization decreasing 10% from 4.0 days to 3.6 days for the same time period.
- The average cost per asthma hospitalization increased with age. The 2007 average costs ranged from $8,343 for the 0-4 year age group to $21,502 for those aged 65 years and older.
- In 2007, among the Medicaid managed care population, over $170 million was spent on more than 160,000 asthma universe individuals for asthma-related services. The average cost was $1,069 per asthma enrollee.

New York State School Building Condition Survey, 2005

- Although relatively few school buildings reported having visible mold (5.4%), almost 40% reported at least one type of moisture or humidity problem, which can indicate potential for mold growth.
- More than 10% of buildings reported potential diesel intrusion, dirt or dust near or in the ventilation system, and poorly functioning dampers. While fewer than 10% reported inadequate fresh air for ventilation, over one-third (36.2%) did not know whether the system was providing enough fresh air.
- Fewer than 5% of buildings reported rodents, cockroaches, wood eating insects or other pests.

Outdoor Air Quality

- For 2005-2007, 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 in New York City tended to decline over the time period from 1997 to 2007.
- The number of days for 2005-2007 when fine particle concentrations were unhealthy for sensitive groups such as asthmatics 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 in New York City tended to decline over the time period from 2000 to 2007.

3

New York State Department of Health Asthma Plan and Asthma Initiatives

Overview of New York State Department of Health Asthma Plan and Asthma Initiatives

New York State is committed to improving the quality of life for those with asthma and their families. The goals of the New York State Asthma Plan (NYSAP) for 2006-2011 are:

- Seamless, evidence-based, patient/family centered asthma care exists for all New Yorkers with asthma.
- Disparities in asthma diagnosis, treatment and outcomes are eliminated.
- "Asthma-friendly" communities exist in New York.
- Policy makers, health care providers and consumers have an increased understanding of asthma, and treat and manage asthma effectively.
- A statewide public/private collaboration exists to shape, implement and monitor New York's action which will improve asthma outcomes in New York.

Asthma Partnership of New York (APNY)

To achieve the goals of NYSAP, the Asthma Partnership of NY (APNY), a public and private collaboration, mobilized a coalition of statewide partners to plan, implement and evaluate population-based and patient-centered strategies to improve asthma-associated outcomes. The APNY connects more than one thousand organizations across the state, including multiple state agencies such as the New York City Department of Health and Mental Hygiene, the New York City Asthma Partnership, the New York City Department of Education, the Business Council of the State of New York, medical societies, regional asthma coalitions, professional societies and associations, health plans, local health departments, hospitals, clinics, home intervention programs, and community organizations, to implement key asthma initiatives.

The numerous initiatives underway to meet the NYSAP goals are organized into four focus areas: (1) Surveillance and Program Evaluation; (2) Health Care; (3) Community-Based Initiatives; and (4) Environmental and Occupational Health.

Asthma Initiatives in New York State

A selection of New York's initiatives/activities includes the following:

Surveillance and Program Evaluation

- **Maintaining and updating existing measures for the following datasets: Behavioral Risk Factor Surveillance System (BRFSS); BRFSS Asthma Call-Back Survey; emergency department (ED) visit data; hospital discharge data, mortality data, Medicaid encounter data, Occupational Lung Disease Registry; Occupational Health Clinic Network data; and the Youth Risk Behavior Survey. Specifically:**
  - *Asthma population-based survey surveillance:* collect data and analyze lifetime and current asthma prevalence, age of 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 ED visit surveillance:* obtain data and analyze asthma ED visit rates by socio-demographic categories as well as generate asthma ED 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 surveillance:* utilize Medicaid encounter and claim data derived from the Office of Health Insurance Programs to assess asthma prevalence, costs, healthcare utilization, and quality of care among the Medicaid population.
- *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 updated NYS asthma surveillance information via surveillance reports, presentations and articles, as well as electronically utilizing the NYSDOH public website** (see www.health.state.ny.us/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 (U.S.) and NYS. Asthma prevalence data are produced from the responses to two asthma questions on the BRFSS Core Questionnaire.
  - ED and hospital discharge data from the are used to create county-specific and ZIP code level asthma ED and hospital discharge data, organized by regions within NYS.
  - 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 regions within NYS.
- **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 NYS Asthma programs and initiatives:** Evaluations have been conducted for the NYS Asthma Regional Asthma Coalitions, the Open Airways Program, NYS School-based Health Centers Asthma Learning Collaborative, and NYS School-based Health Centers Asthma and Influenza Vaccination Campaign.
- **Evaluating the NYS Asthma Control Program (ACP):** NYS will be developing and implementing a five-year asthma evaluation plan for the NYS ACP based on the CDC Framework for Program Evaluation in Public Health.

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.state.ny.us/nysdoh/chplus/).
- **Family Health Plus:** Family Health Plus is available to adults between the ages of 19 and 64 who are residents of NYS and are either U.S. citizens or fall under one of many immigration categories, who do not have health insurance and have incomes too high to qualify for Medicaid (see www.health.state.ny.us/nysdoh/fhplus/).
- **Healthy New York:** Healthy New York is a program for uninsured employed individuals and students who are no longer insured under their families' coverage (see www.ins.state.ny.us/website2/hny/english/hny.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, peak flow meters, nebulizers, pulmonary diagnostic tests, doctor visits and hospital care (see www.nyhealth.gov/health_care/medicaid/index.htm).
- **Quality Assurance Reporting Requirements (QARR) Report:** The QARR report measures the effectiveness of managed care plans in treating asthma. The most recent version of this report identifies how Medicaid managed care plans and commercial insurance plans perform on specific health measures, including asthma management. The report represents one of the most comprehensive report cards for managed care in the nation (see www.health.state.ny.us/health_care/managed_care/qarrfull/qarr_2008/index.htm).
- **NYS Asthma Guideline:** Based on the *Clinical Application of the National Asthma Education and Prevention Program (NAEPP) Expert Panel Report-3 (EPR-3): Guidelines for the Diagnosis & Management of Asthma*, a NYS expert panel produced a decision support tool that established

a common standard of care for providers and health plans. The tool, *Clinical Guideline for the Diagnosis, Evaluation, and Management of Adults and Children with Asthma,* has been endorsed by professional societies, associations and health plans and distributed to over 20,000 physicians in NYS (see www.health.state.ny.us/diseases/asthma/pdf/2009_asthma_guidelines.pdf).

- **Asthma in Primary Care Practice:** NYSDOH supported Dr. Mamta Reddy, Chief of Allergy and Immunology, Bronx-Lebanon Hospital Center and Director of the South Bronx Asthma Partnership to develop a case study based DVD. The DVD, *Clinical Application of the National Asthma Education and Prevention Program (NAEPP) Expert Panel Report-3: Guidelines for the Diagnosis & Management of Asthma,* is based on the NAEPP EPR-3 and promotes the translation of the asthma guidelines into primary care practice. This activity has been reviewed and is acceptable for three evidenced-based CME credits by the American Academy of Family Physicians. This DVD is available until May 31, 2011 for distance learning opportunities for health care providers (see //jeny.ipro.org/files/Asthma/).
- **Asthma Model Benefit Package:** This assessment of public health insurance (Medicaid, Family Health Plus and Child Health Plus) benefit coverage for asthma care includes explaining how the benefit packages differ and how they could be better aligned to support good asthma care.
- **Asthma Self-Management Education:** A new Social Services Law (§ 365-A 2 (r)) that became effective July 1, 2008 allows NYS Medicaid to cover asthma self-management education 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. Self-management education is to be provided by a New York State licensed, registered, or certified health care professional, who is also certified as an educator by the National Asthma Educator Certification Board. Certified Asthma Educators (AE-Cs) are required to enroll in the NYS State Medicaid program as non-billing providers and must be employed by or contract with an appropriate billing provider. For more information about AE-C enrollment forms and instructions see www.emedny.org/info/ProviderEnrollment/index.html. 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 an asthma website (see www.health.state.ny.us/diseases/asthma/index.htm) for all New Yorkers to obtain current information on asthma surveillance, interventions, care and educational materials.
- **Regional Asthma Coalitions:** Eleven regional asthma coalitions work to mobilize local resources to reduce morbidity and mortality through advocacy, education, partnerships and interventions. Program results indicate this is an effective strategy for addressing asthma regionally (see www.health.state.ny.us/diseases/asthma/coalitions.htm).
- **NYS Asthma Outcomes Learning Network:** The NYSDOH Asthma Program has partnered with the National Initiative for Children's Health Care Quality and the 11 regional asthma coalitions to improve the quality of asthma care among children in New York. Each year, 11 asthma improvement teams, representing large health care and community systems, receive training in quality improvement practices, then apply these methods locally and share key learning principles through this Network. More than 40 teams and over 250 health care leaders have been trained.
- **School-Based Health Centers (SBHCs):** There are 217 SBHCs in NYS that play a critical role in providing primary and preventive care to children, including quality asthma care and management (see www.health.state.ny.us/nysdoh/school/).
- **School-Based Health Center Quality Improvement Collaborative:** A Quality Improvement Collaborative to improve asthma care is being conducted in thirty-five school-based health centers. This initiative produces changes in the system of care within the centers to improve outcomes for all children with asthma, especially among children with poorly controlled asthma. This 18-month initiative uses the Breakthrough Series methodology developed by the Institute for Healthcare Improvement.[11]
- **Asthma and Influenza:** The NYSDOH launched an Asthma and Influenza Education Campaign to raise awareness about the importance of receiving influenza vaccinations, 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.state.ny.us/diseases/asthma/influenza).

- **Winning with Asthma – Coaches Clipboard Program:** This 30-minute online educational program was created to train coaches about asthma, how this condition 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.state.ny.us/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.

- **Treatment of 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 to 2000 found that it reduced hospitalizations and was cost-effective.

- **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, the 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 identify and refer eligible patients to the HHENYA program, which provides 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 is sent to each patient, his or her doctor and the referring health plan. On a statewide level, the NYSDOH launched the NYS Asthma-Friendly Homes Network to serve as a venue for similar programs to connect, share lessons learned and mentor new programs.

- **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 suggest that even when policies or practices do 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.

- **School Environmental Assessment Project:** This project entailed surveying school nurses, custodians and district facilities managers to determine the influence of the school environment on childhood asthma. The NYS Education Department's (NYSED) 2000 Building Condition Survey provided information about the overall condition of NYS school buildings and the condition of building systems (e.g., ventilation, plumbing). Hospitalization data were also 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.state.ny.us/diseases/asthma/asthma_in_schools.htm).

  As a result of collaboration with the NYSED, the 2005 Building Condition Survey also provides information about the presence of potential environmental asthma triggers and actions schools are taking to improve indoor air quality. This collaboration will continue to augment the utility of future Building Condition Surveys for assessing building conditions that can impact indoor air quality and occupant respiratory health. Data from the Building Condition Survey, together with attendance and academic test score data from NYSED, hospitalization data, teacher surveys and selected school walkthroughs, are being used in a new study examining the relationship between occupant health and performance and "green" school characteristics such as good lighting, acoustics and indoor air quality.

- **Occupational Lung Disease Toolkit:** A health care provider toolkit for improving the recognition and reporting of occupational lung diseases, including work-related asthma, was developed and distributed. A brochure, *Is Your Asthma Work-Related?*, was also developed to help workers identify whether they have work-related asthma (see www.health.state.ny.us/environmental/workplace/lung_disease_registry/).

- **Air Quality Health Advisories:** The Commissioners of the NYSDOH and the NYS Department of Environmental Conservation (NYSDEC) have agreed to issue a joint press release when forecasted ground-level ozone or fine particle ambient (or air pollution) 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 which provide advice on ways to reduce exposure and steps that citizens can take to reduce air pollution (see www.health.state.ny.us/environmental/air_quality/index.htm#outdoor_air and www.dec.ny.gov/public/43563.html).
- **Stop Smoking Initiative for Idling Trucks:** A NYSDEC initiative, *Stop Smoking and Idling Trucks Initiative,* addresses urban outdoor air quality in environmental justice communities that suffer from high asthma and high traffic volume by targeted enforcement of smoking or idling trucks in violation of the state air quality regulations. The pilot program, which launched in November 2007, focused on East Harlem, where asthma hospitalization rates are four times the national average. 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. In November 2008, NYSDEC expanded the initiative statewide with targeted enforcement in disproportionally impacted communities in the Albany and Newburgh areas.
- **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, three new brochures were developed to enhance communication between patients and providers. A new brochure, designed to meet a range of literacy skills was recently finalized (see www.nyhealth.gov/diseases/asthma/brochures.htm).
- **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. The NYSDOH received a five-year grant from the Centers for Disease Control and Prevention (CDC) in 2006 to develop an EPHT network that is tracking 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 (see www.health.state.ny.us/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. Recent and ongoing research efforts include various 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 and health outcomes; assessment of asthma and contributing factors in the school and home environments; 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. 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 2010 Asthma-Specific Objectives in New York State

Sponsored by the U.S. Department of Health and Human Services, the *Healthy People 2010* initiative is a comprehensive set of disease prevention and health promotion objectives for the nation to achieve over the first decade of this century. Created by scientists both inside and outside of government, it identifies a wide range of public health priorities that can be used by individuals, states, communities, and professional organizations to develop health improvement programs.[12]

The Healthy People 2010 objectives are national benchmarks. The asthma-specific objectives help to guide NYS in advancing asthma prevention and control efforts, comparing its progress with other states and, ultimately, documenting New York's contribution towards achieving national objectives.

This section provides the *Healthy People 2010* national objectives and updated data for asthma ED visits, asthma hospitalizations and asthma mortality for NYS and the U.S.[13] Additional national asthma data for previous years and by race and gender are generated from DATA 2010, an interactive database system developed by the Division of Health Promotion Statistics at the National Center for Health Statistics.[14]

Asthma Emergency Department Visits

Table 4-1
Asthma Emergency Department Visit Rate per 10,000 Residents by Age Group, New York State (2005-2007), United States (2004-2006), and Healthy People 2010 Objectives

Age Group	New York (2005-2007)	United States (2004-2006)	Healthy People 2010
0–4	218.1	148.3	80.0
5–64	81.6	57.4	50.0
65+	32.3	22.8	15.0

Compared to the nation, NYS asthma emergency department (ED) visit rates were higher for all groups. NYS asthma ED visit rates were higher than the *Healthy People 2010* 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, New York State (1999-2007), Healthy People 2010 Objectives, and United States (2006)

Age Group	New York				United States 2006	Healthy People 2010
	1999-2001	2001-2003	2003-2005	2005-2007		
0–4	73.3	71.8	67.7	58.8	43.3	25.0
0–17	35.7	34.8	34.4	29.7	18.0	17.3
5–64	17.8	17.3	17.2	15.8	10.8	7.7
65+	25.4	26.7	30.0	29.9	23.7	11.0

Compared to the 1999-2001 time period, the most recent data for NYS (2005-2007) showed a reduction for asthma hospital discharge rates for all age groups, ranging from 11% to 20%, with the exception of the population aged 65 years and older. However, compared to the nation, NYS asthma hospital discharge rates were higher for all age groups. The 2005-2007 figures show that New York rates were still roughly two to three times higher than the *Healthy People 2010* objectives for each age group (Table 4-2).

Asthma Mortality

Table 4-3
Asthma Mortality Rate per 1,000,000 Residents by Age Group, New York State (1999-2007), United States (2005), and Healthy People 2010 Objectives

Age Group	New York				United States 2006	Healthy People 2010
	1999-2001	2001-2003	2003-2005	2005-2007		
0–4	1.9	3.5	2.4	1.9	2.0	0.9
5–14	5.0	5.5	4.6	3.3	2.4	0.9
15–34	6.9	5.7	5.3	5.1	4.1	1.9
35–64	22.6	21.2	17.5	14.3	12.7	8.0
65+	55.1	50.1	50.0	42.2	52.3	47.0

Compared to the 1999-2001 time period, the most recent data for NYS (2005-2007) showed a decrease in asthma mortality rates for all age groups, ranging from 23% to 37%, with the exception of the population aged 0-4 years. However, compared to the nation, NYS asthma mortality rates were higher for those aged 5-64 years. NYS met the *Healthy People 2010* objective for the 65 year and older age group. However, NYS mortality rates were two to four times higher than the *Healthy People 2010* objectives for all other age groups (Table 4-3).

5

Asthma Survey Data

There are several different sources for prevalence data. However, population-based surveys are among the most commonly used sources for 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, 1999-2008
- Youth Tobacco Survey, 2008
- Youth Risk Behavior Survey, 2007

Highlights: Asthma Survey Data

Behavioral Risk Factor Surveillance System, 1999-2008

Current Asthma Prevalence and Risk Behaviors in Adults, 1999-2008

- In 2008, approximately 1.3 million adult New Yorkers (8.8%) had self-reported current asthma.
- During 1999-2008, there was an upward trend in the prevalence of current asthma among NYS residents.
- Adults who lived in the Rest of State had a higher current asthma prevalence rate (9.4%) compared to adults who lived in New York City (7.6%) in 2007-2008.
- For the past ten years, current asthma prevalence varied by age group and fluctuated over time. In 2007-2008, adults aged 55-64 years had the highest current asthma prevalence (10.1%), while adults 65+ years had the lowest prevalence (7.6%).
- Current asthma prevalence was consistently higher for females than males. The 2007-2008 prevalence of current asthma among New York State women (11.0%) was 75% higher than the prevalence in men (6.3%).
- For the past ten years, current asthma prevalence varied by race and ethnicity. In 2007-2008, non-Hispanic Black (8.5%) and non-Hispanic White (8.9%) New Yorkers had slightly lower prevalence than Hispanic (9.0%) New Yorkers.
- Current asthma prevalence in 2007-2008 was highest in adults who had not graduated from high school (10.9%), while college graduates had the lowest prevalence (7.2%). This pattern was consistent over the past ten years.
- For the past ten years, current asthma prevalence was inversely proportional to annual household income. In 2007-2008, current asthma prevalence was highest for adults with annual household income levels less than $15,000 (15.2%). Adults in households with incomes of $75,000 or more had the lowest prevalence (6.8%).
- The 2007-2008 prevalence of current smoking was higher for adult New Yorkers with asthma (19.9%) compared to those without asthma (17.6%).
- In 2007-2008, 31.4% of adult New Yorkers with asthma reported no leisure time activity for the past month compared to 24.9% of those without asthma.
- In 2007-2008, 39.1% of adults with asthma were obese compared to 23.8% of adults without asthma in New York State.

Current Asthma Prevalence in Children, 2006-2008

- For 2006-2008, approximately 491,000 (11%) children (0-17 years) in New York State had current asthma.
- In 2006-2008, children aged 0-4 years in New York State had the lowest current asthma prevalence at 7.5%, while children aged 5-9 years had the highest current asthma prevalence at 14.3%.
- In 2006-2008, the prevalence among boys (11.4%) was higher than the prevalence among girls (10.5%) residing in New York State.
- Children who live in New York City had higher current asthma prevalence (11.2%) in 2006-2008 compared to children in the Rest of State (10.9%).
- The prevalence of current asthma was higher among non-Hispanic Blacks (17.3%) in 2006-2008 compared to non-Hispanic White (8.7%) and Hispanic (11.1%) New Yorkers.
- In 2006-2008, 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.

Youth Tobacco Survey, 2008

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

- In 2008, current asthma prevalence was 19.6% for middle school students and 20.7% for high school students.
- Current asthma prevalence in 2008 was 21.3% for middle school students in New York City and 18.5% for middle school students in the Rest of State. Among high school students, current asthma prevalence for those in New York City was 20.3% and 21.0% for students in the Rest of State.
- Male and female middle school students had similar current asthma prevalence (20.0% and 19.0%, respectively). There was very little difference in the rate among high school males (20.4%) compared to females (21.0%).
- Current asthma prevalence for middle school non-Hispanic Whites (16.6%) was significantly lower than for non-Hispanic Black (24.2%) and Hispanic (24.1%) students. Similarly, among high school students, prevalence of current asthma among non-Hispanic Whites was lower (19.9%) compared to non-Hispanic Blacks (21.4%) and Hispanics (24.5%). The difference between non-Hispanic Whites and Hispanics was statistically significant.
- Among New York State middle school students with current asthma, 33.6% reported having had asthma episodes or attacks in the past 12 months. The asthma episode/attack prevalence was 31.3% among high school students with current asthma.
- Female New York State high school students with current asthma reported significantly more asthma episodes or attacks in the past 12 months (38.5%) compared to their male counterparts (24.3%).
- There was no significant difference in the prevalence of asthma episodes or attacks by race and ethnicity among New York State middle school and high school students.
- The prevalence of adolescent smoking was higher for asthmatics compared to non-asthmatics. This difference was statistically significant for both the middle school and high school students.

Youth Risk Behavior Survey, 2007

Current Asthma Prevalence in High School Students

- Current asthma prevalence for New York State (excluding New York City) high school students in 2007 was 12.5%, which was higher than the national asthma prevalence of 10.9%.
- The prevalence of current asthma was slightly higher among female (12.6%) than male (12.4%) high school students. Both New York (excluding New York City) male and female current asthma prevalence rates were higher than the gender-specific national prevalence rates.
- Current asthma prevalence varied slightly by race and ethnicity for New York State (excluding New York City) high school students in 2007. Non-Hispanic Black students had the highest current asthma prevalence (14.4%), followed by non-Hispanic White (12.3%) and Hispanic (11.5%) high school students.

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 Centers for Disease Control and Prevention (CDC). Data are collected from a representative sample of about 5,000 adults (aged 18 years and older) each year, and then weighted to adjust for the selection probabilities and estimates of the age-sex-race 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.

The 1999 and 2000 NYS BRFSS survey included two questions for assessing both lifetime and current asthma prevalence among adults: "Did a doctor ever tell you that you have asthma?" and [If Yes] "Do you still have asthma?"

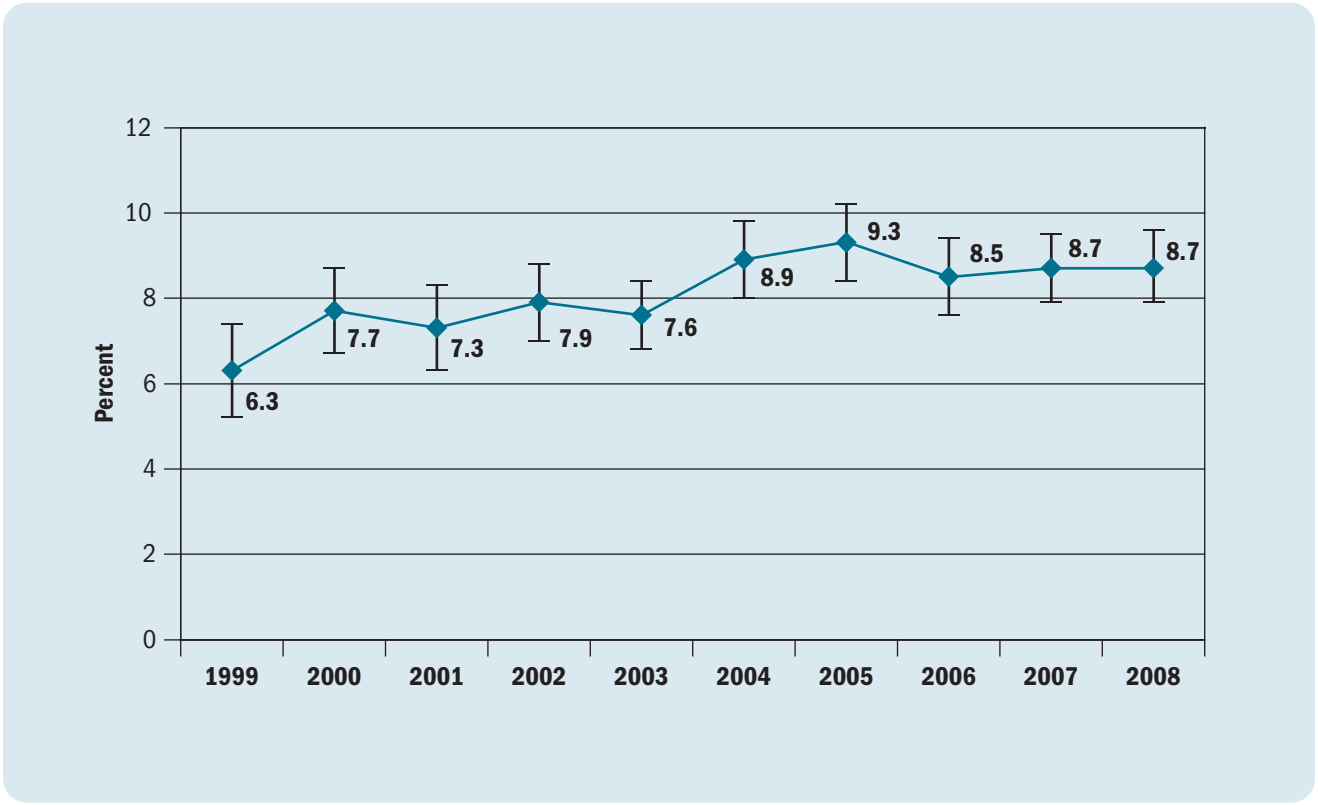
In the 2001 through 2008 surveys, those two questions were modified to: "Have you ever been told by a doctor, nurse, or other health professional that you had asthma?" and [If Yes] "Do you still have asthma?"

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, national and state weighted prevalence estimates for current asthma were obtained for each survey year for adults from the CDC BRFSS Prevalence and Trends Data Query website.[16] In addition, successive years of data were combined to generate more stable estimates for subgroup comparisons among both adults and children. Two-year combined results were calculated for adults for years 1999 through 2008, and three-year combined results for the time period 2006 through 2008 were calculated for children. The 95% confidence intervals (CIs) for these estimates are provided. Estimates are considered "significantly different" from each other when they do not have overlapping CIs.

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 (the Council of American Survey Research Organizations (CASRO) rate, which provides an overall measure of response, was approximately 39% for year 2007 and 40% for year 2008).

Figure 5-1
Prevalence* of Current Asthma Among Adults (18+ Years), New York State, BRFSS, 1999-2008



*Prevalence rates are presented with 95% Confidence Intervals.

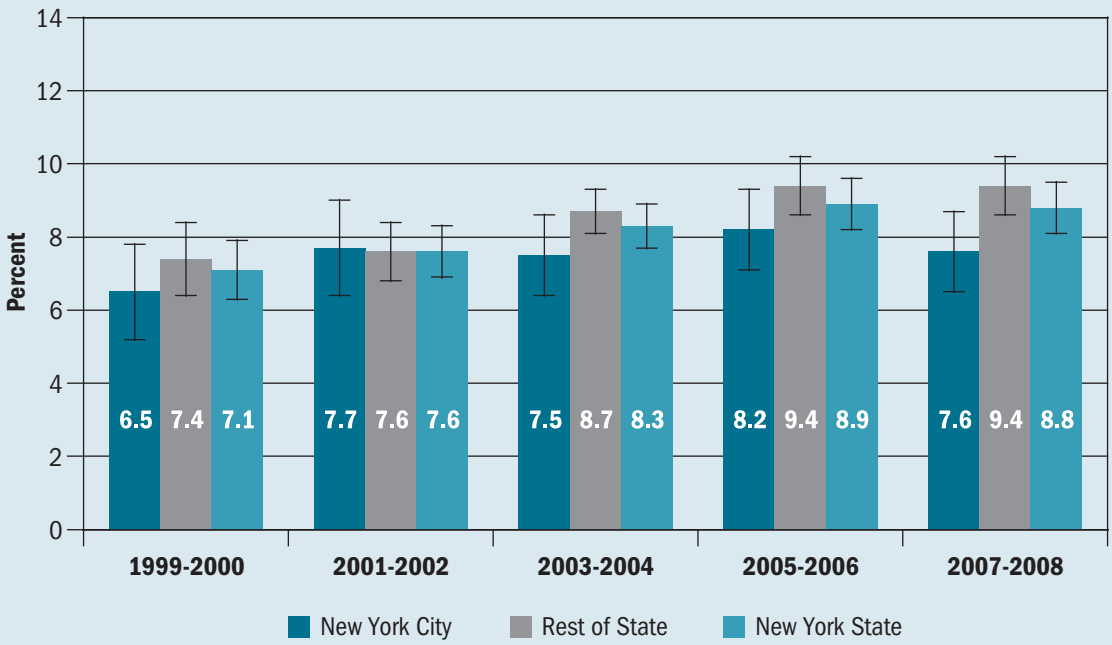
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
New York State	6.3	7.7	7.3	7.9	7.6	8.9	9.3	8.5	8.7	8.7
United States	N/A	7.3	7.3	7.6	7.6	8.3	8.0	8.4	8.3	8.7

Among adult New Yorkers, current asthma prevalence increased from 1999 to 2008. Current asthma prevalence was highest in 2005 at 9.3%. In 2008, current asthma prevalence was 8.7%.

Current asthma prevalence for NYS was higher than the U.S. prevalence for every year except 2001, 2003, and 2008 (Figure 5-1).

Figure 5-2

Prevalence* of Current Asthma Among Adults (18+ Years) by Region and Combined Survey Years, New York State, BRFSS, 1999-2008



*Prevalence rates are presented with 95% Confidence Intervals.

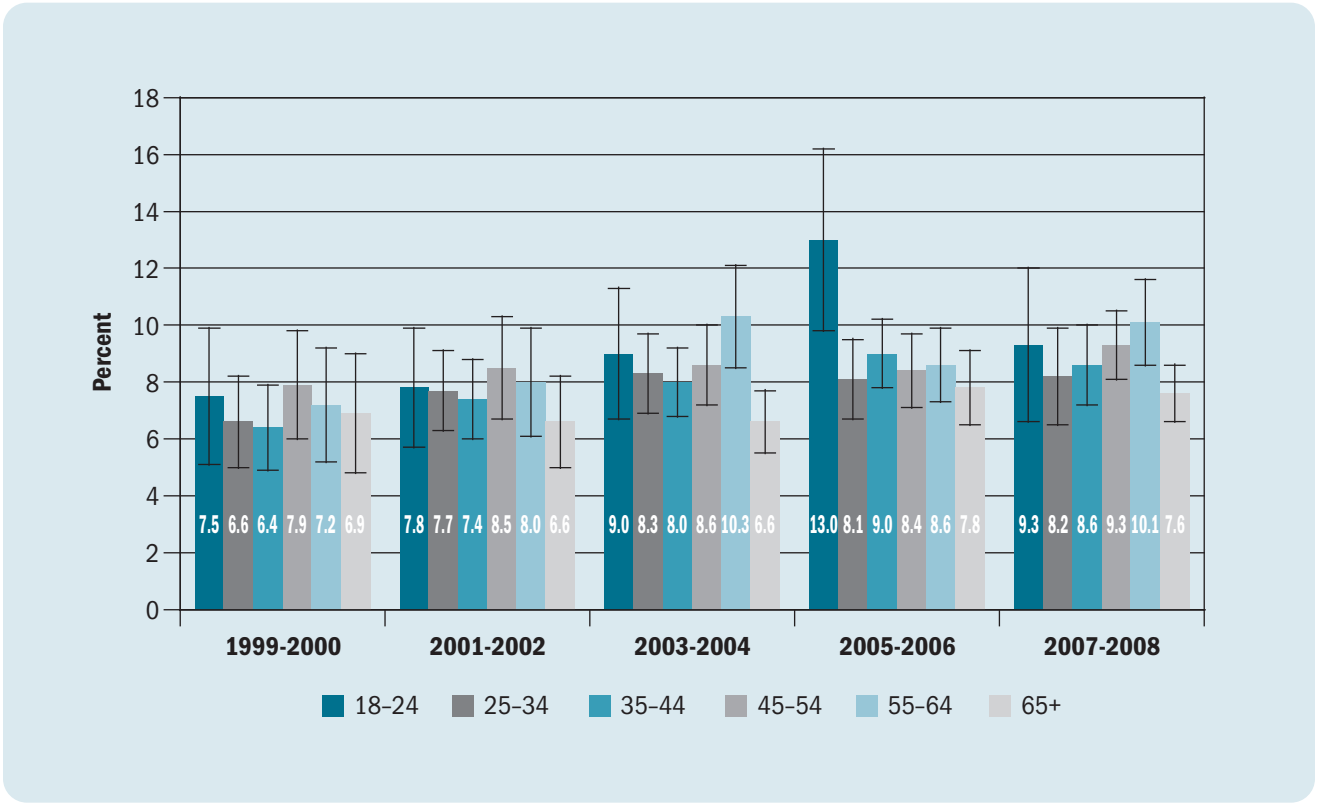
Region	1999–2000		2001–2002		2003–2004		2005–2006		2007-2008	
	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
New York City	6.5	5.3–7.8	7.7	6.5–9.0	7.5	6.5–8.5	8.2	7.1–9.3	7.6	6.5–8.7
Rest of State	7.4	6.4–8.3	7.6	6.8–8.3	8.7	8.0–9.4	9.4	8.6–10.1	9.4	8.6–10.1
New York State	7.1	6.3–7.8	7.6	7.0–8.3	8.3	7.7–8.9	8.9	8.3–9.6	8.8	8.1–9.4

An estimated 1.3 million (8.8%) NYS adults self-reported current asthma for 2007-2008.

Current asthma prevalence fluctuated over time for residents of New York City and increased over time for adults in the Rest of State. In 2007-2008, adults in the Rest of State had higher current asthma prevalence (9.4%) compared to New York City adults (7.6%) (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, 1999-2008

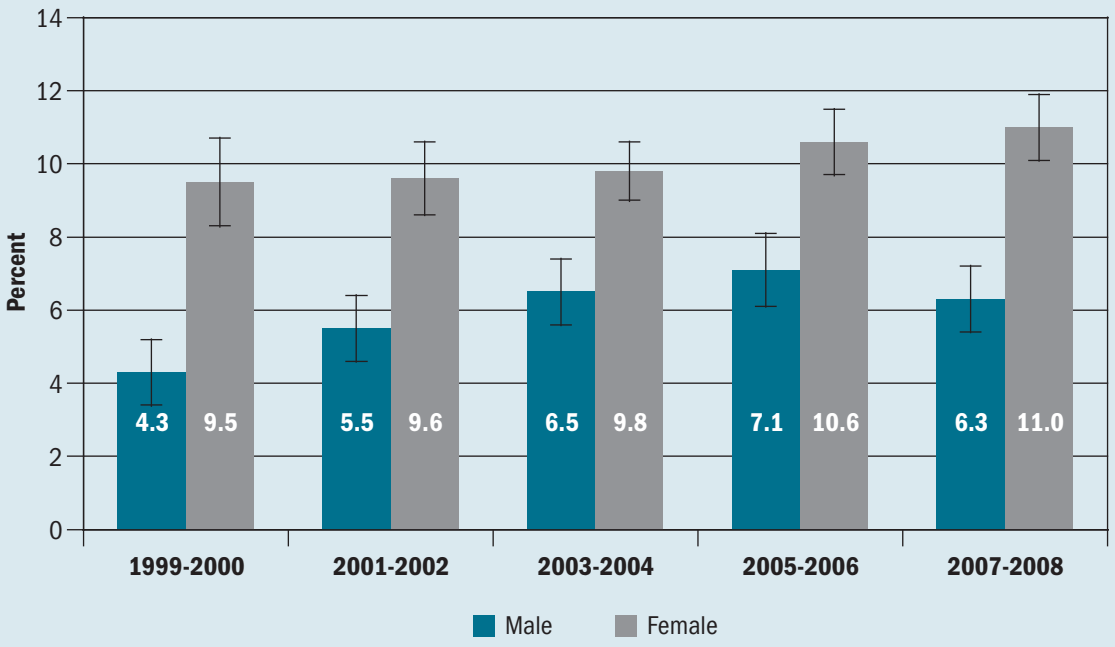


*Prevalence rates are presented with 95% Confidence Intervals.

Age Group	1999–2000		2001–2002		2003–2004		2005–2006		2007-2008	
	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
18–24	7.5	5.1–9.9	7.8	5.7–9.8	9.0	6.7–11.2	13.0	9.8–16.1	9.3	6.6–12.0
25–34	6.6	5.0–8.2	7.7	6.4–9.1	8.3	6.9–9.7	8.1	6.7–9.5	8.2	6.6–9.9
35–44	6.4	5.0–7.9	7.4	6.0–8.8	8.0	6.8–9.2	9.0	7.8–10.2	8.6	7.2–9.9
45–54	7.9	6.0–9.8	8.5	6.8–10.3	8.6	7.2–9.9	8.4	7.1–9.6	9.3	8.2–10.5
55–64	7.2	5.2–9.1	8.0	6.2–9.9	10.3	8.5–12.1	8.6	7.4–9.9	10.1	8.6–11.6
65+	6.9	4.8–9.0	6.6	5.1–8.2	6.6	5.5–7.7	7.8	6.5–9.1	7.6	6.6–8.6

For 1999-2008, current asthma prevalence varied by age group and fluctuated over time. In 2007-2008, adults aged 65+ years had the lowest current asthma prevalence at 7.6%, while adults aged 55-64 years had the highest current asthma prevalence at 10.1% (Figure 5-3).

Figure 5-4
Prevalence* of Current Asthma Among Adults (18+ Years) by Age Group and Combined Survey Years, New York State, BRFSS, 1999-2008



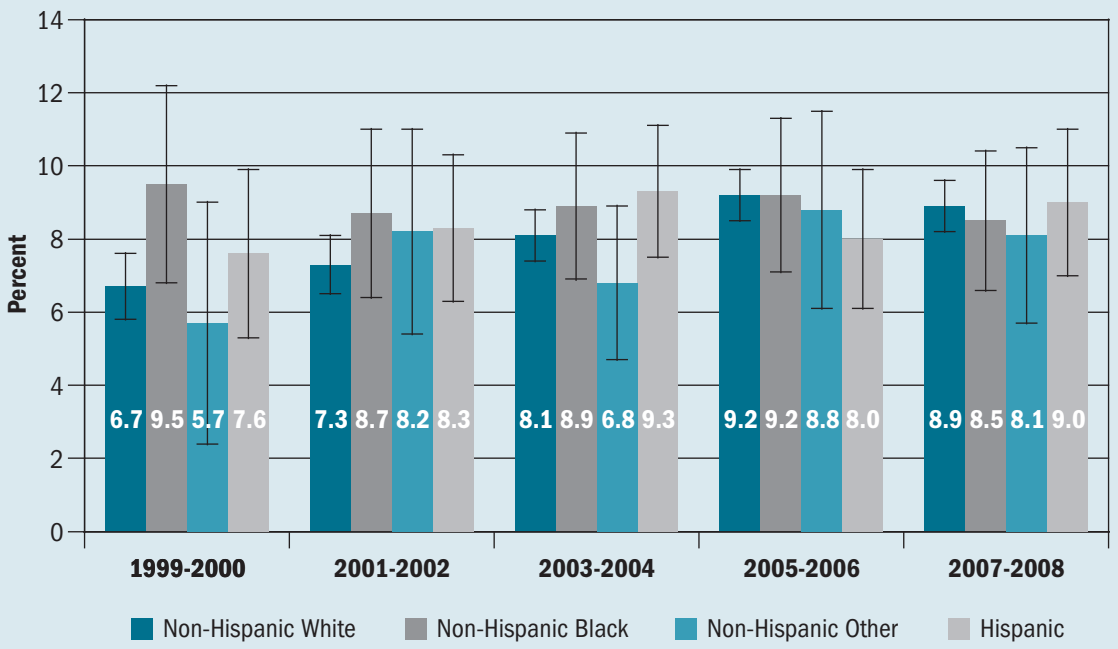
*Prevalence rates are presented with 95% Confidence Intervals.

	1999–2000		2001–2002		2003–2004		2005–2006		2007-2008	
Gender	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
Male	4.3	3.4–5.2	5.5	4.6–6.3	6.5	5.7–7.4	7.1	6.1–8.0	6.3	5.4–7.2
Female	9.5	8.3–10.7	9.6	8.6–10.5	9.8	9.0–10.7	10.6	9.8–11.5	11.0	10.1–11.9

The NYS current adult asthma prevalence was higher in females than in males for all time periods. In general, prevalence increased over time for both genders.

In 2007-2008, the prevalence among females (11.0%) was 75% higher than the prevalence among males (6.3%) (Figure 5-4).

Figure 5-5
Prevalence* of Current Asthma Among Adults (18+ Years) by Race and Ethnicity and Combined Survey Years, New York State, BRFSS, 1999-2008



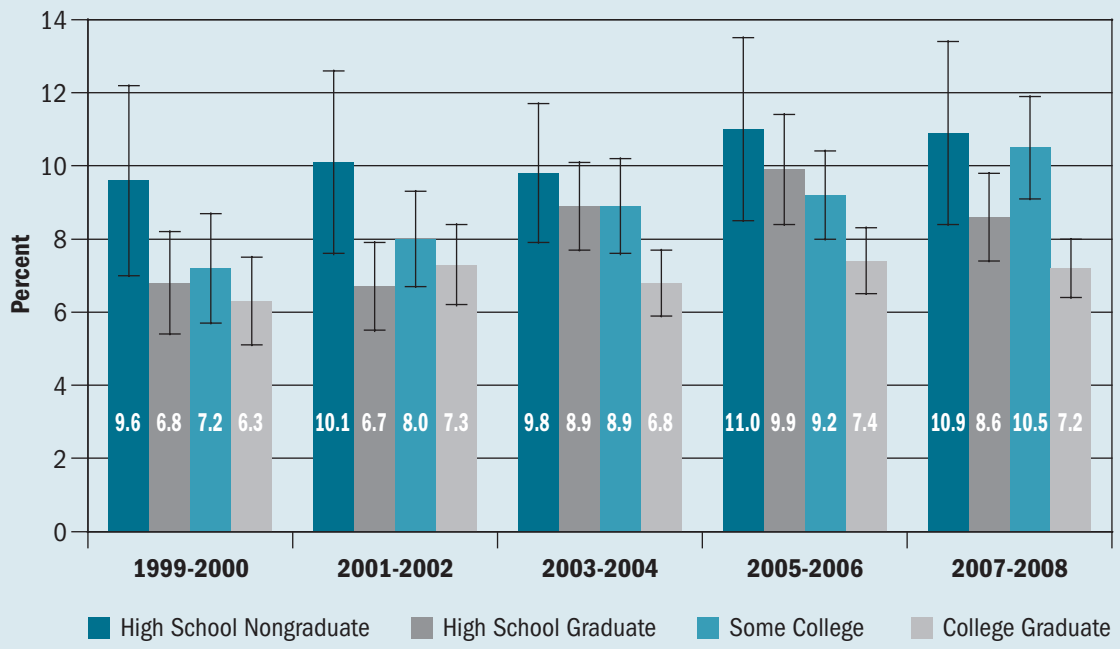
*Prevalence rates are presented with 95% Confidence Intervals.

Race/Ethnicity	1999–2000		2001–2002		2003–2004		2005–2006		2007-2008	
	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
Non-Hispanic White	6.7	5.8–7.5	7.3	6.5–8.0	8.1	7.4–8.8	9.2	8.5–9.9	8.9	8.2–9.6
Non-Hispanic Black	9.5	6.8–12.1	8.7	6.4–11.0	8.9	7.0–10.9	9.2	7.1–11.3	8.5	6.7–10.4
Non-Hispanic Other	5.7	2.4–8.9	8.2	5.5–11.0	6.8	4.8–8.9	8.8	6.1–11.4	8.1	5.8–10.5
Hispanic	7.6	5.4–9.9	8.3	6.3–10.2	9.3	7.5–11.1	8.0	6.2–9.9	9.0	7.0–11.0

For 1999-2008, current asthma prevalence varied by race and ethnicity. Current asthma prevalence increased slightly over time for non-Hispanic Whites but prevalence fluctuated for non-Hispanic Blacks and Hispanic adults for the ten-year period.

The prevalence of current asthma was slightly lower in both non-Hispanic Black and non-Hispanic White adults in 2007-2008 at 8.5% and 8.9%, respectively, compared to Hispanic New Yorkers (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, 1999-2008



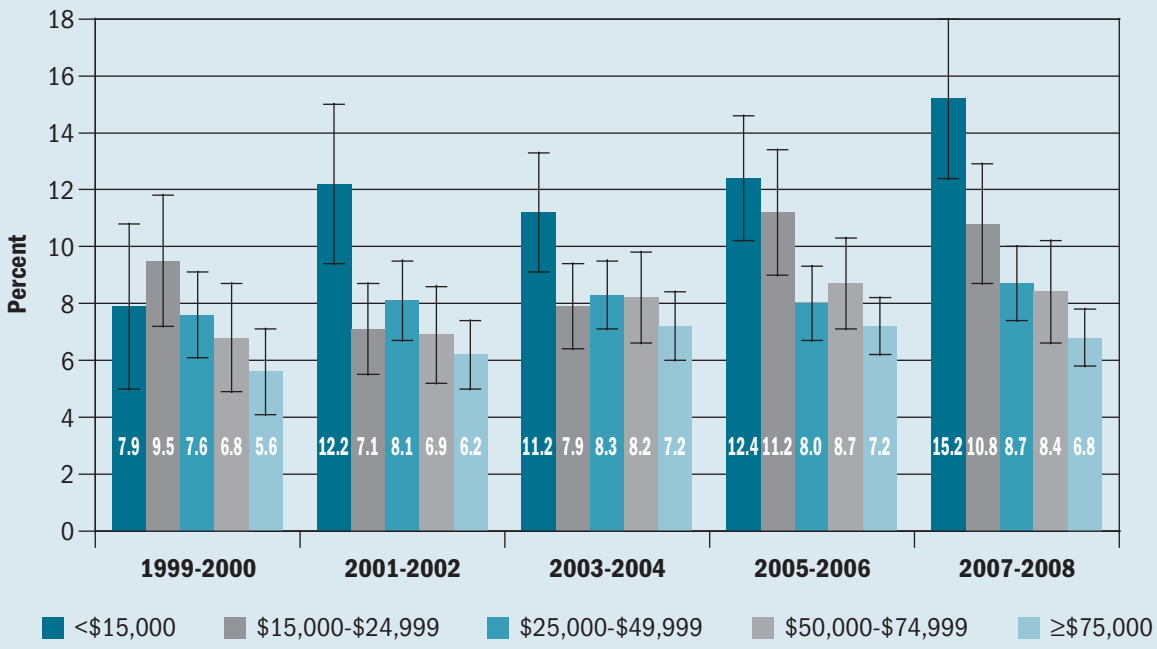
*Prevalence rates are presented with 95% Confidence Intervals.

	1999–2000		2001–2002		2003–2004		2005–2006		2007-2008	
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	9.6	7.0–12.2	10.1	7.6–12.6	9.8	7.9–11.7	11.0	8.6–13.5	10.9	8.4–13.3
High School Graduate	6.8	5.4–8.2	6.7	5.6–7.9	8.9	7.7–10.0	9.9	8.5–11.4	8.6	7.4–9.8
Some College	7.2	5.7–8.7	8.0	6.8–9.3	8.9	7.7–10.2	9.2	8.0–10.4	10.5	9.1–11.9
College Graduate	6.3	5.1–7.5	7.3	6.2–8.3	6.8	5.9–7.7	7.4	6.5–8.2	7.2	6.4–8.0

For 1999-2008, 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 10.9% in 2007-2008, while adults with a college education had the lowest current asthma prevalence at 7.2% (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, 1999-2008



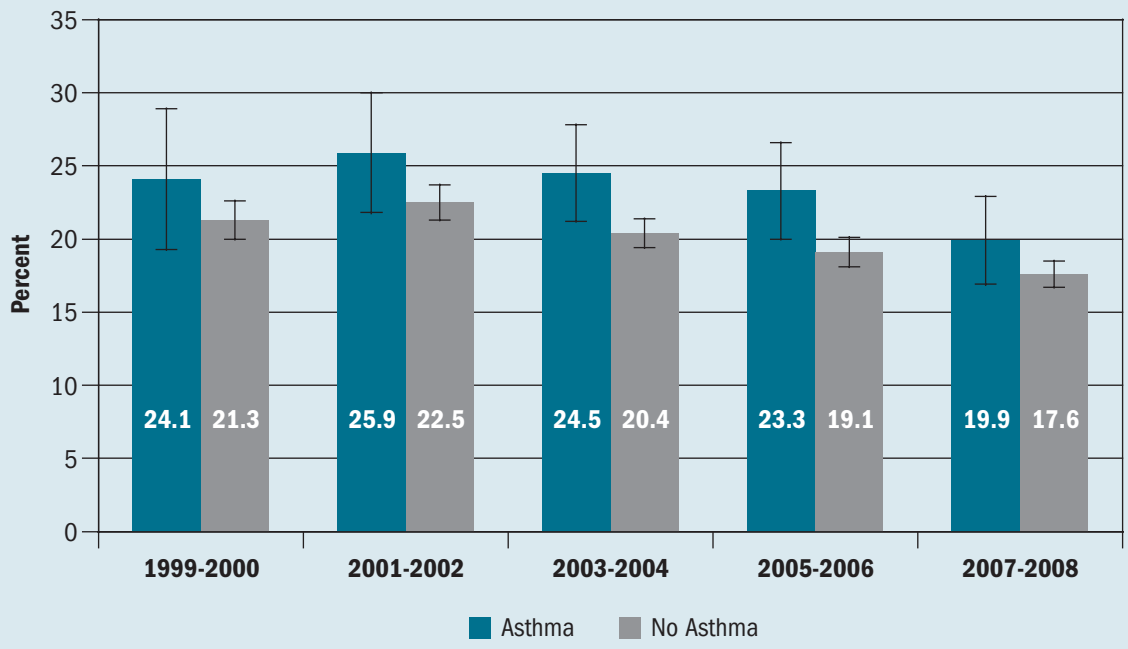
*Prevalence rates are presented with 95% Confidence Intervals.

	1999–2000		2001–2002		2003–2004		2005–2006		2007-2008	
Household Income	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI	Weighted Prevalence (%)	95% CI
<$15,000	7.9	5.1–10.8	12.2	9.4–14.9	11.2	9.1–13.2	12.4	10.2–14.6	15.2	12.4–17.9
$15,000–$24,999	9.5	7.2–11.7	7.1	5.5–8.6	7.9	6.4–9.4	11.2	9.0–13.3	10.8	8.8–12.9
$25,000–$49,999	7.6	6.1–9.1	8.1	6.8–9.4	8.3	7.1–9.5	8.0	6.7–9.3	8.7	7.4–10.0
$50,000–$74,999	6.8	5.0–8.7	6.9	5.2–8.5	8.2	6.6–9.8	8.7	7.1–10.2	8.4	6.6–10.2
≥$75,000	5.6	4.1–7.1	6.2	5.0–7.4	7.2	6.0–8.4	7.2	6.2–8.2	6.8	5.8–7.7

For 1999-2008, current asthma prevalence was inversely proportional to annual household income. From 2001 to 2008, households with an annual income less than $15,000 had the highest current asthma prevalence. In 2007-2008, adults with an annual household income of less than $15,000 had the highest current asthma prevalence at 15.2%, while adults with an annual household income level of $75,000 or more had the lowest current asthma prevalence at 6.8%. In general, prevalence increased over time for adults with annual household income levels of at least $25,000.

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
Percent* of Adult (18+ Years) New Yorkers Who Currently Smoke** by Asthma Status and Combined Survey Years, New York State, BRFSS, 1999-2008



*Percentages are presented with 95% Confidence Intervals.

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

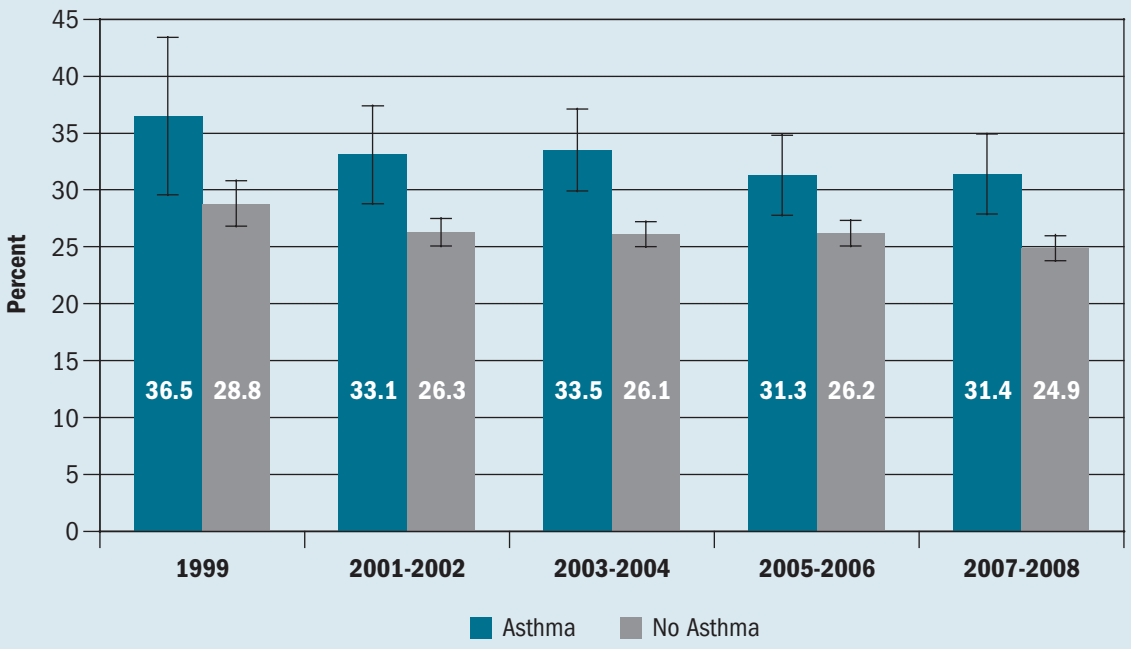
Year	Asthma		No Asthma	
	Weighted Percentage (%)	95% CI	Weighted Percentage (%)	95% CI
1999–2000	24.1	19.3–28.9	21.3	20.0–22.6
2001–2002	25.9	21.8–30.0	22.5	21.3–23.6
2003–2004	24.5	21.2–27.7	20.4	19.5–21.4
2005–2006	23.3	20.0–26.6	19.1	18.2–20.0
2007–2008	19.9	16.9–22.8	17.6	16.7–18.5

For each survey period during 2001-2008, the percent of current smoking declined but was consistently higher for adults with asthma compared to those without asthma.

In 2007-2008, 19.9% of adults with asthma reported that they were current smokers, compared to 17.6% of those without asthma (Figure 5-8).

Figure 5-9

Percent* 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, 1999-2008**



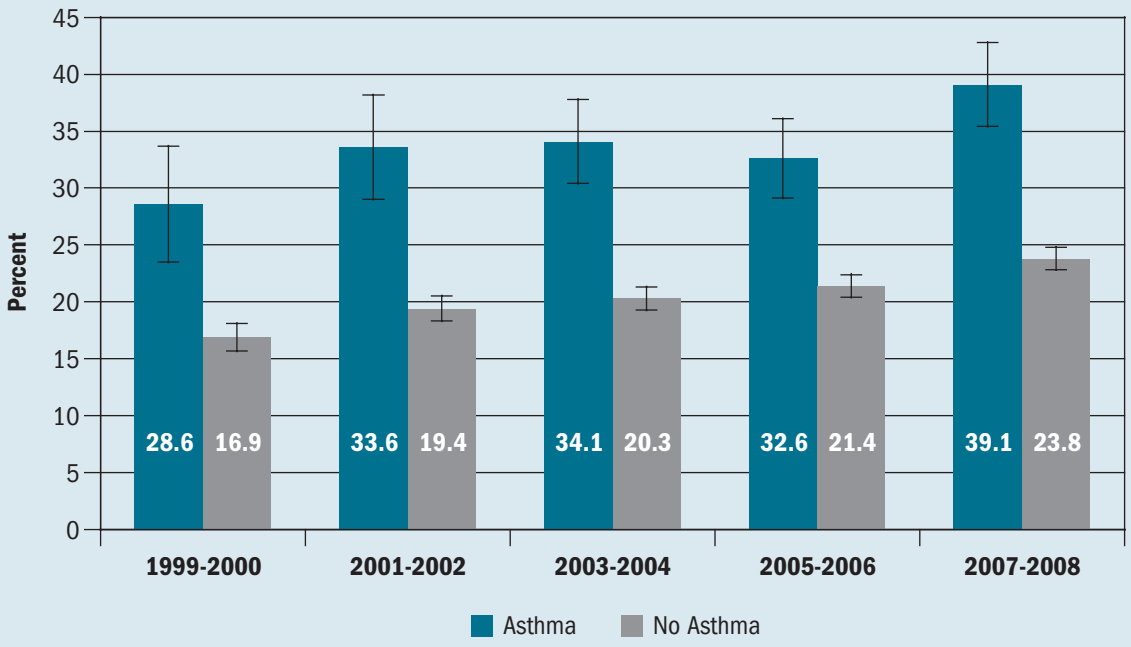
*Percentages are presented with 95% Confidence Intervals.

**A respondent who answered "no" when asked "During 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
1999	36.5	29.6–43.3	28.8	26.8–30.8
2001–2002	33.1	28.9–37.4	26.3	25.1–27.5
2003–2004	33.5	30.0–37.1	26.1	25.1–27.2
2005–2006	31.3	27.8–34.8	26.2	25.2–27.3
2007–2008	31.4	28.0–34.9	24.9	23.8–25.9

For 1999-2008, the percent of adults who reported no leisure time physical activity for the past month steadily decreased in both adults with and without asthma. For this time period, persons with asthma were more likely than those without asthma to report no leisure-time physical activity in the past month. In 2007-2008, 31.4% of adults with asthma reported no leisure time physical activity compared to 24.9% for those without asthma (Figure 5-9).

Figure 5-10
Percent* of Adult (18+ Years) New Yorkers Who Are Obese** by Asthma Status and Combined Survey Years, New York State, BRFSS, 1999-2008



*Percentages are presented with 95% Confidence Intervals.

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

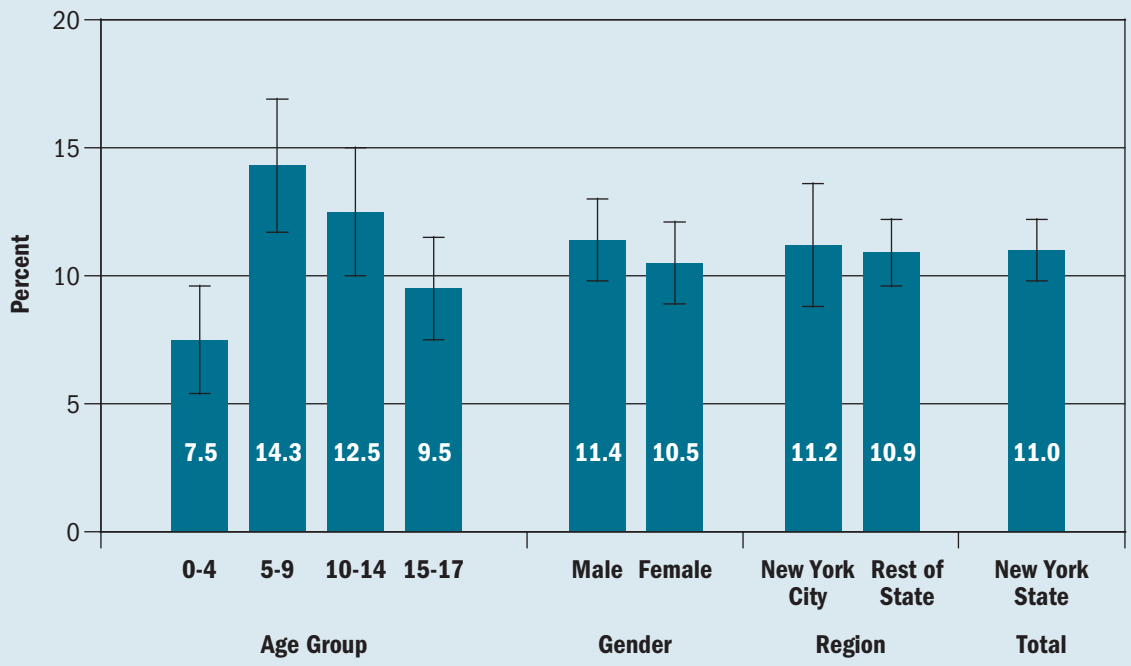
Year	Asthma		No Asthma	
	Weighted Percentage (%)	95% CI	Weighted Percentage (%)	95% CI
1999–2000	28.6	23.5–33.7	16.9	15.7–18.1
2001–2002	33.6	29.0–38.2	19.4	18.3–20.5
2003–2004	34.1	30.4–37.8	20.3	19.4–21.3
2005–2006	32.6	29.2–36.1	21.4	20.5–22.4
2007–2008	39.1	35.4–42.8	23.8	22.8–24.8

For 1999-2008, the percent of respondents who were obese steadily increased in adult New Yorkers — those with asthma as well as those without asthma.

For all time periods, the percent of respondents who were obese was significantly greater among adults with asthma than adults without asthma.

In 2007-2008, 39.1% of adult New Yorkers with asthma were obese, compared to 23.8% of 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 2006-2008



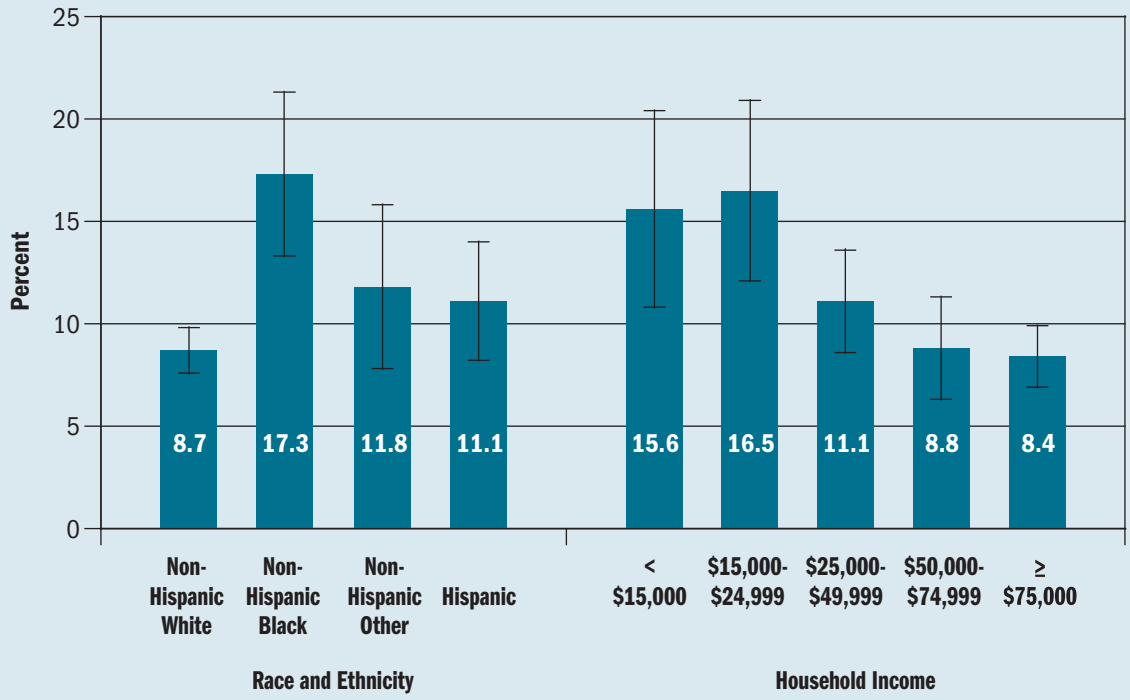
*Prevalence rates are presented with 95% Confidence Intervals.

		Weighted Prevalence (%)	95% CI
Age Group	0–4	7.5	5.4–9.5
	5–9	14.3	11.8–16.9
	10–14	12.5	10.0–14.9
	15–17	9.5	7.5–11.4
Gender	Male	11.4	9.8–13.0
	Female	10.5	8.9–12.1
Region	New York City	11.2	8.8–13.6
	Rest of State	10.9	9.6–12.1
Total	*New York State*	*11.0*	*9.8–12.1*

For 2006-2008, approximately 491,000 (11%) 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 7.5%, while children aged 5-9 years had the highest current asthma prevalence at 14.3%.

The prevalence among boys (11.4%) was higher than the prevalence for girls (10.5%). There was no difference in current asthma prevalence when comparing children who live in New York City (11.2%) and the Rest of State (10.9%) (Figure 5-11).

Figure 5-12
Prevalence* of Current Asthma Among Children (0-17 Years) by Race and Ethnicity and Household Income, New York State, BRFSS, Combined Survey Years 2006-2008



*Prevalence rates are presented with 95% Confidence Intervals.

		Weighted Prevalence (%)	95% CI
Race/Ethnicity	Non-Hispanic White	8.7	7.7–9.8
	Non-Hispanic Black	17.3	13.2–21.3
	Non-Hispanic Other	11.8	7.8–15.7
	Hispanic	11.1	8.2–14.0
Household Income	<$15,000	15.6	10.8–20.4
	$15,000–$24,999	16.5	12.2–20.9
	$25,000–$49,999	11.1	8.6–13.5
	$50,000–$74,999	8.8	6.4–11.3
	≥$75,000	8.4	7.0–9.9

The 2006-2008 prevalence of current asthma was higher in non-Hispanic Black children (17.3%) compared to non-Hispanic Whites (8.7%) and Hispanics (11.1%). In 2006-2008, children from households with an annual income between $15,000 and $24,999 had the highest current asthma prevalence at 16.5%, while children from households with annual household incomes of $75,000 or more had the lowest current asthma prevalence at 8.4% (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.

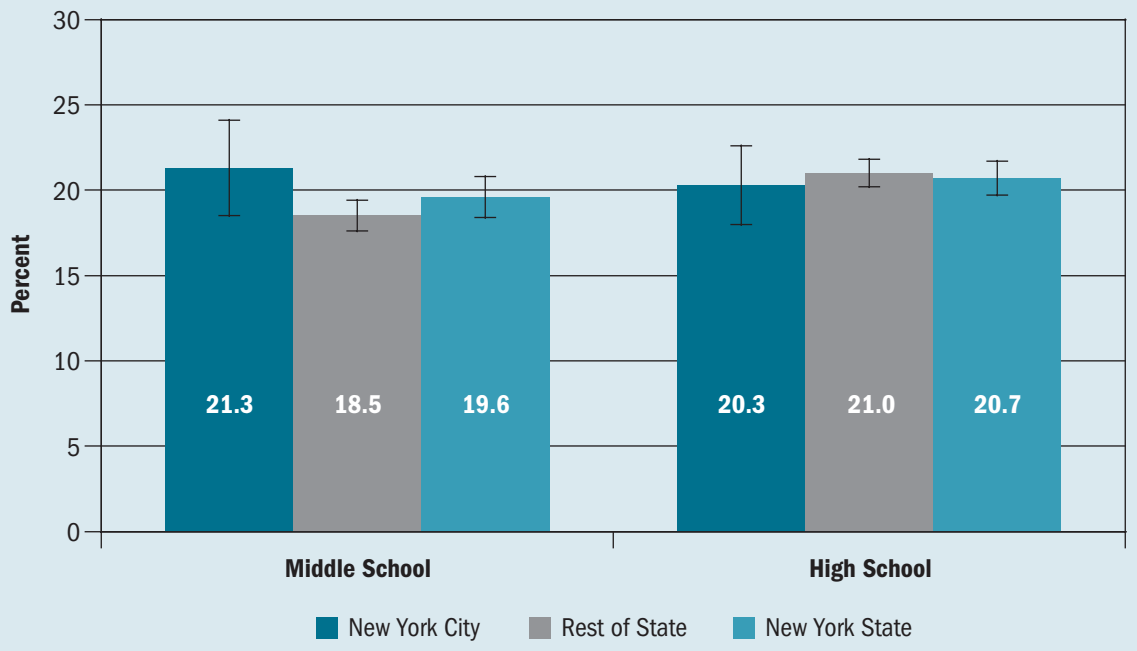
The YTS is administered in NYS every two years to students in grades 6 through 12. For the 2008 survey, there were a total of 43,332 students from 373 schools across the state. Middle school surveys included students who reported they were in grades 6, 7 or 8, while high school surveys included students who reported they were in grades 9, 10, 11 or 12.

The 2008 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 "For the past 12 months, have you had an episode of asthma or an asthma attack?"

Possible responses to the second question were as follows: a) "I do not have asthma"; b) "No, I have asthma but I have not had an episode of asthma or an asthma attack for the past 12 months"; c) "Yes, I have had an episode of asthma or an asthma attack for 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 or 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 size or analyses.

This report provides 2008 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 or 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 "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, 2008



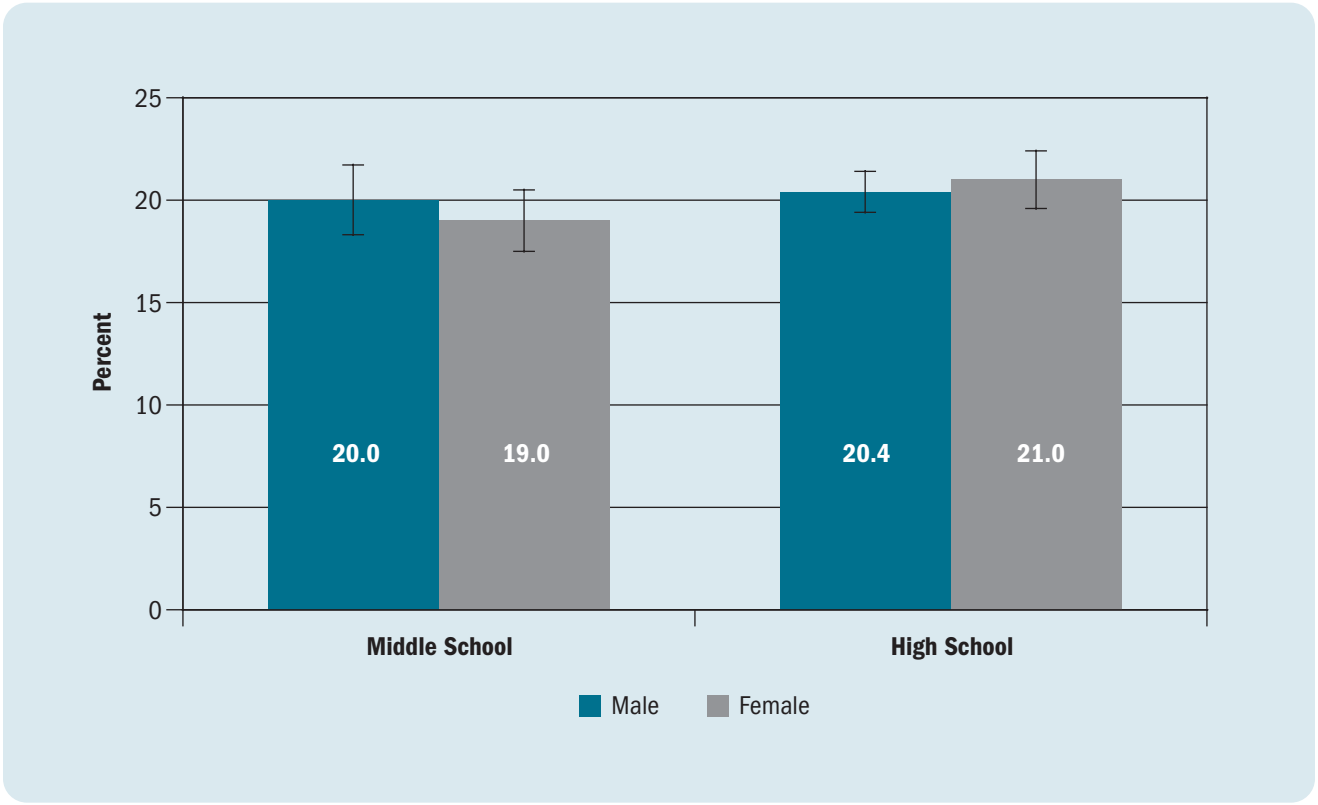
*Prevalence rates are presented with 95% Confidence Intervals.

	Region	Weighted Prevalence (%)	95% CI
Middle School	New York City	21.3	18.4–24.1
	Rest of State	18.5	17.7–19.4
	New York State	19.6	18.3–20.8
High School	New York City	20.3	17.9–22.6
	Rest of State	21.0	20.2–21.8
	New York State	20.7	19.7–21.7

In 2008, the current asthma prevalence was 19.6% for middle school students and 20.7% for high school students in NYS.

Current asthma prevalence was 21.3% for New York City middle school students compared to 18.5% for those in the Rest of State. Among high school students, prevalence of current asthma for New York City students was 20.3% and 21.0% 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, 2008

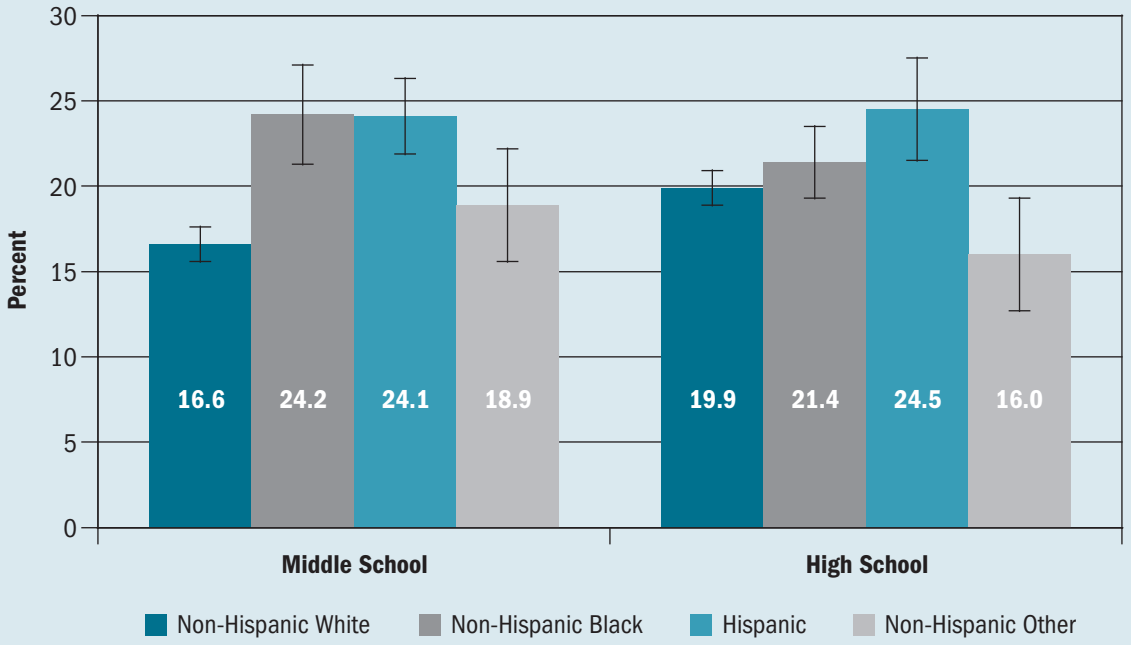


*Prevalence rates are presented with 95% Confidence Intervals.

	Gender	Weighted Prevalence (%)	95% CI
Middle School	Male	20.0	18.3–21.7
	Female	19.0	17.5–20.5
High School	Male	20.4	19.4–21.4
	Female	21.0	19.6–22.4

Among middle school students, males had slightly higher current asthma prevalence (20.0%) than females (19.0%). The prevalence among high school males was 20.4% compared to 21.0% among females (Figure 5-14).

Figure 5-15
Prevalence* of Current Asthma Among Middle and High School Students by Race and Ethnicity, New York State, YTS, 2008



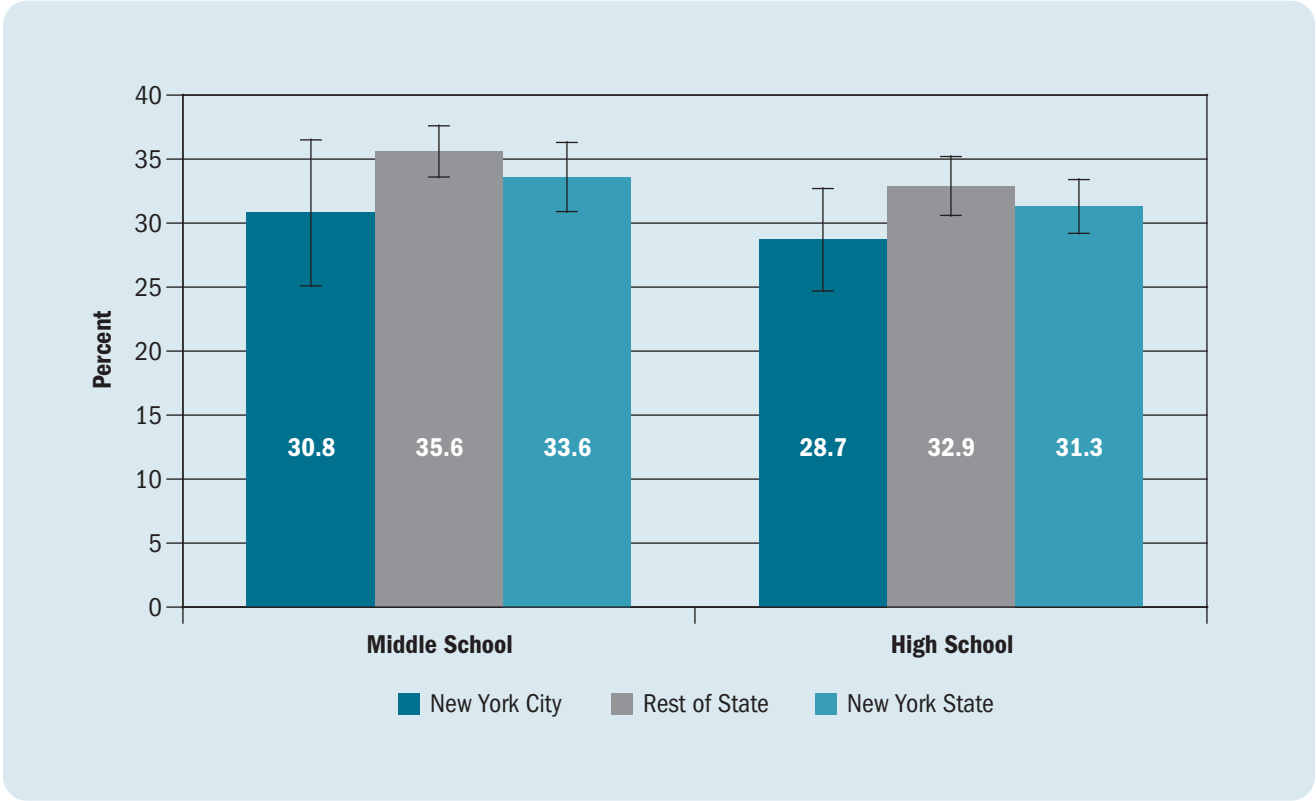
*Prevalence rates are presented with 95% Confidence Intervals.

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

	Race/Ethnicity	Weighted Prevalence (%)	95% CI
Middle School	Non-Hispanic White	16.6	15.6–17.6
	Non-Hispanic Black	24.2	21.2–27.1
	Hispanic	24.1	21.8–26.3
	Non-Hispanic Other**	18.9	15.6–22.2
High School	Non-Hispanic White	19.9	18.8–20.9
	Non-Hispanic Black	21.4	19.3–23.5
	Hispanic	24.5	21.6–27.5
	Non-Hispanic Other**	16.0	12.6–19.3

Current asthma prevalence for middle school non-Hispanic Whites (16.6%) was lower than non-Hispanic Black (24.2%) and Hispanic (24.1%) students. This difference was statistically significant. Similarly, among high school students, prevalence of current asthma among non-Hispanic Whites (19.9%) was lower compared to non-Hispanic Blacks (21.4%) and Hispanics (24.5%). The difference between non-Hispanic Whites and Hispanics was statistically significant (Figure 5-15).

Figure 5-16
Prevalence* of Asthma Episodes or Attacks For the Past 12 Months Among Middle and High School Students with Current Asthma by Region, New York State, YTS, 2008**



*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?"

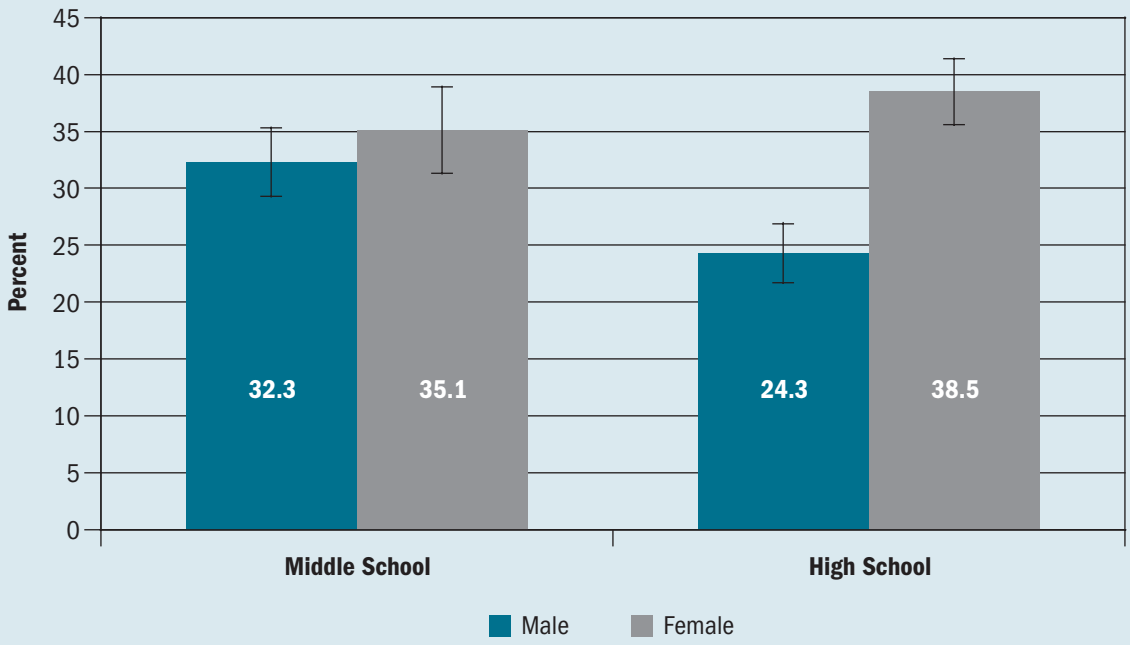
	Region	Weighted Prevalence (%)	95% CI
Middle School	New York City	30.8	25.1–36.5
	Rest of State	35.6	33.6–37.6
	New York State	33.6	31.0–36.3
High School	New York City	28.7	24.7–32.7
	Rest of State	32.9	30.5–35.2
	New York State	31.3	29.2–33.4

Among NYS middle school students with current asthma, 33.6% reported having had asthma episodes or attacks in the past 12 months. For high school students with current asthma, 31.3% reported having asthma episodes or attacks in the past 12 months.

When analyzed by region, 30.8% of New York City middle school students with current asthma reported having had asthma episodes or attacks for the past 12 months compared to 35.6% of their counterparts in the Rest of State.

The proportion of high school students with current asthma who reported having asthma episodes or attacks among New York City and Rest of State students was 28.7% and 32.9%, respectively. (Figure 5-16).

Figure 5-17
Prevalence* of Asthma Episodes or Attacks** For the Past 12 Months Among Middle and High School Students with Current Asthma by Gender, New York State, YTS, 2008



*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?"

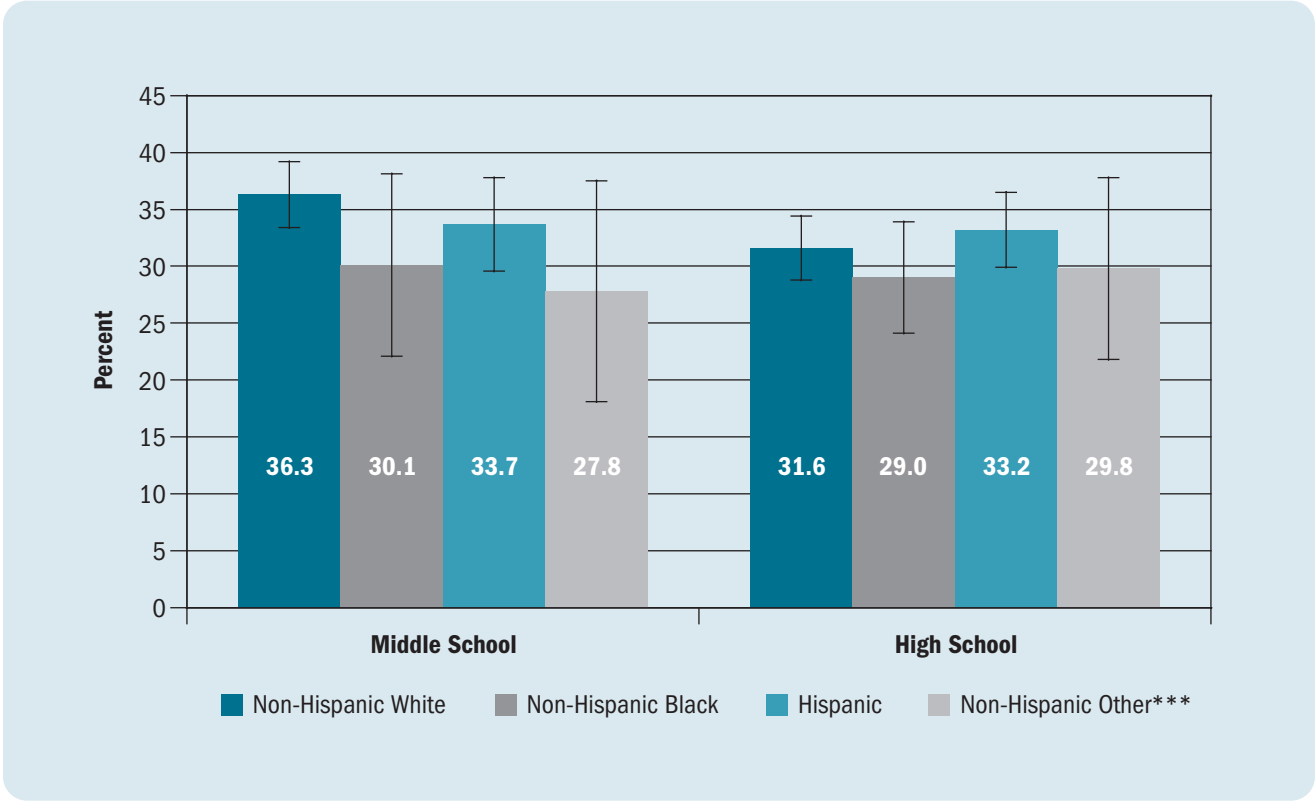
	Gender	Weighted Prevalence (%)	95% CI
Middle School	Male	32.3	29.3–35.3
	Female	35.1	31.3–38.9
High School	Male	24.3	21.7–26.9
	Female	38.5	35.6–41.4

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, 35.1% reported having had asthma episodes or attacks compared to 32.3% among male middle school students.

In contrast, there were significantly more female NYS high school students with current asthma (38.5%) who reported having an asthma attack in the past 12 months compared to males (24.3%) (Figure 5-17).

Figure 5-18

Prevalence* of Asthma Episodes or Attacks For the Past 12 Months Among Middle and High School Students with Current Asthma by Race and Ethnicity, New York State, YTS, 2008**



*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?"

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

	Race/Ethnicity	Weighted Prevalence (%)	95% CI
Middle School	Non-Hispanic White	36.3	33.5–39.2
	Non-Hispanic Black	30.1	22.0–38.1
	Hispanic	33.7	29.6–37.8
	Non-Hispanic Other***	27.8	18.0–37.5
High School	Non-Hispanic White	31.6	28.9–34.4
	Non-Hispanic Black	29.0	24.2–33.9
	Hispanic	33.2	29.8–36.5
	Non-Hispanic Other***	29.8	21.9–37.8

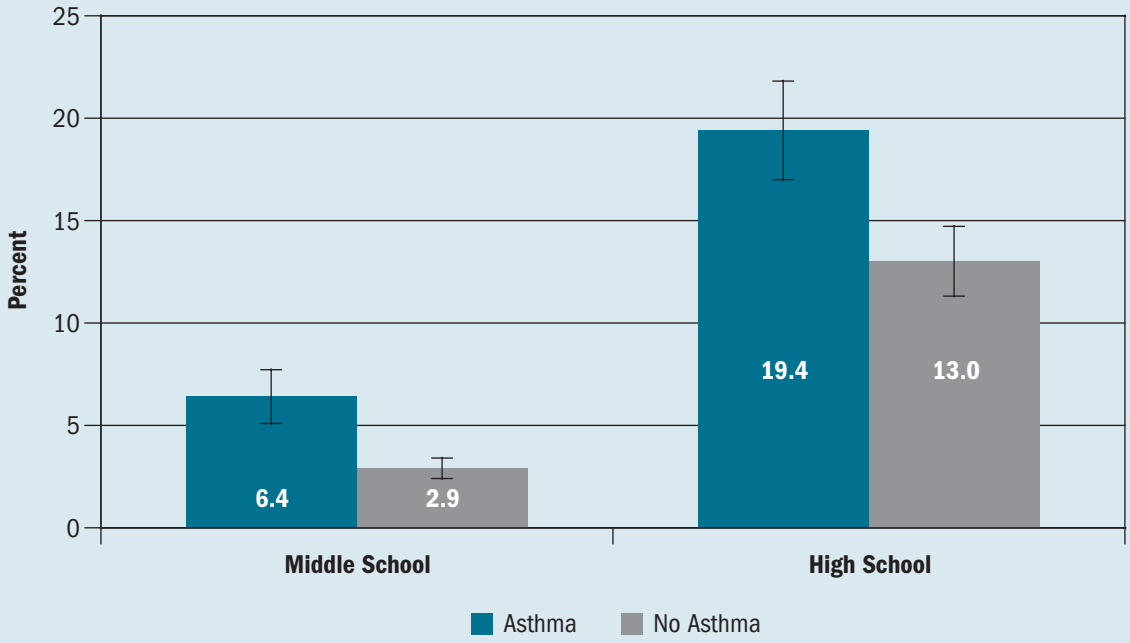
There were no significant differences in the prevalence of asthma episodes or attacks by race and ethnicity among NYS middle school or high school students with current asthma.

The prevalence of having had asthma episodes or attacks in the past 12 months for NYS middle school non-Hispanic White, non-Hispanic Black, and Hispanic students was 36.3%, 30.1%, and 33.7%, respectively.

Hispanic and non-Hispanic White high school students with current asthma reported a similar prevalence of having had asthma episodes or attacks in the past 12 months (33.2% and 31.6%, respectively). These prevalence rates were not significantly different from those reported by non-Hispanic Black high school students (29.0%) with current asthma (Figure 5-18).

Figure 5-19

Percent* of Middle and High School Students Who Smoked** in the Past 30 Days by Asthma Status, New York State, YTS, 2008



*Percentages are presented with 95% Confidence Intervals.

**A respondent who answered 1 through 30 when asked: "During 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	6.4	5.2–7.7	2.9	2.4–3.4
High School	19.4	17.1–21.8	13.0	11.3–14.7

Overall, the prevalence of adolescent smoking was higher for students with asthma compared to those without asthma. These differences were statistically significant for both middle school students and high school students.

In 2008, 6.4% of middle school students with asthma reported that they smoked cigarettes for the past 30 days, compared to 2.9% of those without asthma.

The percent of high school students who reported that they smoked cigarettes for the past 30 days was greater among students with asthma (19.4%) than those without asthma (13.0%) (Figure 5-19).

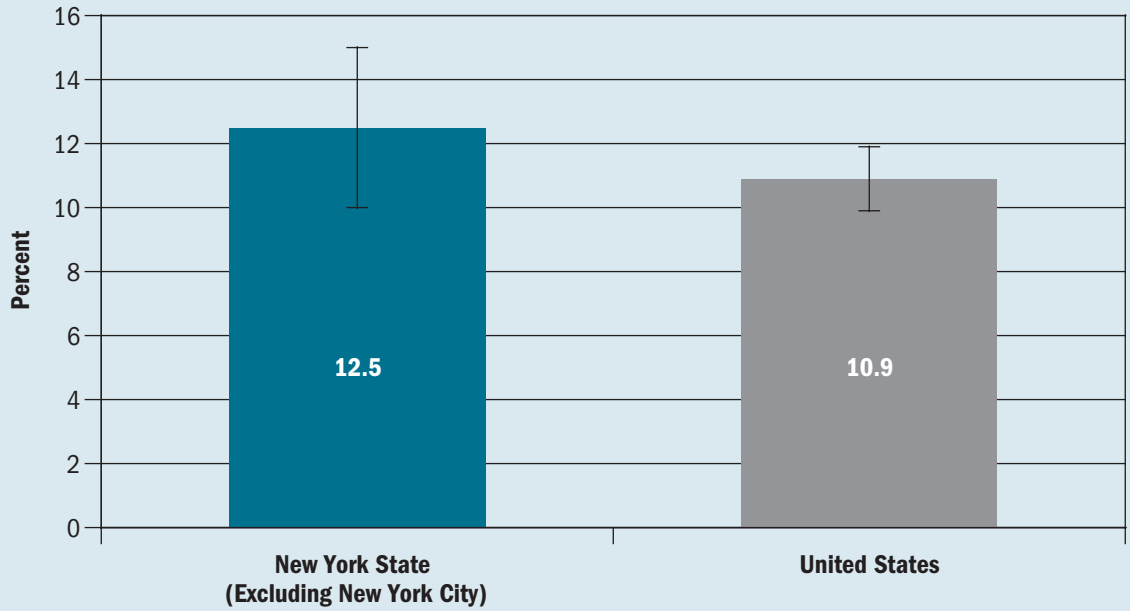
Methodology

The Youth Risk Behavior Survey (YRBS) is a self-administered, paper-based survey of public high school students developed by the Centers for Disease Control and Prevention (CDC) and administered in New York State (NYS) by the State Education Department (SED). The NYS YRBS data were obtained from two separate samples of schools. One sample was selected in New York City while the other sample included schools in areas of NYS outside of New York City. The survey is conducted every two years among high school students (grades 9-12) and includes questions about their health-risk behaviors.

Questions about asthma were added to the YRBS in 2005 and 2007. The 2007 YRBS that was conducted in NYS (excluding New York City) included two questions for assessing both lifetime and current prevalence of asthma: "Has a doctor or nurse ever told you that you have asthma?" and "Do you still have asthma?" These questions are identical to the ones asked in the NYS BRFSS. However, the two questions were worded differently in 2005, so the current asthma prevalence estimates are not comparable between the two survey years. In addition, the 2007 New York City survey did not ask a question about current asthma. Thus, while there were 13,439 NYS high school students who participated in the 2007 YRBS, the responses to the current asthma question were obtained only from 4,359 students in NYS (excluding New York City). Because the YRBS is conducted in public high schools only, the data are not representative of all high school students.

The survey results presented in this report were obtained directly from the CDC YRBS Youth Online query.[17] The query results include weighted estimates for current asthma prevalence for NYS (excluding New York City) and the U.S. These estimates are presented by total population, gender and race and ethnicity. The 95% confidence intervals (CIs) for these estimates are provided. Estimates are considered "significantly different" from each other when they do not have overlapping CIs.

Figure 5-20
Prevalence* of Current Asthma Among High School Students for New York State (Excluding New York City) and the United States, YRBS, 2007



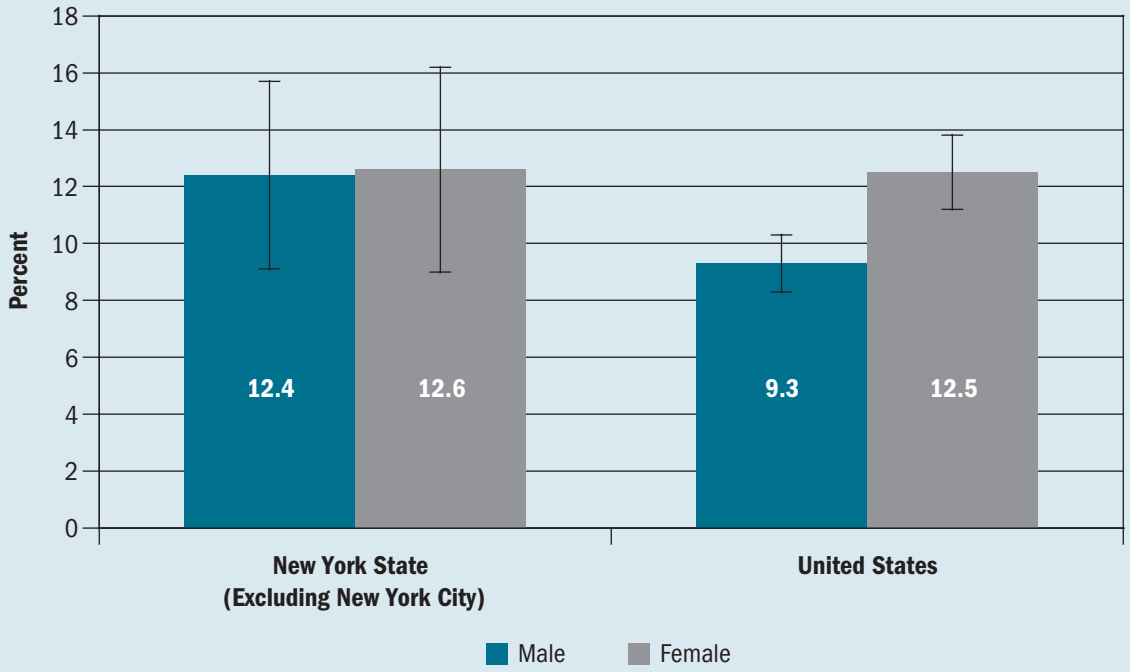
*Prevalence rates are presented with 95% Confidence Intervals.

	Weighted Percentage (%)	95% CI
New York State (Excluding New York City)	12.5	10.4–15.0
United States	10.9	10.1–11.9

The 2007 current asthma prevalence for NYS (excluding New York City) high school students was 12.5%, which was higher than the national asthma prevalence of 10.9% (Figure 5-20).

While the current asthma prevalence rate among NYS (excluding New York City) high school students from the 2007 YRBS (12.5%) is lower than reported in the 2008 YTS (21.0%), they are not comparable due to the difference in how the current asthma questions were asked in each survey.

Figure 5-21
Prevalence* of Current Asthma Among High School Students by Gender for New York State (Excluding New York City) and the United States, YRBS, 2007

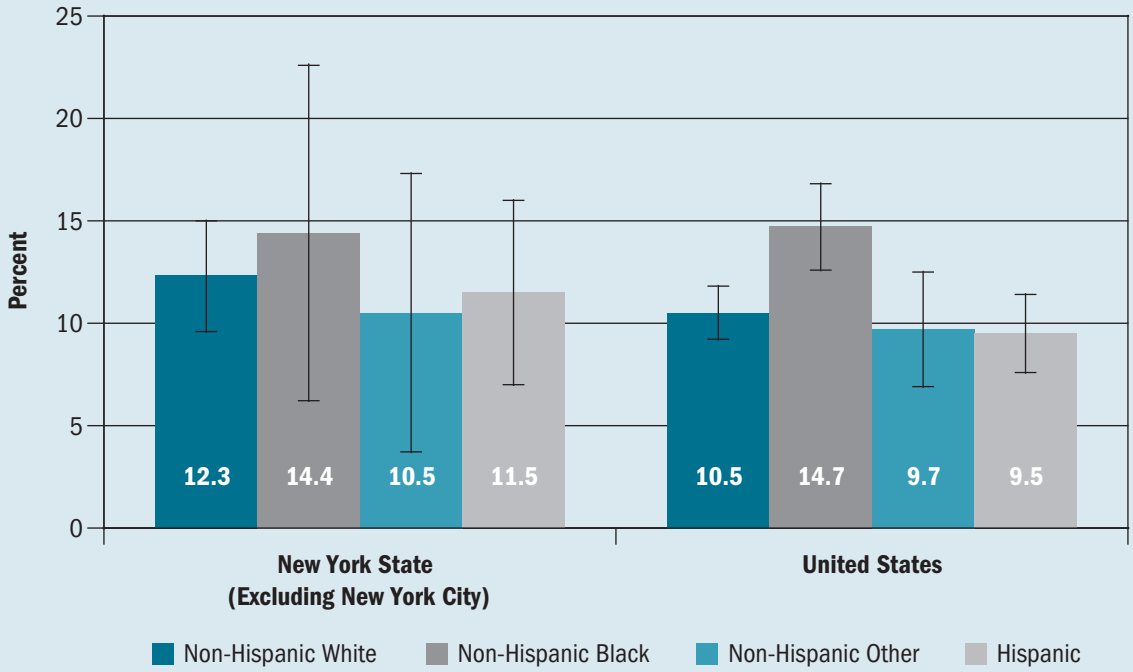


*Prevalence rates are presented with 95% Confidence Intervals.

	Gender	Weighted Percentage (%)	95% CI
New York State (Excluding New York City)	Male	12.4	9.8–15.7
	Female	12.6	9.8–16.2
United States	Male	9.3	8.4–10.3
	Female	12.5	11.3–13.8

In NYS (excluding New York City), females had slightly higher current asthma prevalence (12.6%) compared to male high school students (12.4%). Both were slightly higher than the national gender-specific asthma prevalence rates. None of the differences were statistically significant (Figure 5-21).

Figure 5-22
Prevalence* of Current Asthma Among High School Students by Race and Ethnicity for New York State (Excluding New York City) and the United States, YRBS, 2007



*Prevalence rates are presented with 95% Confidence Intervals.

	Race and Ethnicity	Weighted Percentage (%)	95% CI
New York State (Excluding New York City)	Non-Hispanic White	12.3	10.0–15.0
	Non-Hispanic Black	14.4	8.9–22.6
	Non-Hispanic Other	10.5	6.1–17.3
	Hispanic	11.5	8.2–16.0
United States	Non-Hispanic White	10.5	9.4–11.8
	Non-Hispanic Black	14.7	12.8–16.8
	Non-Hispanic Other	9.7	7.4–12.5
	Hispanic	9.5	8.0–11.4

Overall, current asthma prevalence varied slightly by race and ethnicity among NYS (excluding New York City) high school students. In 2007, non-Hispanic Black students had the highest current asthma prevalence (14.4%), followed by non-Hispanic White (12.3%) and Hispanic high school students (11.5%). New York's race and ethnicity-specific current asthma prevalence rates were higher than the corresponding national prevalence among non-Hispanic White and Hispanic high school students, and slightly lower than the national prevalence rate among non-Hispanic Black high school students (Figure 5-22).

6

Asthma Emergency Department Visits

Highlights: Asthma Emergency Department Visits

- The annual number of asthma emergency department visits among New York State residents was 159,572 in 2005, 164,116 in 2006, and 161,200 in 2007.
- The annual asthma emergency department visit rate in New York State was similar for 2005-2007. In 2007, the asthma emergency department visit rate was 83.5 per 10,000.
- Overall, asthma emergency department visits showed a seasonal pattern, with peaks in the spring and fall and a decline in the summer.
- For 2005-2007, the 0-4 age group had the highest emergency department visit rate compared to all other age groups.
- For 2005-2007, female New Yorkers had higher crude and age-adjusted asthma emergency department visit rates (86.6 per 10,000; 89.8 per 10,000) compared to males (80.6 per 10,000; 81.8 per 10,000).
- Males had a higher percentage of asthma emergency department visits compared to females in the 0-4 year (64% versus 36%) and 5-14 year (62% versus 38%) age groups. However, males had lower percentages for all remaining age groups.
- For the period 2005-2007, crude and age-adjusted asthma emergency department visit rates for non-Hispanic Black (192.0 per 10,000; 187.0 per 10,000) and Hispanic (144.0 per 10,000; 140.0 per 10,000) New York State residents were higher than the rates for non-Hispanic White residents (29.9 per 10,000; 32.0 per 10,000).
- New York City residents had crude and age-adjusted asthma emergency department visit rates (128.0 per 10,000; 130.0 per 10,000) in 2005-2007 that were approximately 2.5 times higher than residents in the Rest of State (50.8 per 10,000; 53.2 per 10,000).
- Asthma emergency department visit rates at the county level varied across New York State for 2005-2007. New York City residents of the Bronx had the highest age-adjusted emergency department visit rate of 246.8 per 10,000 residents.
- Other third party or private insurance payers were the source of payment for 56% of the 2005-2007 asthma emergency department visits in New York. Medicaid was the payment source for 22% of emergency department visits; while Medicare was the payment source for 6% of visits.

Asthma Emergency Department Visit Rates for Adults with Current Asthma (At-Risk Based Rates), 2005-2007

- The annual at-risk based rate for asthma emergency department visits in New York State increased from 7.0 asthma emergency department visits per 100 adults with current asthma in 2005 to 7.9 per 100 in 2006. The rate then decreased to 7.6 per 100 in 2007.
- For 2005-2007, non-Hispanic Blacks (20.4 per 100 in 2007) consistently had the highest at-risk based rate for asthma emergency department visits compared to non-Hispanic Whites (2.8 per 100 in 2007) in New York State.

- For 2005-2007, among adults with current asthma, New York City (17.7 per 100 in 2007) residents consistently had a higher at-risk based rate for asthma emergency department visits compared to those in the Rest of State (3.9 per 100 in 2007). The New York City rate increased from 13.7 per 100 in 2005 to 17.1 per 100 in 2007.

Asthma Emergency Department Visit Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2007

- For the 2006-2007 time period, there were approximately 13 asthma emergency department visits each year per 100 children with current asthma in New York State.
- For 2006-2007, 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 (26.6 per 100) compared to all other age groups.
- The at-risk based rate for asthma emergency department visits for 2006-2007 was higher for boys (14.7 per 100) compared to girls (11.0 per 100).
- For 2006-2007, among children with current asthma, the at-risk based rate for asthma emergency department visits for non-Hispanic Blacks (19.8 per 100) was more than three times higher compared to non-Hispanic White children (5.3 per 100). Hispanic children also had a higher at-risk based rate for asthma emergency department visits (13.0 per 100) compared to non-Hispanic White children.
- The at-risk based rate for asthma emergency department visits for 2006-2007 was 4.5 times higher for children living in New York City (26.7 per 100) compared to those living in the Rest of State (5.9 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 as well as for those patients who were discharged elsewhere.* NYS ED visit information has been generated 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.

The SPARCS Outpatient Database contains information on ED visits for patients who visit the ED but are not hospitalized. 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 United States (U.S.) Census Bureau.

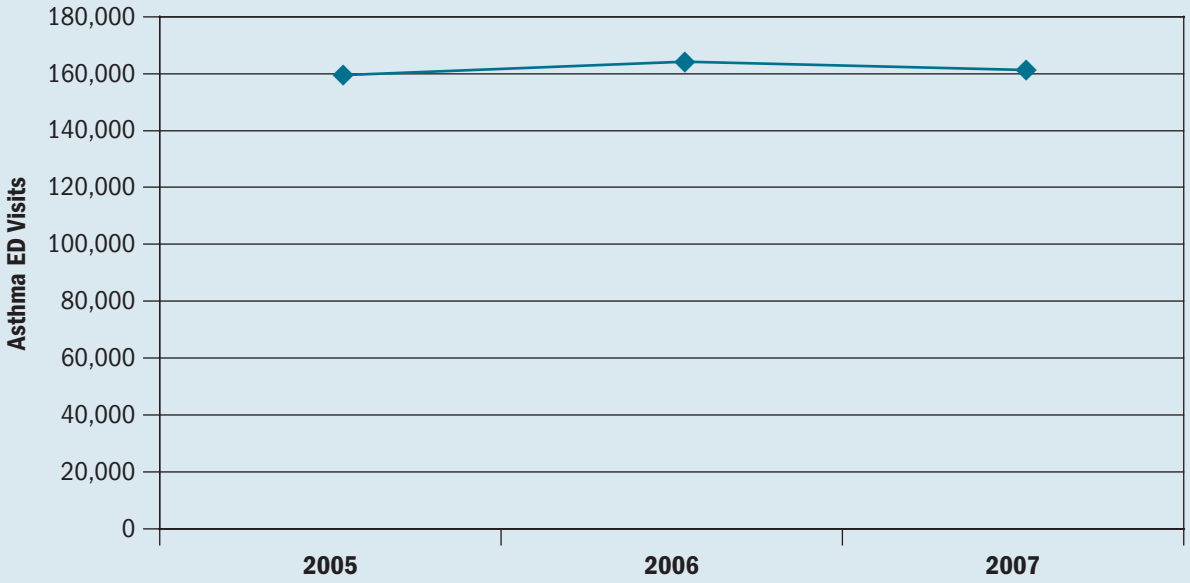
Crude and age-adjusted asthma ED visit rates were calculated per 10,000 residents. The age-adjusted rates were calculated using the 2000 U.S. Standard Population (see Appendix 2).

Trends of asthma ED visit data (2005-2007) 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 (2005-2007) 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 2005-2007 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 (2006) and multiplied by 10,000. Asthma ED visit data for 2005-2007 are also presented as tables, maps and graphs at the state and county level.

*This is a change in methodology for the inclusion of asthma ED visits compared to the New York State Asthma Surveillance Summary Report 2007, which only analyzed asthma ED visits that were discharged elsewhere but *did not* include ED visits for patients who were admitted to the hospital.

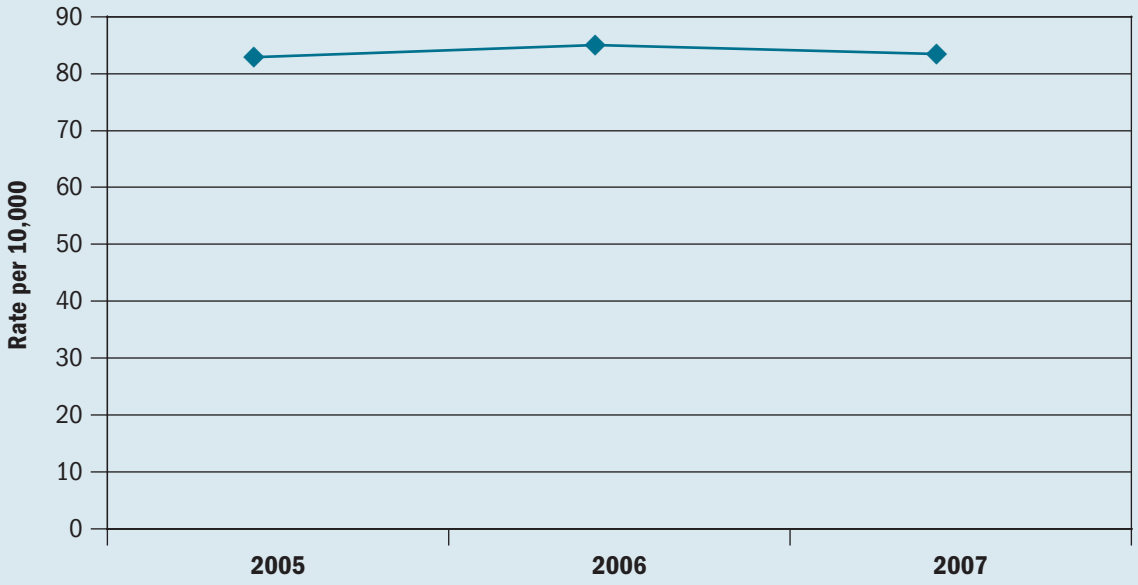
Figure 6-1
Annual Asthma Emergency Department Visits, New York State, 2005-2007



	2005	2006	2007
Asthma ED Visits	159,572	164,116	161,200

The annual number of asthma ED visits among NYS residents was 159,572 in 2005, 164,116 in 2006, and 161,200 in 2007 (Figure 6–1).

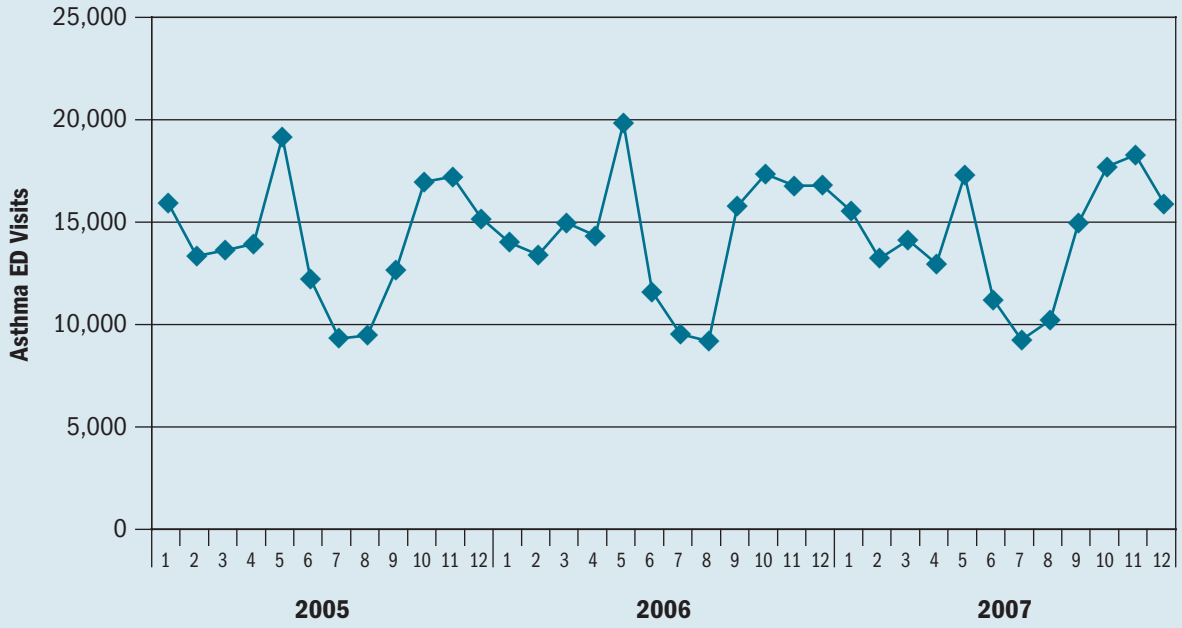
Figure 6-2
Annual Asthma Emergency Department Visit Rate per 10,000 Residents, New York State, 2005-2007



	2005	2006	2007
Rate per 100,000	82.9	85.0	83.5

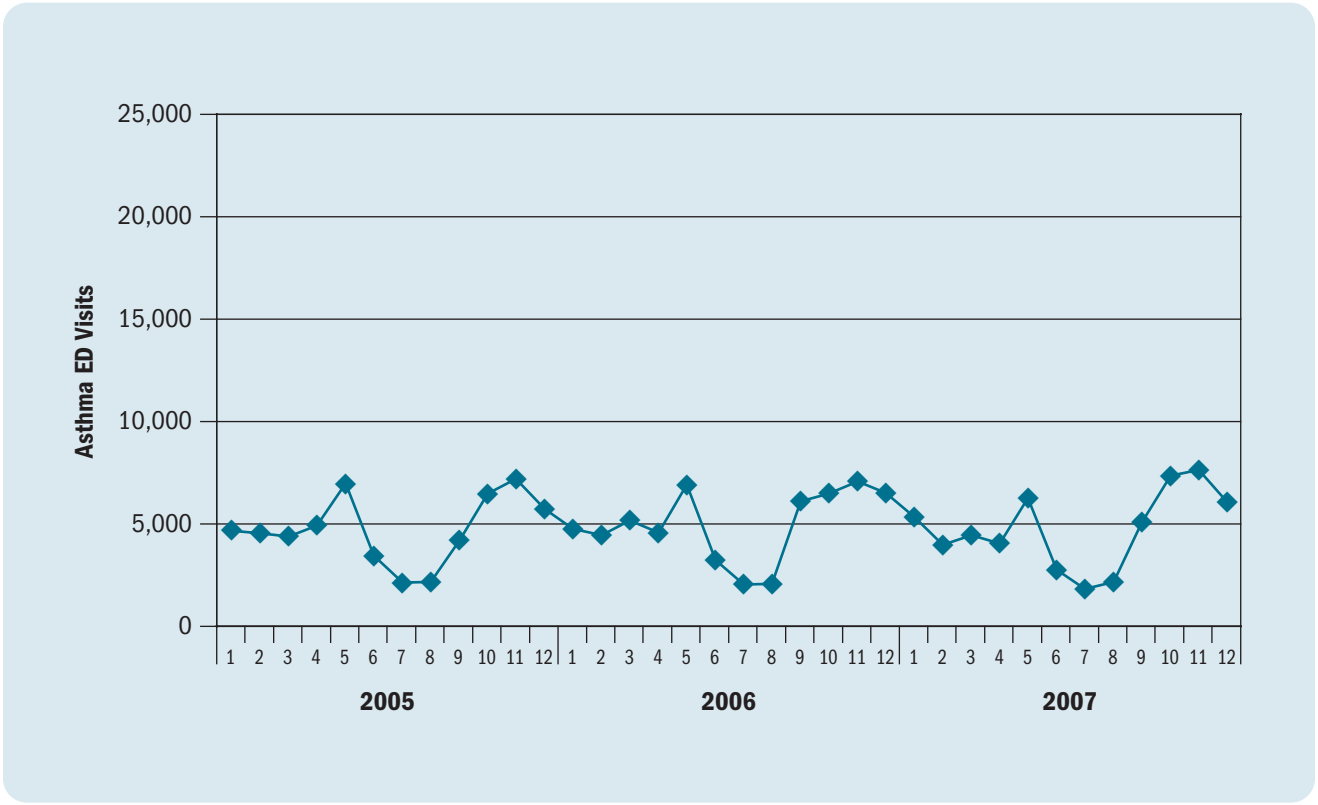
The annual asthma ED visit rate in NYS was similar for 2005-2007. In 2007, the asthma ED visit rate was 83.5 per 10,000 (Figure 6–2).

Figure 6-3
Asthma Emergency Department Visits by Month, New York State, 2005-2007



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, 2005-2007



For 2005-2007, 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 and Ethnicity and Region, New York State, 2005-2007

		Crude	Age-Adjusted*
Gender	Male	80.6	81.8
	Female	86.6	89.8
Race and Ethnicity	Non-Hispanic White	29.9	32.0
	Non-Hispanic Black	192.0	187.0
	Non-Hispanic Other	71.5	74.8
	Hispanic	144.0	140.0
Region	New York City	128.0	130.0
	Rest of State	50.8	53.2
Total	New York State	83.7	86.3

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

For 2005-2007, the crude asthma ED visit rate for NYS was 83.7 per 10,000 residents and the age-adjusted asthma ED visit rate was 86.3 per 10,000.

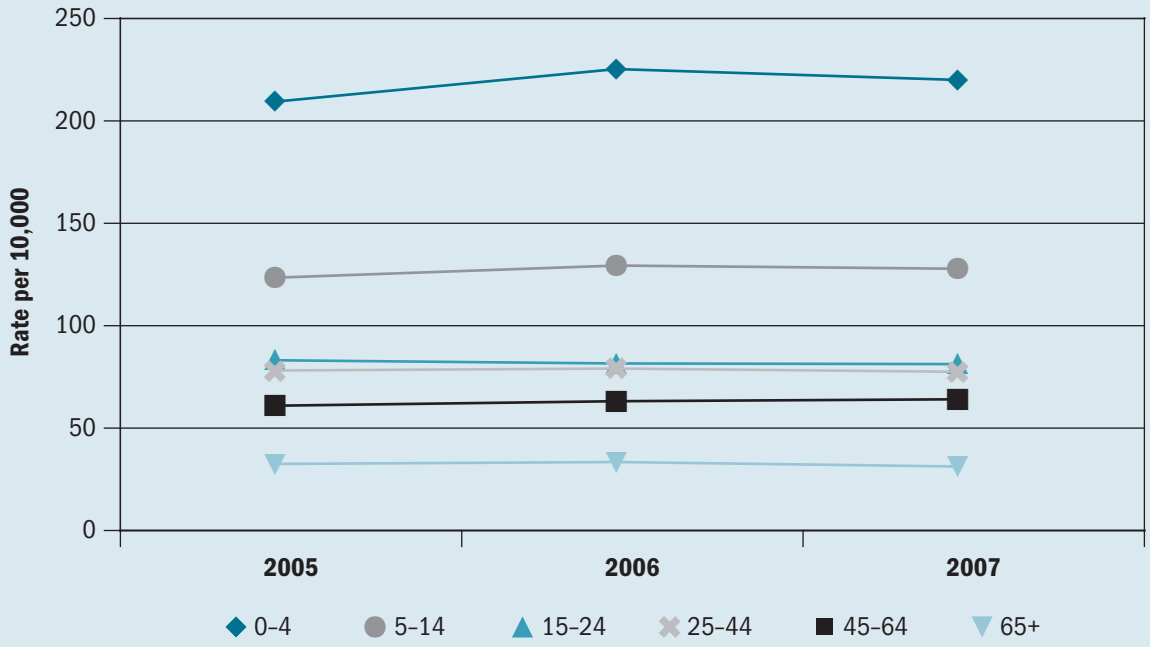
Female New Yorkers had higher crude and age-adjusted asthma ED visit rates (86.6 per 10,000; 89.8 per 10,000) compared to males (80.6 per 10,000; 81.8 per 10,000).

Non-Hispanic Black New Yorkers had crude and age-adjusted ED visit rates (192.0 per 10,000; 187.0 per 10,000) that were six times higher than non-Hispanic White New Yorkers (29.9 per 10,000; 32.0 per 10,000).

Hispanic New Yorkers had crude and age-adjusted ED visit rates (144.0 per 10,000; 140.0 per 10,000) that were four to five times higher than non-Hispanic White residents (29.9 per 10,000; 32.0 per 10,000).

New York City residents had crude and age-adjusted asthma ED visit rates (128.0 per 10,000; 130.0 per 10,000) in 2005-2007 that were approximately 2.5 times higher than residents in the Rest of State (50.8 per 10,000; 53.2 per 10,000) (Table 6-1).

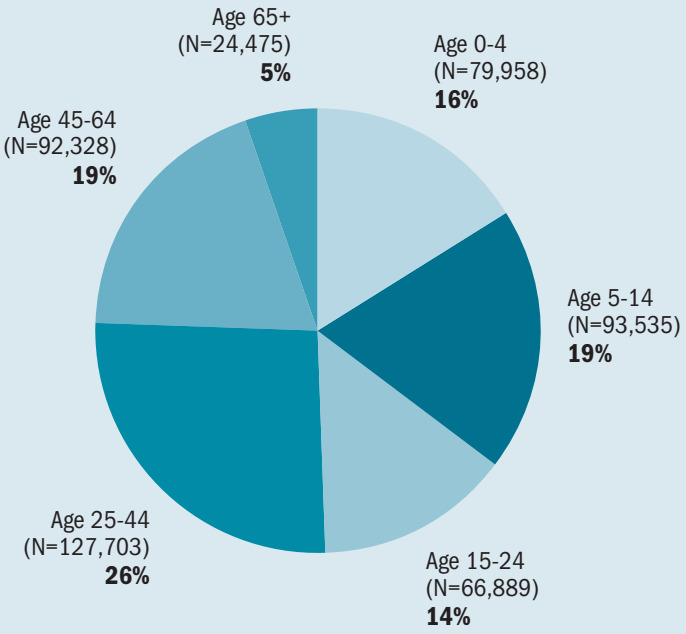
Figure 6-5
Asthma Emergency Department Visit Rate per 10,000 Residents by Age Group and Year, New York State, 2005-2007



Age Group	2005	2006	2007
0–4	209.4	225.3	219.8
5–14	123.5	129.4	127.8
15–24	83.2	81.4	81.3
25–44	77.9	79.0	77.4
45–64	61.0	63.0	64.1
65+	32.3	33.3	31.3

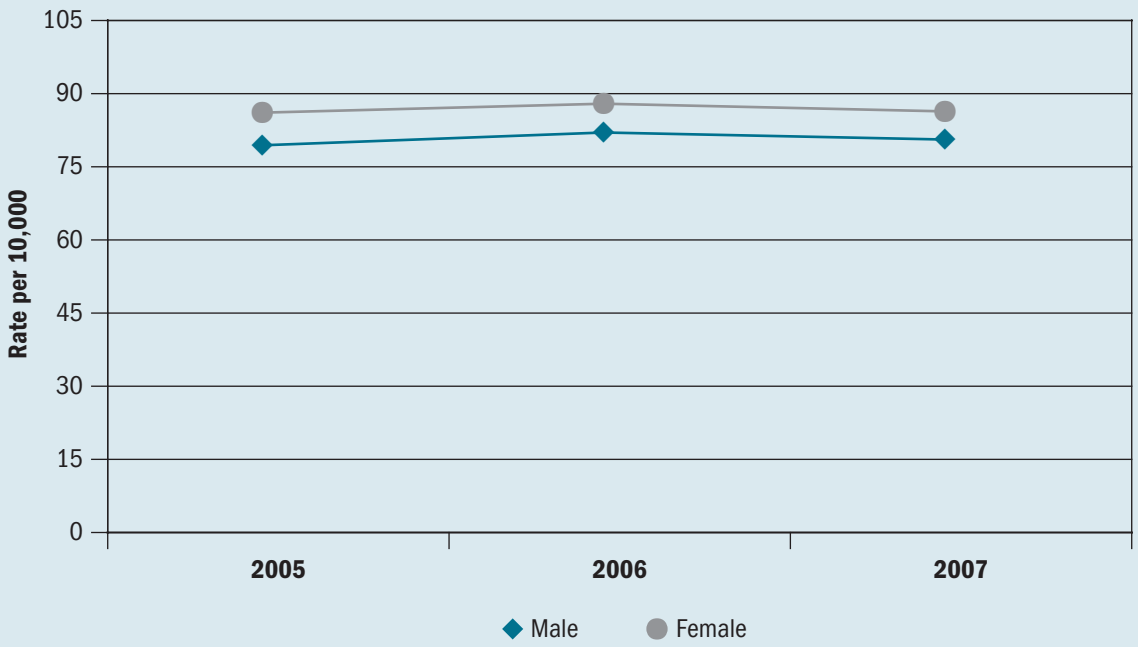
For 2005-2007, the 0-4 year age group had the highest asthma ED visit rate compared to all other age groups in NYS (Figure 6-5).

Figure 6-6
Asthma Emergency Department Visits by Age Group, New York State, 2005-2007



For 2005-2007, 35% of the asthma ED visits were for children aged 0-14 years; 5% of the asthma ED visits were for the 65 and older age group (Figure 6-6).

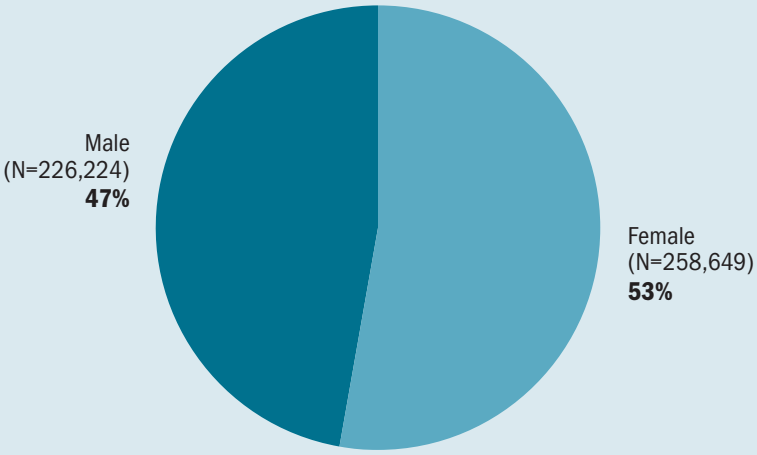
Figure 6-7
Asthma Emergency Department Visit Rate per 10,000 Residents by Gender and Year, New York State, 2005-2007



Gender	2005	2006	2007
Male	79.4	82.0	80.6
Female	86.1	87.9	86.3

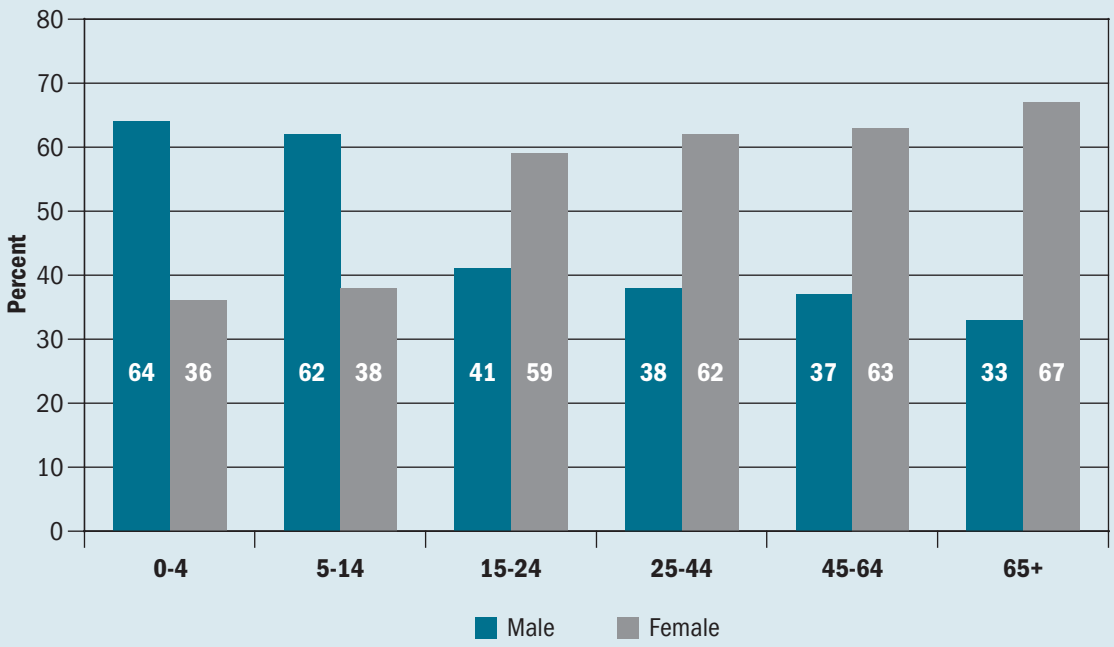
There was a slight increase in asthma ED visit rates between 2005 and 2006 for males and females. The asthma ED visit rates then decreased 2% for both men and women from 2006 to 2007 (Figure 6-7).

Figure 6-8
Asthma Emergency Department Visits by Gender, New York State, 2005-2007



For 2005-2007, 53% of asthma ED visits were for female New Yorkers (Figure 6–8).

Figure 6-9
Percent of Asthma Emergency Department Visits by Age Group and Gender, New York State, 2005-2007



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 – 62%, females – 38%).

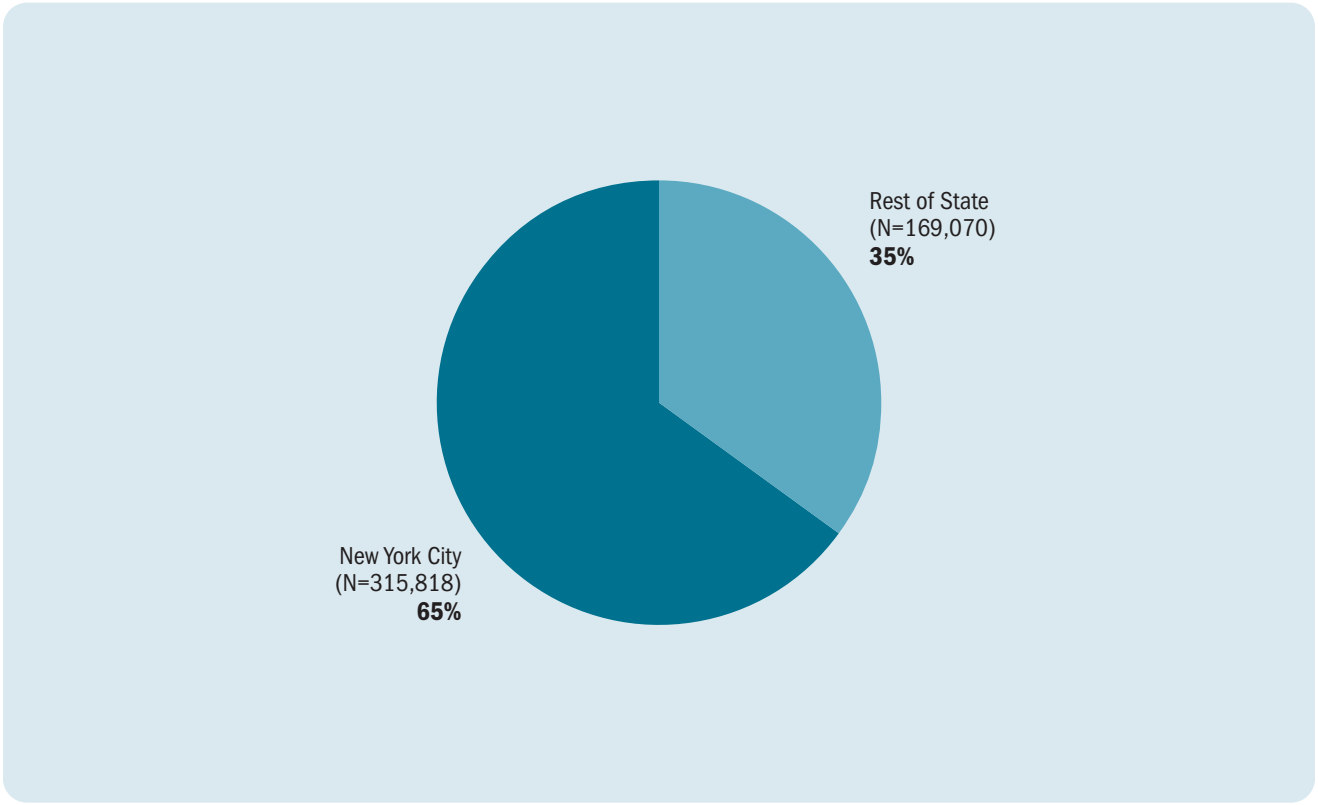
In contrast, among those aged 15 years and older, females accounted for a higher proportion of asthma ED visits compared to males (15-24 years: males – 41%, females – 59%; 25-44 years: males – 38%, females – 62%; 45-64 years: males – 37%, females – 63%; 65+ years: males – 33%, females – 67%) (Figure 6–9).

Figure 6-10
Asthma Emergency Department Visit Rate per 10,000 Residents by Region and Year, New York State, 2005-2007

	2005	2006	2007
New York City	126.2	130.4	128.0
Rest of State	51.1	51.4	50.1

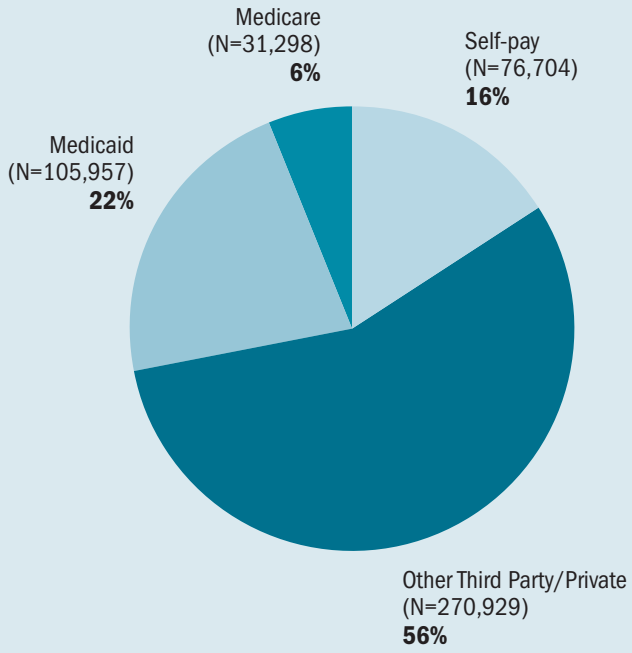
New York City residents had consistently higher asthma ED visit rates compared to residents in the Rest of State (Figure 6-10).

Figure 6-11
Asthma Emergency Department Visits by Region, New York State, 2005-2007



For 2005-2007, New York City residents accounted for 65% of all asthma ED visits in NYS (Figure 6-11).

Figure 6-12
Asthma Emergency Department Visits by Source of Payment, New York State, 2005-2007



Other third party or private insurance was the source of payment for 56% of all the 2005-2007 asthma-related ED visits in NYS. Medicaid was the payment source for 22% of asthma ED visits, and Medicare was the source for only 6% 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, 2005-2007

Region/County	ED Visits				Population 2006	Crude Average Rate	Adjusted Average Rate
	2005	2006	2007	Total			
REGION 1: WESTERN NEW YORK							
Allegany	171	140	180	491	50,267	32.6	35.0
Cattaraugus	360	377	449	1,186	81,534	48.5	51.8
Chautauqua	974	844	754	2,572	135,357	63.3	67.5
Erie	5,370	5,222	4,893	15,485	921,390	56.0	60.3
Genesee	320	259	210	789	58,830	44.7	47.8
Niagara	1,195	1,187	1,195	3,577	216,130	55.2	59.4
Orleans	175	190	159	524	43,213	40.4	42.4
Wyoming	175	160	144	479	42,613	37.5	39.3
Region Total	*8,740*	*8,379*	*7,984*	*25,103*	*1,549,334*	*54.0*	*57.9*
REGION 2: FINGER LAKES							
Chemung	784	740	671	2,195	88,641	82.5	85.6
Livingston	266	265	269	800	64,173	41.6	45.2
Monroe	4,143	4,191	4,075	12,409	730,807	56.6	59.7
Ontario	566	503	461	1,530	104,353	48.9	51.0
Schuyler	144	116	100	360	19,415	61.8	64.5
Seneca	118	136	99	353	34,724	33.9	35.5
Steuben	522	512	469	1,503	98,236	51.0	54.3
Wayne	430	390	369	1,189	92,889	42.7	44.9
Yates	126	124	102	352	24,732	47.4	49.2
Region Total	*7,099*	*6,977*	*6,615*	*20,691*	*1,257,970*	*54.8*	*57.8*
REGION 3: CENTRAL NEW YORK							
Cayuga	355	322	317	994	81,243	40.8	42.3
Cortland	37	52	164	253	48,483	17.4	18.0
Herkimer	215	186	209	610	63,332	32.1	34.5
Jefferson	565	528	455	1,548	114,264	45.2	44.5
Lewis	143	139	124	406	26,685	50.7	54.1
Madison	353	333	298	984	70,197	46.7	50.6
Oneida	1,182	1,200	1,131	3,513	233,954	50.1	52.2
Onondaga	2,169	2,124	1,971	6,264	456,777	45.7	48.0
Oswego	444	478	429	1,351	123,077	36.6	37.5
St Lawrence	827	754	686	2,267	111,284	67.9	72.0
Tompkins	281	275	249	805	100,407	26.7	30.2
Region Total	*6,571*	*6,391*	*6,033*	*18,995*	*1,429,703*	*44.3*	*46.2*

*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, 2005-2007

Region/County	ED Visits				Population 2006	Crude Average Rate	Adjusted Average Rate
	2005	2006	2007	Total			
REGION 4: NEW YORK-PENNSYLVANIA							
Broome	954	964	909	2,827	196,269	48.0	51.4
Chenango	223	241	257	721	51,787	46.4	49.6
Tioga	80	82	49	211	51,285	13.7	14.3
Region Total	*1,257*	*1,287*	*1,215*	*3,759*	*299,341*	*41.9*	*44.5*
REGION 5: NORTHEASTERN NEW YORK							
Albany	1,990	2,072	1,963	6,025	297,556	67.5	71.9
Clinton	868	858	898	2,624	82,166	106.5	104.1
Columbia	286	274	290	850	62,955	45.0	49.9
Delaware	159	156	135	450	46,977	31.9	35.2
Essex	152	214	235	601	38,649	51.8	53.3
Franklin	358	291	313	962	50,968	62.9	65.9
Fulton	116	106	391	613	55,435	36.9	40.3
Greene	206	230	212	648	49,822	43.4	46.1
Hamilton	3	5	6	14	5,162	9.0	10.4
Montgomery	331	335	376	1,042	49,112	70.7	76.8
Otsego	181	199	197	577	62,583	30.7	33.2
Rensselaer	862	941	929	2,732	155,292	58.6	62.0
Saratoga	669	624	594	1,887	215,473	29.2	30.4
Schenectady	1,094	1,034	952	3,080	150,440	68.2	72.9
Schoharie	150	137	64	351	32,196	36.3	39.3
Warren	271	334	329	934	66,087	47.1	49.5
Washington	232	215	207	654	63,368	34.4	35.9
Region Total	*7,928*	*8,025*	*8,091*	*24,044*	*1,484,241*	*54.0*	*57.0*
REGION 6: HUDSON VALLEY							
Dutchess	1,366	1,601	1,615	4,582	295,146	51.7	53.3
Orange	2,354	2,642	2,507	7,503	376,392	66.4	65.5
Putnam	323	270	258	851	100,603	28.2	29.0
Rockland	1,126	1,083	1,026	3,235	294,965	36.6	37.4
Sullivan	565	557	480	1,602	76,588	69.7	72.7
Ulster	940	983	865	2,788	182,742	50.9	53.8
Westchester	5,507	5,897	5,590	16,994	949,355	59.7	61.6
Region Total	*12,181*	*13,033*	*12,341*	*37,555*	*2,275,791*	*55.0*	*56.2*

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

Table 6-2 *continued*

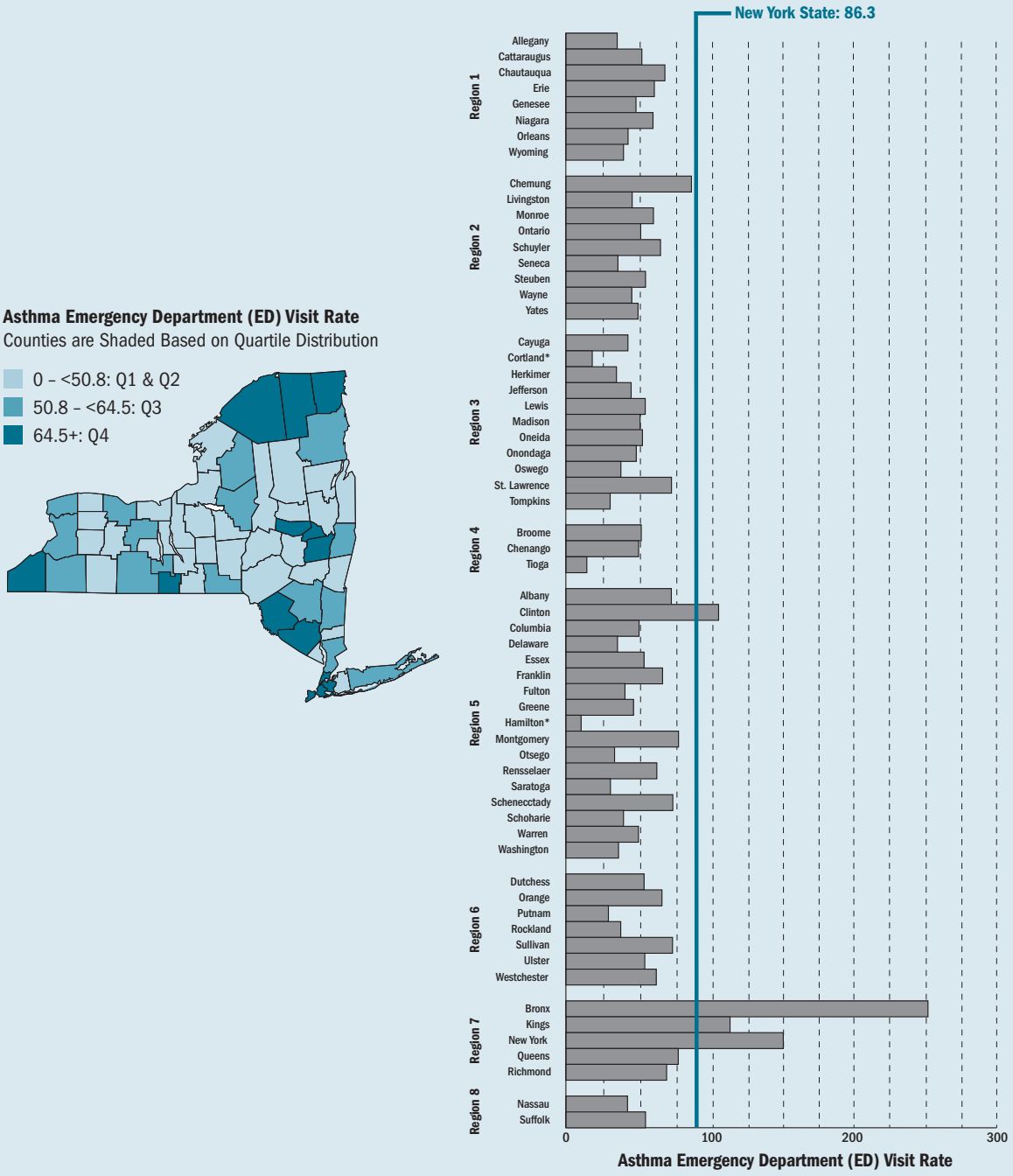
Crude and Age-Adjusted* Asthma Emergency Department Visit Rates per 10,000 Residents by Region and County, New York State, 2005-2007

Region/County	ED Visits				Population 2006	Crude Average Rate	Adjusted Average Rate
	2005	2006	2007	Total			
REGION 7: NEW YORK CITY							
Bronx	32,059	36,033	35,575	103,667	1,361,473	253.8	246.8
Kings	30,212	29,496	30,352	90,060	2,508,820	119.7	119.2
New York	21,343	20,630	20,983	62,956	1,611,581	130.2	148.2
Queens	15,935	17,636	15,971	49,542	2,255,175	73.2	76.6
Richmond	3,229	3,311	3,053	9,593	477,377	67.0	68.7
Region Total	*102,778*	*107,106*	*105,934*	*315,818*	*8,214,426*	*128.2*	*130.3*
REGION 8: NASSAU-SUFFOLK							
Nassau	5,110	5,089	5,446	15,645	1,325,662	39.3	42.0
Suffolk	7,908	7,829	7,541	23,278	1,469,715	52.8	54.3
Region Total	*13,018*	*12,918*	*12,987*	*38,923*	*2,795,377*	*46.4*	*48.6*
New York State Total	*159,572*	*164,116*	*161,200*	*484,888*	*19,306,183*	*83.7*	*86.3*

*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, 2005-2007



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 presents the age-adjusted NYS county-specific asthma ED visit rates for 2005-2007. Similar data for specific age groups (e.g., 0-4 years, 0-14 years, 0-17 years, 18-64 years, 65+ years) are available at the NYSDOH Asthma Surveillance website: www.health.state.ny.us/statistics/ny_asthma/index.htm

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 246.8 per 10,000 residents followed by New York County with an age-adjusted rate of 148.2 per 10,000 residents. For counties in the Rest of State, age-adjusted rates ranged from highs of 104.1 per 10,000 residents (Clinton) and 85.6 per 10,000 residents (Chemung) to 14.3 per 10,000 residents (Tioga) and 10.4 per 10,000 residents (Hamilton).

Figure 6-14
Albany County: Asthma Emergency Department Visit Rate per 10,000 Residents, 2005-2007

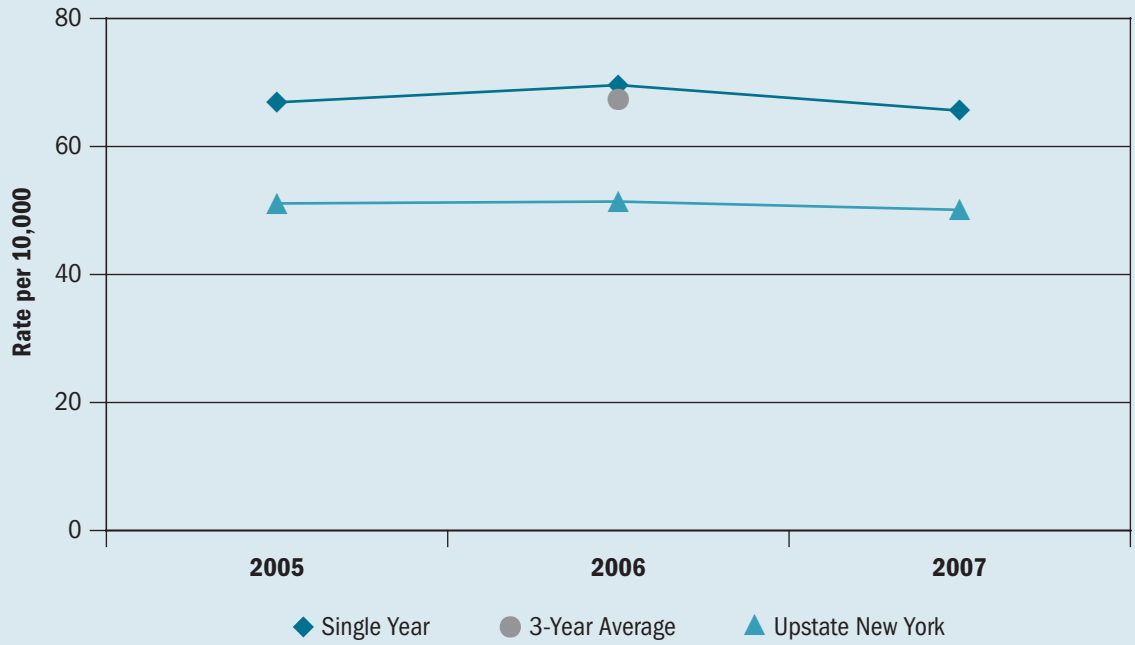


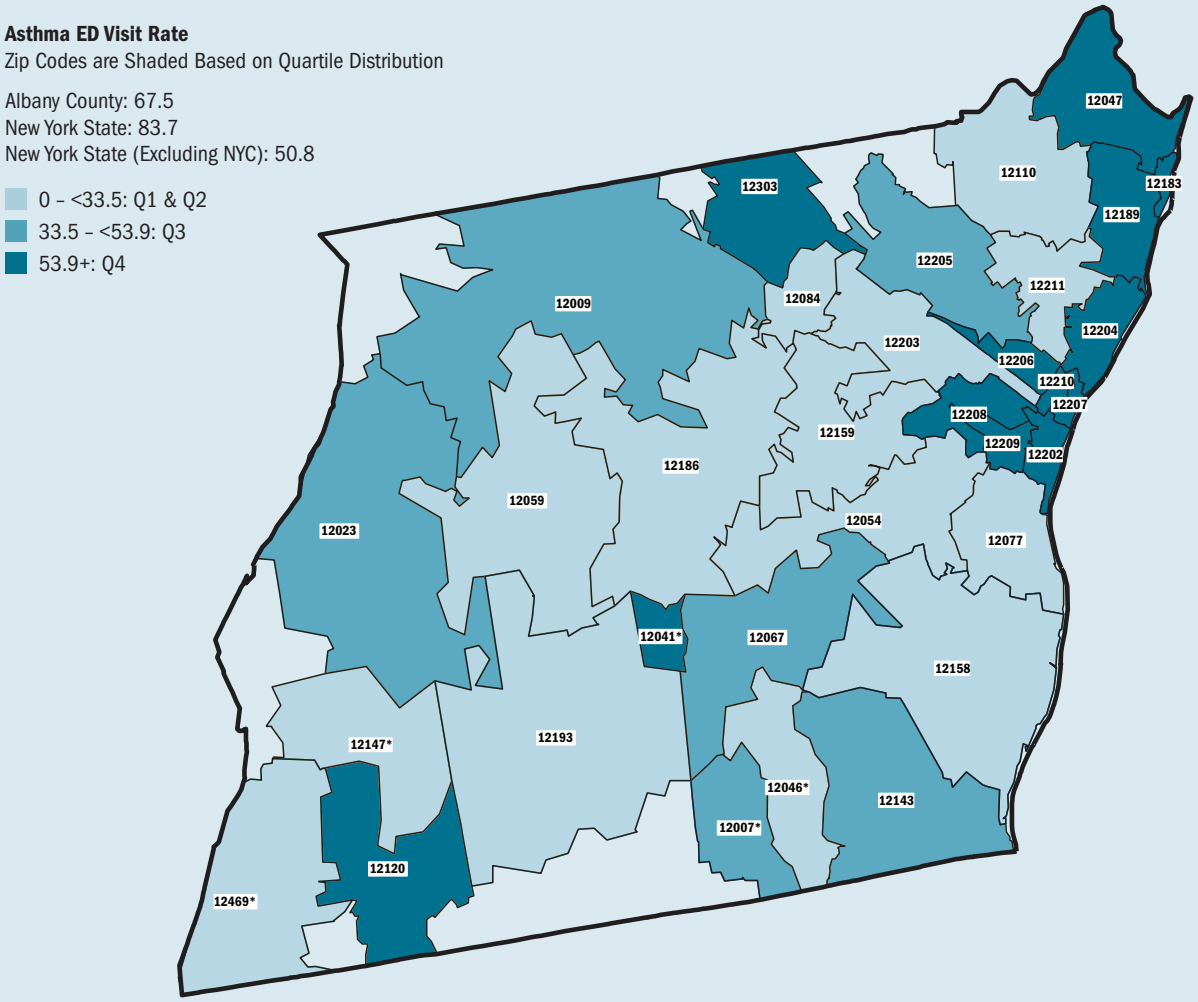
Table 6-3
Albany County: Asthma Emergency Department Visit Rate per 10,000 Residents, 2005-2007

Year	Single Year	3-Year Average	Upstate New York
2005	66.9		51.1
2006	69.6	67.4	51.4
2007	65.6		50.1

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: www.health.state.ny.us/statistics/ny_asthma/index.htm

Figure 6-15

Albany County: Total Asthma Emergency Department Visit Rate per 10,000 Residents by ZIP Code, 2005-2007



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

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 2005-2007

ZIP Code	ED Visits 2005–2007	Population 2006	ED Visit Rate
12007*	3	191	52.4
12009	81	7,725	35.0
12023	23	1,897	40.4
12041*	3	107	93.5
12046*	3	602	16.6
12047	338	18,006	62.6
12054	137	16,926	27.0
12059	16	1,960	27.2
12067	19	1,705	37.1
12077	52	7,269	23.8
12084	26	4,577	18.9
12110	145	21,643	22.3
12120	11	550	66.7
12143	79	6,119	43.0
12147*	4	571	23.4
12158	62	6,738	30.7
12159	50	8,396	19.9
12183	59	2,936	67.0
12186	52	6,858	25.3
12189	298	16,637	59.7
12193	16	2,202	24.2
12202	789	9,641	272.8
12203	307	34,573	29.6
12204	207	6,807	101.4
12205	359	26,282	45.5
12206	1,255	15,631	267.6
12207	188	1,984	315.9
12208	467	21,073	73.9
12209	293	10,204	95.7
12210	568	9,296	203.7
12211	77	13,619	18.8
12303	509	28,866	58.8
12469*	3	721	13.9

*Less than or equal to 10 emergency department visits, therefore rate may not be stable (Relative Standard Error >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, are available at the NYSDOH Asthma Surveillance website: www.health.state.ny.us/statistics/ny_asthma/index.htm

At-risk Based Rates for Asthma Emergency Department Visits

Methodology

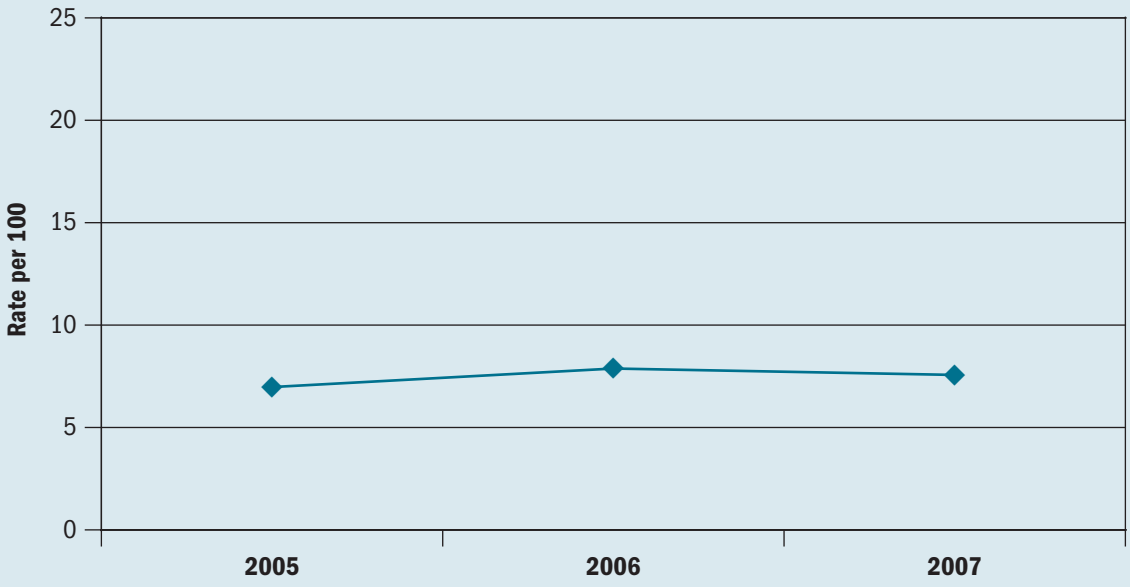
At-risk based rates (ARR) for asthma emergency department (ED) visits represent the number of asthma-related ED visits for individuals with current asthma rather than for the general population. Rates for a specific period of time were calculated by dividing the number of asthma ED visits by the estimated number of people with current asthma for that time period and then multiplying by 100.[18-21]

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 57 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 30 for a full description of how current asthma was defined and how current asthma prevalence was calculated). The estimated number of people with current asthma was generated based on the weighted current asthma prevalence. The estimates were the denominator for the ARR.

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 2007. 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 for years 2006-2008, while SPARCS ED data are available for years 2005-2007. Therefore the ARR for asthma ED visits for children was calculated by dividing the average annual number of asthma ED visits for 2006-2007 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 "significantly different" from each other when they do not have overlapping CIs. All comparisons of ARR for different subgroups are statistically significant.

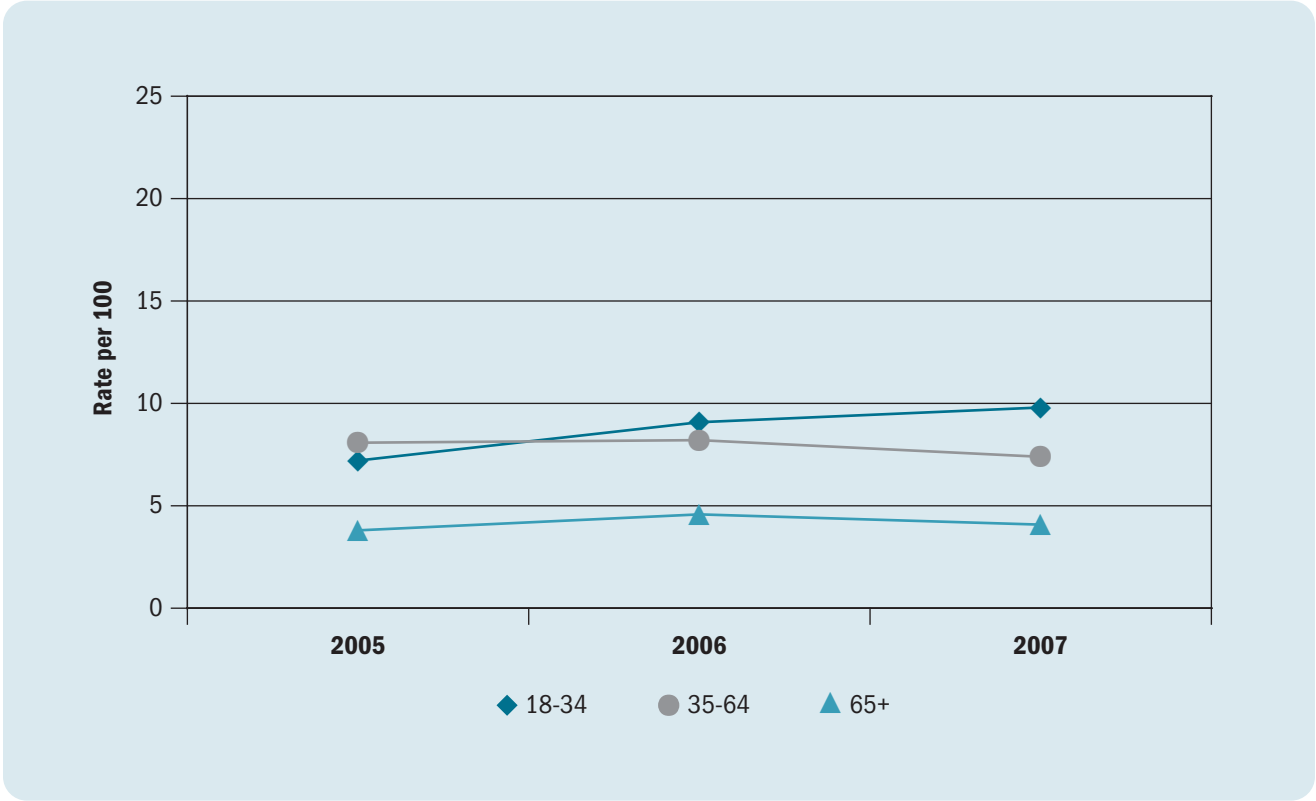
Figure 6-16
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma, New York State, 2005-2007



	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
New York State	7.0 (6.99–7.08)	7.9 (7.82–7.92)	7.6 (7.53–7.63)

The annual ARR for asthma ED visits in NYS increased from 7.0 asthma ED visits per 100 adults with current asthma in 2005 to 7.9 per 100 in 2006. The ARR then decreased to 7.6 per 100 in 2007 (Figure 6–14).

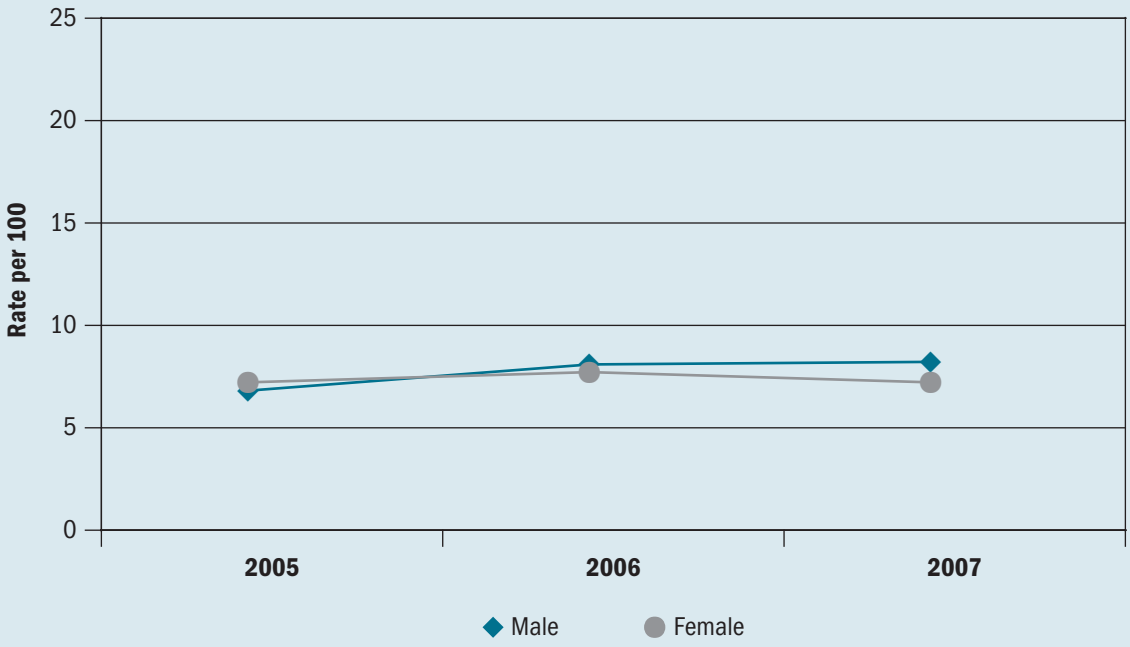
Figure 6-17
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Age Group and Year, New York State, 2005-2007



Age Group	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
18–34	7.2 (7.09–7.25)	9.1 (9.03–9.23)	9.8 (9.74–9.96)
35–64	8.1 (8.02–8.16)	8.2 (8.13–8.27)	7.4 (7.38–7.51)
65+	3.8 (3.76–3.93)	4.6 (4.49–4.69)	4.1 (4.03–4.21)

In 2005, the 35-64 year age group had the highest ARR for asthma ED visits compared to other adult age groups in NYS. However, for 2006 to 2007, the 18-34 year age group had the highest rate per 100 adults with current asthma (Figure 6-15).

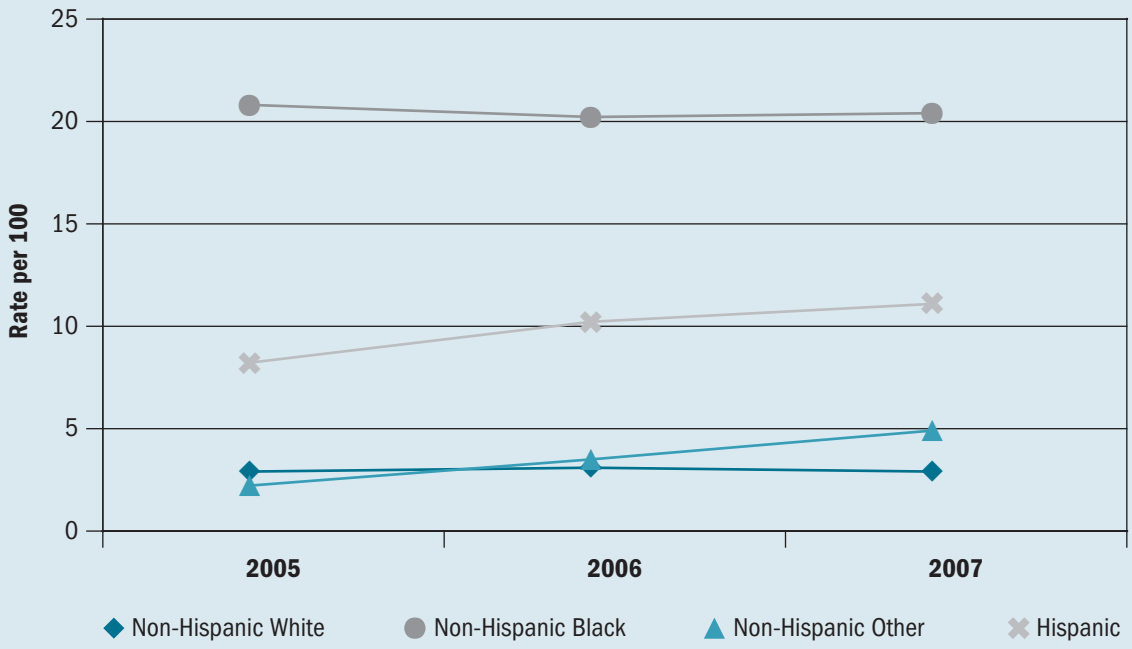
Figure 6-18
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Gender and Year, New York State, 2005-2007



Gender	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
Male	6.8 (6.74–6.88)	8.1 (8.00–8.17)	8.2 (8.11–8.29)
Female	7.2 (7.11–7.23)	7.7 (7.68–7.81)	7.2 (7.18–7.30)

Women had a higher ARR than men in 2005, but the reverse was true in 2006 and 2007 (Figure 6-16).

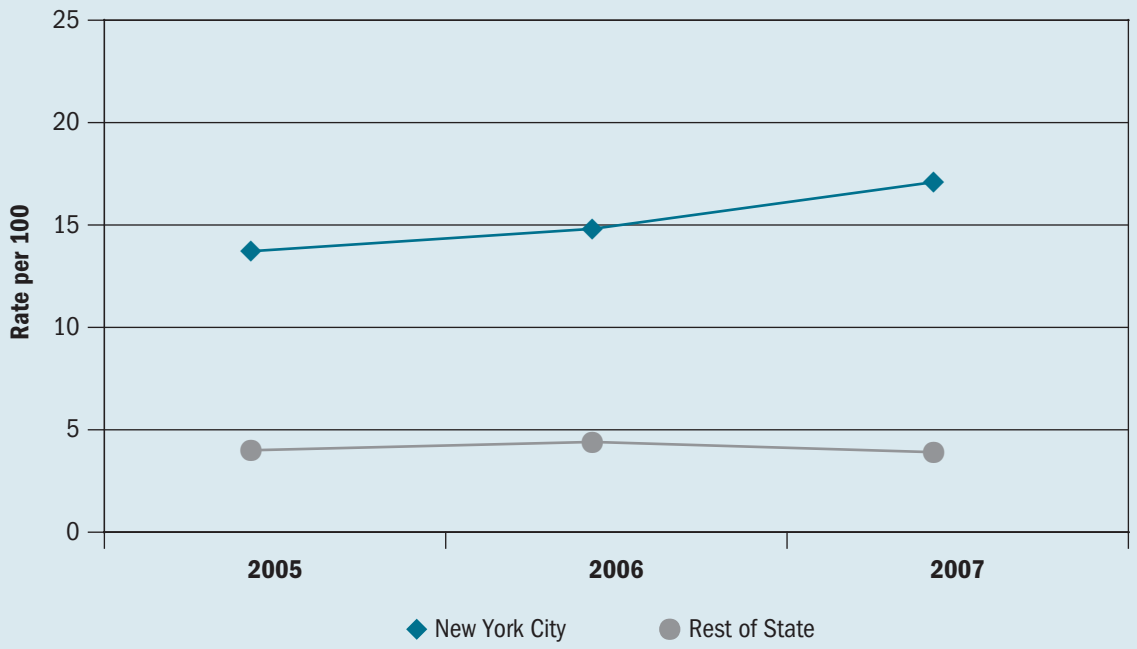
Figure 6-19
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Race and Ethnicity and Year, New York State, 2005-2007



Race and Ethnicity	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
Non-Hispanic White	2.9 (2.89–2.97)	3.1 (3.07–3.15)	2.9 (2.89–2.96)
Non-Hispanic Black	20.8 (20.55–21.05)	20.2 (19.94–20.42)	20.4 (20.14–20.61)
Non-Hispanic Other	2.2 (2.13–2.28)	3.5 (3.36–3.60)	4.9 (4.79–5.10)
Hispanic	8.2 (8.05–8.31)	10.2 (10.04–10.34)	11.1 (10.90–11.21)

For 2005-2007, 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. The ARR for asthma ED visits increased for Hispanics and remained relatively stable for non-Hispanic Whites from 2005 to 2007 (Figure 6-17).

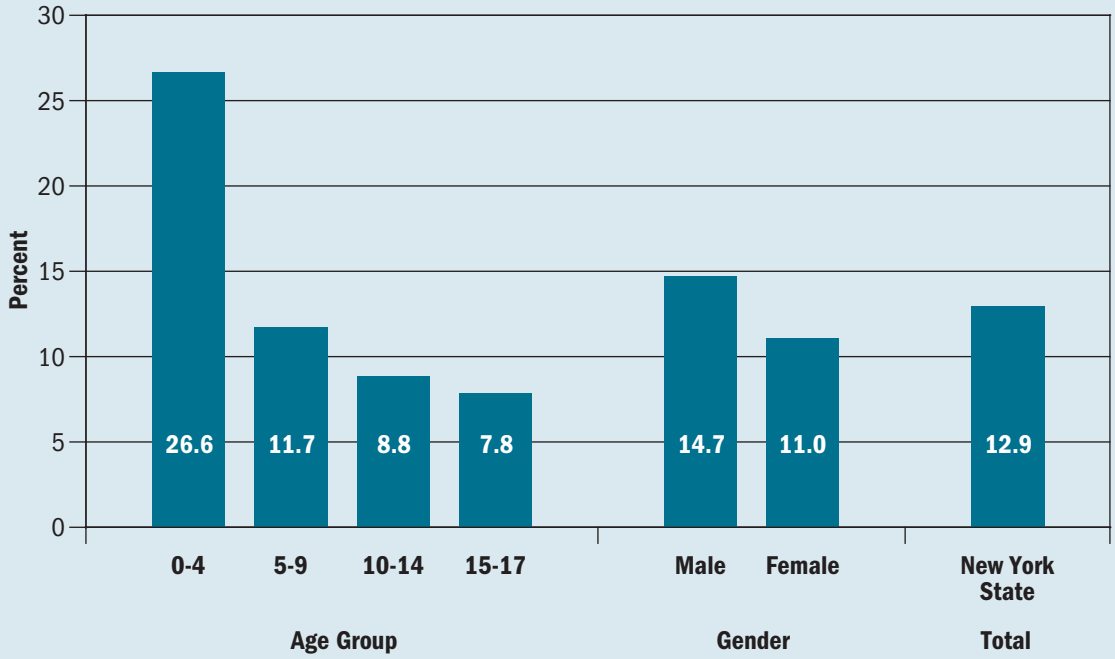
Figure 6-20
Asthma Emergency Department Visit Rate per 100 Adults (18+ Years) with Current Asthma by Region and Year, New York State, 2005-2007



Region	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
New York City	13.7 (13.56–13.79)	14.8 (14.67–14.92)	17.1 (16.95–17.25)
Rest of State	3.96 (3.92–4.00)	4.4 (4.37–4.46)	3.9 (3.83–3.91)

From 2005 to 2007, the ARR for asthma ED visits among adults with current asthma was consistently higher in New York City residents compared to those in the Rest of State. For this time period, the ARR increased for New York City residents but decreased slightly for those in the Rest of State (Table 6-18).

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, 2006-2007



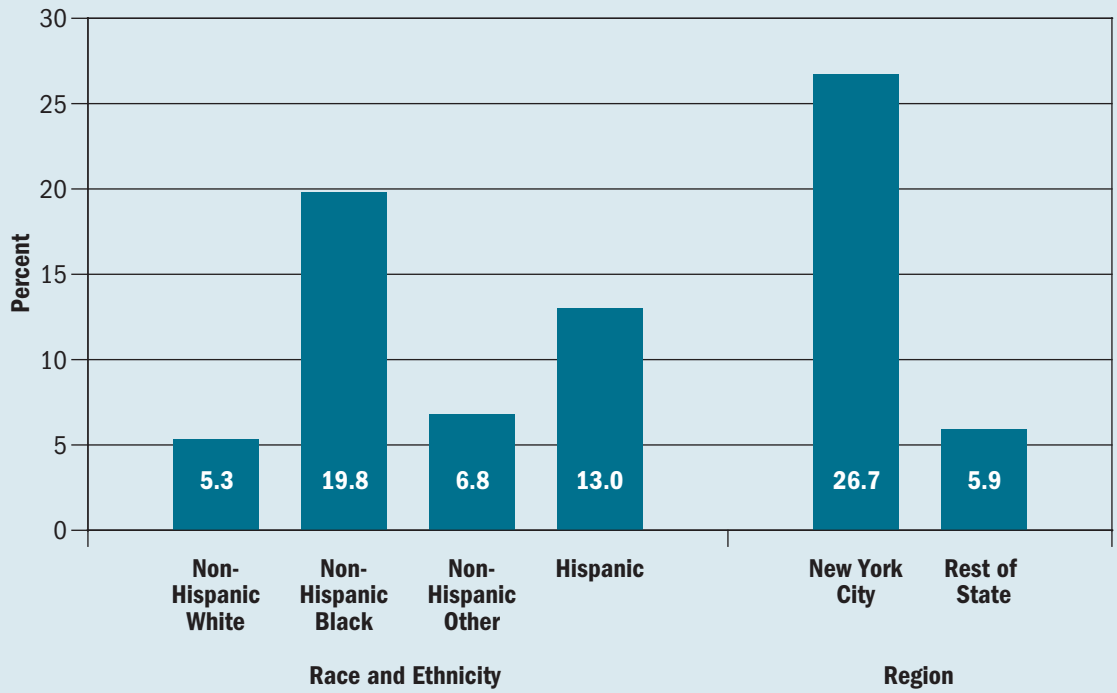
		Rate per 100 with Current Asthma	95% CI
Age Group	0-4	26.6	26.27–26.99
	5-9	11.7	11.48–11.84
	10-14	8.8	8.68–9.00
	15-17	7.8	7.59–7.99
Gender	Male	14.7	14.53–14.85
	Female	11.0	10.82–11.10
Total	*New York State*	*12.9*	*12.82–13.04*

For the 2006-2007 time period, there were approximately 13 asthma ED visits each year per 100 children with current asthma in NYS. This is nearly double the ARR seen for adults (see Figure 6-14).

For NYS children with current asthma, the 0-4 year age group had the highest 2006-2007 ARR for asthma ED visits (26.6 per 100) compared to all other child age groups.

The ARR for asthma ED visits was higher for boys (14.7 per 100) compared to girls (11.0 per 100) (Figure 6-19).

Figure 6-22
Asthma Emergency Department Visit Rate per 100 Children (0-17 Years) with Current Asthma by Race and Ethnicity and Region, New York State, 2006-2007



		Rate per 100 with Current Asthma	95% CI
Race and Ethnicity	Non-Hispanic White	5.3	5.23–5.45
	Non-Hispanic Black	19.8	19.52–20.08
	Non-Hispanic Other	6.8	6.53–6.97
	Hispanic	13.0	12.81–13.25
Region	New York City	26.7	26.46–27.02
	Rest of State	5.9	5.78–5.96

For children with current asthma, the 2006-2007 ARR for asthma ED visits for non-Hispanic Blacks (19.8 per 100) was more than three times higher compared to non-Hispanic White children (5.3 per 100). Hispanic children also had a higher ARR for asthma ED visits (13.0 per 100) compared to non-Hispanic White children.

The 2006-2007 ARR for asthma ED visits was 4.5 times higher for children with asthma living in New York City (26.7 per 100) compared to those living in the Rest of State (5.9 per 100) (Figure 6-20).

7

Asthma Hospital Discharges

Highlights: Asthma Hospital Discharges

- The number of hospital discharges due to asthma in New York State decreased approximately 11% in the past ten years from 42,557 in 1998 to 37,950 in 2007.
- Asthma hospital discharge rates showed a 13% decline from 22.7 per 10,000 residents in 1998 to 19.7 per 10,000 in 2007.
- Overall, asthma hospital discharges showed a seasonal pattern with peaks in the spring and fall, and a decline in the summer.
- For 2005-2007, 32% of asthma hospital discharges were for children aged 0-14 years; and 19% were for adults 65 years of age and older. In addition, 60% of asthma hospital discharges were for females, and 66% were for New York City residents.
- For 1998-2007, 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 2005-2007, the crude and age-adjusted asthma hospital discharge rates for female New Yorkers (23.8 per 10,000; 23.1 per 10,000) were higher compared to males (17.2 per 10,000; 17.6 per 10,000).
- Males had a higher percentage of asthma hospital discharges compared to females in the 0-4 year (64% versus 36%) and 5-14 year (60% versus 40%) age groups. However, males had lower percentages for all remaining age groups.
- For the period 2005-2007, crude and age-adjusted asthma hospital discharge rates for non-Hispanic Black (41.7 per 10,000; 42.3 per 10,000) and Hispanic (37.4 per 10,000; 41.4 per 10,000) New York State residents were almost five times higher than non-Hispanic White residents (9.3 per 10,000; 8.9 per 10,000).
- New York City residents had crude and age-adjusted asthma hospital discharge rates (31.5 per 10,000; 31.7 per 0,000) in 2005-2007 that were more than 2.5 times higher than residents in the Rest of State (12.1 per 10,000; 12.1 per 10,000).
- Asthma hospital discharge rates for 2005-2007 varied across New York State, with the highest in the Bronx (63.9 per 10,000) and the lowest in Tioga County (2.9 per 10,000).
- Medicaid was the source of payment for 43% of the 2005-2007 asthma hospital discharges in New York. Other third party or private insurance payers were the payment source for 26% of asthma hospital discharges, while Medicare was the payment source for 23% of the asthma hospital discharges.

Asthma Hospital Discharge Rates for Adults with Current Asthma (At-Risk Based Rates), 2001-2007

- From 2001-2007, the annual at-risk based rate for asthma hospital discharges in New York State decreased from 2.3 asthma hospital discharges per 100 adults with current asthma in 2001 to 2.0 per 100 in 2007.
- Asthma hospital discharges among those with current asthma increased with age. The 65 year and older age group (3.9 per 100 in 2007) consistently had the highest at-risk based rate for asthma hospital discharges compared to other adult age groups in New York State.
- For 2001-2007, among adults with current asthma in New York State, women consistently had higher at-risk based rates for asthma hospital discharges compared to men (2.1 and 1.7 per 100 in 2007, respectively). Over this period, the rate decreased for both women and men.

- For 2001-2007, among adults with current asthma, non-Hispanic and Hispanics (4.3 and 3.0 per 100 in 2007, respectively) consistently had higher at-risk based rates for asthma hospital discharges compared to non-Hispanic Whites (0.9 per 100 in 2007) in New York State.
- For 2001-2007, 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 (4.6 and 1.0 per 100 in 2007, respectively).

Asthma Hospital Discharge Rates for Children with Current Asthma (At-Risk Based Rates), 2006-2007

- For the 2006-2007 time period, there were 2.6 asthma hospital discharges each year per 100 children with current asthma in New York State.
- Among New York State children with current asthma, the 0-4 year age group had the highest 2006-2007 at-risk based rate for asthma hospital discharges (7.1 per 100) compared to all other age groups.
- The at-risk based rate for asthma hospital discharges for 2006-2007 was higher for boys (3.0 per 100) compared to girls with current asthma (2.2 per 100).
- Among children with current asthma, the 2006-2007 at-risk based rate for asthma hospital discharges was highest for non-Hispanic Blacks (4.0 per 100) compared to Hispanics (2.6 per 100) and non-Hispanic Whites (1.3 per 100).
- The at-risk based rate for asthma hospital discharges for 2006-2007 was more than four times higher for children with current asthma living in New York City (5.4 per 100) compared to those living in the Rest of State (1.2 per 100).

Asthma Hospital Discharges

Methodology

Asthma hospital discharge information for New York State (NYS) was generated 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. Population estimates used for computing the asthma hospital discharge rates were obtained from the United States (U.S.) 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 (1998-2007) 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 (2005-2007) 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 2005-2007 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 (2006) and multiplied by 10,000.

Asthma hospital discharge data for 2005-2007 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.

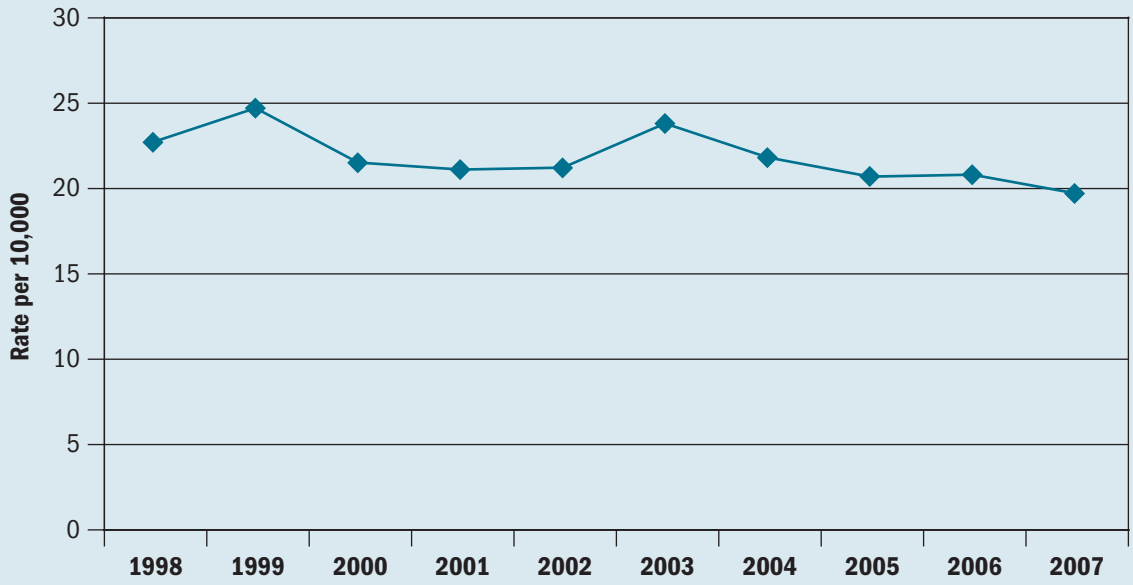
Trends in Asthma Hospital Discharges

Figure 7-1
Annual Asthma Hospital Discharges, New York State, 1998-2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Asthma Hospital Discharges	42,557	46,639	40,784	40,270	40,585	45,670	41,991	39,927	40,205	37,950

From 1998 to 2007, the number of annual asthma hospital discharges among NYS residents decreased approximately 11% from 42,557 to 37,950, with peaks in 1999 and 2003 (Figure 7-1).

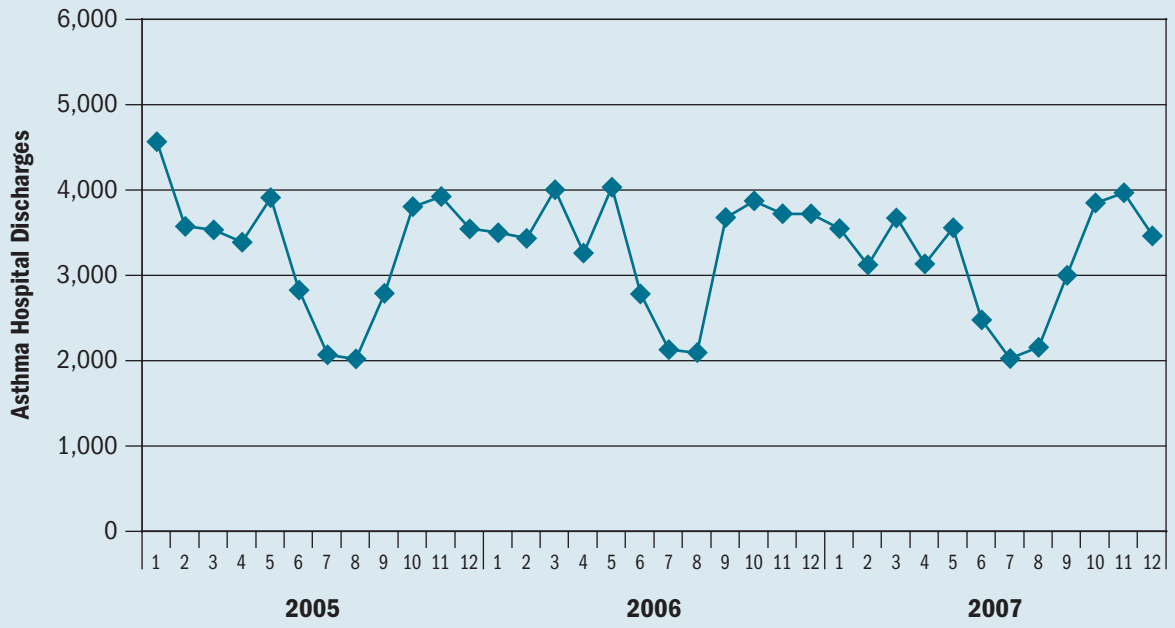
Figure 7-2
Annual Asthma Hospital Discharge Rate per 10,000 Residents, New York State, 1998-2007



Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Rate per 10,000	22.7	24.7	21.5	21.1	21.2	23.8	21.8	20.7	20.8	19.7

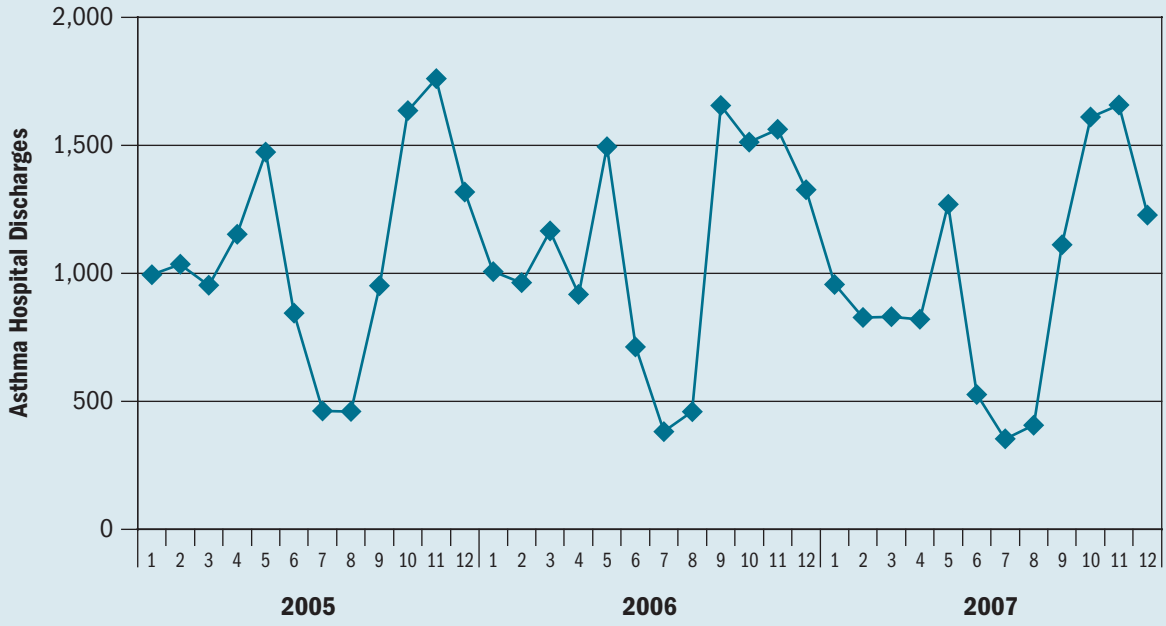
The annual asthma hospital discharge rate in NYS decreased 13% from 22.7 asthma hospital discharges per 10,000 residents in 1998 to 19.7 asthma hospital discharges per 10,000 residents in 2007 (Figure 7-2).

Figure 7-3
Asthma Hospital Discharges by Month, New York State, 2005-2007



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, 2005-2007



For 2005-2007, 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 and Ethnicity and Region, New York State, 2005-2007

		Crude	Age-Adjusted*
Gender	Male	17.2	17.6
	Female	23.8	23.8
Race and Ethnicity	Non-Hispanic White	9.3	8.9
	Non-Hispanic Black	41.7	42.3
	Non-Hispanic Other	19.4	21.7
	Hispanic	37.4	41.4
Region	New York City	31.5	31.7
	Rest of State	12.1	12.1
Total	*New York State*	*20.6*	*20.7*

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

For 2005-2007, the crude and age-adjusted asthma hospital discharge rates for NYS were similar at 20.6 per 10,000 residents and 20.7 per 10,000, respectively.

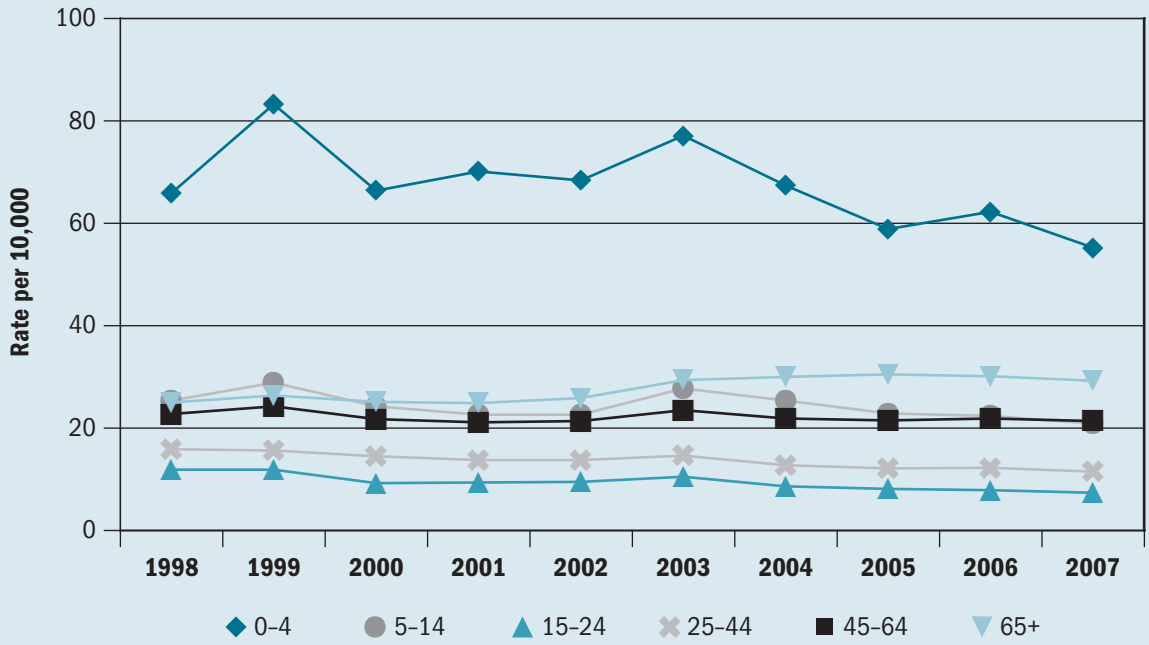
Female New Yorkers had higher crude and age-adjusted asthma hospital discharge rates (23.8 per 10,000; 23.1 per 10,000) compared to males (17.2 per 10,000; 17.6 per 10,000).

Non-Hispanic Black New Yorkers had crude and age-adjusted hospital discharge rates (41.7 per 10,000; 42.3 per 10,000) that were almost five times higher than non-Hispanic White New Yorkers (9.3 per 10,000; 8.9 per 10,000).

Hispanic New Yorkers had crude and age-adjusted hospital discharge rates (37.4 per 10,000; 41.4 per 10,000) that were 4.5 times higher than non-Hispanic White residents (9.3 per 10,000; 8.9 per 10,000).

New York City residents had crude and age-adjusted asthma hospital discharge rates (31.5 per 10,000; 31.7 per 10,000) in 2005-2007 that were more than 2.5 times higher than residents in the Rest of State (12.1 per 10,000; 12.1 per 10,000) (Table 7-1).

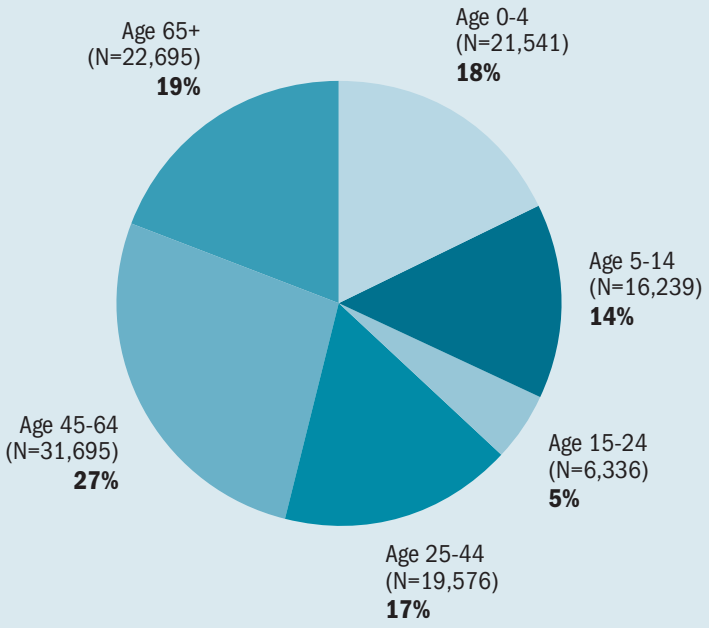
Figure 7-5
Asthma Hospital Discharge Rate per 10,000 Residents by Age Group and Year, New York State, 1998-2007



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
0–4	65.9	83.2	66.4	70.1	68.4	77.1	67.4	58.8	62.2	55.2
5–14	25.4	28.8	24.2	22.6	22.6	27.7	25.3	22.8	22.4	20.8
15–24	11.8	11.8	9.2	9.3	9.5	10.5	8.6	8.1	7.8	7.4
25–44	15.9	15.6	14.5	13.7	13.7	14.6	12.7	12.1	12.2	11.5
45–64	22.7	24.2	21.7	21.1	21.3	23.5	21.8	21.5	21.8	21.4
65+	25.0	26.3	25.1	24.9	25.8	29.4	30.0	30.5	30.1	29.2

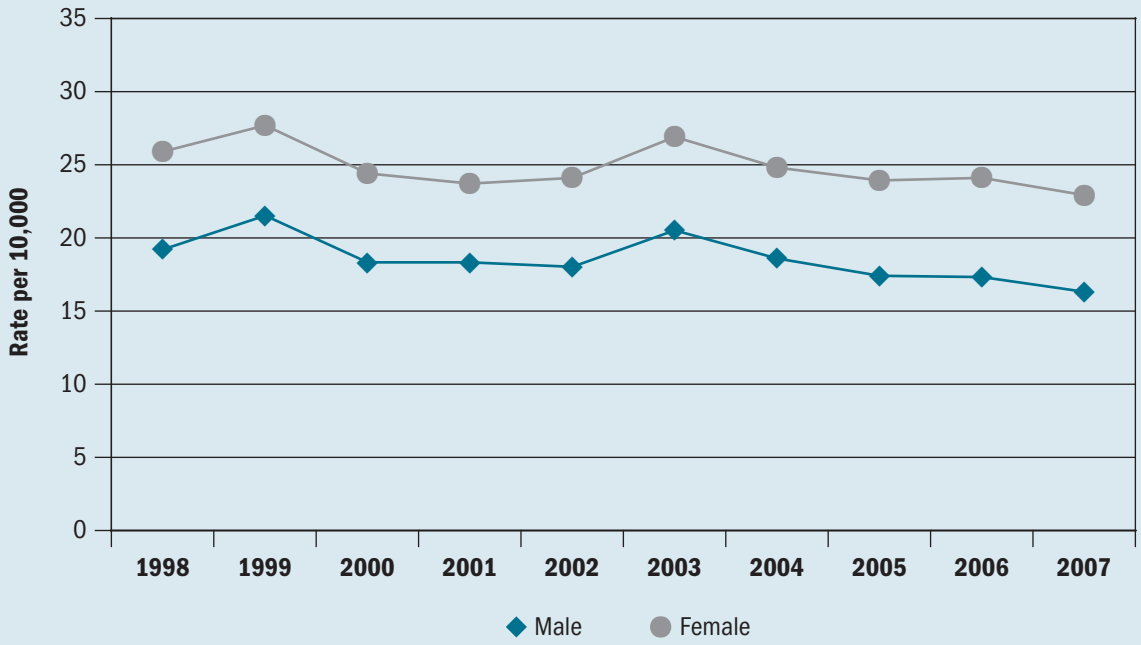
For 1998-2007, the 0-4 year age group had the highest asthma hospital discharge rate compared to all other age groups in NYS. Each age group showed a downward trend over time with the exception of the age 65 and older age group (Figure 7-5).

Figure 7-6
Asthma Hospital Discharges by Age Group, New York State, 2005-2007



For 2005-2007, 32% of the asthma hospital discharges were for children aged 0-14 years, and 19% of the asthma hospital discharges were for the 65 and older age group (Figure 7–6).

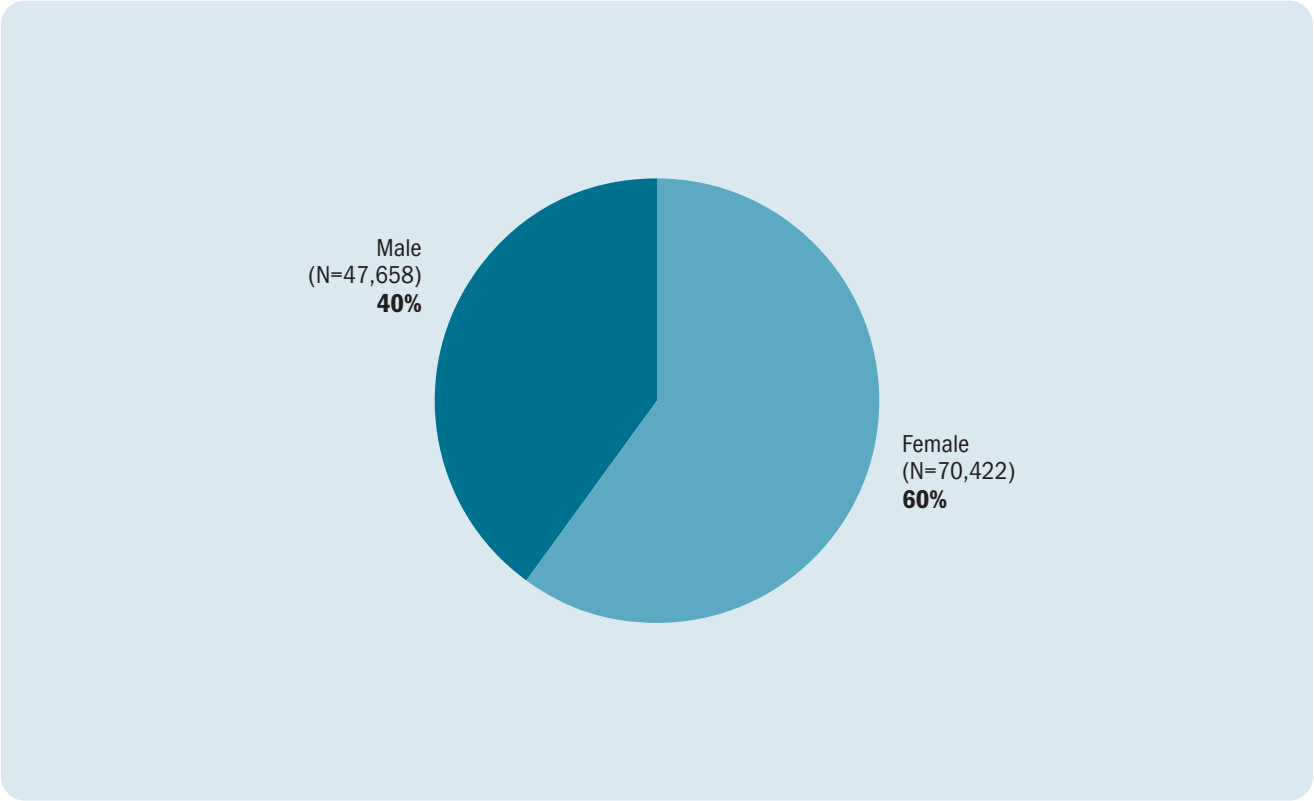
Figure 7-7
Asthma Hospital Discharge Rate per 10,000 Residents by Gender and Year, New York State, 1998-2007



Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Male	19.2	21.5	18.3	18.3	18.0	20.5	18.6	17.4	17.3	16.3
Female	25.9	27.7	24.4	23.7	24.1	26.9	24.8	23.9	24.1	22.9

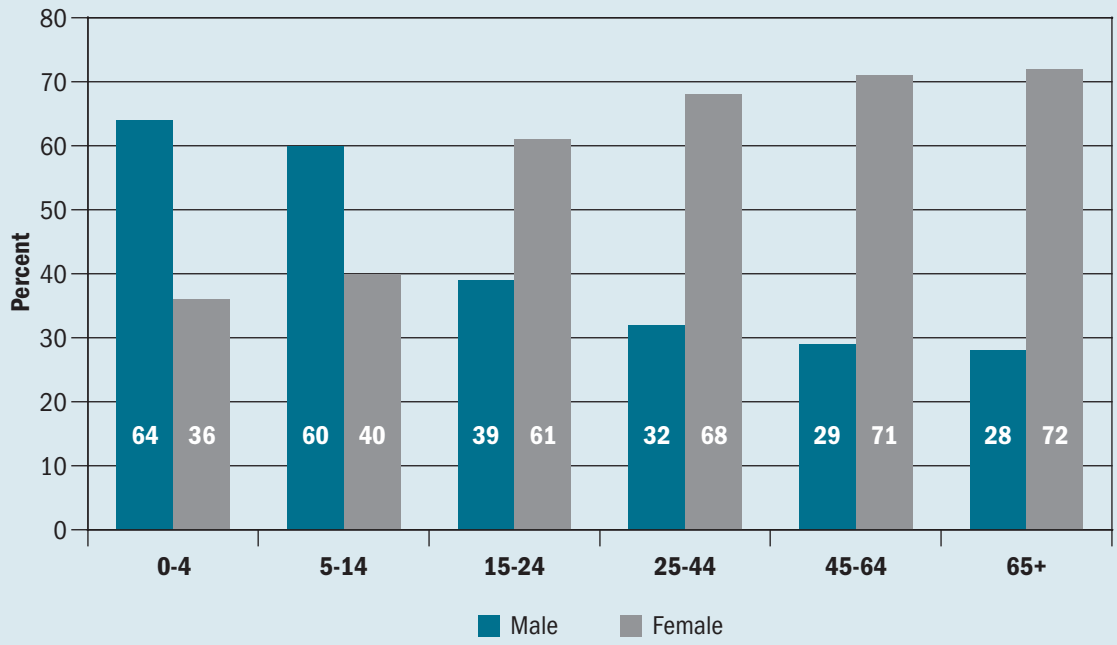
There was a decline of asthma hospital discharge rates from 1998-2007 for both males (15%) and females (12%) (Figure 7-7).

Figure 7-8
Asthma Hospital Discharges by Gender, New York State, 2005-2007



For 2005-2007, 60% of asthma hospital discharges were for female New Yorkers (Figure 7-8).

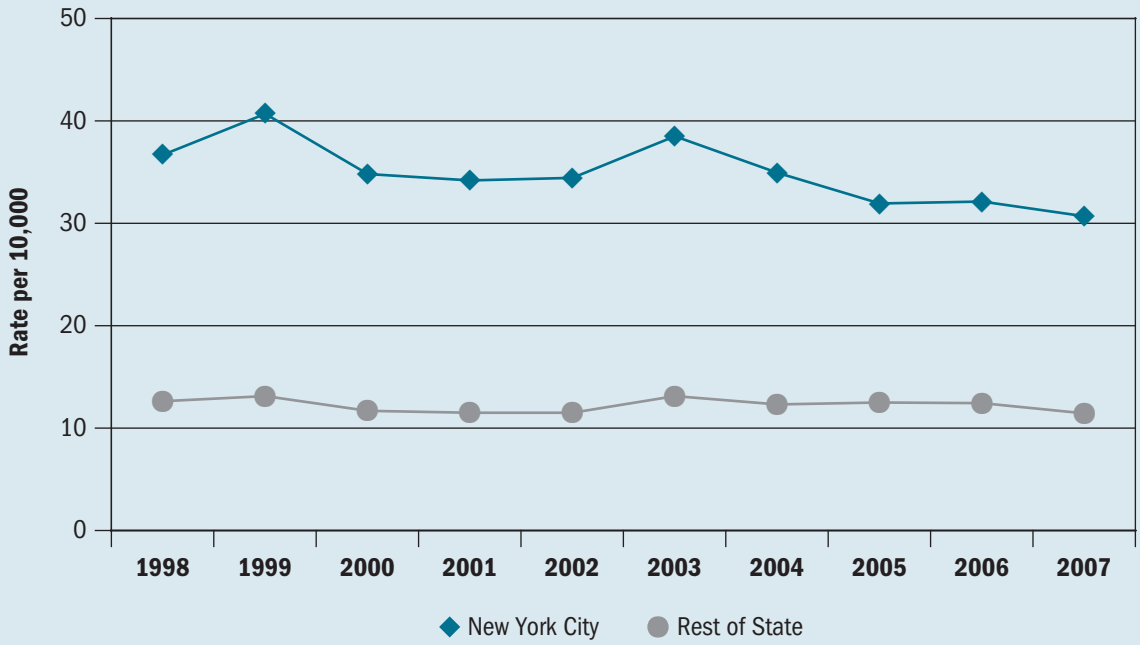
Figure 7-9
Percent of Asthma Hospital Discharges by Age Group and Gender, New York State, 2005-2007



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 – 60%, females – 40%).

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 – 32%, females – 68%; 45-64 years: males – 29%, females – 71%; 65+ years: males – 28%, females – 72%) (Figure 7–9).

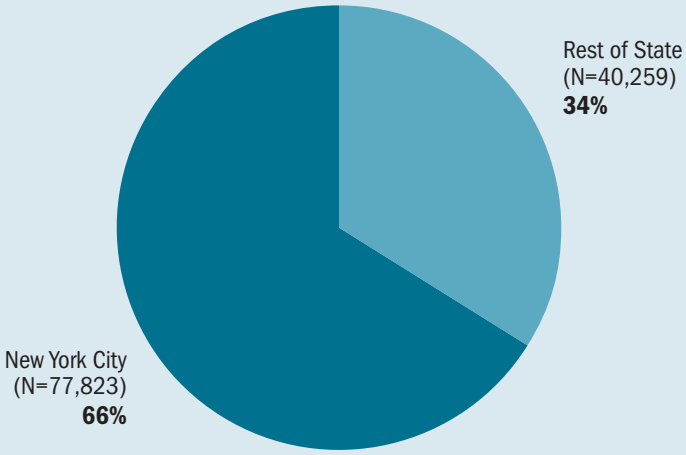
Figure 7-10
Asthma Hospital Discharge Rate per 10,000 Residents by Region and Year, New York State, 1998-2007



Region	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
New York City	36.7	40.7	34.8	34.2	34.4	38.5	34.9	31.9	32.1	30.7
Rest of State	12.6	13.1	11.7	11.5	11.5	13.1	12.3	12.5	12.4	11.4

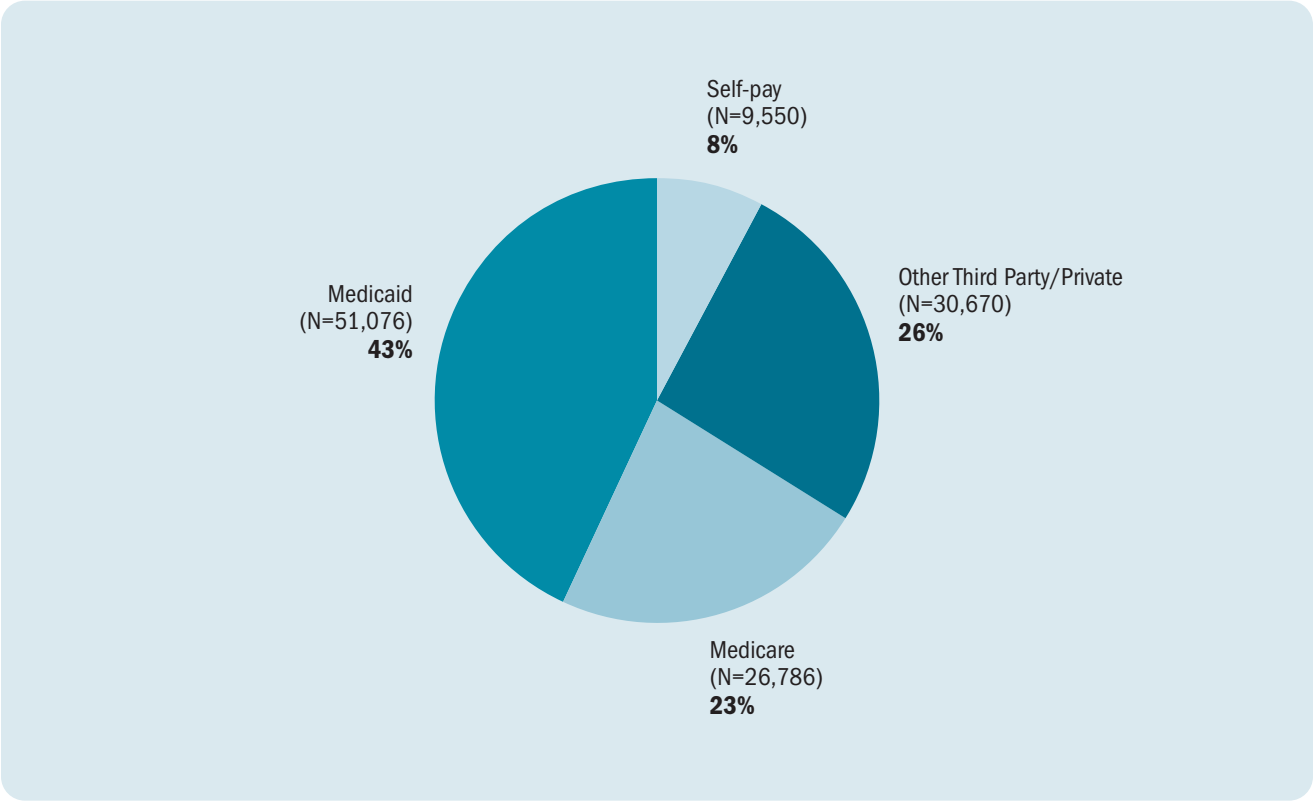
There was a 16% decline in asthma hospital discharge rates for residents in New York City and a 10% decline among Rest of State residents for 1998-2007. New York City residents had consistently higher asthma hospital discharges when compared to residents in the Rest of State (Figure 7-10).

Figure 7-11
Asthma Hospital Discharges by Region, New York State, 2005-2007



For 2005-2007, New York City residents accounted for 66% of all asthma hospital discharges in NYS (Figure 7–11).

Figure 7-12
Asthma Hospital Discharges by Source of Payment, New York State, 2005-2007



Medicaid was the source of payment for 43% of the 2005-2007 asthma hospital discharges in NYS. Other third party or private insurance payers were the payment source for 26% of asthma hospital discharges, and Medicare was the payment source for 23% 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, 2005-2007

Region/County	Discharges				Population 2006	Crude Average Rate	Adjusted Average Rate
	2005	2006	2007	Total			
REGION 1: WESTERN NEW YORK							
Allegany	65	44	53	162	50,267	10.7	12.0
Cattaraugus	97	87	63	247	81,534	10.1	10.6
Chautauqua	176	152	137	465	135,357	11.5	11.3
Erie	1,297	1,246	1,083	3,626	921,390	13.1	13.5
Genesee	90	77	61	228	58,830	12.9	12.5
Niagara	281	295	249	825	216,130	12.7	12.7
Orleans	38	40	39	117	43,213	9.0	8.7
Wyoming	61	54	38	153	42,613	12.0	11.9
Region Total	*2,105*	*1,995*	*1,723*	*5,823*	*1,549,334*	*12.5*	*12.8*
REGION 2: FINGER LAKES							
Chemung	135	121	117	373	88,641	14.0	14.4
Livingston	49	50	51	150	64,173	7.8	8.4
Monroe	839	819	780	2,438	730,807	11.1	11.1
Ontario	88	61	78	227	104,353	7.3	7.2
Schuyler	16	25	13	54	19,415	9.3	8.9
Seneca	23	22	19	64	34,724	6.1	5.9
Steuben	130	135	86	351	98,236	11.9	12.1
Wayne	72	76	56	204	92,889	7.3	7.3
Yates	19	22	23	64	24,732	8.6	8.3
Region Total	*1,371*	*1,331*	*1,223*	*3,925*	*1,257,970*	*10.4*	*10.4*
REGION 3: CENTRAL NEW YORK							
Cayuga	100	72	61	233	81,243	9.6	9.3
Cortland	40	37	33	110	48,483	7.6	8.3
Herkimer	62	69	50	181	63,332	9.5	9.1
Jefferson	98	86	70	254	114,264	7.4	7.7
Lewis	18	21	16	55	26,685	6.9	6.6
Madison	66	70	57	193	70,197	9.2	9.5
Oneida	390	393	330	1,113	233,954	15.9	15.1
Onondaga	405	423	334	1,162	456,777	8.5	8.5
Oswego	109	101	88	298	123,077	8.1	8.5
St Lawrence	194	185	135	514	111,284	15.4	16.1
Tompkins	45	43	51	139	100,407	4.6	6.0
Region Total	*1,527*	*1,500*	*1,225*	*4,252*	*1,429,703*	*9.9*	*10.1*

*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, 2005-2007

Region/County	Discharges				Population 2006	Crude Average Rate	Adjusted Average Rate
	2005	2006	2007	Total			
REGION 4: NEW YORK-PENNSYLVANIA							
Broome	150	184	179	513	196,269	8.7	8.6
Chenango	34	43	42	119	51,787	7.7	7.8
Tioga	13	14	19	46	51,285	3.0	2.9
Region Total	*197*	*241*	*240*	*678*	*299,341*	*7.5*	*7.5*
REGION 5: NORTHEASTERN NEW YORK							
Albany	402	384	363	1,149	297,556	12.9	13.5
Clinton	173	102	121	396	82,166	16.1	16.6
Columbia	48	37	39	124	62,955	6.6	6.7
Delaware	57	55	51	163	46,977	11.6	12.2
Essex	24	29	25	78	38,649	6.7	6.1
Franklin	46	41	46	133	50,968	8.7	8.9
Fulton	107	116	78	301	55,435	18.1	19.4
Greene	51	47	37	135	49,822	9.0	9.2
Hamilton	5	4	4	13	5,162	8.4	8.0
Montgomery	61	64	57	182	49,112	12.4	12.4
Otsego	72	73	69	214	62,583	11.4	12.6
Rensselaer	253	250	209	712	155,292	15.3	16.0
Saratoga	161	174	159	494	215,473	7.6	7.9
Schenectady	249	210	178	637	150,440	14.1	14.4
Schoharie	22	22	26	70	32,196	7.2	7.7
Warren	78	94	75	247	66,087	12.5	12.3
Washington	44	60	59	163	63,368	8.6	8.8
Region Total	*1,853*	*1,762*	*1,596*	*5,211*	*1,484,241*	*11.7*	*12.1*
REGION 6: HUDSON VALLEY							
Dutchess	327	321	364	1,012	295,146	11.4	12.1
Orange	567	576	499	1,642	376,392	14.5	14.8
Putnam	88	74	83	245	100,603	8.1	8.4
Rockland	275	350	275	900	294,965	10.2	10.1
Sullivan	179	113	107	399	76,588	17.4	18.2
Ulster	202	202	195	599	182,742	10.9	11.3
Westchester	1,227	1,401	1,328	3,956	949,355	13.9	13.4
Region Total	*2,865*	*3,037*	*2,851*	*8,753*	*2,275,791*	*12.8*	*12.7*

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

Table 7-2 *continued*

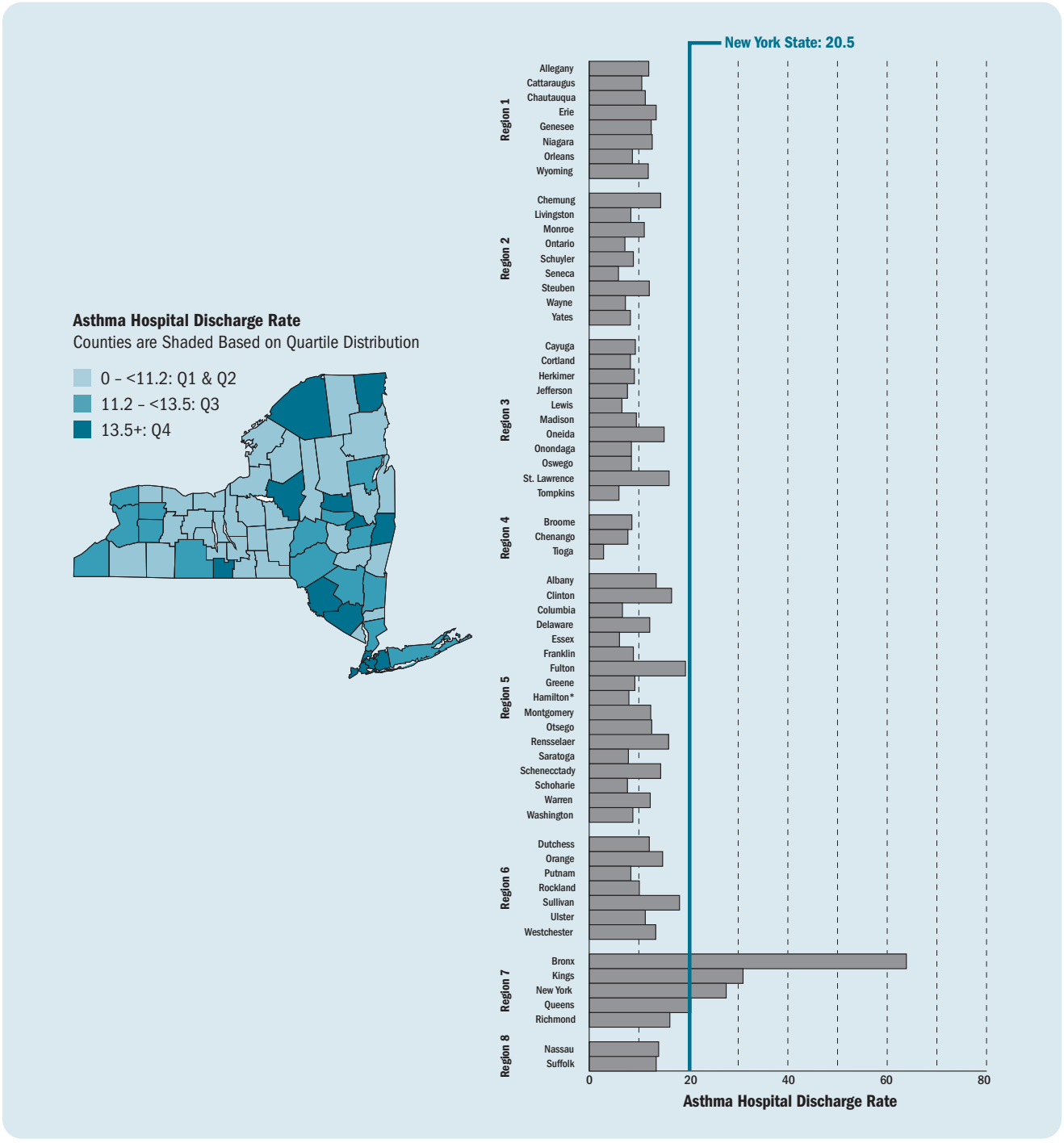
Crude and Age-Adjusted* Asthma Hospital Discharge Rate per 10,000 Residents by Region and County, New York State, 2005-2007

Region/County	Discharges				Population 2006	Crude Average Rate	Adjusted Average Rate
	2005	2006	2007	Total			
REGION 7: NEW YORK CITY							
Bronx	8,467	8,650	8,731	25,848	1,361,473	63.3	63.9
Kings	8,098	8,035	7,415	23,548	2,508,820	31.3	31.1
New York	4,106	4,300	3,996	12,402	1,611,581	25.7	27.6
Queens	4,577	4,635	4,501	13,713	2,255,175	20.3	20.5
Richmond	762	777	773	2,312	477,377	16.1	16.3
Region Total	*26,010*	*26,397*	*25,416*	*77,823*	*8,214,426*	*31.6*	*31.9*
REGION 8: NASSAU-SUFFOLK							
Nassau	1,988	1,889	1,794	5,671	1,325,662	14.3	14.0
Suffolk	2,011	2,053	1,882	5,946	1,469,715	13.5	13.5
Region Total	*3,999*	*3,942*	*3,676*	*11,617*	*2,795,377*	*13.9*	*13.7*
New York State Total	*39,927*	*40,205*	*37,950*	*118,082*	*19,306,183*	*20.4*	*20.5*

*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, 2005-2007



*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 presents the age-adjusted NYS county-specific asthma hospital discharge rates for 2005-2007. 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: www.health.state.ny.us/statistics/ny_asthma/index.htm

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 63.9 per 10,000 residents, followed by Kings County with an age-adjusted rate of 31.1 per 10,000 residents. For counties in the Rest of State, age-adjusted rates ranged from highs of 19.4 per 10,000 residents (Fulton) and 18.2 per 10,000 residents (Sullivan) to 2.9 per 10,000 residents (Tioga) and 5.9 per 10,000 residents (Seneca).

Figure 7-14
Albany County: Asthma Hospital Discharge Rate per 10,000 Residents, 1998-2007

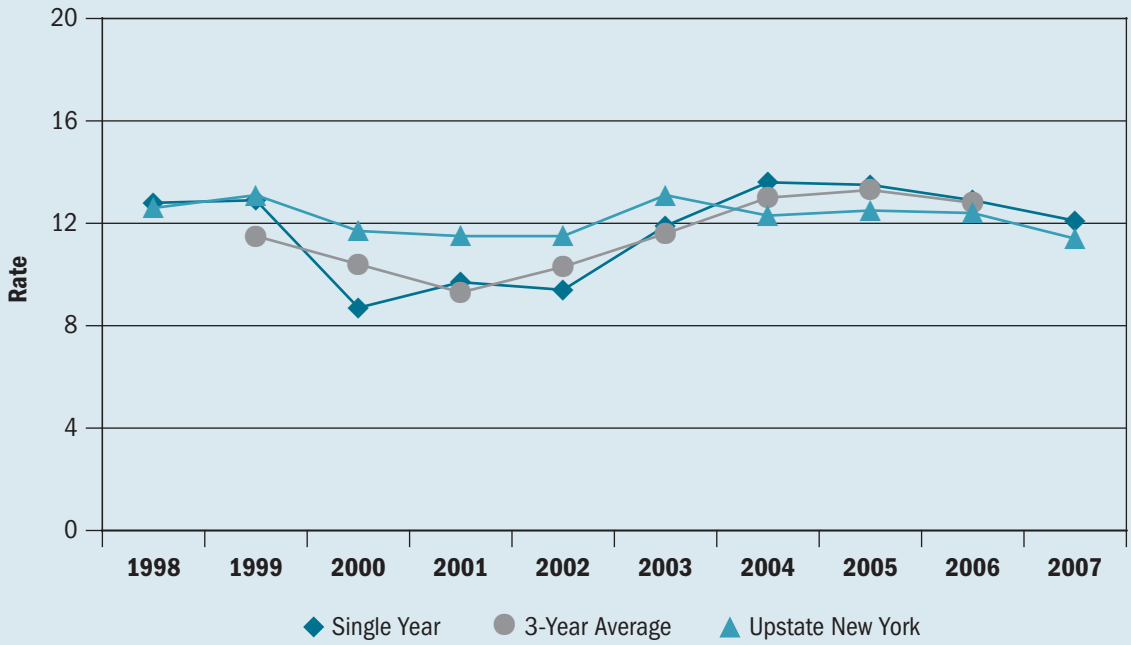


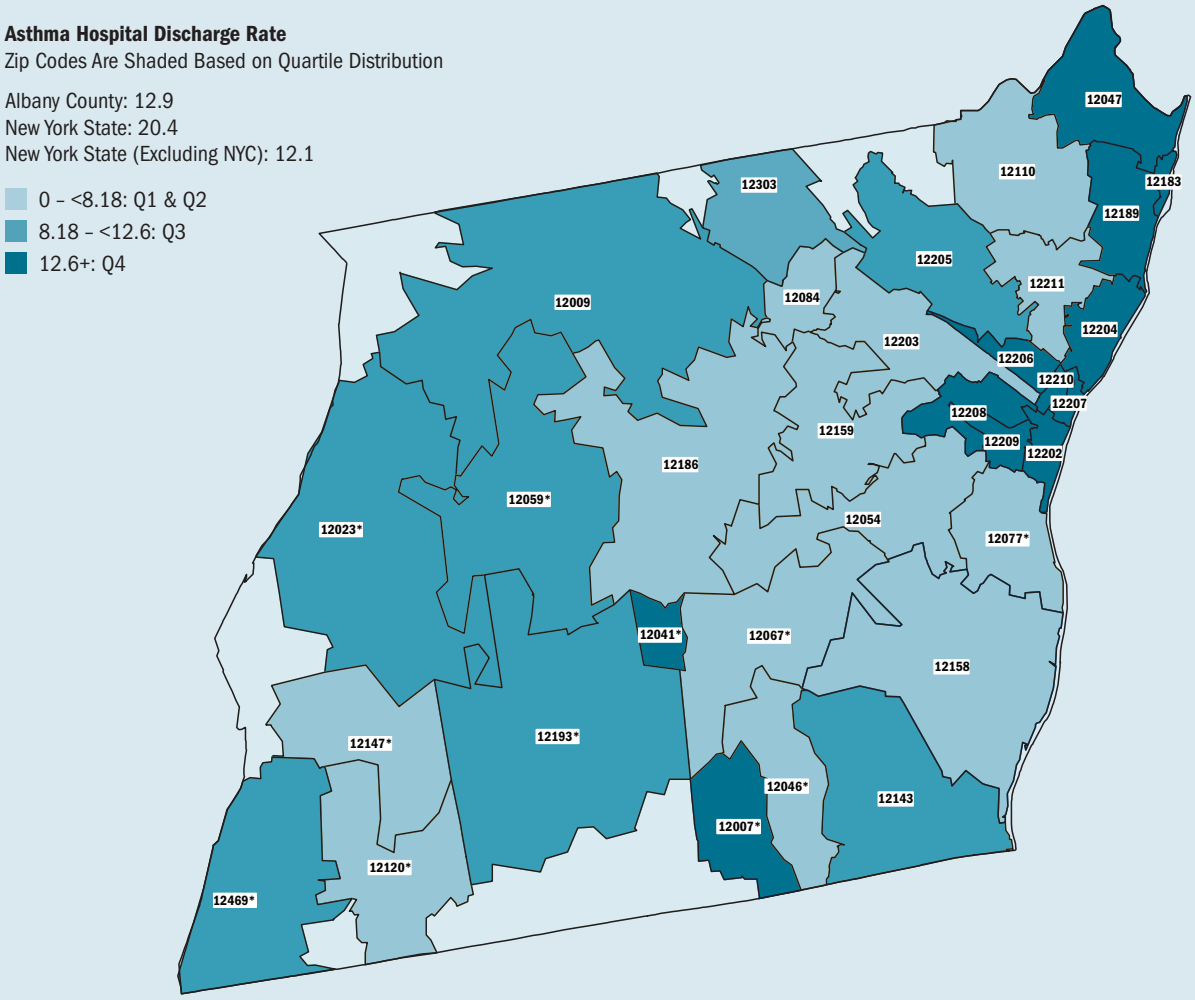
Table 7-3
Albany County: Asthma Hospital Discharge Rate per 10,000 Residents, 1998-2007

Year	Single Year	3-Year Average	Upstate New York
1998	12.8	—	12.6
1999	12.9	11.5	13.1
2000	8.7	10.4	11.7
2001	9.7	9.3	11.5
2002	9.4	10.3	11.5
2003	11.9	11.6	13.1
2004	13.6	13.0	12.3
2005	13.5	13.3	12.5
2006	12.9	12.8	12.4
2007	12.1	—	11.4

Figure 7-14 and Table 7-3 are examples of ten-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: www.health.state.ny.us/statistics/ny_asthma/index.htm

Figure 7-15

Albany County: Total Asthma Hospital Discharge Rate per 10,000 Residents by ZIP Code, 2005-2007



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

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 2003–2005

ZIP Code	Discharges 2005–2007	Population 2006	Discharge Rate
12007*	—	191	—
12009	22	7,725	9.5
12023**	5	1,897	8.8
12041*	—	107	—
12046*	—	602	—
12047	97	18,006	18.0
12054	32	16,926	6.3
12059**	5	1,960	8.5
12067**	3	1,705	5.9
12077**	5	7,269	2.3
12084	15	4,577	10.9
12110	46	21,643	7.1
12120*	—	550	—
12143	20	6,119	10.9
12147**	0	571	0.0
12158	15	6,738	7.4
12159	14	8,396	5.6
12183	19	2,936	21.6
12186	15	6,858	7.3
12189	88	16,637	17.6
12193**	6	2,202	9.1
12202	118	9,641	40.8
12203	80	34,573	7.7
12204	29	6,807	14.2
12205	80	26,282	10.1
12206	175	15,631	37.3
12207	30	1,984	50.4
12208	80	21,073	12.7
12209	52	10,204	17.0
12210	62	9,296	22.2
12211	23	13,619	5.6
12303	106	28,866	12.2
12469*	—	721	—

*Data suppressed for confidentiality purposes if there are less than 3 discharges per ZIP code or if the average annual population in each ZIP code contains less than 33 people.

**Less than or equal to 10 discharges, therefore rate may not be stable (Relative Standard Error >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, are available at the NYSDOH Asthma Surveillance website: www.health.state.ny.us/statistics/ny_asthma/index.htm

At-risk Based Rates for Asthma Hospital Discharges

Methodology

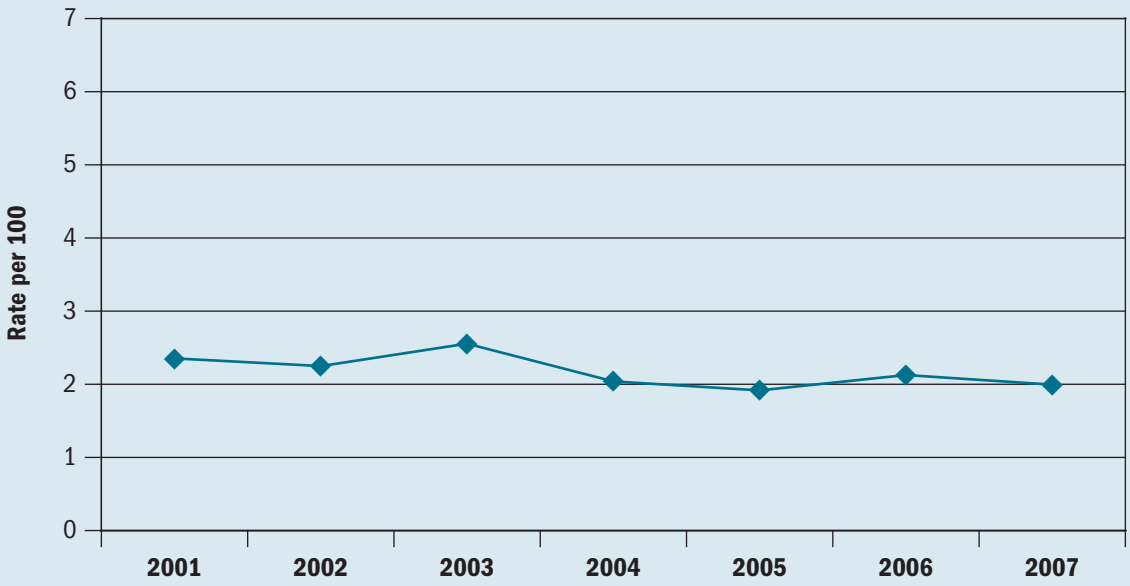
At-risk based rates (ARR) for asthma hospital discharges represent the number of asthma-related hospital discharges for individuals with current asthma rather than for the general population. Rates for a specific period of time were calculated by dividing the number of asthma hospital discharges by the estimated number of people with current asthma for that time period and then multiplying by 100.[18-21]

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 88 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 30 for a full description of how current asthma was defined and how current asthma prevalence was calculated). The estimated number of people with current asthma was generated based on the weighted current asthma prevalence. The estimates were the denominator for the ARR.

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 2001 through 2007. ARR for asthma hospital discharges for children are also presented by age group, gender, race and ethnicity and geographic region. However, for children, rates were computed for combined years due to the small sample size of children in the BRFSS. The BRFSS child data are only available for years 2006-2008, while SPARCS hospital discharge data are available through 2007. Therefore, the ARR for asthma hospital discharges for children was calculated by dividing the average annual number of asthma hospital discharges for 2006-2007 divided 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 "significantly different" from each other when they do not have overlapping CIs. All comparisons of ARR for different subgroups are statistically significant.

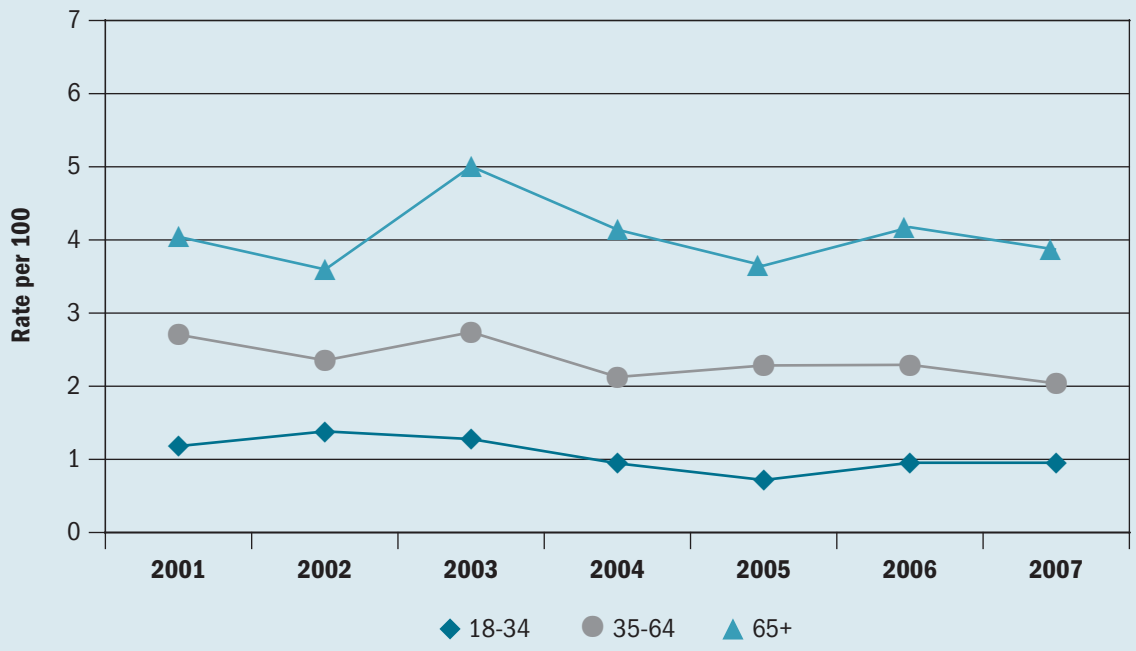
Figure 7-16
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma, New York State, 2001-2007



	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
New York State	2.3 (2.32–2.38)	2.2 (2.22–2.28)	2.6 (2.52–2.58)	2.0 (2.01–2.06)	1.9 (1.89–1.94)	2.1 (2.09–2.15)	2.0 (1.97–2.02)

From 2001-2007, the annual ARR for asthma hospital discharges in NYS decreased from 2.3 asthma hospital discharges per 100 adults with current asthma in 2001 to 2.0 per 100 in 2007 (Figure 7-16).

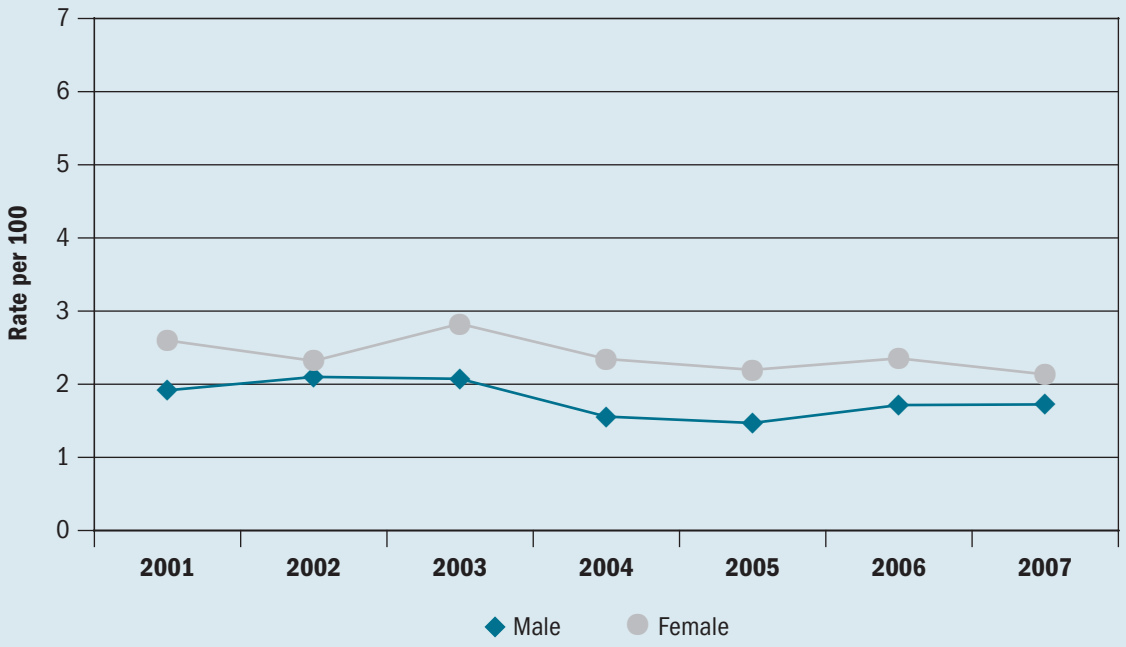
Figure 7-17
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Age Group and Year, New York State, 2001-2007



Age Group	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
18–34 Years	1.2 (1.15–1.22)	1.4 (1.33–1.42)	1.3 (1.24–1.31)	0.95 (0.92–0.98)	0.72 (0.70–0.74)	0.95 (0.92–0.98)	0.95 (0.92–0.98)
35–64 Years	2.7 (2.66–2.75)	2.35 (2.31–2.39)	2.74 (2.70–2.78)	2.1 (2.09–2.15)	2.3 (2.25–2.32)	2.3 (2.25–2.32)	2.03 (2.00–2.07)
65+ Years	4.0 (3.94–4.15)	3.6 (3.50–3.68)	5.0 (4.88–5.12)	4.1 (4.04–4.23)	3.6 (3.56–3.73)	4.2 (4.08–4.27)	3.9 (3.77–3.95)

For 2001-2007, 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).

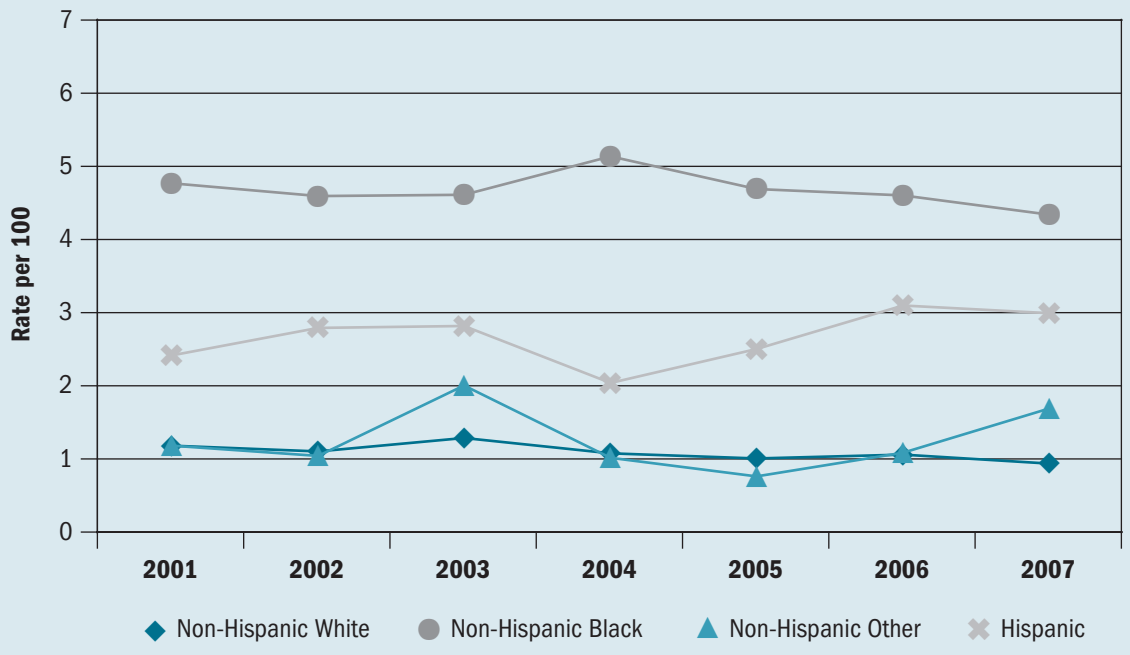
Figure 7-18
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Gender and Year, New York State, 2001-2007



Gender	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
Male	1.9 (1.87–1.96)	2.1 (2.05–2.15)	2.1 (2.03–2.12)	1.6 (1.52–1.59)	1.5 (1.43–1.50)	1.7 (1.67–1.75)	1.7 (1.68–1.76)
Female	2.6 (2.56–2.64)	2.3 (2.28–2.35)	2.8 (2.78–2.86)	2.34 (2.31–2.37)	2.2 (2.16–2.22)	2.4 (2.32–2.39)	2.14 (2.10–2.17)

For 2001-2007, among adults with current asthma in NYS, women consistently had higher ARR for asthma hospital discharges compared to men. The rate decreased for both women and men from 2001 to 2007 (Figure 7-18).

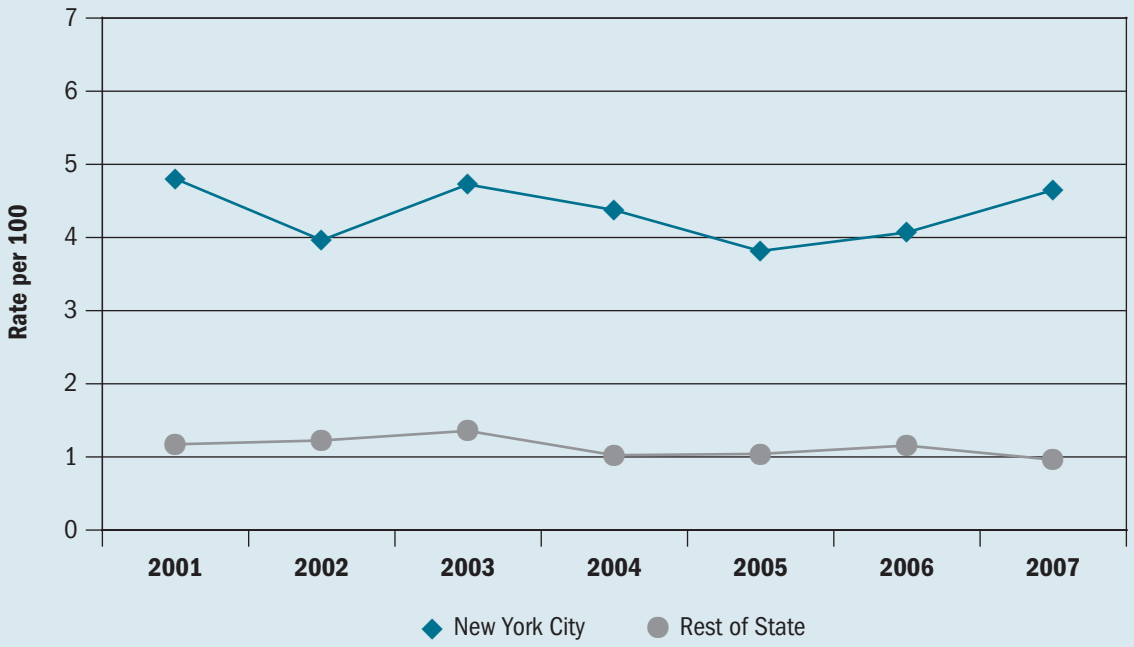
Figure 7-19
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Race and Ethnicity and Year, New York State, 2001-2007



Race and Ethnicity	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
Non-Hispanic White	1.2 (1.15–1.20)	1.1 (1.08–1.13)	1.3 (1.25–1.31)	1.1 (1.05–1.10)	1.0 (0.98–1.03)	1.1 (1.03–1.08)	0.94 (0.92–0.96)
Non-Hispanic Black	4.8 (4.65–4.89)	4.6 (4.48–4.70)	4.6 (4.51–4.72)	5.1 (5.01–5.25)	4.7 (4.58–4.80)	4.6 (4.50–4.71)	4.3 (4.24–4.44)
Non-Hispanic Other	1.2 (1.11–1.25)	1.0 (0.98–1.10)	2.0 (1.89–2.12)	1.0 (0.95–1.07)	0.8 (0.71–0.81)	1.1 (1.02–1.15)	1.7 (1.60–1.77)
Hispanic	2.4 (2.35–2.48)	2.8 (2.71–2.87)	2.8 (2.74–2.89)	2.0 (1.98–2.09)	2.5 (2.43–2.57)	3.1 (3.02–3.18)	3.0 (2.91–3.07)

For 2001-2007, the ARR for asthma hospital discharges among adults with current asthma varied by race and ethnicity. For this time period, 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 4.8 per 100 in 2001 to 4.3 per 100 in 2007 for non-Hispanic Blacks, and from 1.2 per 100 in 2001 to 0.9 per 100 in 2007 for non-Hispanic Whites. However, the ARR for asthma hospital discharges increased from 2.4 per 100 in 2001 to 3.0 per 100 in 2007 for Hispanics for 2001-2007 (Figure 7-19).

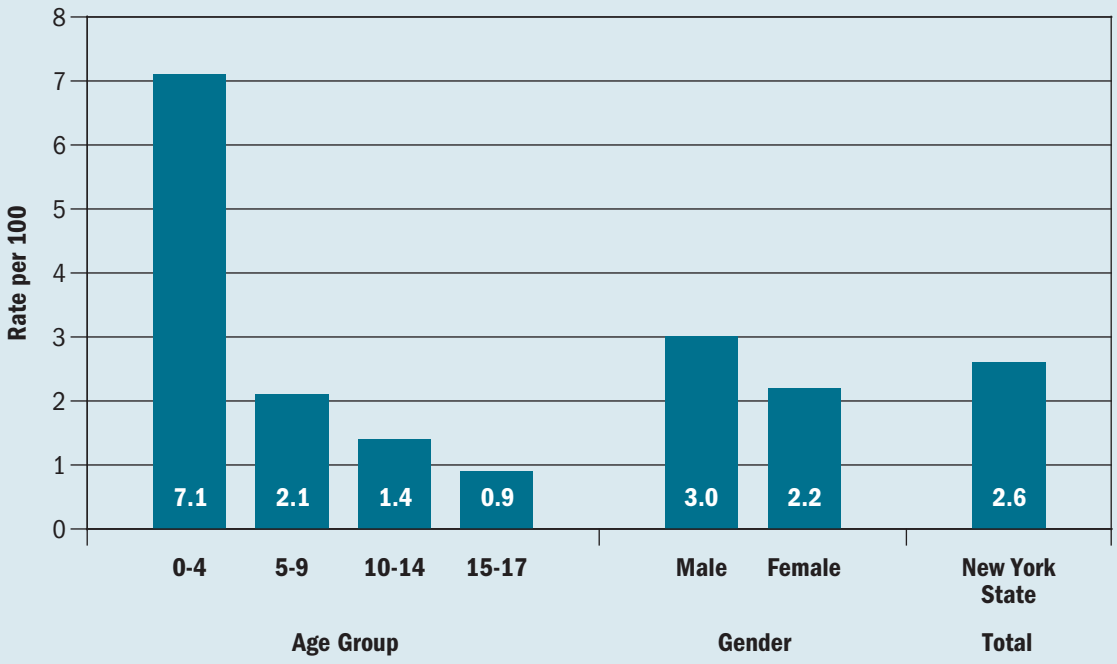
Figure 7-20
Asthma Hospital Discharge Rate per 100 Adults (18+ Years) with Current Asthma by Region and Year, New York State, 2001-2007



Region	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
New York City	4.8 (4.73–4.88)	4.0 (3.90–4.02)	4.7 (4.66–4.79)	4.4 (4.31–4.44)	3.8 (3.75–3.87)	4.1 (4.01–4.13)	4.6 (4.57–4.72)
Rest of State	1.2 (1.14–1.19)	1.2 (1.20–1.25)	1.4 (1.33–1.38)	1.0 (1.00–1.04)	1.0 (1.01–1.06)	1.1 (1.13–1.17)	1.0 (0.94–0.98)

For 2001-2007, 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. When comparing rates from 2001 to 2007, the ARR decreased slightly from 4.8 per 100 in 2001 to 4.6 per 100 in 2007 for New York City residents, and from 1.2 per 100 in 2001 to 1.0 per 100 in 2007 for those in the Rest of State (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, 2006-2007



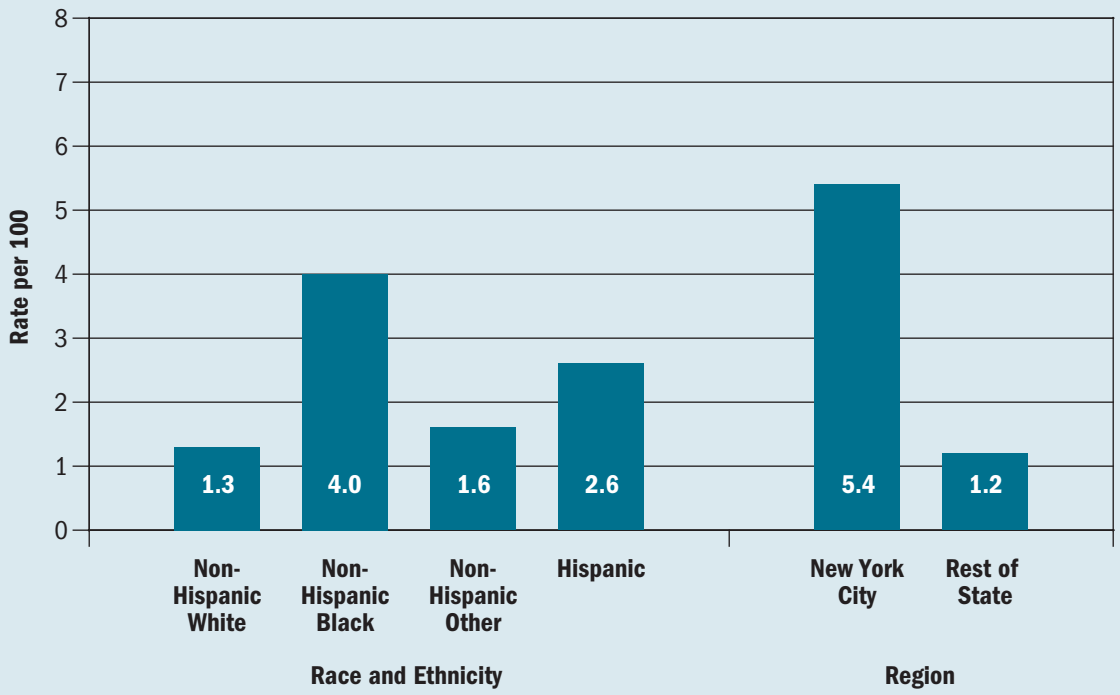
		Rate per 100 with Current Asthma	95% CI
Age Group	0-4	7.1	6.88–7.22
	5-9	2.1	2.03–2.17
	10-14	1.4	1.29–1.41
	15-17	0.9	0.87–1.01
Gender	Male	3.0	2.95–3.09
	Female	2.2	2.16–2.28
Total	*New York State*	*2.6*	*2.59–2.69*

For the 2006-2007 time period, there were 2.6 asthma hospital discharges each year per 100 children with current asthma in NYS.

Among NYS children with current asthma, the 0-4 year age group had the highest 2006-2007 ARR for asthma hospital discharges (7.1 per 100) compared to all other age groups.

The ARR for asthma hospital discharges for 2006-2007 was higher for boys (3.0 per 100) compared to girls (2.2 per 100) (Figure 7-21), while the adult ARRs were higher for women than men (see Figure 7-18).

Figure 7-22
Asthma Hospital Discharge Rate per 100 Children (0-17 Years) with Current Asthma by Race and Ethnicity and Region, New York State, 2006-2007



		Rate per 100 with Current Asthma	95% CI
Race and Ethnicity	Non-Hispanic White	1.3	1.28–1.38
	Non-Hispanic Black	4.0	3.88–4.12
	Non-Hispanic Other	1.6	1.50–1.70
	Hispanic	2.6	2.49–2.67
Region	New York City	5.4	5.33–5.55
	Rest of State	1.2	1.17–1.25

For children with current asthma, the 2006-2007 ARR for asthma hospital discharges for non-Hispanic Blacks (4.0 per 100) was three times higher than non-Hispanic White children (1.3 per 100). Hispanic (2.6 per 100) children also had a higher ARR for asthma hospital discharges compared to non-Hispanic White children.

The 2006-2007 ARR for asthma hospital discharges was 4.5 times higher for children with asthma living in New York City (5.4 per 100) compared to those living in the Rest of State (1.2 per 100) (Figure 7-22).

8

Asthma Mortality

Highlights: Asthma Mortality

- An annual average of 255 deaths were due to asthma in New York for 2005-2007, for a rate of 13.2 deaths per one million residents.
- In the past ten years, the New York State asthma mortality rate decreased 42% from 20.7 per one million residents in 1998 to 12.0 per one million residents in 2007. Similar decreases were seen for residents of the Rest of State and New York City.
- Asthma mortality increased with age. New York State children aged 0-14 years had a 2005-2007 asthma mortality rate of 2.8 per one million residents, while New Yorkers 65 years of age and older had a mortality rate of 42.2 per one million residents.
- New York State women had a higher 2005-2007 age-adjusted asthma mortality rate of 13.7 per one million residents compared to men at 10.7 per one million residents.
- Non-Hispanic Black (31.1 per 1,000,000) and Hispanic (19.8 per 1,000,000) New York State residents had much higher age-adjusted mortality rates compared to non-Hispanic White residents (7.4 per 1,000,000).
- New York City's age-adjusted asthma mortality rate (18.5 per 1,000,000) for 2005-2007 was more than double the rate for the Rest of State (8.2 per 1,000,000).

Asthma Mortality Rates for Adults with Current Asthma (At-Risk Based Rates), 2001-2007

- From 2001-2007, the annual at-risk based rate for asthma mortality in New York State decreased from 30.1 asthma deaths per 100,000 adults with current asthma in 2001 to 17.2 per 100,000 in 2007. Similar decreases were seen for residents of the Rest of State and New York City.
- Asthma mortality among those with current asthma increased with age. For 2001-2007, the 65 year and older age group consistently had the highest at-risk based rate (50.3 per 100,000 in 2007) for asthma mortality compared to other adult age groups in New York State.
- For 2001-2007, the at-risk based rate for asthma mortality among women showed a downward trend over time while the rates for men fluctuated. From 2001-2007, the at-risk based rate for asthma mortality decreased for both women and men.
- For 2001-2007, among adults with current asthma, non-Hispanic Blacks (36.7 per 100,000 in 2007) and Hispanics (21.2 per 100,000 in 2007) consistently had higher at-risk based rates for asthma mortality compared to non-Hispanic Whites (12.9 per 100,000 in 2007).
- Among adults with current asthma, the 2001-2007 at-risk based rate for asthma mortality was approximately four times higher for residents in New York City (38.0 per 100,000 in 2007) compared to those in the Rest of State (9.2 per 100,000 in 2007).

Methodology

The source of the asthma mortality data is the New York State Department of Health's (NYSDOH's) 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 mortality rates were obtained from the United States (U.S.) Census Bureau.

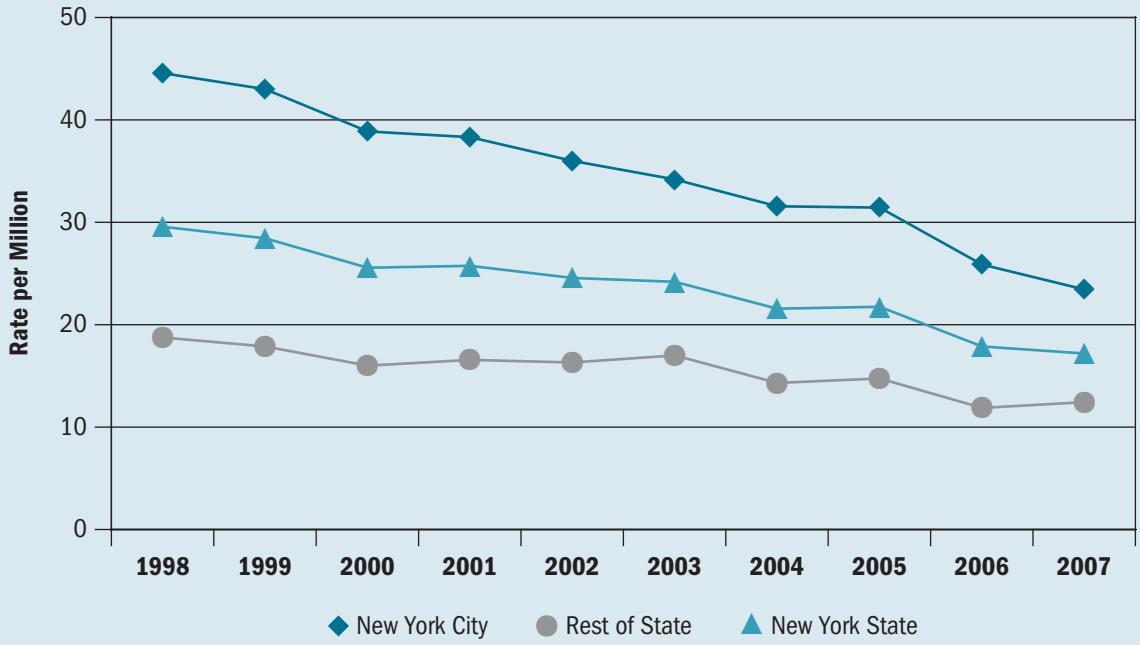
Crude and age-adjusted asthma mortality rates were calculated per 1,000,000 residents. The age-adjusted asthma mortality rates were calculated using the 2000 U.S. Standard Population (see Appendix 2).

Ten-year trend data for asthma mortality (1998-2007) are presented for the state total and geographic region (New York City and Rest of State). Asthma mortality rates for a specific year were calculated by dividing the number of asthma deaths by the population of that year and then multiplying by 1,000,000.

Combined years (2005-2007) of data for asthma mortality are presented by age group, gender, race and ethnicity and geographic region (New York City and Rest of State). For the period 2005-2007, the three-year average annual asthma mortality rates per 1,000,000 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 (2006) and multiplied by 1,000,000.

Asthma mortality data for 2005-2007 are presented as tables, maps and graphs at the state and county level. An example of asthma mortality data at the county level is also presented.

Figure 8-1
Asthma Mortality Rate per 1,000,000 Residents by Region, New York State, 1998-2007



Region	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
New York City	31.2	30.1	27.2	26.8	25.2	23.9	22.1	22.0	18.1	16.4
Rest of State	13.1	12.5	11.2	11.6	11.4	11.9	10.0	10.3	8.3	8.7
New York State	20.7	19.9	17.9	18.0	17.2	16.9	15.1	15.2	12.5	12.0

In the past decade, the NYS asthma mortality rate decreased 42% from 20.7 per one million in 1998 to 12.0 per one million in 2007. Similar decreases were seen for residents of the Rest of State and New York City (Figure 8–1).

Asthma Mortality by Socio-demographic Characteristics

Table 8-1
Asthma Mortality Rate per 1,000,000 by Age Group, New York State, 2005-2007

Age Group	Number	Rate
0–14	31	2.8
15–34	81	5.1
35–64	334	14.3
65+	320	42.2
Total	*766*	*13.2*

There was an annual average of 255 deaths due to asthma in New York for 2005-2007, for a rate of 13.2 per one million residents. Asthma mortality rates increased with age among NYS residents.

For 2005-2007, NYS children aged 0-14 years had an asthma mortality rate of 2.8 per one million residents, while New Yorkers 65 years of age and older had a mortality rate of 42.2 per one million residents (Table 8-1).

Table 8-2
Crude and Age-Adjusted* Asthma Mortality Rate per 1,000,000 Residents by Gender, Race and Ethnicity and Region, New York State, 2005-2007

		Crude	Age-Adjusted*
Gender	Male	10.4	10.7
	Female	15.9	13.7
Race/Ethnicity	Non-Hispanic White	9.3	7.4
	Non-Hispanic Black	28.9	31.3
	Hispanic	15.7	19.8
Region	New York City	18.8	18.5
	Rest of State	9.1	8.2
Total	*New York State*	*13.2*	*12.5*

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

For 2005-2007, the crude asthma mortality rate for NYS was 13.2 per one million residents and the age-adjusted mortality rate was 12.5 per one million.

NYS women had a higher age-adjusted asthma mortality rate for 2005-2007 (13.7 per 1,000,000 residents) compared to men (10.7 per 1,000,000).

Non-Hispanic Black New Yorkers had an age-adjusted mortality rate of 31.3 per one million, which was more than four times the non-Hispanic White mortality rate (7.4 per 1,000,000).

Hispanic New Yorkers had an age-adjusted asthma mortality rate of 19.8 per one million, which was more than 2.5 times higher than non-Hispanic White residents.

New York City's age-adjusted asthma mortality rate (18.5 per 1,000,000) for 2005-2007 was more than double the rate for the Rest of State (8.2 per 1,000,000) (Table 8-2).

Table 8-3

Crude and Age-Adjusted* Asthma Mortality Rate Per 1,000,000 Residents by Region and County, New York State, 2005-2007

Region/County	Deaths				Population 2006	Crude Rate	Adjusted Rate
	2005	2006	2007	Total			
REGION 1: WESTERN NEW YORK							
Allegany	0	1	0	1	50,267	6.6	6.0
Cattaraugus	2	1	1	4	81,534	16.4	12.6
Chautauqua	0	2	3	5	135,357	12.3	8.8
Erie	10	8	8	26	921,390	9.4	8.4
Genesee	0	0	0	0	58,830	0.0	0.0
Niagara	2	0	1	3	216,130	4.6	3.8
Orleans	1	0	0	1	43,213	7.7	7.8
Wyoming	0	1	0	1	42,613	7.8	7.9
Region Total	*15*	*13*	*13*	*41*	*1,549,334*	*8.8*	*7.6*
REGION 2: FINGER LAKES							
Chemung	0	1	1	2	88,641	7.5	5.9
Livingston	4	0	0	4	64,173	20.8	20.2
Monroe	6	6	8	20	730,807	9.1	8.4
Ontario	0	0	1	1	104,353	3.2	2.4
Schuyler	0	0	0	0	19,415	0.0	0.0
Seneca	1	0	0	1	34,724	9.6	7.5
Steuben	1	2	1	4	98,236	13.6	10.8
Wayne	0	1	1	2	92,889	7.2	7.7
Yates	1	1	1	3	24,732	40.4	30.8
Region Total	*13*	*11*	*13*	*37*	*1,257,970*	*9.8*	*8.6*
REGION 3: CENTRAL NEW YORK							
Cayuga	0	1	0	1	81,243	4.1	3.5
Cortland	0	1	3	4	48,483	27.5	28.7
Herkimer	0	0	1	1	63,332	5.3	4.6
Jefferson	0	1	1	2	114,264	5.8	5.3
Lewis	0	0	1	1	26,685	12.5	11.3
Madison	0	0	0	0	70,197	0.0	0.0
Oneida	7	3	0	10	233,954	14.2	12.2
Onondaga	6	3	4	13	456,777	9.5	9.0
Oswego	0	0	0	0	123,077	0.0	0.0
St Lawrence	1	2	2	5	111,284	15.0	14.8
Tompkins	0	1	2	3	100,407	10.0	10.9
Region Total	*14*	*12*	*14*	*40*	*1,429,703*	*9.3*	*8.6*

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

Table 8-3 *continued*

Crude and Age-Adjusted* Asthma Mortality Rate Per 1,000,000 Residents by Region and County, New York State, 2005-2007

Region/County	Deaths				Population 2006	Crude Rate	Adjusted Rate
	2005	2006	2007	Total			
REGION 4: NEW YORK-PENNSYLVANIA							
Broome	4	4	1	9	196,269	15.3	12.3
Chenango	0	0	1	1	51,787	6.4	4.6
Tioga	1	2	0	3	51,285	19.5	17.7
Region Total	*5*	*6*	*2*	*13*	*299,341*	*14.5*	*11.8*
REGION 5: NORTHEASTERN NEW YORK							
Albany	6	3	3	12	297,556	13.4	12.2
Clinton	1	1	2	4	82,166	16.2	16.1
Columbia	0	1	1	2	62,955	10.6	9.8
Delaware	1	0	0	1	46,977	7.1	9.4
Essex	0	0	0	0	38,649	0.0	0.0
Franklin	1	0	0	1	50,968	6.5	6.6
Fulton	0	0	0	0	55,435	0.0	0.0
Greene	1	1	2	4	49,822	26.8	23.6
Hamilton	0	0	0	0	5,162	0.0	0.0
Montgomery	0	0	0	0	49,112	0.0	0.0
Otsego	0	2	1	3	62,583	16.0	14.7
Rensselaer	1	2	1	4	155,292	8.6	7.4
Saratoga	2	0	1	3	215,473	4.6	4.7
Schenectady	1	2	2	5	150,440	11.1	9.9
Schoharie	0	0	1	1	32,196	10.4	11.8
Warren	0	1	1	2	66,087	10.1	7.4
Washington	0	1	0	1	63,368	5.3	4.2
Region Total	*14*	*14*	*15*	*43*	*1,484,241*	*9.7*	*8.5*
REGION 6: HUDSON VALLEY							
Dutchess	2	3	2	7	295,146	7.9	8.0
Orange	7	6	4	17	376,392	15.1	16.1
Putnam	0	1	0	1	100,603	3.3	2.5
Rockland	2	4	2	8	294,965	9.0	8.2
Sullivan	0	2	1	3	76,588	13.1	11.8
Ulster	5	0	4	9	182,742	16.4	14.6
Westchester	17	3	7	27	949,355	9.5	8.9
Region Total	*33*	*19*	*20*	*72*	*2,275,791*	*10.5*	*10.1*

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

Table 8-3 *continued*

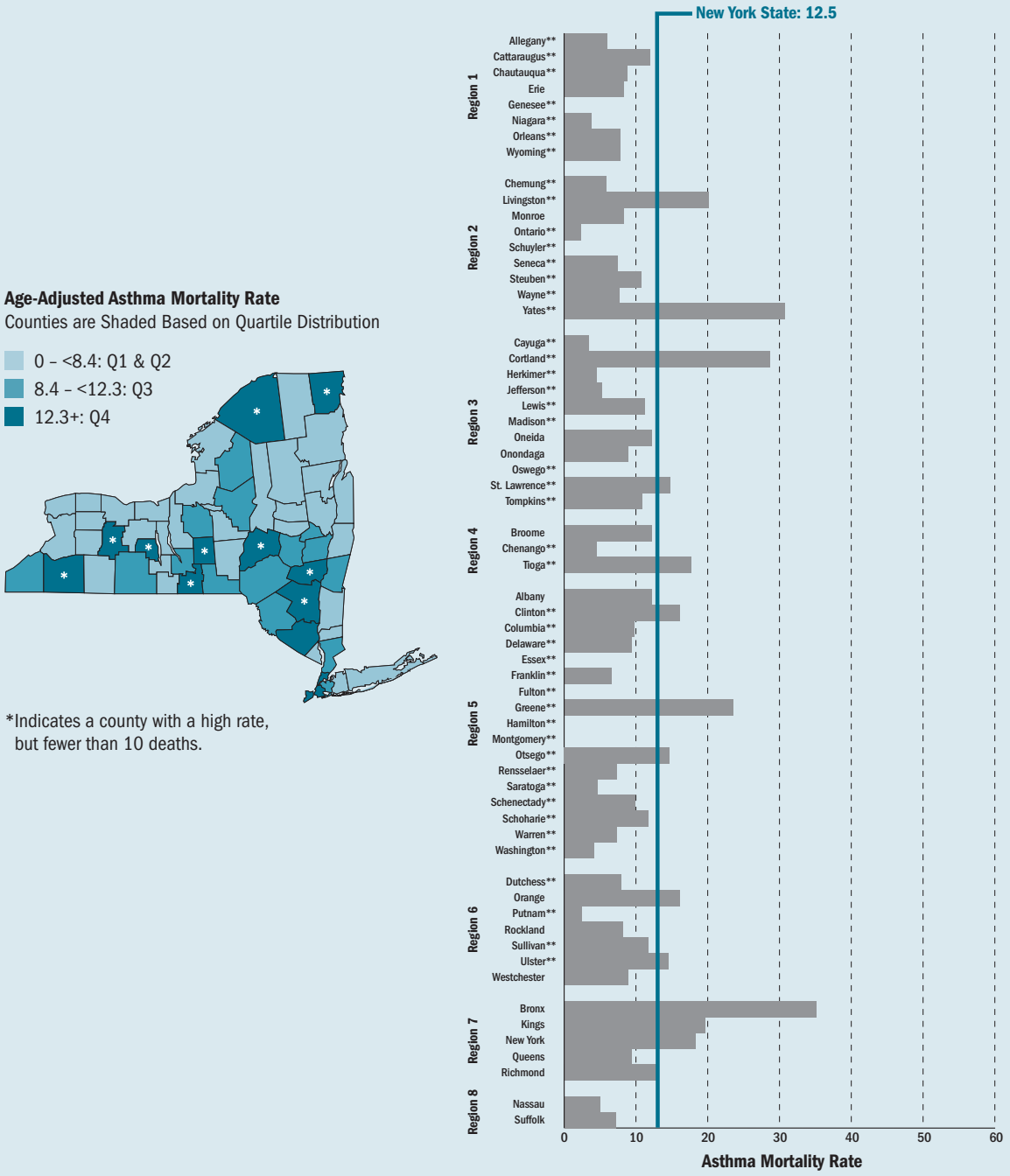
Crude and Age-Adjusted* Asthma Mortality Rate Per 1,000,000 Residents by Region and County, New York State, 2005-2007

Region/County	Deaths				Population 2006	Crude Rate	Adjusted Rate
	2005	2006	2007	Total			
REGION 7: NEW YORK CITY							
Bronx	46	44	46	136	1,361,473	33.3	35.2
Kings	53	48	47	148	2,508,820	19.7	19.7
New York	41	30	22	93	1,611,581	19.2	18.4
Queens	29	23	16	68	2,255,175	10.1	9.4
Richmond	10	4	5	19	477,377	13.3	13.2
Region Total	*179*	*149*	*136*	*464*	*8,214,426*	*18.8*	*18.5*
REGION 8: NASSAU-SUFFOLK							
Nassau	7	7	10	24	1,325,662	6.0	5.0
Suffolk	13	10	9	32	1,469,715	7.3	7.2
Region Total	*20*	*17*	*19*	*56*	*2,795,377*	*6.7*	*6.1*
New York State Total	*293*	*241*	*232*	*766*	*19,306,183*	*13.2*	*12.5*

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

Figure 8-2

Age-Adjusted* Asthma Mortality Rate per 1,000,000 Residents, New York State, 2005-2007



Source: Vital Statistics

**Indicates rate is based on fewer than 10 deaths.

Table 8-3 presents the crude and age-adjusted county-specific mortality rate and Figure 8-2 presents the age-adjusted NYS county-specific asthma mortality rate for 2005-2007.

Asthma mortality rates varied by region and county of residence; however, some county mortality rates are potentially unstable because they are based on fewer than ten asthma deaths. For example, Yates County had the highest age-adjusted asthma mortality rate (30.8 per 1,000,000) but this rate is based on one asthma death per year. Therefore, these rates should be interpreted with caution.

The Western New York region had the lowest crude (8.8 per 1,000,000) and age-adjusted (7.6 per 1,000,000) mortality rate. New York City had the highest crude (18.8 per 1,000,000) and age-adjusted (18.5 per 1,000,000) asthma mortality rate. Within New York City, Bronx County had the highest age-adjusted asthma mortality rate (35.2 per 1,000,000).

Figure 8-3
Albany County: Asthma Mortality Rate Per 1,000,000 Residents, 1998-2007

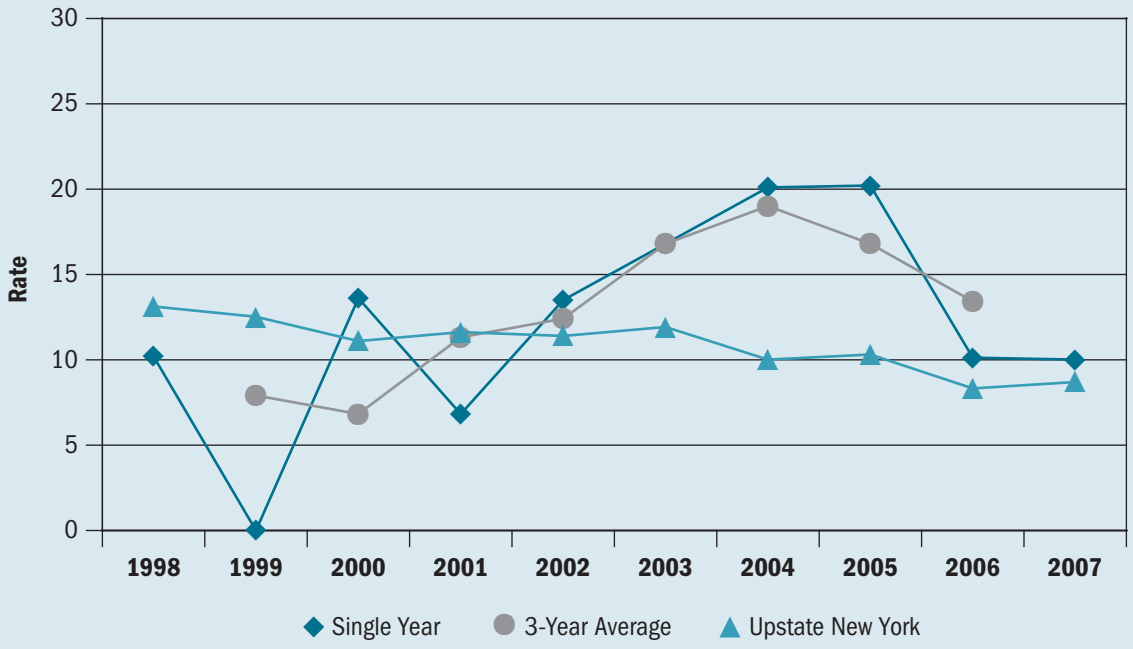


Table 8-4
Albany County: Asthma Mortality Rate Per 1,000,000 Residents, 1998-2007

Year	Single Year	3-Year Average	Upstate New York
1998	10.2	—	13.1
1999	0.0	7.9	12.5
2000	13.6	6.8	11.1
2001	6.8	11.3	11.6
2002	13.5	12.4	11.4
2003	16.8	16.8	11.9
2004	20.1	19.0	10.0
2005	20.2	16.8	10.3
2006	10.1	13.4	8.3
2007	10.0	—	8.7

Figure 8-3 and Table 8-4 are examples of ten-year trend data for asthma mortality rates for Albany County. These data are available for every county in NYS at the NYSDOH Asthma Surveillance website: www.health.state.ny.us/statistics/ny_asthma/index.htm

At-risk Based Rates for Asthma Mortality

Methodology

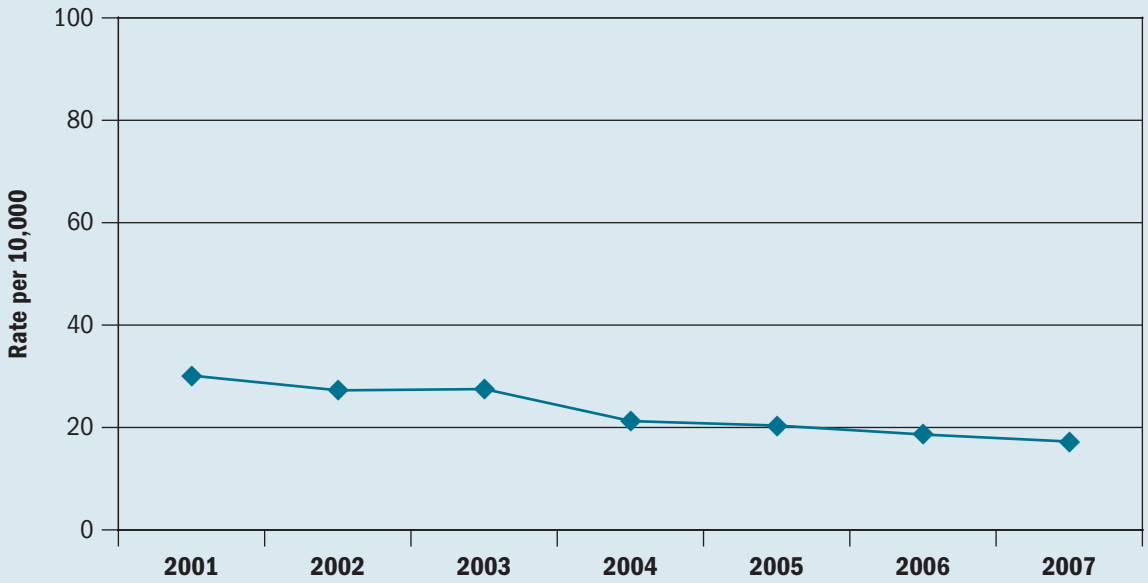
At-risk based rates (ARR) for asthma deaths represent the number of asthma-related deaths for individuals with current asthma rather than for the general population. Rates for a specific period of time were calculated by dividing the number of asthma deaths by the estimated number of people with current asthma for that time period and then multiplying by 100,000.[18-21]

The number of asthma deaths in NYS was generated by the New York State Department of Health's (NYSDOH's) Bureau of Biometrics and Health Statistics (BBHS) death files. (See the Methodology section on page 118 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 30 for a full description of how current asthma was defined and how current asthma prevalence was calculated). The estimated number of people with current asthma was generated based on the weighted current asthma prevalence. The estimates were the denominator for the ARR.

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 for 2001-2007. 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.

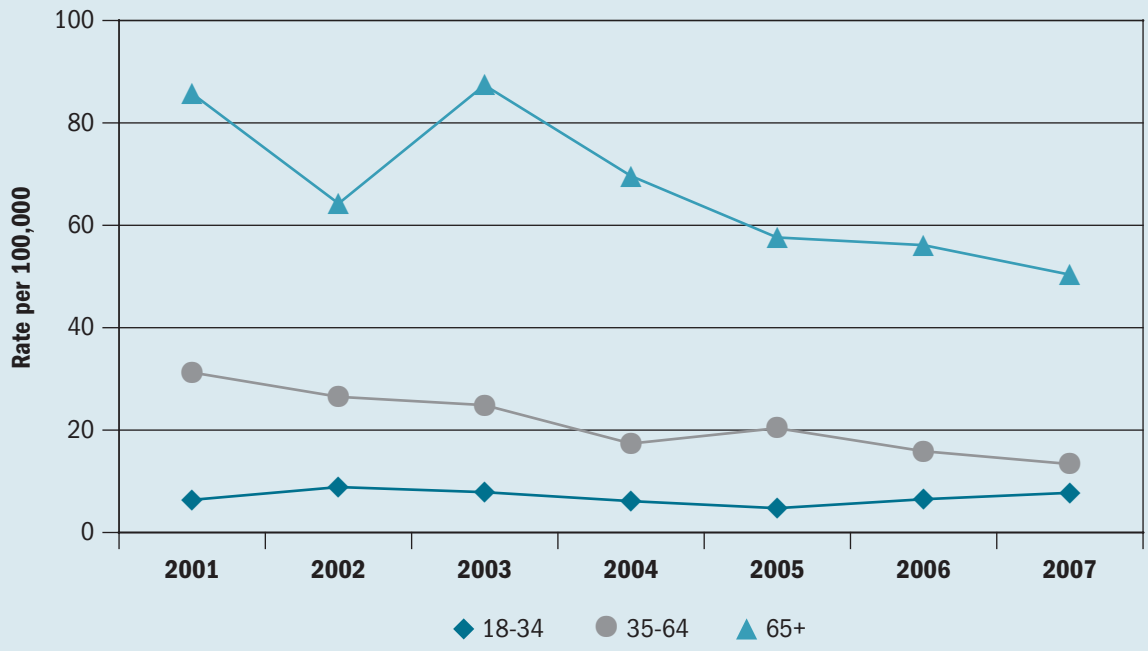
Figure 8-4
Asthma Mortality Rate per 100,000 Adults (18+ Years) with Current Asthma, New York State, 2001-2007



	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
New York State	30.1 (26.82–33.43)	27.2 (24.20–30.29)	27.5 (24.39–30.57)	21.2 (18.69–23.72)	20.3 (17.92–22.70)	18.6 (16.22–21.02)	17.2 (8.02–26.47)

From 2001-2007, the annual ARR for asthma mortality in NYS decreased from 30.1 asthma deaths per 100,000 adults with current asthma in 2001 to 17.2 per 100,000 in 2007. This was due to a decrease in the number of asthma deaths over time as well as an increase in the estimated number of adults with self-reported current asthma (Figure 8-4).

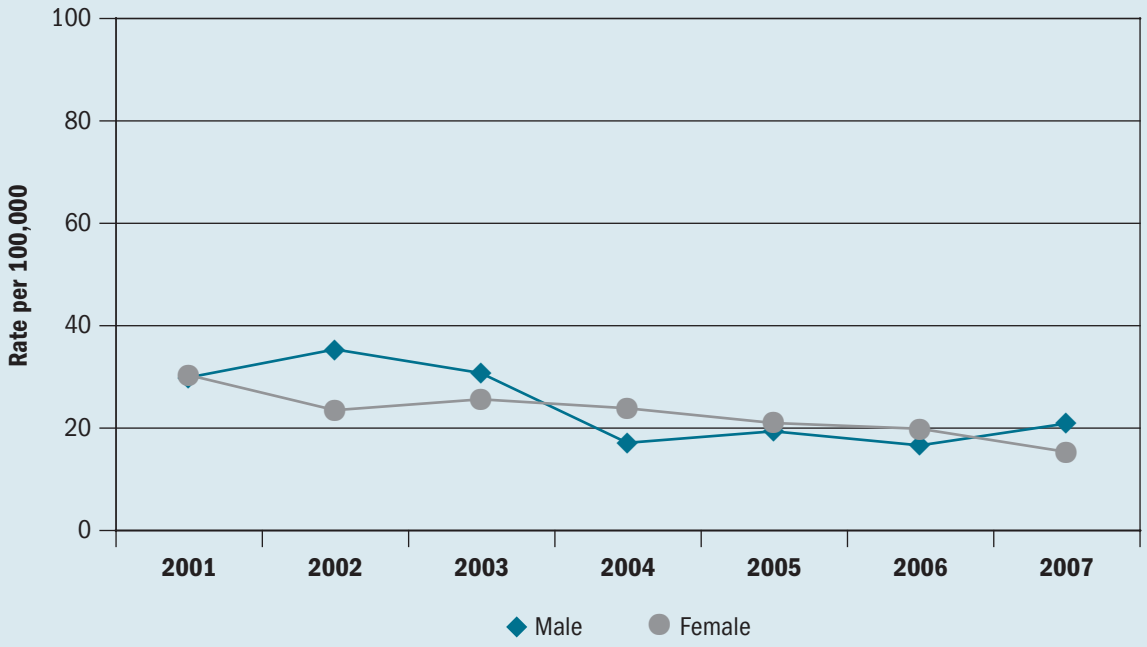
Figure 8-5
Asthma Mortality Rate per 100,000 Adults (18+ Years) with Current Asthma by Age Group and Year, New York State, 2001-2007



Age Group	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
18–34	6.3 (3.70–8.81)	8.9 (5.60–12.18)	7.8 (4.89–10.65)	6.1 (3.63–8.48)	4.7 (2.77–6.61)	6.5 (3.93–9.00)	7.7 (4.88–10.61)
35–64	31.2 (26.43–35.92)	26.5 (22.45–30.51)	24.8 (20.84–28.85)	17.4 (14.36–20.50)	20.4 (16.94–23.88)	15.8 (12.76–18.84)	13.4 (10.71–16.03)
65+	85.7 (70.96–100.44)	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)

For 2001-2007, the 65 year and older age group consistently had the highest ARR for asthma mortality compared to other adult age groups in NYS. Since 2003, the 35-64 year and 65 year and older age groups showed a downward trend over time (Figure 8-5).

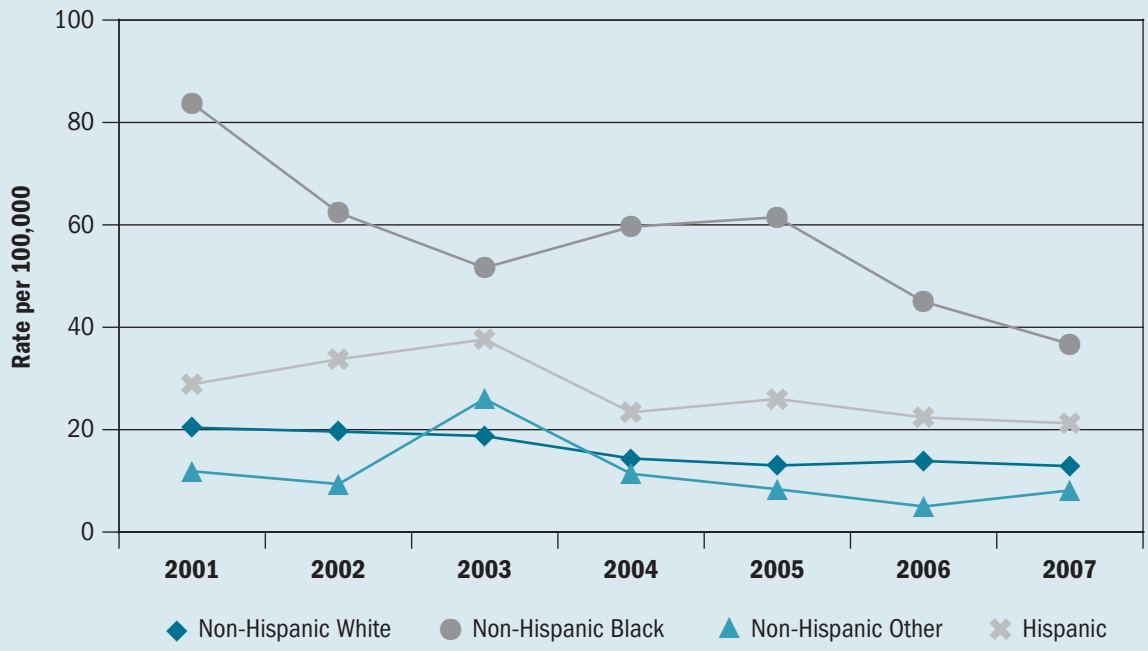
Figure 8-6
Asthma Mortality Rate per 100,000 Adults (18+ Years) with Current Asthma by Gender and Year, New York State, 2001-2007



Gender	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
Male	29.8 (24.36–35.26)	35.3 (29.12–41.45)	30.7 (25.28–36.14)	17.1 (13.47–20.74)	19.3 (15.51–23.03)	16.6 (12.86–20.39)	20.9 (16.69–25.15)
Female	30.3 (26.14–34.46)	23.5 (20.11–26.95)	25.6 (21.91–29.38)	23.8 (20.38–27.16)	21.0 (17.86–24.06)	19.8 (16.66–22.87)	15.3 (12.63–17.92)

Overall, for 2001-2007, the ARR for asthma mortality in women showed a downward trend while the rates for men fluctuated. Men had the highest ARR for asthma mortality in 2002, 2003 and 2007. However, for 2004-2006, women had higher rates than men. From 2001-2007, the ARR for asthma mortality decreased for both women and men (Figure 8-6).

Figure 8-7
Asthma Mortality Rate per 100,000 Adults (18+ Years) with Current Asthma by Race and Ethnicity and Year, New York State, 2001-2007

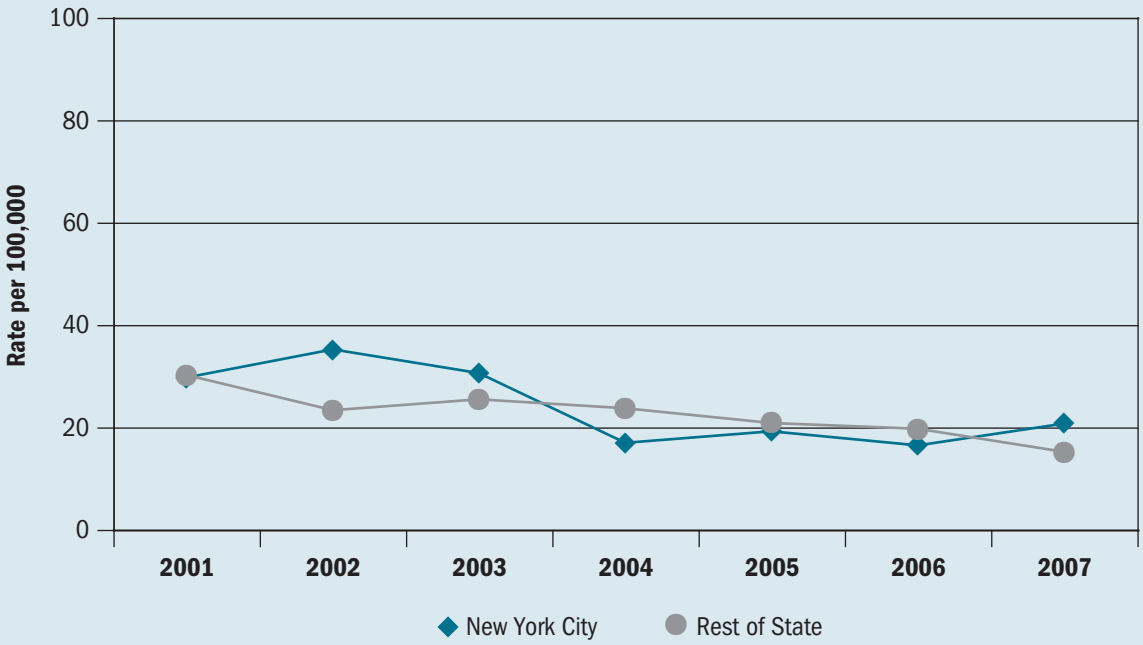


Race and Ethnicity	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
Non-Hispanic White	20.4 (16.86–23.93)	19.6 (16.23–22.90)	18.7 (15.45–22.01)	14.3 (11.60–16.96)	13.0 (10.61–15.49)	13.8 (11.20–16.40)	12.9 (10.47–15.39)
Non-Hispanic Black	83.7 (68.40–99.02)	62.4 (49.78–75.02)	51.6 (40.83–62.41)	59.6 (46.99–72.18)	61.5 (49.22–73.85)	45.0 (34.80–55.16)	36.7 (27.73–45.72)
Non-Hispanic Other	11.8 (4.50–19.16)	9.3 (3.53–15.04)	26.0 (12.82–39.10)	11.4 (5.19–17.56)	8.3 (3.61–13.01)	5.0 (0.62–9.43)	8.1 (2.09–14.02)
Hispanic	28.9 (21.58–36.20)	33.7 (25.26–42.18)	37.6 (29.02–46.15)	23.4 (17.47–29.30)	26.0 (19.05–32.90)	22.4 (15.53–29.24)	21.2 (14.71–27.68)

For adults with current asthma, the 2001-2007 ARR for asthma mortality varied by race and ethnicity. Non-Hispanic Blacks consistently had the highest ARR for asthma mortality compared to other racial and ethnic groups in NYS. This rate decreased from 83.7 per 100,000 in 2001 to 36.7 per 100,000 in 2007.

The ARR for mortality also decreased for Hispanics and for non-Hispanic Whites in NYS for 2001-2007 (Figure 8-7).

Figure 8-8
Asthma Mortality Rate per 100,000 Adults (18+ Years) with Current Asthma by Region and Year, New York State, 2001-2007



Region	2001 Rate (95% CI)	2002 Rate (95% CI)	2003 Rate (95% CI)	2004 Rate (95% CI)	2005 Rate (95% CI)	2006 Rate (95% CI)	2007 Rate (95% CI)
New York City	60.5 (52.28–68.73)	49 (42.28–55.63)	47.7 (40.85–54.53)	45.3 (38.64–52.00)	42.2 (36.05–48.31)	35.4 (29.63–41.11)	38.0 (31.64–44.38)
Rest of State	15.5 (12.63–18.41)	14.3 (11.49–17.05)	16.4 (13.41–19.35)	10.8 (8.62–12.9)	10.2 (8.14–12.24)	10.3 (8.09–12.45)	9.2 (7.22–11.12)

For adults with current asthma, the 2001-2007 ARR for asthma mortality was approximately four times higher for residents in New York City compared to those in the Rest of State. For this period, the rate decreased from 60.5 per 100 in 2001 to 38.0 per 100 in 2007 for New York City residents and from 15.5 per 100 in 2001 to 9.2 per 100 in 2007 for those in the Rest of State (Figure 8-8).

9

Program-Based Asthma Surveillance

Highlights: Program-Based Asthma Surveillance

Asthma Prevalence Among the Medicaid Managed Care Population, 2006-2007

- There were 162,204 (10.1%) and 161,763 (10.4%) Medicaid managed care enrollees classified as asthma universe in 2006 and 2007, respectively.
- There was a slight increase in asthma universe prevalence for Medicaid managed care enrollees across all age groups, and racial and ethnic groups between 2006 and 2007.
- The highest prevalence rate of asthma universe was observed among the 0-4 year and 5-9 year age groups (14.0% and 14.5% in 2006 and 14.3% and 14.7% in 2007, respectively), Hispanic and non-Hispanic Black enrollees (11.4% and 11.1% in 2006 and 12.1% and 11.5% in 2007, respectively), and residents in the Rest of State (12.0% in 2006 and 12.3% in 2007).
- There were 50,327 (4.6%) and 49,210 (4.7%) Medicaid managed care enrollees that were classified as persistent asthmatics in 2006 and 2007, respectively.
- The highest persistent asthmatic prevalence was seen among those aged 57-64 years (6.5% in 2006 and 6.6% in 2007), Hispanic enrollees (5.5% in 2006 and 5.6% in 2007), and Rest of State residents (5.1% in 2006 and 5.3% in 2007).

Utilization of Health Services by the Medicaid Managed Care Asthma Universe Population, 2006-2007

- Overall, there were more than 170,000 physician visits per year for 2006-2007; 57,392 outpatient clinic visits in 2006 and 51,042 in 2007; 34,555 ED visits in 2006 and 33,583 in 2007; and 8,094 hospitalizations in 2006 and 6,201in 2007 due to asthma among the asthma universe population. For the same time period, more than 1.1 million asthma-related pharmacy claims were filled each year.
- The highest rate of physician visits was seen among children aged 0-4 years and 5-9 years (116 visits per 100 asthma universe enrollees aged 0-4 years and 5-9 years in 2006 and 118 per 100 asthma universe enrollees aged 0-4 years and 5-9 years in 2007).
- There were few differences in asthma outpatient visit rates among age groups, with the overall rate of 35 and 32 visits per 100 asthma universe individuals in 2006 and 2007, respectively.
- Asthma emergency department visit rates varied by age group with the highest rate among children aged 0-4 years (26 per 100 in 2006 and 2007).
- Hospitalization rates due to asthma were highest among very young children aged 0-4 years (9 per 100 in 2006 and 6 per 100 in 2007).
- Hospitalization rates due to asthma decreased between 2006 and 2007 for all age groups.
- Asthma-related pharmacy claim rates increased with age. The highest rate was among adults aged 57-64 years (1,095 and 1,146 claims per 100 in 2006 and 2007, respectively).
- Physician visit rates were higher for Medicaid managed care asthma universe enrollees in the Rest of State (120 per 100 asthma universe enrollees in 2006 and 112 per 100 in 2007) compared to those in New York City (99 per 100 in 2006 and 103 per 100 in 2007).
- Medicaid managed care asthma universe enrollees in New York City had a much higher outpatient clinic visit rate (44 per 100 in 2006 and 39 per 100 in 2007) than Medicaid managed care asthma universe enrollees from the Rest of State (15 per 100 in 2006 and 2007).

- Rates of asthma emergency department visits were also higher for Medicaid managed care enrollees with asthma who reside in New York City (24 per 100 in 2006 and 23 per 100 in 2007) compared to those in the Rest of State (16 per 100 in 2006 and 15 per 100 in 2007).
- Asthma hospitalizations among Medicaid managed care enrollees were also slightly higher for those living in New York City (6 per 100 in 2006 and 4 per 100 in 2007) than in the Rest of State (4 per 100 in 2006 and 2 per 100 in 2007).
- There were small differences in asthma-related pharmacy claim rates for Medicaid managed care asthma universe enrollees when comparing New York City (700 claims per 100 in 2006 and 722 per 100 in 2007) and the Rest of State (626 per 100 in 2006 and 633 per 100 in 2007).

Managed Care Quality Assurance Reporting Requirement Asthma-Specific Indicator

- Among Commercial insurance, Child Health Plus and Medicaid managed care plans, the proportion of children aged 5–17 years with persistent asthma who received appropriate medications increased slightly from 2005 to 2007.
- For 2005-2007, the proportion of persistent asthmatic adults (18-56 years) who received appropriate medications for asthma increased slightly for both Commercial insurance and Medicaid managed care plans.
- In 2007, among Commercial and Child Health Plus plans, 95% of children with persistent asthma received appropriate medications for asthma, compared to 92% for children with persistent asthma in Medicaid managed care plans.
- In 2007, the proportion of adults with persistent asthma receiving appropriate asthma medications was slightly higher among Commercial than Medicaid managed care plan enrollees (92% and 90%, respectively).

Methodology

The information in this section represents 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.

Program-based surveillance is not representative of the general population. Approximately 21% of the NYS population is served by Medicaid health care programs. However, these data provide useful information about asthmatics, including the burden of asthma and the use of health care services and medications among this population. Asthma MMC information was obtained from the NYSDOH Office of Health Insurance Programs Medicaid Encounter Data System.

This report provides Medicaid asthma universe and persistent asthma prevalence data for the MMC population. Prevalence for MMC data are presented for asthma universe and persistent asthma for the total population, by age group, race and ethnicity and geographic region (New York City and Rest of State).

Definitions for the asthma universe and persistent asthma are based on the technical specifications for the National Committee for Quality Assurance's (NCQA's) Healthcare Effectiveness Data and Information Set (HEDIS®) 2007-2008. [22-23] Asthma universe prevalence was generated for individuals aged 0 to 64 years who were continuously enrolled in MMC for 12 or more months as of December 2006 or December 2007.

Asthma Universe: Individuals are identified as asthma universe patients if they had at least:

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

Persistent Asthma: Individuals are identified as persistent asthma patients if they had at least:

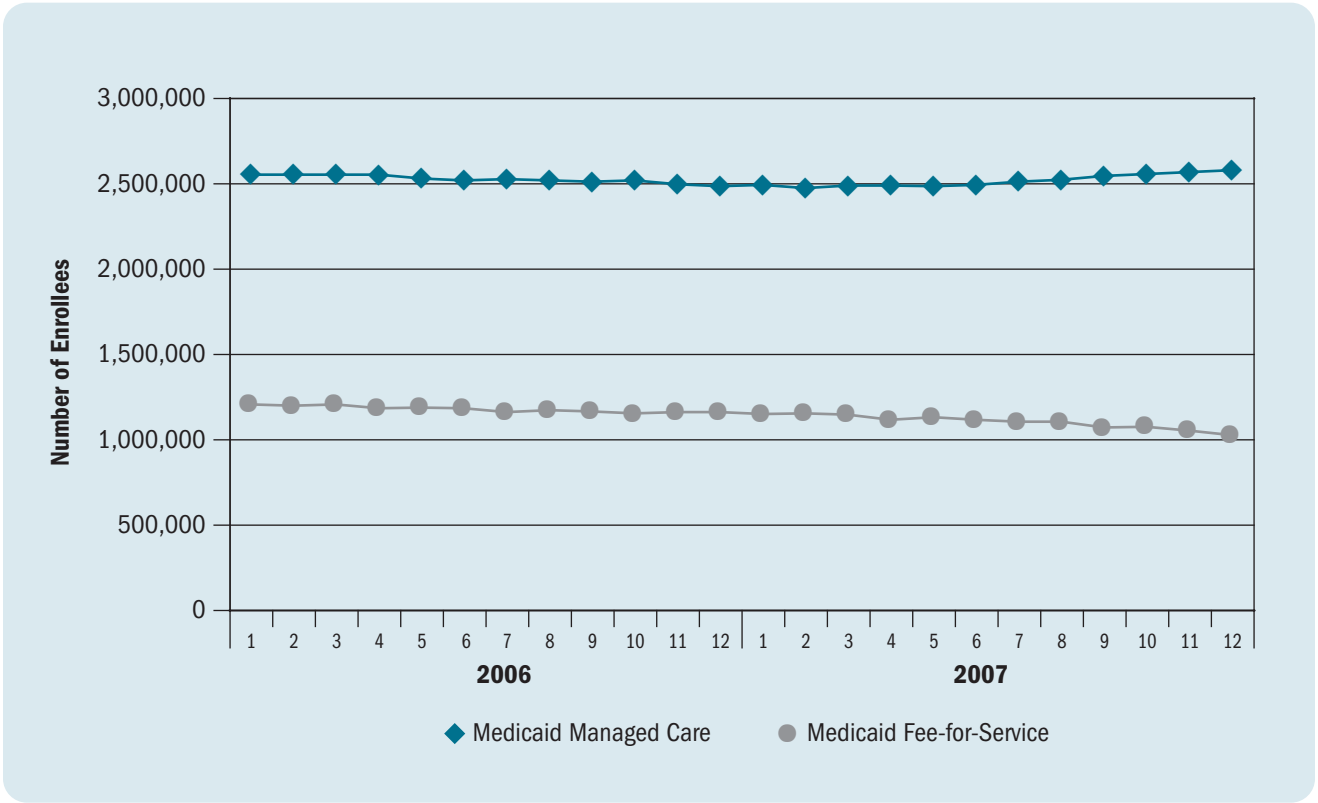
- four outpatient asthma visits with asthma (ICD-9 code 493.XX) as one of the listed diagnoses and at least two asthma medication events for a specified 12-month period of time; or
- one ED visit with asthma (ICD-9 code 493.XX) as the principal diagnosis for a specified 12-month period of time; or
-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

To be defined as having persistent asthma, individuals must meet one of four criteria for both the measurement year (2006 or 2007) and the prior year (2005 or 2006, criteria need not be the same across years).

Persistent asthma prevalence was generated for individuals aged 0 to 64 years who were continuously enrolled in Medicaid managed care for 24 or more months as of December 2006 or 2007.

*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.

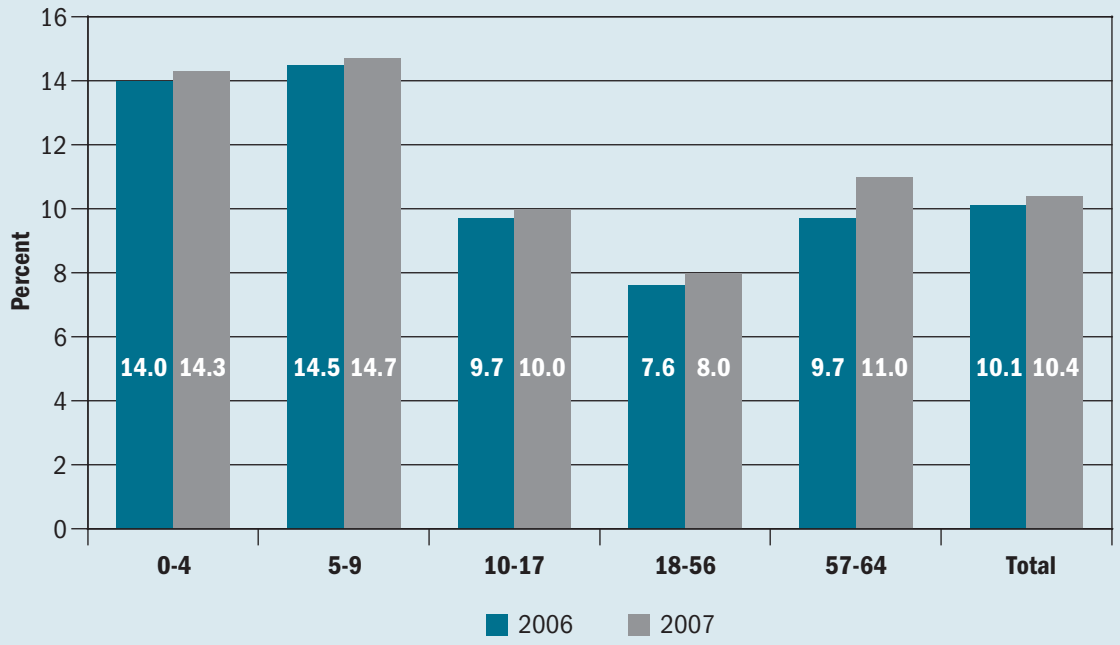
Figure 9-1
New York State Medicaid Managed Care* and Medicaid Fee-for-Service Enrollees Aged 0-64 Years by Month, January 2006–December 2007



*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 number of enrollees by month for MMC and Medicaid FFS from January 2006 to December 2007. Enrollment became relatively stable for the MMC population, with a slight increase at the end of 2007. During this time period, the MMC population fluctuated between nearly 2.5 to 2.6 million while the Medicaid FFS population varied between 1.0 to 1.2 million per month. There was a decreasing trend in enrollment in the Medicaid FFS program over these two years. There was a reduction (14.9%) in enrollment among the Medicaid FFS population between January 2006 and December 2007 (Figure 9-1).

Figure 9-2
Asthma Universe Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2006-2007



*12 months continuous enrollment.

Table 9-1
Asthma Universe Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2006-2007

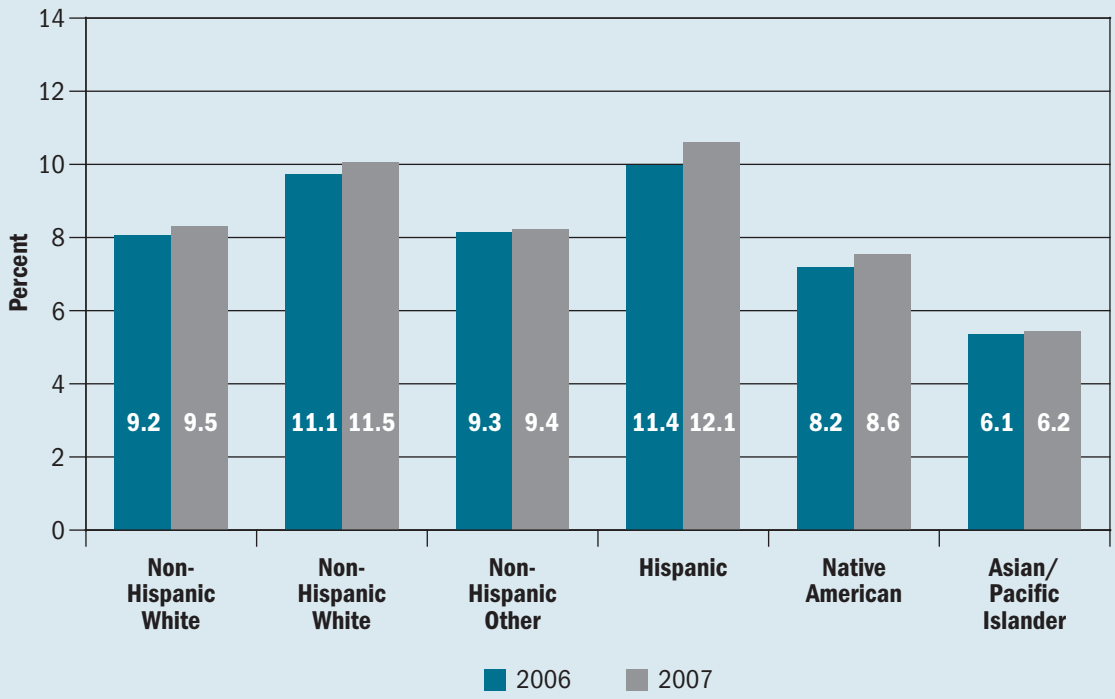
	Asthma Universe		Medicaid Managed Care Enrollees		Asthma Universe Prevalence Rate per 100	
Age Group	2006	2007	2006	2007	2006	2007
0–4	32,460	31,503	232,228	219,667	14.0	14.3
5–9	33,868	32,402	234,313	220,752	14.5	14.7
10–17	31,615	29,981	325,832	300,504	9.7	10.0
18–56	56,266	57,949	736,752	721,301	7.6	8.0
57–64	7,995	9,928	82,505	90,641	9.7	11.0
Total	*162,204*	*161,763*	*1,611,630*	*1,552,865*	*10.1*	*10.4*

There were 162,204 (10.1%) and 161,763 (10.4%) people who met the asthma universe definition among the more than 1.6 million and 1.55 million MMC enrollees in 2006 and 2007, respectively.

Asthma universe prevalence among MMC enrollees varied by age. Enrollees aged 0-4 years and 5-9 years had the highest prevalence rate of asthma universe (14.0% and 14.5% in 2006 and 14.3% and 14.7% in 2007, respectively), followed by enrollees aged 10-17 years (9.7% in 2006 and 10.0% in 2007). Adult enrollees aged 18-56 years had the lowest prevalence rate at 7.6% in 2006 and 8.0% in 2007.

There was a slight increase in asthma universe prevalence for MMC enrollees across all age groups between 2006 and 2007 (Figure 9-2, Table 9-1).

Figure 9-3
Asthma Universe Prevalence* by Race and Ethnicity, Medicaid Managed Care Population, New York State, 2006-2007



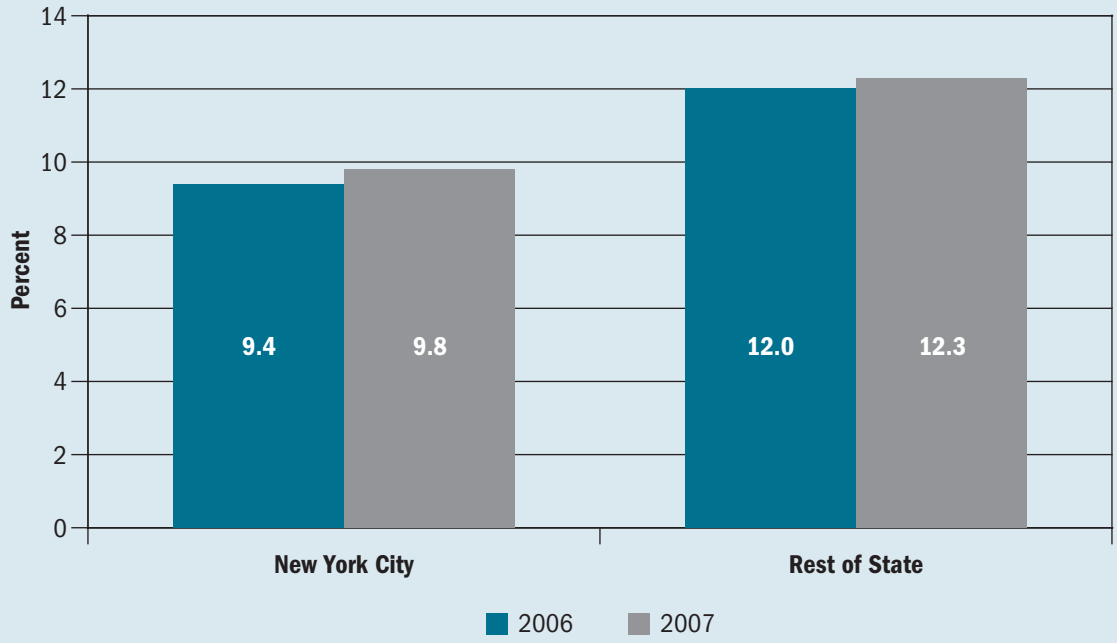
*12 months continuous enrollment.

Table 9-2
Asthma Universe Prevalence* by Race and Ethnicity, Medicaid Managed Care Population, New York State, 2006-2007

	Asthma Universe		Medicaid Managed Care Enrollees		Asthma Universe Prevalence Rate per 100	
Race Group	2006	2007	2006	2007	2006	2007
Non-Hispanic White	35,189	36,425	383,277	383,306	9.2	9.5
Non-Hispanic Black	40,699	39,732	366,168	347,000	11.1	11.5
Non-Hispanic Other	8,930	8,540	95,737	91,177	9.3	9.4
Hispanic	62,757	61,076	552,844	503,769	11.4	12.1
Native American	574	585	6,988	6,828	8.2	8.6
Asian/Pacific Islander	10,871	11,761	178,778	191,171	6.1	6.2

Asthma universe prevalence among MMC enrollees varied by race and ethnicity. Hispanic and non-Hispanic Black enrollees had the highest prevalence rate of asthma universe (11.4% and 11.1% in 2006 and 12.1% and 11.5% in 2007, respectively), followed by non-Hispanic White enrollees (9.2% in 2006 and 9.5% in 2007). Asian or Pacific Islander enrollees had the lowest prevalence rate at 6.1% in 2006 and 6.2% in 2007. There was a slight increase in asthma universe prevalence for MMC enrollees across all racial and ethnic groups between 2006 and 2007 (Figure 9-3, Table 9-2).

Figure 9-4
Asthma Universe Prevalence* by Region, Medicaid Managed Care Population, New York State, 2006-2007



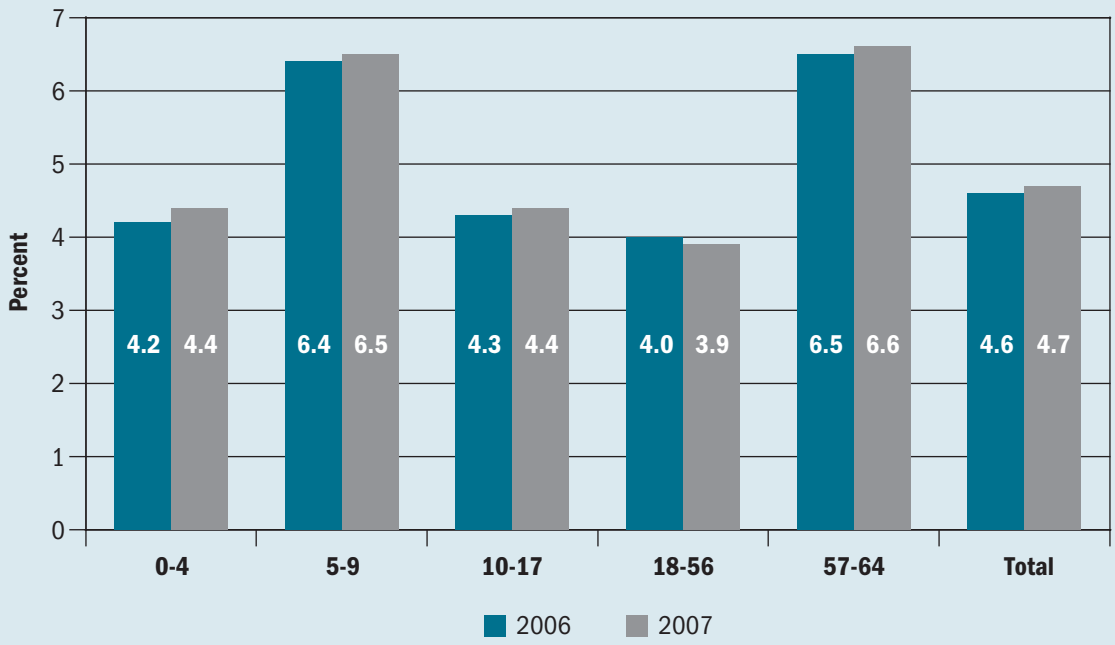
*12 months continuous enrollment.

Table 9-3
Asthma Universe Prevalence* by Region, Medicaid Managed Care Population, New York State, 2006-2007

Region	Asthma Universe		Medicaid Managed Care Enrollees		Asthma Universe Prevalence Rate per 100	
	2006	2007	2006	2007	2006	2007
New York City	115,114	113,736	1,220,171	1,162,628	9.4	9.8
Rest of State	47,090	48,027	391,459	390,237	12.0	12.3

Asthma universe prevalence among MMC enrollees varied by region. Rest of State residents had a higher prevalence rate of asthma universe (12.0% in 2006 and 12.3% in 2007) compared to New York City residents (9.4% in 2006 and 9.8% in 2007) (Figure 9-4, Table 9-3).

Figure 9-5
Persistent Asthmatic Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2006-2007



*24 months continuous enrollment.

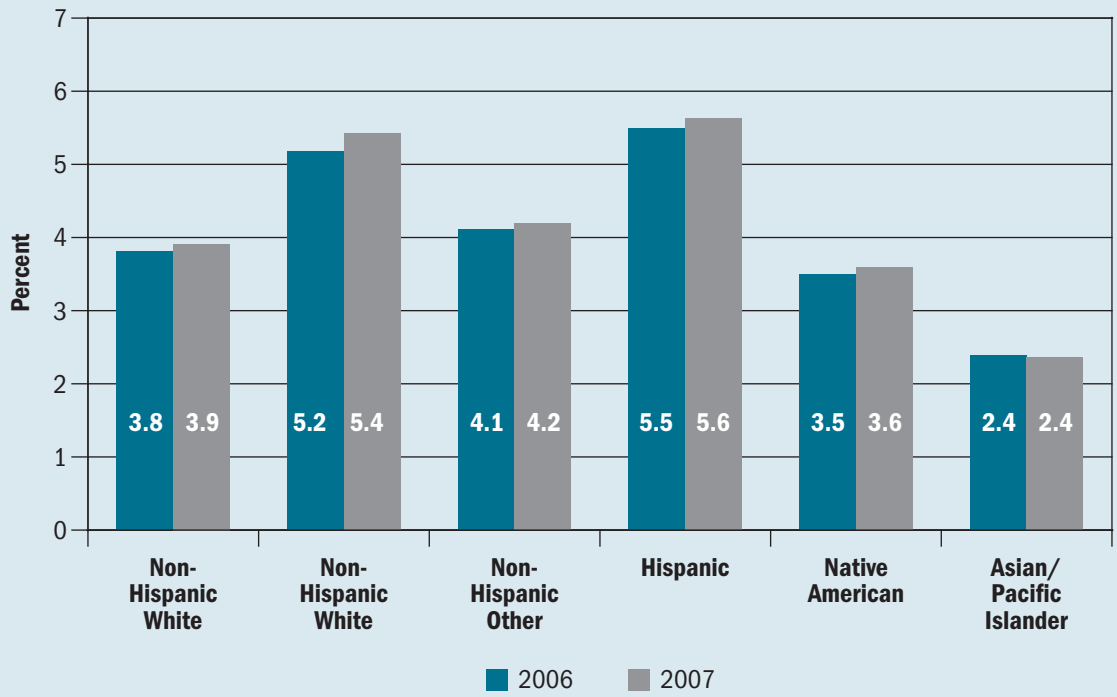
Table 9-4
Persistent Asthmatic Prevalence* by Age Group, Medicaid Managed Care Population, New York State, 2006-2007

	Asthma Universe		Medicaid Managed Care Enrollees		Asthma Universe Prevalence Rate per 100	
Age Group	2006	2007	2006	2007	2006	2007
0–4	5,183	4,991	122,344	113,929	4.2	4.4
5–9	11,427	11,015	179,414	168,237	6.4	6.5
10–17	11,043	10,402	255,636	234,295	4.3	4.4
18–56	18,861	18,633	477,423	474,909	4.0	3.9
57–64	3,813	4,169	58,222	63,003	6.5	6.6
Total	*50,327*	*49,210*	*1,093,039*	*1,054,373*	*4.6*	*4.7*

Among the MMC enrollees with 24 months continuous enrollment by the end of 2006 and 2007, 50,327 individuals (4.6%) and 49,210 individuals (4.7%) met the definition of persistent asthma, respectively.

Persistent asthmatic prevalence among MMC enrollees varied by age. Enrollees aged 57-64 years had the highest prevalence rate of persistent asthma (6.5% in 2006 and 6.6% in 2007), followed closely by enrollees aged 5-9 years (6.4% in 2006 and 6.5% in 2007). Enrollees aged 18-56 years had the lowest prevalence rate at 4.0% in 2006 and 3.9% in 2007. (Figure 9-5, Table 9-4).

Figure 9-6
Persistent Asthmatic Prevalence* by Race and Ethnicity, Medicaid Managed Care Population, New York State, 2006-2007



*24 months continuous enrollment.

Table 9-5
Persistent Asthmatic Prevalence* by Race and Ethnicity, Medicaid Managed Care Population, New York State, 2006-2007

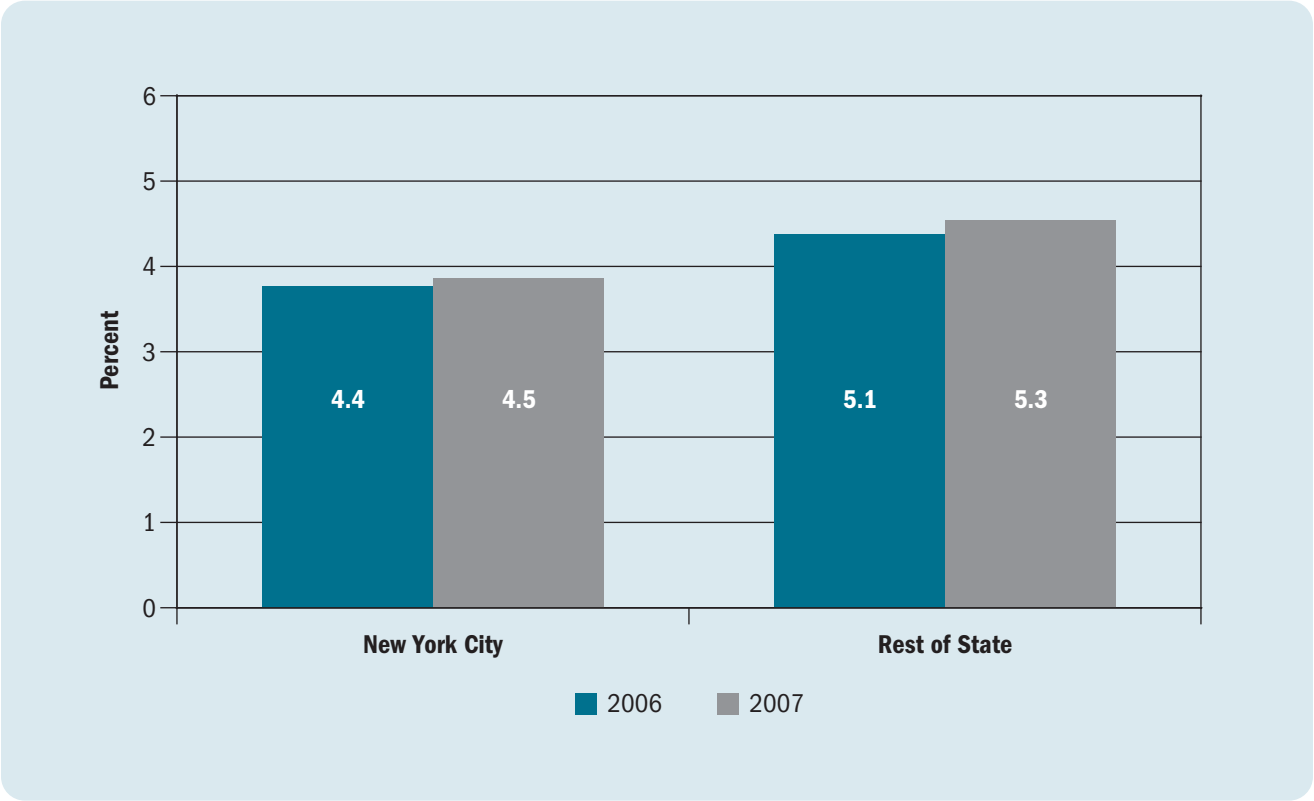
	Persistent Asthmatics		Medicaid Managed Care Enrollees		Persistent Asthmatic Prevalence Rate per 100	
Race Group	2006	2007	2006	2007	2006	2007
Non-Hispanic White	9,885	10,257	259,611	262,664	3.8	3.9
Non-Hispanic Black	12,865	12,711	249,026	234,379	5.2	5.4
Non-Hispanic Other	2,636	2,577	64,134	61,467	4.1	4.2
Hispanic	20,858	19,361	380,437	344,301	5.5	5.6
Native America	164	173	4,695	4,823	3.5	3.6
Asian/Pacific Islander	2,761	3,038	115,730	128,566	2.4	2.4

*24 months continuous enrollment.

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

Hispanic enrollees had the highest prevalence rate of persistent asthma (5.5% in 2006 and 5.6% in 2007), followed by non-Hispanic Black enrollees (5.2% in 2006 and 5.4% in 2007). Asian or Pacific Islander enrollees had the lowest prevalence rate at 2.4% in both 2006 and 2007. (Figure 9-6, Table 9-5).

Figure 9-7
Persistent Asthmatic Prevalence* by Region, Medicaid Managed Care Population, New York State, 2006-2007



*24 months continuous enrollment.

Table 9-6
Persistent Asthmatic Prevalence* by Region, Medicaid Managed Care Population, New York State, 2006-2007

	Persistent Asthmatics		Medicaid Managed Care Enrollees		Persistent Asthmatic Prevalence Rate per 100	
Race Group	2006	2007	2006	2007	2006	2007
New York City	36,989	35,775	831,453	802,368	4.4	4.5
Rest of State	13,338	13,435	261,586	252,005	5.1	5.3

*24 months continuous enrollment.

Persistent asthmatic prevalence among MMC enrollees varied by region. Rest of State residents had a higher prevalence rate of persistent asthma (5.1% in 2006 and 5.3% in 2007) compared to New York City residents (4.4% in 2006 and 4.5% in 2007) (Figure 9-7, Table 9-6).

Methodology

Information about the utilization of health services was generated for the NYS MMC asthmatic population. This information corresponds to the universe asthmatics (see definition on page 134), aged 0-64 years, who were continuously enrolled in MMC for a twelve-month period as of December 2006 or December 2007.

The total number of services or claims associated with asthma that were covered by MMC was generated based on primary diagnosis with an International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code of 493 for physician, outpatient, emergency department (ED) visits, inpatient hospital services, and drug formulary code for pharmacy claims. The numbers of these services or claims per 100 asthma universe population are also provided. Results are presented for total population, by age group and geographic region (New York City and Rest of State).

Health care utilization information was only available for the MMC population. This information is presented by type of health care service or claim. Utilization of asthma-related health services was not available for the Medicaid FFS population.

Table 9-7
Asthma-Related Utilization by Type of Health Care Service by Age Group, Medicaid Managed Care Asthma Universe Population, New York State, 2006-2007

	Age Group	Asthma Universe	Physician Visits	Outpatient Clinic Visits	ED Visits	Hospital-izations	Pharmacy Claims
2006	0–4	32,460	37,847	12,046	8,511	2,761	142,362
	5–9	33,868	39,393	13,254	7,208	1,478	220,022
	10–17	31,615	32,790	10,774	5,829	1,102	201,871
	18–56	56,266	54,062	18,521	12,170	2,325	448,596
	57–64	7,995	6,156	2,797	837	428	87,502
	Total	*162,204*	*170,248*	*57,392*	*34,555*	*8,094*	*1,100,353*
2007	0–4	31,503	37,085	9,788	8,179	1,830	137,161
	5–9	32,402	38,165	11,050	6,468	1,097	211,208
	10–17	29,981	30,938	9,290	5,290	770	193,153
	18–56	57,949	56,265	17,584	12,420	2,043	469,580
	57–64	9,928	7,683	3,330	1,226	461	113,751
	Total	*161,763*	*170,136*	*51,042*	*33,583*	*6,201*	*1,124,853*

Table 9-8
Asthma-Related Utilization by Type of Health Care Service and by Region,
Medicaid Managed Care Asthma Universe Population, New York State, 2006-2007

	Region	Asthma Universe	Physician Visits	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Claims
2006	New York City	115,114	113,732	50,511	27,019	6,458	805,523
	Rest of State	47,090	56,516	6,881	7,536	1,636	294,830
2007	New York City	113,736	116,585	44,079	26,440	5,039	820,742
	Rest of State	48,027	53,551	6,963	7,143	1,162	304,111

Overall, there were 170,248 physician visits in 2006 and 170,136 in 2007; 57,392 outpatient clinic visits in 2006 and 51,042 in 2007; 34,555 ED visits in 2006 and 33,583 in 2007; 8,094 hospitalizations in 2006 and 6,201 in 2007 due to asthma among the asthma universe population. In addition, 1,100,353 asthma-related pharmacy claims were filled in 2006 and 1,124,853 were filled in 2007 (Table 9-7).

Table 9-9
Asthma-Related Utilization Rate (per 100 Asthma Universe Enrollees) by Type of Health Care Service and by Age Group,
Medicaid Managed Care Asthma Universe Population, New York State, 2006-2007

	Age Group	Physician Visits	Outpatient Clinic Visits	ED Visits	Hospital-izations	Pharmacy Claims
2006	0–4	116.6	37.1	26.2	8.5	438.6
	5–9	116.3	39.1	21.3	4.4	649.6
	10–17	103.7	34.1	18.4	3.5	638.5
	18–56	96.1	32.9	21.6	4.1	797.3
	57–64	77.0	35.0	10.5	5.4	1,094.5
	Total	*105.0*	*35.4*	*21.3*	*5.0*	*678.4*
2007	0–4	117.7	31.1	26.0	5.8	435.4
	5–9	117.8	34.1	20.0	3.4	651.8
	10–17	103.2	31.0	17.6	2.6	644.3
	18–56	97.1	30.3	21.4	3.5	810.3
	57–64	77.4	33.5	12.3	4.6	1,145.8
	Total	*105.2*	*31.6*	*20.8*	*3.8*	*695.4*

The service or claim rates per 100 asthma universe individuals in each service category varied by age. The rates for physician visits were highest among children aged 0-4 years and 5-9 years (116 visits per 100 asthma universe enrollees in 2006 and 118 per 100 in 2007) and lowest among adults aged 57-64 years (77 per 100 in 2006 and 2007).

There were few differences in asthma outpatient visit rates among age groups, with an overall rate of 35 and 32 visits per 100 asthma universe individuals in 2006 and 2007, respectively.

Asthma ED visit rates varied by age group, with the highest rate among children aged 0-4 years (26 per 100 both in 2006 and 2007) and the lowest rate among adults aged 57-64 years (11 per 100 in 2006 and 12 per 100 in 2007).

Hospitalizations due to asthma were also highest among very young children aged 0-4 years (9 per 100 in 2006 and 6 per 100 in 2007). Hospitalization rates due to asthma decreased between 2006 and 2007 for all age groups.

Asthma-related pharmacy claim rates increased with age. The highest rate of asthma- related pharmacy claims was among adults aged 57-64 years (1,095 claims per 100 in 2006 and 1,146 claims per 100 in 2007) (Table 9-9).

Table 9-10
Asthma-Related Utilization Rate (per 100 Asthma Universe Enrollees) by Type of Health Care Service and by Region, Medicaid Managed Care Asthma Universe Population, New York State, 2006-2007

	Region	Physician Visits	Outpatient Visits	ED Visits	Hospital-izations	Pharmacy Claims
2006	New York City	98.8	43.9	23.5	5.6	699.8
	Rest of State	120.0	14.6	16.0	3.5	626.1
2007	New York City	102.5	38.8	23.2	4.4	721.6
	Rest of State	111.5	14.5	14.9	2.4	633.2

The service or claim rates per 100 asthma universe individuals in each service category varied by region.

Physician visit rates were higher for MMC asthma universe enrollees in the Rest of State (120 per 100 asthma universe enrollees in 2006 and 112 per 100 in 2007) compared to those in New York City (99 per 100 in 2006 and 103 per 100 in 2007).

However, MMC asthma universe enrollees in New York City had a much higher outpatient clinic visit rate (44 per 100 in 2006 and 39 per 100 in 2007) than MMC asthma universe enrollees from the Rest of State (15 per 100 in 2006 and 2007). In addition, rates of ED visits were also higher for MMC enrollees with asthma who reside in New York City (24 per 100 in 2006 and 23 per 100 in 2007) compared to those in the Rest of State (16 per 100 in 2006 and 15 per 100 in 2007).

Asthma hospitalizations among MMC enrollees were also much higher for those living in New York City (6 per 100 in 2006 and 4 per 100 in 2007) than in the Rest of State (4 per 100 in 2006 and 2 per 100 in 2007). There were small differences in asthma- related pharmacy claim rates for MMC asthma universe enrollees when comparing New York City (700 claims per 100 in 2006 and 722 per 100 in 2007) and the Rest of State (626 per 100 in 2006 and 633 per 100 in 2007) (Table 9-10).

Managed Care Quality Assurance Reporting Requirement Asthma-Specific Indicator

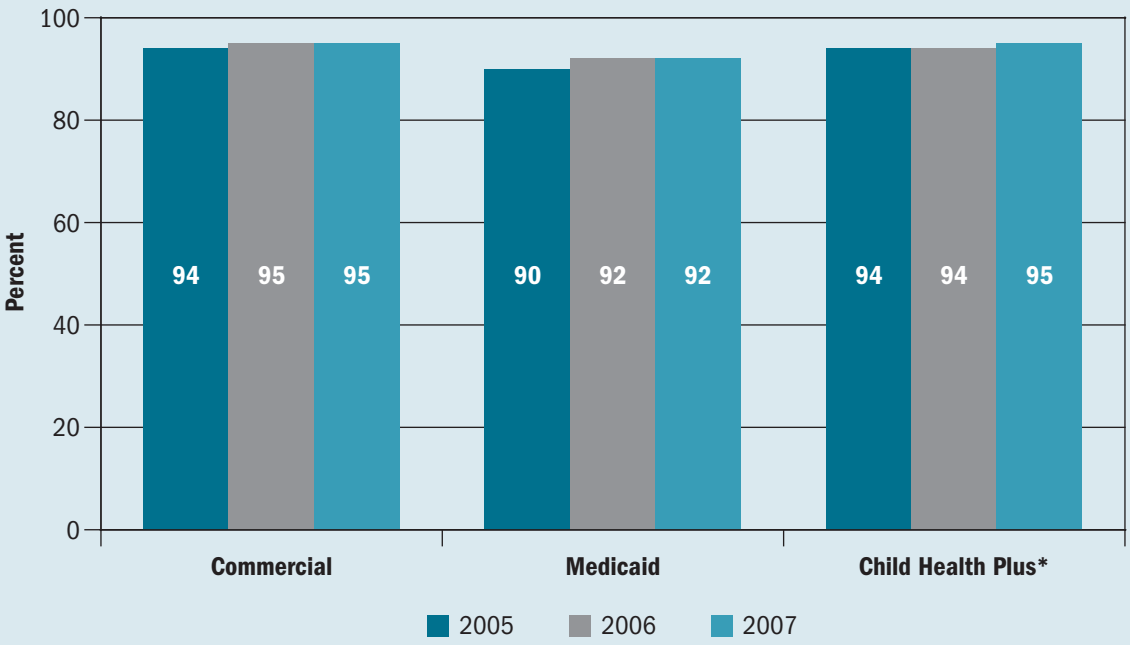
Methodology

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®) 2006-2008[22-24] and NYS-specific measures. This report presents: "Use of Appropriate Medications for People with Asthma" for 2006-2008, a measure for asthma

The QARR measure for asthma care is the percentage of enrollees 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 2005, 2006 or 2007.

The QARR measure for asthma in this report contains summary information for 2007 data from 31 health plans. Sixteen plans reported data about their commercial enrollees; 23 plans reported on their Medicaid enrollees; and 22 plans reported on Child Health Plus enrollees. The measure was generated for children aged 5-17 years and adults aged 18-56 years and by type of plan.

Figure 9-8
Percent of Children (5–17 Years) with Persistent Asthma Who Received Appropriate Medications by Type of Plan, New York State, 2005-2007

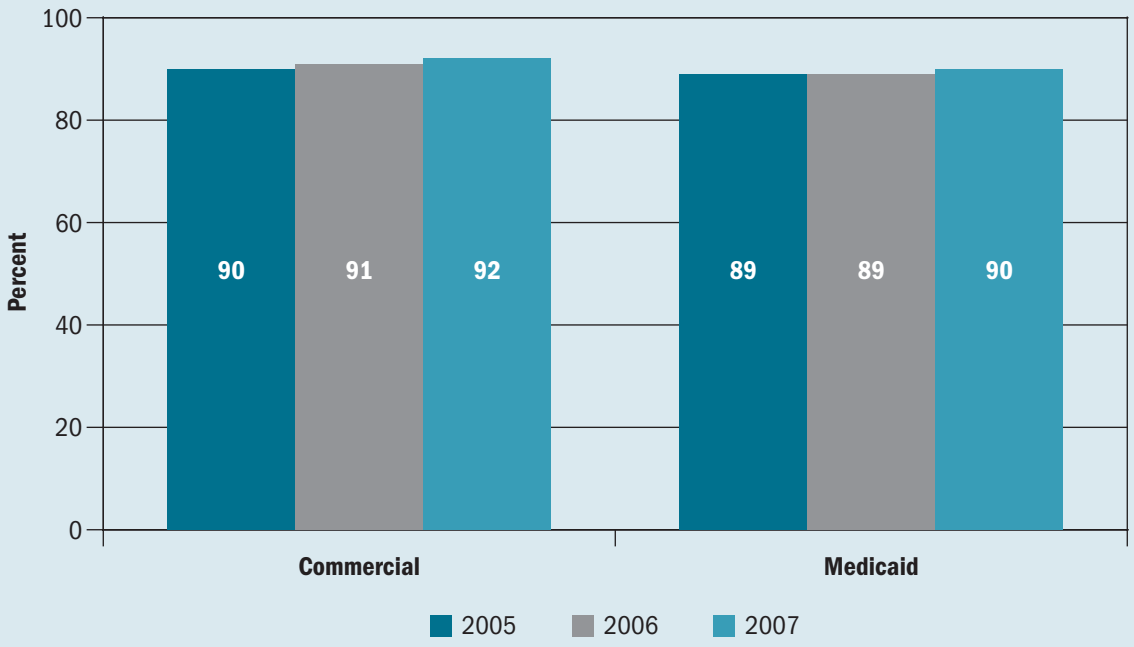


*Child Health Plus data included children aged 5-18 years.

The proportion of children aged 5–17 years with persistent asthma who received appropriate medications increased slightly between 2005 and 2007.

In 2007, among persistent asthmatic children, 95% of enrollees of either Commercial or Child Health Plus plans received appropriate medications for asthma; 92% of persistent asthmatic children enrolled in MMC plans received appropriate medications (Figure 9-8).

Figure 9-9
Percent of Adults (18–56 Years) with Persistent Asthma Who Received Appropriate Medications by Type of Plan, New York State, 2005-2007



Among persistent asthmatic adults aged 18-56 years, the proportion of adults who received appropriate medications for asthma increased slightly from 2005 to 2007 for both Commercial insurance and MMC plans.

In 2007, adults with persistent asthma who were enrolled in Commercial plans showed a slightly higher proportion of receiving appropriate medications compared to those enrolled in MMC plans (92% and 90%, respectively) (Figure 9-9).

10

Work-Related Asthma

In the United States (U.S.), as in other industrialized countries, asthma of occupational etiology causes a largely unrecognized burden of preventable disease and disability.[25] In the last decade, work-related asthma (WRA) has become the most frequently diagnosed occupational respiratory disease in developed countries. Estimates of the proportion of asthma in the adult population that are work-related range from 2% to 26%.[26] In the U.S., it is estimated that there are more than 20 million workers potentially exposed to occupational asthmagens.[27] WRA can present as a new condition or it can be work-aggravated asthma. It can be triggered by either irritants or sensitizers, of which more than 350 have been documented.[28, 29] Cases identified as WRA most likely represent only a small proportion of all cases of WRA. It can be difficult to distinguish a diagnosis of definitive WRA from asthma of a non-occupational origin.

The prognosis for a case of WRA depends on the severity and duration at the time of diagnosis. The most effective clinical approach is to avoid or modify exposure to the agent(s) causing the asthma or triggering asthma symptoms. Optimally, industrial hygiene measures can prevent exposures from occurring in the first place.

Highlights: Work-Related Asthma

Work-Related Asthma Prevalence

- For 2005, approximately 11.4% of adult asthmatics 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 (see the *New York State Asthma Surveillance Summary Report 2007* for additional information). [30]

Work-Related Asthma Hospital Discharges

- For 1998-2007, work-related asthma hospital discharges ranged from 47 to 72 per year in New York State.
- The mean length of stay for a work-related asthma hospitalization decreased over time from 4.3 to 4.0 days, while the average cost increased for the 1998-2007 time period.
- The cost of a work-related asthma hospitalization in 2007 was approximately $630,000.

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 73 patients in 1998 to 329 patients in 2004.

New York State Occupational Lung Disease Registry

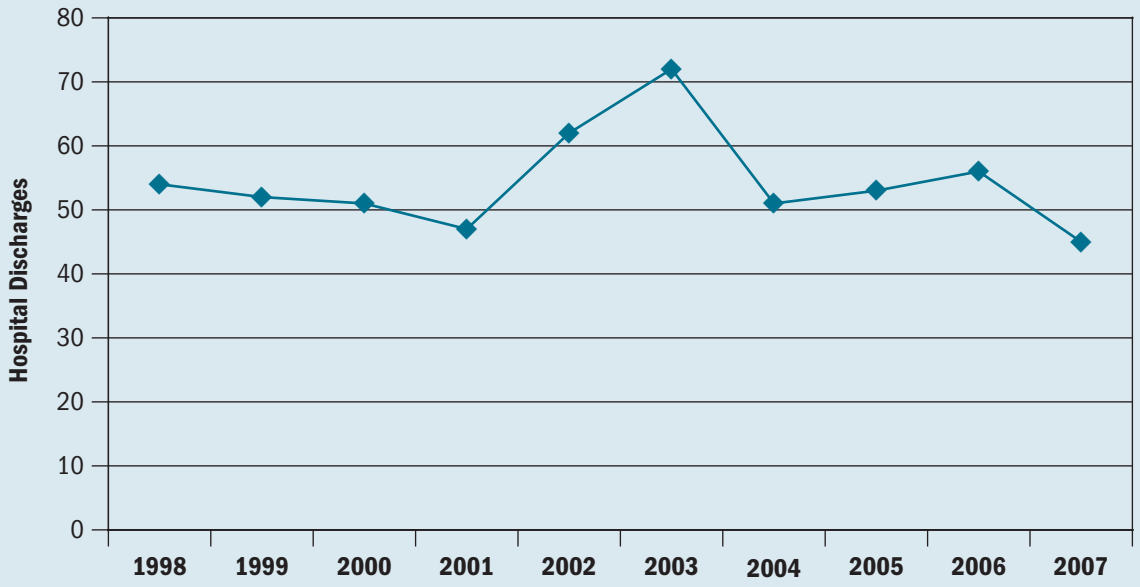
- The number of work-related asthma cases reported to the New York State Occupational Lung Disease Registry in the past 10 years, by year of first visit, ranged from 29 patients in 1999 to 157 patients in 2005.

Methodology

Hospital discharge information from the Statewide Planning and Research Cooperative System (SPARCS) was reviewed for years 1998 through 2007 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 primary expected payer was 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, longshore and maritime workers are not covered by state Workers' Compensation systems. The attribution of payer in the hospital discharge dataset may not be accurate — this represents expected payer at time of admission and may not actually be the payment source. Therefore, the data are considered an under-representation of the actual number of individuals hospitalized with WRA.

Figure 10-1
Annual Work-Related Asthma Hospital Discharges, New York State, 1998-2007



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Asthma Hospital Discharges	54	52	51	47	62	72	51	53	56	45

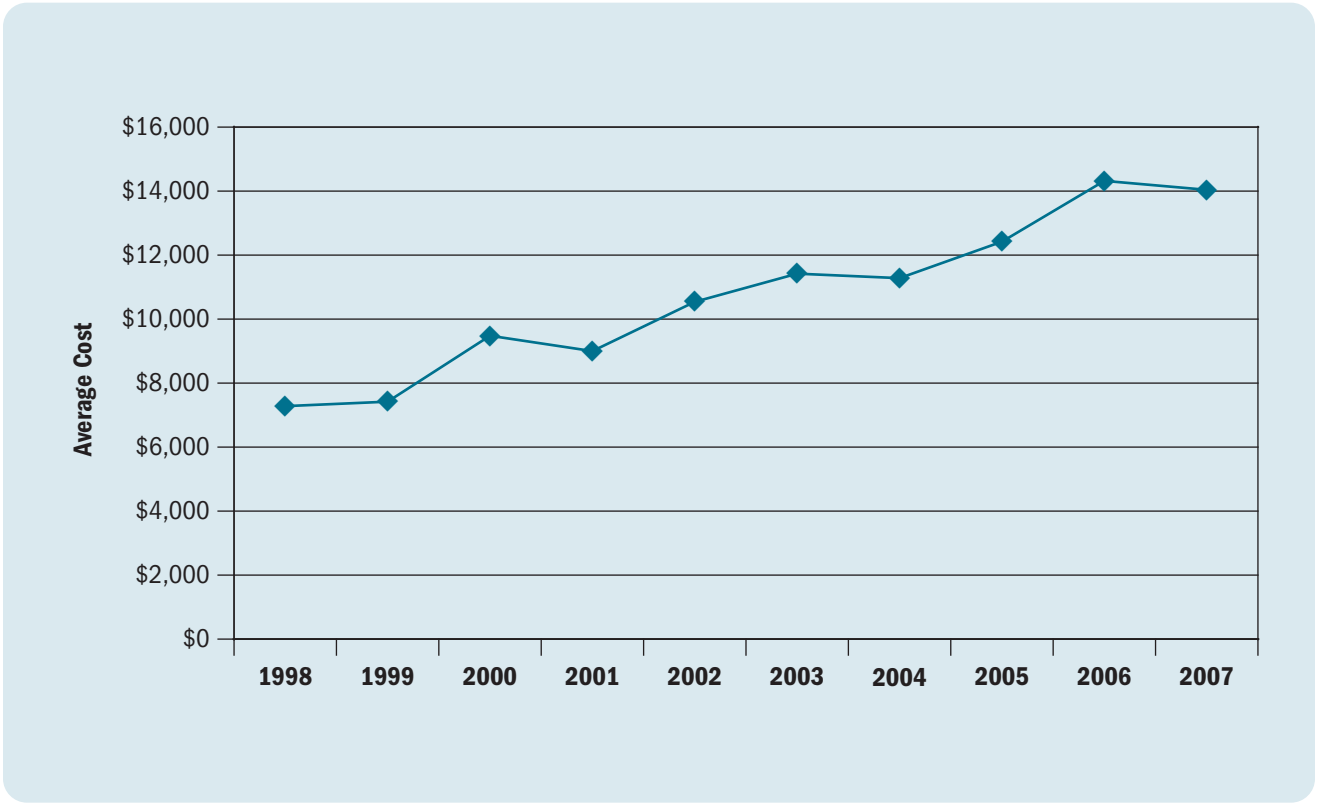
From 1998 to 2007, the number of annual WRA hospitalizations among NYS residents decreased approximately 17% from 54 to 45 with a peak at 72 in 2003 (Figure 10-1).

Figure 10-2
Average Length of Stay for Work-Related Asthma Hospitalizations, New York State, 1998-2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Average Length of Stay (Days)	4.3	4.3	5.1	4.3	4.2	4.1	3.8	3.4	4.0	4.0

For 1998-2007, the average length of stay for a WRA hospitalization decreased 7% from 4.3 days in 1998 to 4.0 days in 2007 (Figure 10-2).

Figure 10-3
Average Cost of Work-Related Asthma Hospitalizations, New York State, 1998-2007



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Average Cost	$7,274	$7,422	$9,470	$8,999	$10,542	$11,422	$11,274	$12,421	$14,313	$14,028

The average cost per WRA hospitalization steadily increased from 1998 to 2007. The average cost of a WRA hospitalization increased 93%, from $7,274 in 1998 to $14,028 in 2007.

Because the average cost for a WRA hospitalization was not adjusted for inflation, comparisons across years should be made with caution (Figure 10-3).

Figure 10-4
Total Cost of Work-Related Asthma Hospitalizations, New York State, 1998-2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total Cost	$392,777	$385,925	$482,993	$422,936	$653,579	$822,381	$574,973	$658,327	$801,526	$631,272

The total cost of WRA hospitalizations rose for the period 1998-2007. The total cost of WRA hospitalizations increased 61%,from $392,777 in 1998 to $631,272 in 2007, with peaks at $822,381 in 2003 and $801,526 in 2006.

Because the total cost of WRA hospitalizations was not adjusted for inflation, comparisons across years should be made with caution (Figure 10-4).

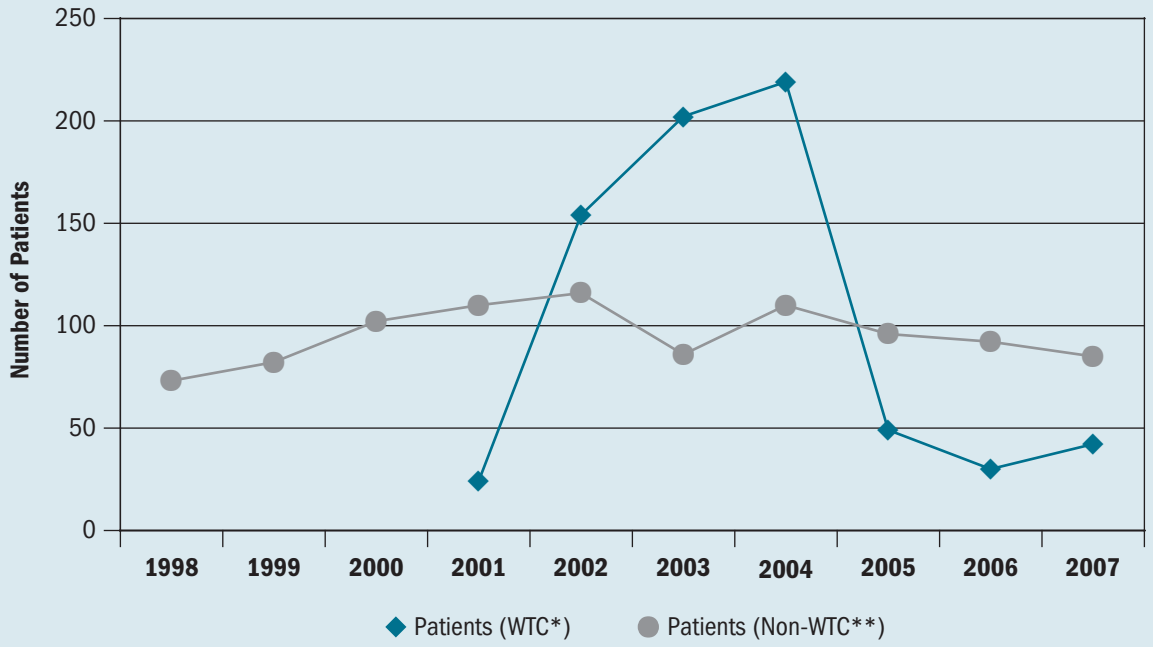
Methodology

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 workplaces of concern; and provide education and prevention programs. In aggregate, the clinics see approximately 5,000 workers each year from hundreds of workplaces. The clinics all 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 disaster. This report presents the number of cases seen in the clinics for 1998-2007 by year of the patient's first visit. For this time period, the OHCN was comprised of eight clinics.

It is recognized that clinic-based reporting suffers from problems with 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); therefore, it is unknown whether the patients seen by the clinic network are representative of the State's employed population.

Figure 10-5
Number of Work-Related Asthma Patients Seen by the New York State Occupational Health Clinic Network, by Year of First Visit, 1998-2007



*Patients that resulted from World Trade Center disaster.

**Patients that did not result from the World Trade Center disaster.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Patients (WTC*)	N/A	N/A	N/A	24	154	202	219	49	30	42
Patients (Non-WTC**)	73	82	102	110	116	86	110	96	92	85
Total Patients	*73*	*82*	*102*	*134*	*270*	*288*	*329*	*145*	*122*	*127*

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, increased 74% from 73 in 1998 to 127 in 2007, with a peak at 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 10-5).

Work-Related Asthma Incidence – New York State Occupational Lung Disease Registry

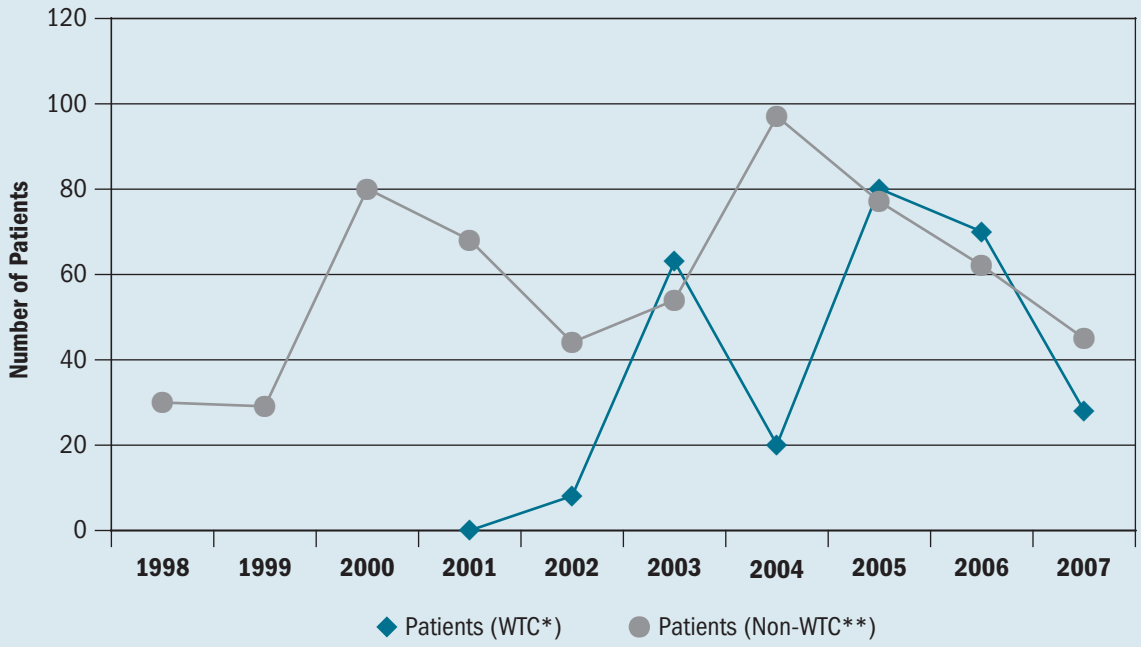
Methodology

The New York State Occupational Lung Disease Registry (OLDR) was originally 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 any cases of occupational lung disease to NYSDOH.

This section provides the number of work-related asthma patients reported to the New York State OLDR by year of first report for 1998-2007.

The OLDR has had problems with underreporting. From 2003 to 2005, NYS utilized National Institute for Occupational Safety and Health (NIOSH) Core Occupational Health Surveillance funding to enhance reporting to the registry. These efforts have substantially increased the number of reports received by the registry. These patients may also have been counted as hospital discharges or NYS OHCN visits.

Figure 10-6
Number of Suspected or Confirmed Work-Related Asthma Patients Reported to the New York State Occupational Lung Disease Registry by Year of First Report, 1998-2007



*Patients that resulted from World Trade Center disaster.

**Patients that did not result from the World Trade Center disaster.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Patients (WTC*)	N/A	N/A	N/A	0	8	63	20	80	70	28
Patients (Non-WTC**)	30	29	80	68	44	54	97	77	62	45
Total Patients	*30*	*29*	*80*	*68*	*52*	*117*	*117*	*157*	*132*	*73*

The number of WRA patients reported to the OLDR increased 143% from 30 in 1998 to 73 in 2007, with a peak at 157 in 2005. Over 40% of the cases reported to the OLDR since 2002 have been a result of the World Trade Center Disaster (Figure 10-6).

11

Asthma Costs

Highlights: Asthma Costs

Asthma Hospitalization Costs

- The total cost of asthma hospitalizations in New York State for 2007 was approximately $535 million, a 70% increase in the cost since 1998 ($315 million). The Consumer Price Index-adjusted asthma hospitalization cost increased 17% from the 1998 adjusted cost of $457 million.
- The average cost per asthma hospitalization increased 91% from $7,399 in 1998 to $14,107 in 2007. The average adjusted asthma hospitalization cost increased 31% over this time period. This occurred despite the average length of stay for an asthma hospitalization decreasing 10% from 4.0 days to 3.6 days for the same time period.
- The average cost per asthma hospitalization increased with age. The 2007 average costs ranged from $8,343 for the 0-4 year age group to $21,502 for those aged 65 years and older.
- Females had consistently higher average asthma hospitalization costs compared to males throughout 1998-2007. Females had a 2007 average cost of $15,419 compared to $12,150 for their male counterparts.
- Residents of New York City had consistently higher average costs per asthma hospitalization than residents from the Rest of State throughout 1998-2007. New York City residents had a 2007 average cost of $14,269 compared to $13,779 for those residing in the Rest of State.
- Medicare had the highest average cost of $21,142 among all sources of payment for 2007 asthma hospitalizations. This was followed by other third party or private insurance ($12,727), Medicaid ($12,224), and self-pay ($8,962).
- For 2005-2007, Medicaid accounted for 43% of the total asthma hospitalizations and incurred 37% of the total asthma hospitalization costs. Medicare, on the other hand, accounted for 23% of the total asthma hospitalizations and incurred 34% of the total asthma hospitalization costs.

Asthma Medicaid Managed Care Costs

- An estimated total of over $170 million was spent on more than 160,000 asthma universe individuals for asthma-related services in 2007 (an average cost of $1,069 per recipient). This accounted for 18% of the Medicaid managed care dollars for all health care services ($961 million) that were spent on the asthma universe population.
- In 2007, hospitalizations comprised 24% of the total asthma-related costs, with an average cost of $6,941 per hospitalization and $8,656 per recipient among the asthma universe population. Pharmacy costs comprised 61% of the total costs, with an average of $93 per claim and $737 per recipient.
- An average of $1,069 was spent per asthma patient among the Medicaid managed care population in 2007. The average cost was highest for patients aged 57-64 ($1,661) and lowest for patients aged 10-17 ($910).
- For 2007, about 67% of Medicaid managed care asthma-related costs were spent on pharmacy in the Rest of State while only 59% 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.
- New York City accounted for 76% of the total New York State Medicaid managed care asthma-related costs while serving 71% of the asthma universe population.

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 (e.g., nursing, pharmacy, laboratory, respiratory therapy, pulmonary function, etc.).

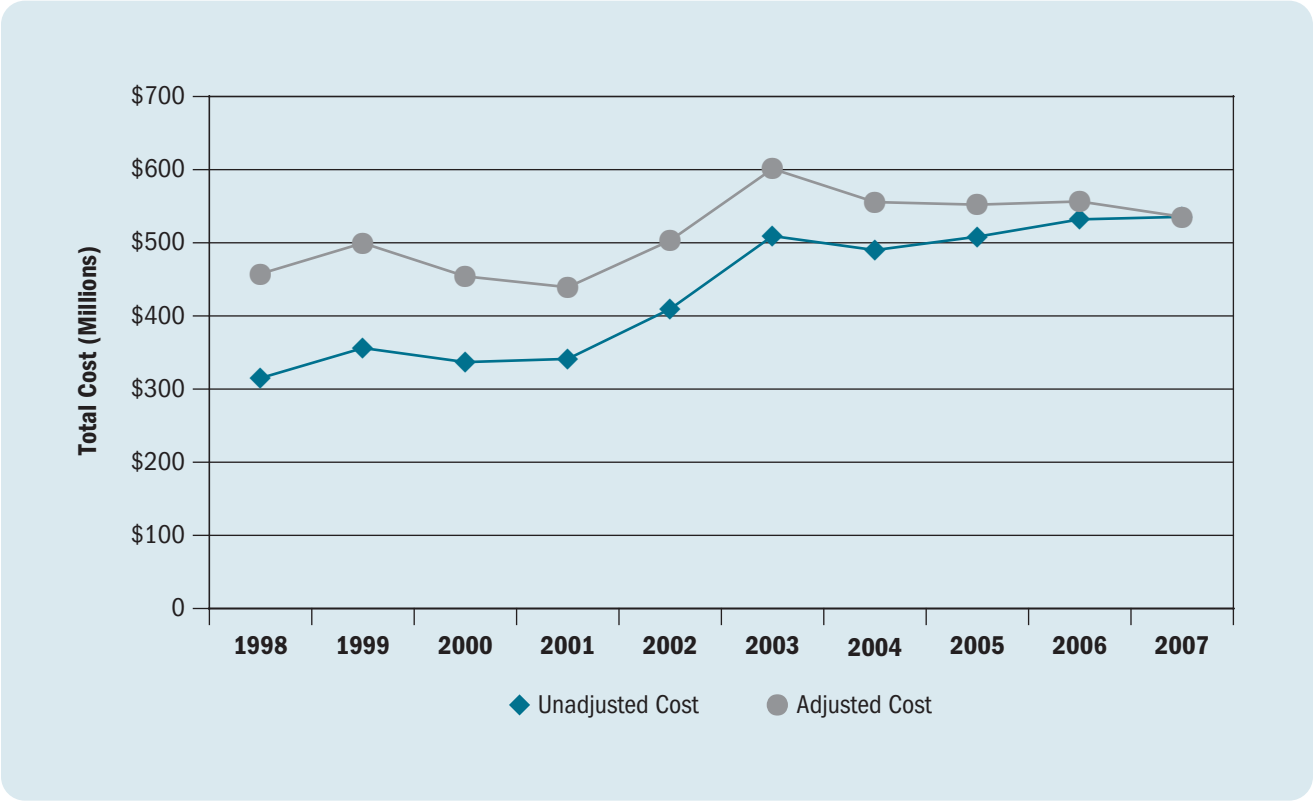
The crude and Consumer Price Index (CPI)-adjusted asthma hospitalization costs and average asthma hospitalization costs were calculated. Adjusted asthma hospitalization costs were calculated using the 2007 CPI[31] to adjust for inflation (see Appendix 2).

This report provides ten-year (1999-2008) trends 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 2005-2007 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, 1998-2007

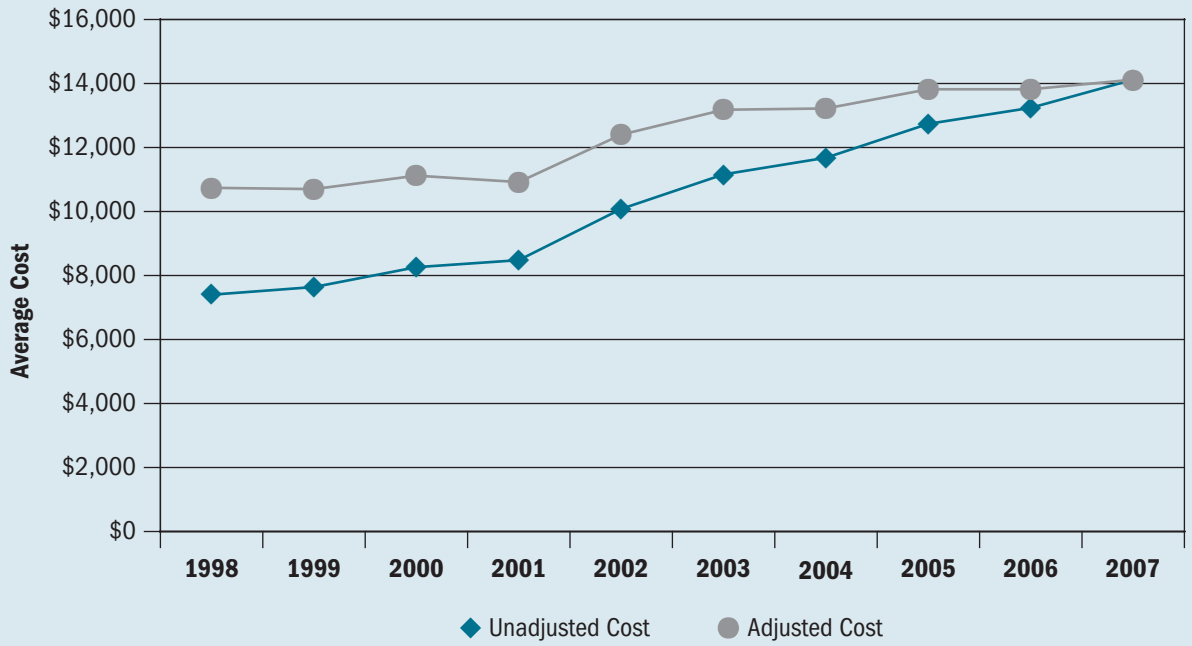


*Cost-adjusted using the 2007 Consumer Price Index.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total Cost (Millions)	$315	$356	$337	$341	$409	$509	$490	$508	$532	$535
Adjusted Total Cost (Millions)	$457	$499	$454	$439	$503	$601	$555	$552	$556	$535

There were increasing trends for both crude and adjusted total cost of asthma hospitalizations from 1998 to 2007. The crude total cost of asthma hospitalizations increased 70%, from $315 million in 1998 to $535 million in 2007. The adjusted total cost of asthma hospitalizations increased 17%, from $457 million in 1998 to $535 million in 2007 (Figure 11-1).

Figure 11-2
Average Crude and Adjusted* Cost per Asthma Hospitalization, New York State, 1998-2007

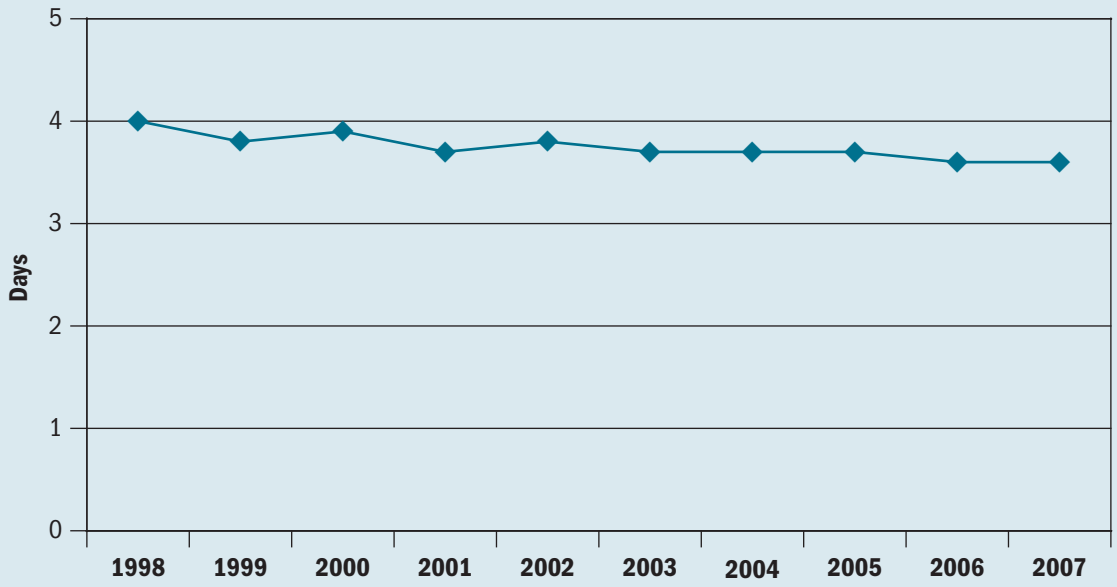


*Cost-adjusted using the 2007 Consumer Price Index.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Average Cost	$ 7,399	$ 7,630	$ 8,258	$ 8,477	$10,080	$11,147	$11,678	$12,725	$13,230	$14,107
Adjusted Average Cost	$10,729	$10,689	$11,116	$10,909	$12,390	$13,171	$13,220	$13,822	$13,815	$14,107

Increasing trends for both crude and adjusted average cost per asthma hospitalization were seen from 1998 to 2007. The average cost per asthma hospitalization increased 91%, from $7,399 in 1998 to $14,107 in 2007. The adjusted average cost per asthma hospitalization increased 31%, from $10,729 in 1998 to $14,107 in 2007 (Figure 11-2).

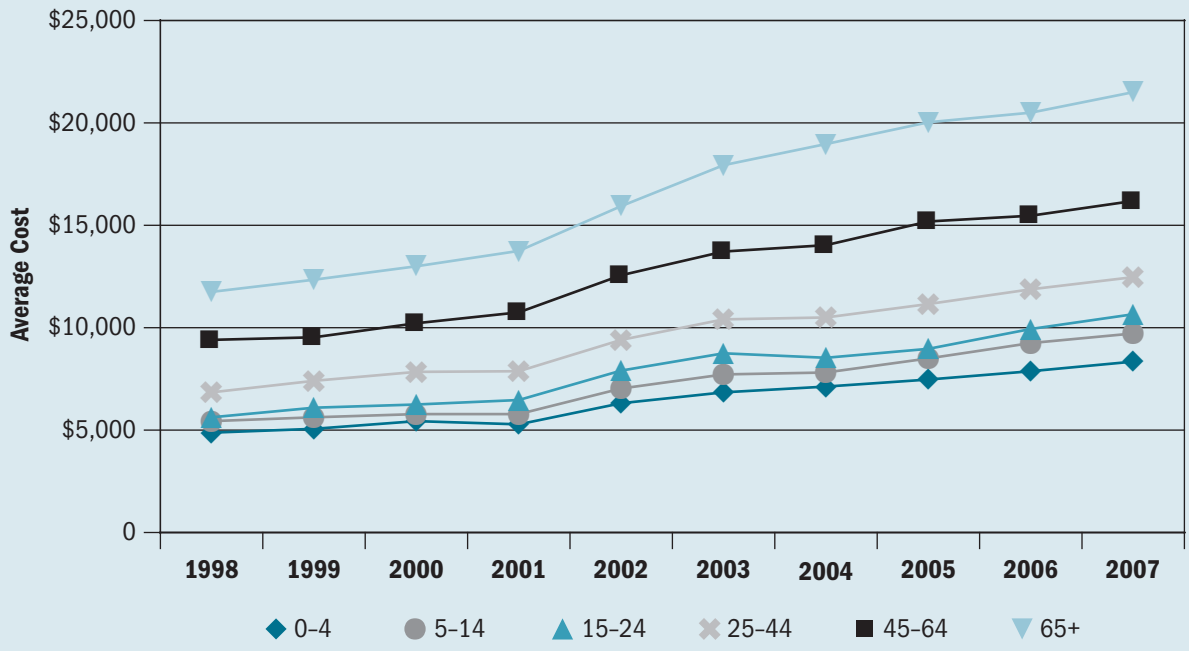
Figure 11-3
Average Length of Stay for Asthma Hospitalizations, New York State, 1998-2007



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Average Length of Stay (Days)	4.0	3.8	3.9	3.7	3.8	3.7	3.7	3.7	3.6	3.6

For 1998-2007, the average length of stay for an asthma hospitalization decreased 10%, from 4.0 days in 1998 to 3.6 days in 2007 (Figure 11-3).

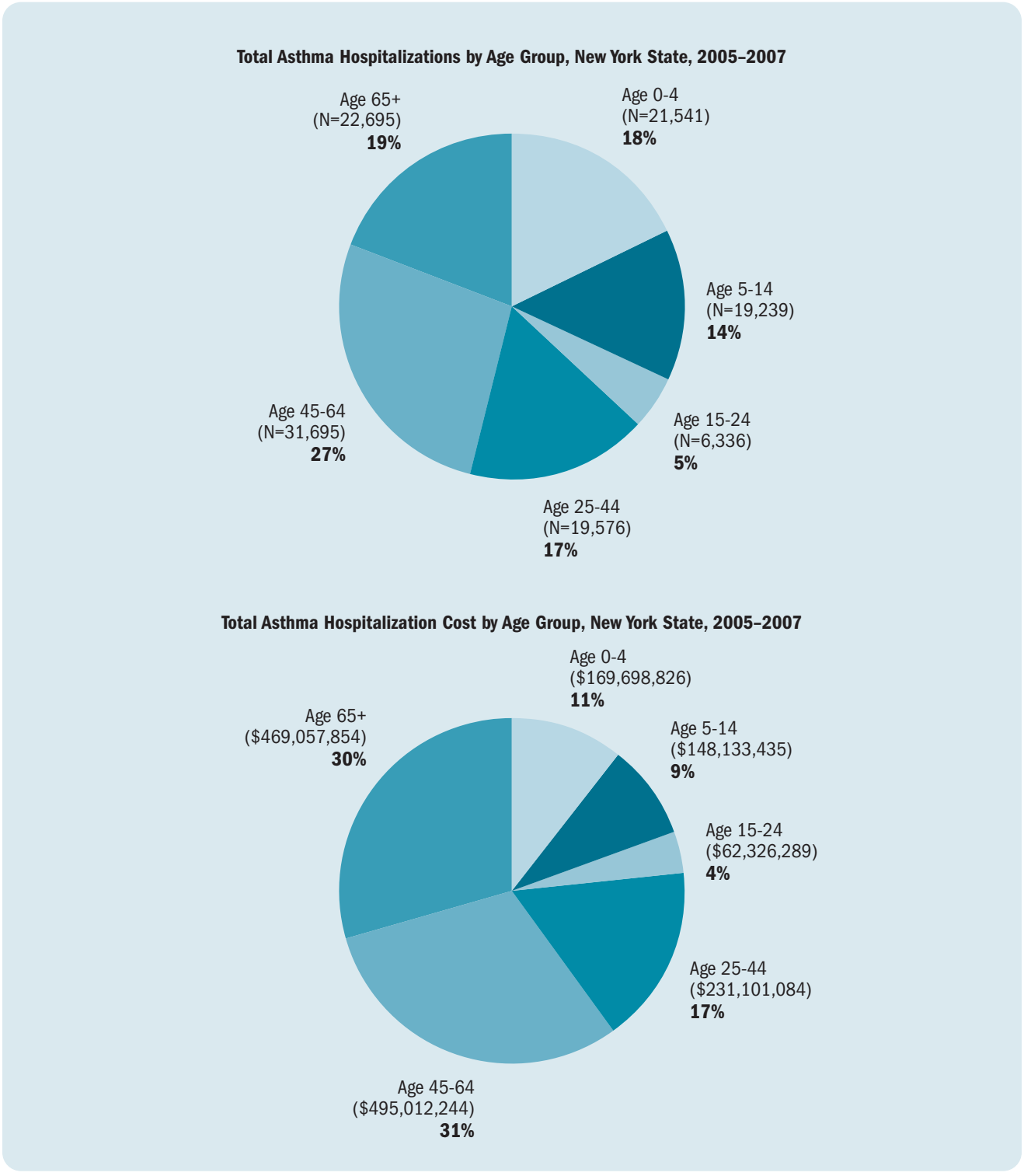
Figure 11-4
Average Cost per Asthma Hospitalization by Age Group, New York State, 1998-2007



Age Group	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
0–4	$ 4,853	$ 5,040	$ 5,415	$ 5,288	$ 6,293	$ 6,848	$ 7,105	$ 7,466	$ 7,873	$ 8,343
5–14	$ 5,423	$ 5,616	$ 5,775	$ 5,784	$ 7,008	$ 7,697	$ 7,820	$ 8,492	$ 9,241	$ 9,707
15–24	$ 5,627	$ 6,075	$ 6,250	$ 6,452	$ 7,910	$ 8,732	$ 8,524	$ 8,956	$ 9,927	$10,652
25–44	$ 6,843	$ 7,385	$ 7,831	$ 7,871	$ 9,385	$10,389	$10,502	$11,148	$11,867	$12,457
45–64	$ 9,410	$ 9,536	$10,196	$10,733	$12,542	$13,719	$14,037	$15,180	$15,467	$16,194
65+	$11,752	$12,320	$13,004	$13,732	$15,935	$17,914	$18,955	$20,027	$20,496	$21,502

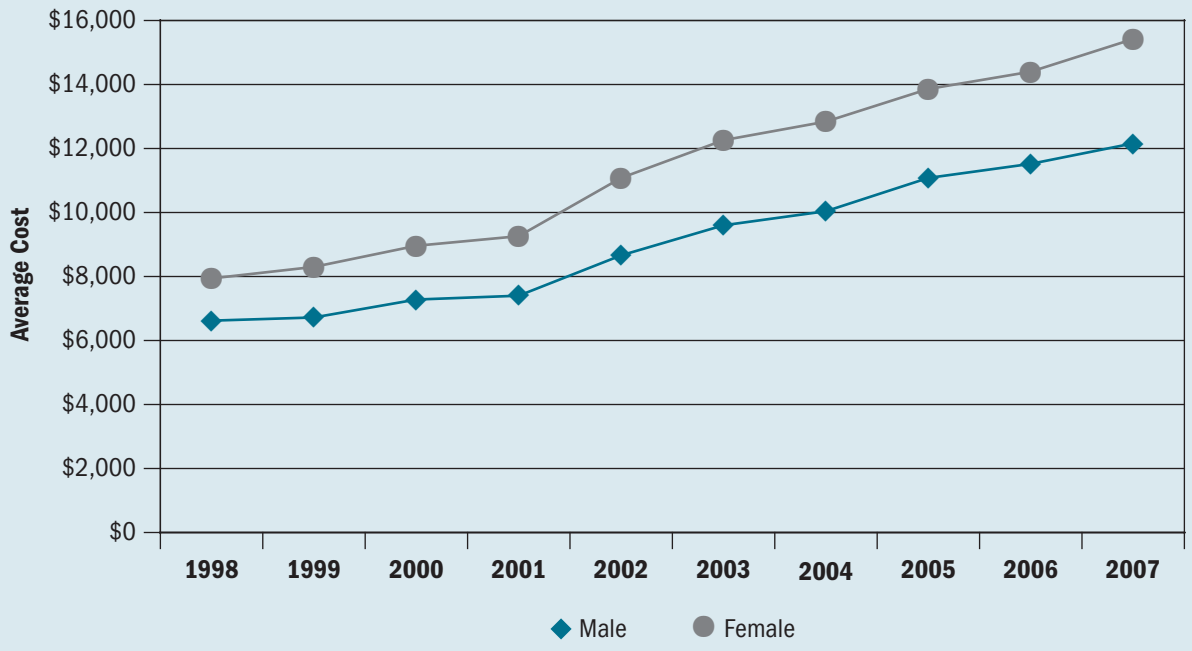
Average cost per asthma hospitalization for all age groups increased between 1998 and 2007 with the increases being greatest among older age groups. In addition, the average cost per asthma hospitalization increased with age in any given year. In 2007, the average cost for those aged 0-4 years was $8,343; the 65 year and older age group had an average cost of $21,502 (Figure 11-4).

Figure 11-5
Comparison of Number of Asthma Hospitalizations to Cost Incurred by Age Group, New York State, 2005-2007



For 2005-2007, asthma hospital discharges for the 0-4 year age group comprised 18% of all discharges, yet contributed only 11% to the total cost. Conversely, the 65 and older age group comprised 19% of the hospitalizations, yet accounted for 30% of the total cost (Figure 11-5).

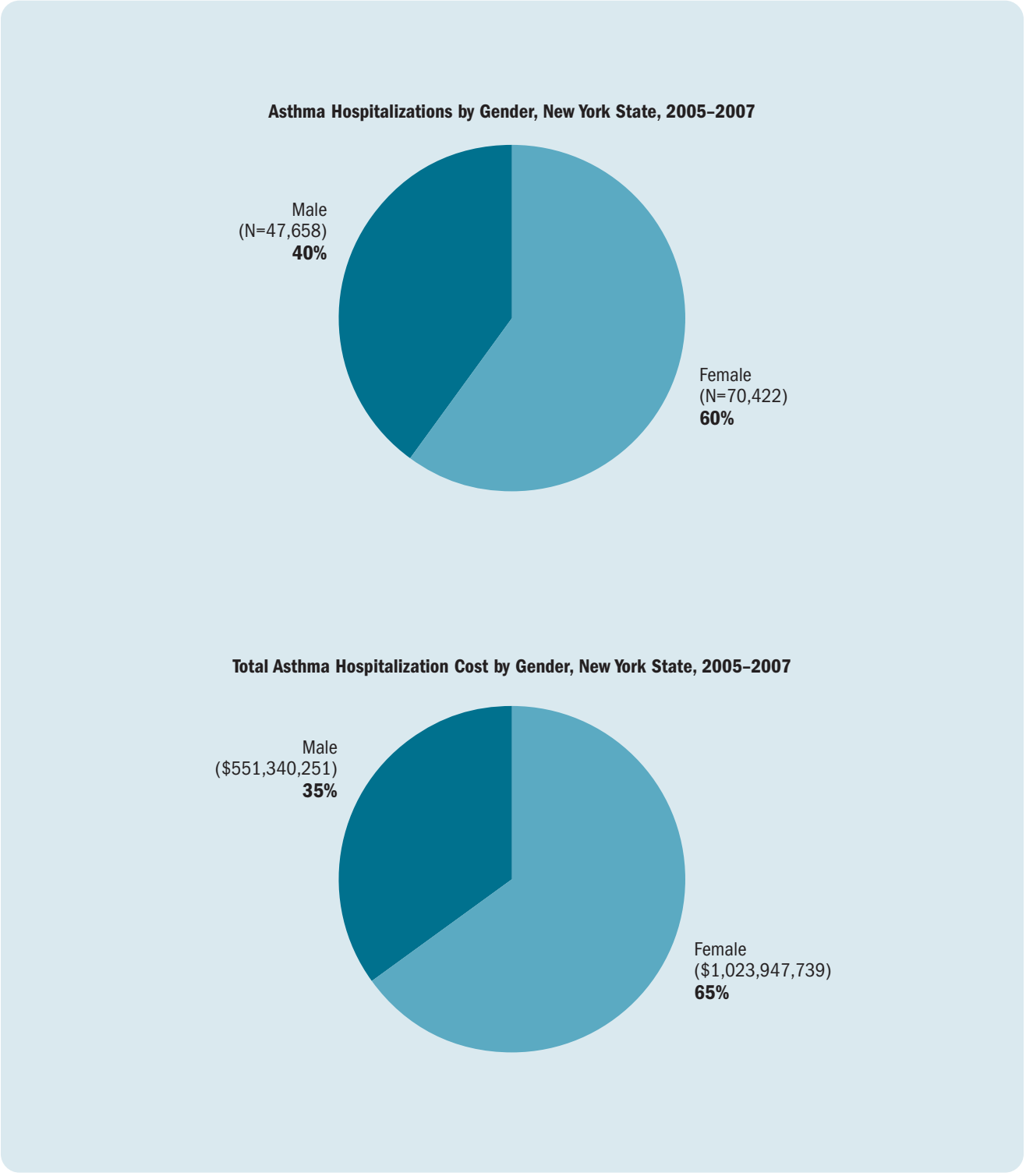
Figure 11-6
Average Cost per Asthma Hospitalization by Gender, New York State, 1998-2007



Gender	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Male	$6,612	$6,715	$7,269	$7,400	$ 8,661	$ 9,599	$10,038	$11,069	$11,521	$12,150
Female	$7,942	$8,291	$8,949	$9,254	$11,070	$12,253	$12,833	$13,855	$14,386	$15,419

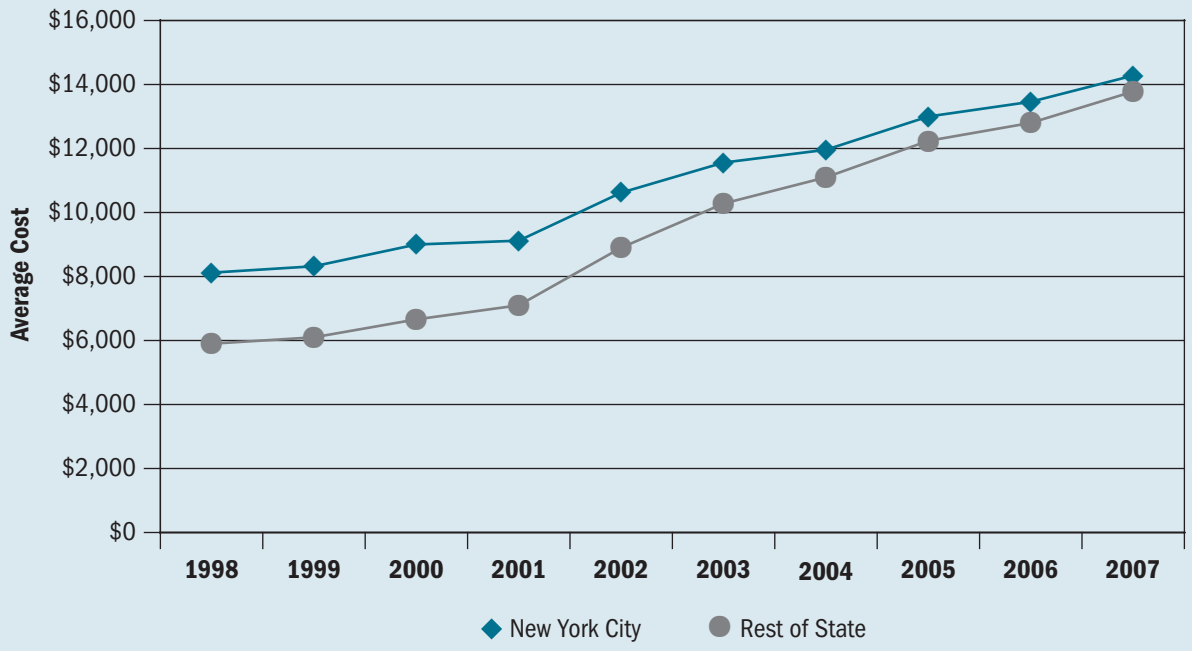
For 1998-2007, females had consistently higher average asthma hospitalization costs compared to males. In 2007, the average female asthma hospitalization cost of $15,419 was 27% higher than the male average cost of $12,150 (Figure 11-6).

Figure 11-7
Comparison of Number of Asthma Hospitalizations to Cost Incurred by Gender, New York State, 2005-2007



For 2005-2007, females comprised 60% of the asthma hospitalizations and incurred 65% of the total hospitalization costs (Figure 11-7).

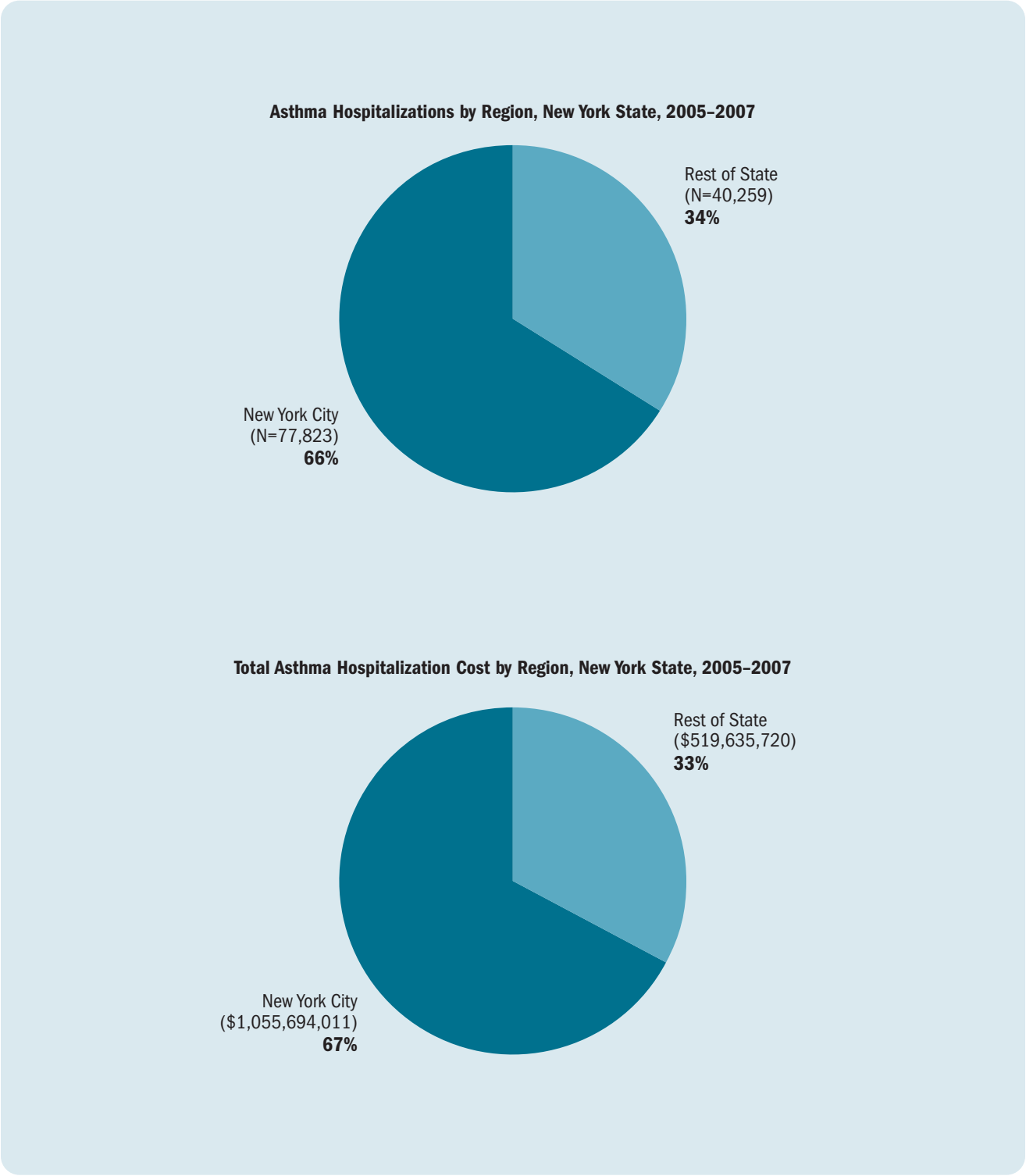
Figure 11-8
Average Cost per Asthma Hospitalization by Region, New York State, 1998-2007



Region	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
New York City	$8,110	$8,315	$8,996	$9,109	$10,624	$11,552	$11,962	$12,988	$13,456	$14,269
Rest of State	$5,903	$6,085	$6,664	$7,102	$ 8,897	$10,284	$11,093	$12,232	$12,796	$13,779

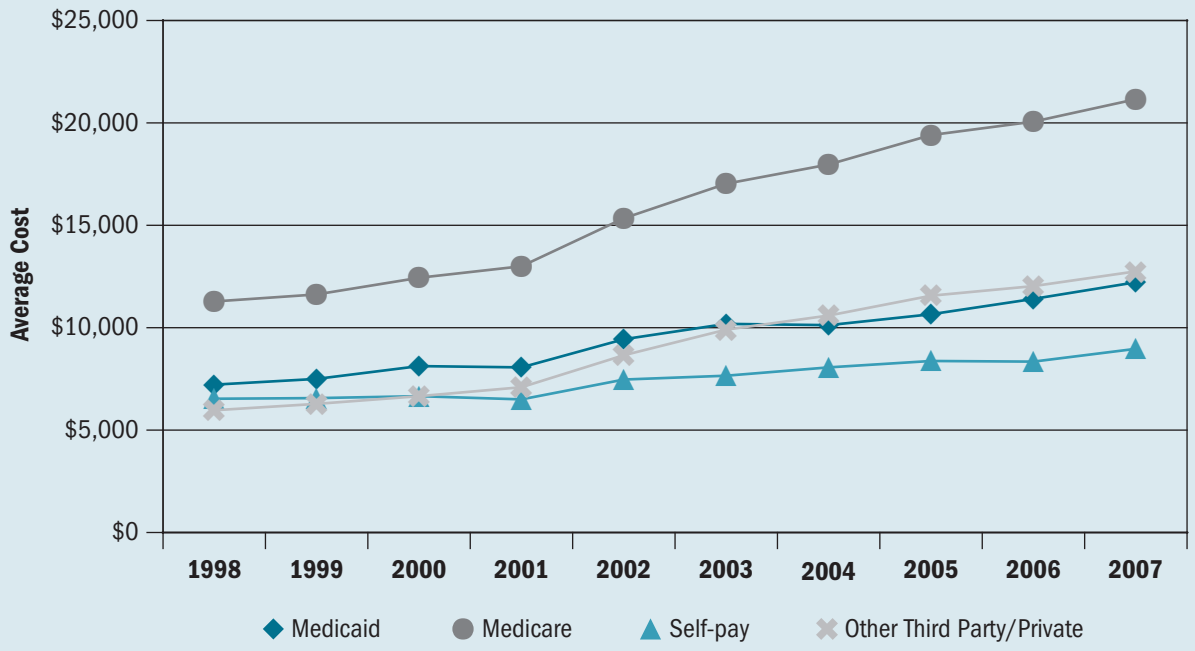
For 1998-2007, the average costs per asthma hospitalization were consistently higher for New York City ($14,269 in 2007) than the Rest of State ($13,779) (Figure 11-8).

Figure 11-9
Comparison of Number of Asthma Hospitalizations to Cost Incurred by Region, New York State, 2005-2007



For 2005-2007, New York City contributed 67% of the total number of asthma hospitalizations and incurred 67% of the asthma hospitalization costs (Figure 11-9).

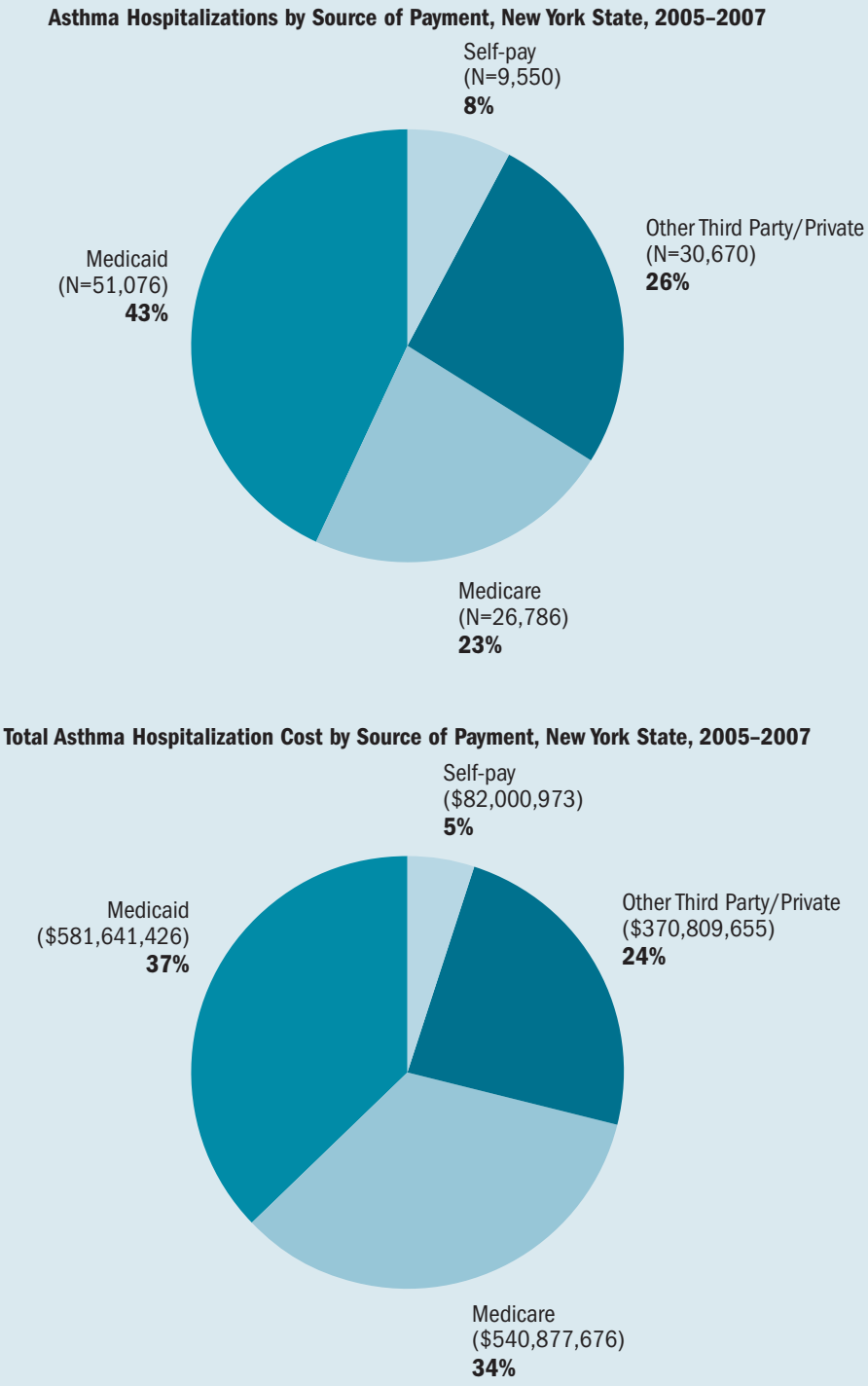
Figure 11-10
Average Cost per Asthma Hospitalization by Source of Payment, New York State, 1998-2007



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Medicaid	$ 7,210	$ 7,497	$ 8,103	$ 8,070	$ 9,421	$10,182	$10,103	$10,642	$11,411	$12,224
Medicare	$11,267	$11,625	$12,442	$12,999	$15,339	$17,030	$17,950	$19,388	$20,067	$21,142
Self-pay	$ 6,523	$ 6,556	$ 6,647	$ 6,479	$ 7,466	$ 7,636	$ 8,065	$ 8,380	$ 8,332	$ 8,962
Other Third Party/Private	$ 5,975	$ 6,277	$ 6,655	$ 7,070	$ 8,648	$ 9,884	$10,593	$11,566	$12,025	$12,727

The average asthma hospitalization costs were consistently the highest for the Medicare population. Between 1998 and 2007, the increase in average cost ranged from 37% for self-pay patients to 113% 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, 2005-2007



For 2005-2007, Medicaid accounted for 43% of the total asthma hospitalizations and incurred 37% of the total asthma hospitalization costs. Medicare, on the other hand, accounted for 23% of the total asthma hospitalizations and incurred 34% 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 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 in order 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 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 2007 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®) 2008 [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 plans, Prepaid Health Services Plans – PHSP, Partial Capitation plans) in 2007. 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 2007 were removed from the denominator of universe asthmatics 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, 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 2007 estimated MMC cost information for asthma-related services including: total and average cost per asthma universe enrollee, total and average cost per asthma-related service and average cost per recipient. The average cost per recipient and average cost per enrollee were generated by age group. The distribution of total costs for asthma-related services was analyzed by geographic region (New York City and Rest of State).

Table 11-1
Medicaid Managed Care Costs for the Asthma Universe* Population, New York State, 2007

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
160,126	$171,110,804	$961,334,928	18%	$1,069

*12 months continuous enrollment.

While 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 a total of over $170 million was spent on more than 160,000 asthma universe individuals for asthma-related services in 2007 (an average cost of $1,069 per recipient). This accounted for 18% of the MMC dollars for all health care services ($961 million) that were spent on the asthma universe population (Table 11-1).

Table 11-2
Medicaid Managed Care Total Cost, Average Cost per Service and per Recipient by Type of Asthma-Related Service for the Asthma Universe* Population, New York State, 2007

Asthma-Related Service	Total Costs	Percent Total	Number of Services	Average Cost per Service	Number of Recipients	Average Cost per Recipient
ED Visit	$ 5,023,607	2.9%	33,302	$ 151	20,706	$ 243
Hospitalization	$ 40,676,608	23.8%	5,860	$6,941	4,699	$8,656
Outpatient Visit	$ 21,918,479	12.8%	416,608	$ 53	98,856	$ 222
Pharmacy	$103,492,110	60.5%	1,112,112	$ 93	140,428	$ 737

*12 months continuous enrollment.

In 2007, hospitalizations comprised 24% of the total asthma-related costs, with an average cost of $6,941 per hospitalization and $8,656 per recipient among the asthma universe population. Pharmacy costs comprised 61% of the total costs, with an average of $93 per claim and $737 per recipient (Table 11-2).

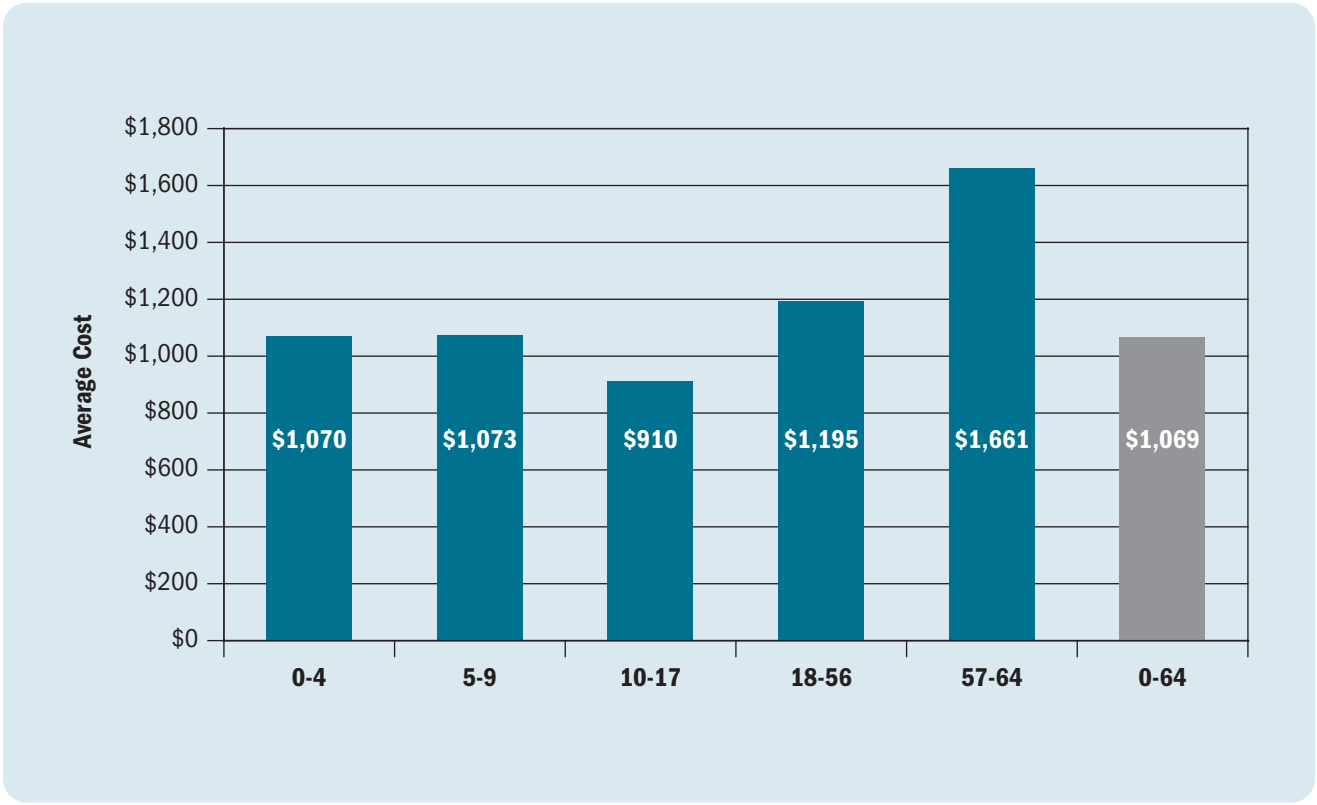
Table 11-3
Medicaid Managed Care* Average Asthma-Related Service Cost per Recipient by Age for the Asthma Universe* Population, New York State, 2007

Asthma-Related Service	0–4	5–9	10–17	18–56	57–64
ED Visit	$ 234	$ 227	$ 221	$ 266	$ 291
Hospitalization	$7,747	$7,968	$8,061	$9,833	$10,559
Outpatient Visit	$ 200	$ 208	$ 218	$ 232	$ 287
Pharmacy	$ 554	$ 717	$ 611	$ 832	$ 1,221

*12 months continuous enrollment.

There was great variation in the average asthma hospitalization and pharmacy costs per recipient among age groups in the MMC asthma universe population. The average asthma hospitalization costs increased 36%, from $7,747 in the 0-4 year age group to $10,559 in the 57-64 year age group. The average asthma pharmacy costs increased over two times, from $554 in the 0-4 year age group to $1,221 for asthmatics 57-64 years of age. The average asthma costs per recipient for outpatient visits increased with age. The average asthma costs per recipient for ED visits also varied by age group (Table 11-3).

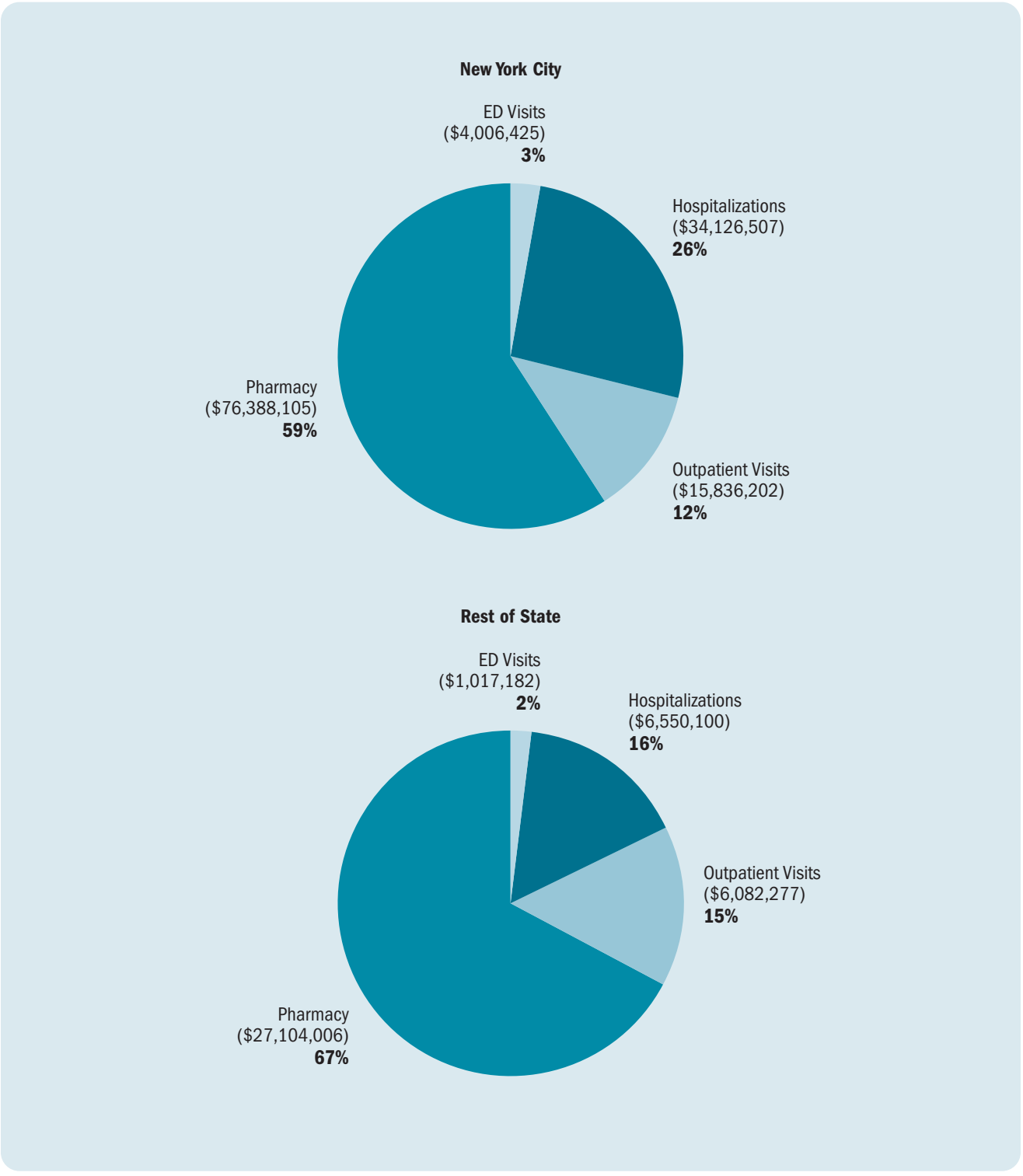
Figure 11-12
Medicaid Managed Care Average Asthma-Related Service Cost per Asthma Universe* Enrollee by Age Group, New York State, 2007



*12 months continuous enrollment.

An average of $1,069 was spent per asthma patient among the MMC population in 2007. The average cost was highest for patients aged 57-64 ($1,661) and lowest for patients aged 10-17 ($910) (Figure 11-12).

Figure 11-13
Distribution of Asthma Medicaid Managed Care Costs Among the Asthma Universe* Population by Region, New York State, 2007



*12 months continuous enrollment.

There were differences seen in patterns of asthma-related costs among the asthma universe population between New York City and the Rest of State. For 2007, about 67% of MMC asthma-related costs were spent on pharmacy in the Rest of State, while only 59% 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 (26% versus 16%, respectively). New York City accounted for 76% of the total NYS MMC asthma-related cost while serving 71% of the asthma universe population (Figure 11-13).

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 effective 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.

In the United States, the average person spends up to 90% of each day indoors.[32] For about 20% of the U.S. population, a considerable proportion of their indoor time each day is spent inside elementary and secondary school buildings.[32] In many cases, children and school staff who have asthma may be exposed to conditions inside these buildings that have the potential to exacerbate asthma. About one-fifth of the nation's schools have poor indoor air quality (IAQ), 27% report poor ventilation, 60% need major repairs to at least one building system and approximately half report having a program in place to maintain good IAQ.[33-35] Potential asthma triggers such as mold, allergens produced by dust mites, cockroaches and rodents, cleaning chemicals and diesel exhaust can exist in the school environment in quantities sufficient to exacerbate or even cause asthma.[36-41] Therefore, it is important to assess conditions in schools that can promote the existence of these and other asthma triggers.

Factors in the outdoor air can also affect people with asthma. When inhaled, outdoor pollutants such as ozone or fine particles can irritate the lungs and exacerbate an individual's asthma symptoms. These pollutants may vary seasonally or with changes in meteorological conditions such as temperature. In the northeastern U.S., summer ozone pollution has been associated with 10-20% of summertime respiratory hospital visits and admissions.[42] In U.S. and Canadian studies, the ozone-associated increase in daily respiratory hospital admissions ranged from 2-30% with daily ozone increments in the warm season that ranged from 20-40 parts per billion (ppb) for different ozone averaging times.[42] The association between ambient air particulate matter (PM) concentrations and asthma, including increased hospital admissions, is well documented.[43, 44] Models demonstrate 5-15% 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.[45]

The NYS Department of Environmental Conservation operates a network of air monitors located throughout NYS. This statewide network provides real-time information about levels of important air pollutants.[46] This pollutant information, combined with weather forecasts, is used to issue Air Quality Health Advisories. These advisories inform people to take precautions to reduce exposure on days with expected high pollutant levels. Data gathered from the monitoring network is also used to track pollutant levels over time.

There are many actions individuals and communities can take to reduce exposure to indoor and outdoor air pollutants (see www.health.state.ny.us/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

New York State School Building Condition Survey, 2005

- Although relatively few school buildings reported having visible mold (5.4%), almost 40% reported at least one type of moisture or humidity problem, which can indicate potential for mold growth.
- More than 10% of buildings reported potential diesel intrusion, dirt or dust near or in the ventilation system, and poorly functioning dampers. While fewer than 10% reported inadequate fresh air for ventilation, over one third (36.2%) didn't know whether the system was providing enough fresh air.
- Fewer than 5% of buildings reported rodents, cockroaches, wood eating insects or other pests.

Outdoor Air Quality

- For 2005-2007, 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 in New York City tended to decline over the period from 1997 to 2007.
- For 2005-2007, the number of days when fine particle concentrations were unhealthy for sensitive groups, such as asthmatics, 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 in New York City tended to decline over the period from 2000 to 2007.

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 School Building Condition Survey (BCS) is a physical inspection of NYS public school buildings, which 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 first BCS was completed in 2000 and a second, revised version was conducted in 2005. The BCS can be used to track environmental conditions in NYS public schools over time.

For each building or facility, inspectors rate the overall building condition, as well as the condition of 53 individual building systems (e.g., roof, plumbing, windows). In addition, the Center for Environmental Health worked with the NYS Education Department (NYSED) to incorporate a section pertaining to school IAQ into the 2005 BCS. 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, minimizes the intrusion of outdoor pollutants and is not a reservoir for dirt or debris. Adequate ventilation also dilutes any allergens or irritants that may be present in the school. Schools answered whether the following problems exist:

Ventilation System Problem	School Building Condition Survey Questions
Potential diesel intrusion	Are there fresh air intakes near the following: • The bus loading areas? • Truck delivery areas? • Garbage storage or 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. Visible mold.

Mold spores are a well known allergen and asthma trigger. Schools reported whether mold was visible in or around the following areas:

- Classrooms
- Common areas
- Supply or return grilles
- Other areas

3. *Moisture or humidity problems.*

Excessive moisture or humidity in a building can lead to the growth of mold, and can indicate the possibility of mold in visibly inaccessible places. Schools were asked whether the following types of moisture or humidity problems exist:

- Visible evidence of (current or past) water damage
- Active leaks in roof
- Active leaks in plumbing
- Moisture condensation

4. Vermin or pests.

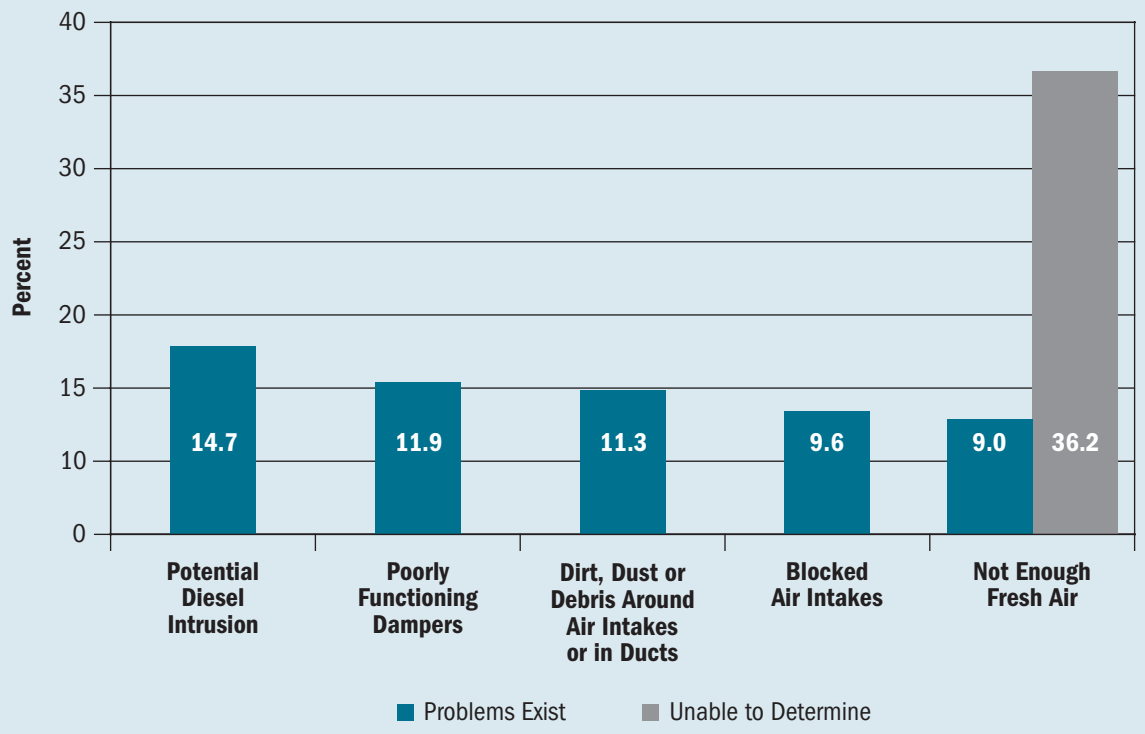
Certain pests, most notably rodents and cockroaches, produce allergens that can trigger asthma attacks or allergic reactions in building occupants. Schools were asked whether there was evidence of active infestations of:

- 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 3,271 NYS school buildings located outside of New York City (in 697 school districts, representing more than 99% 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 since 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 underway.

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.

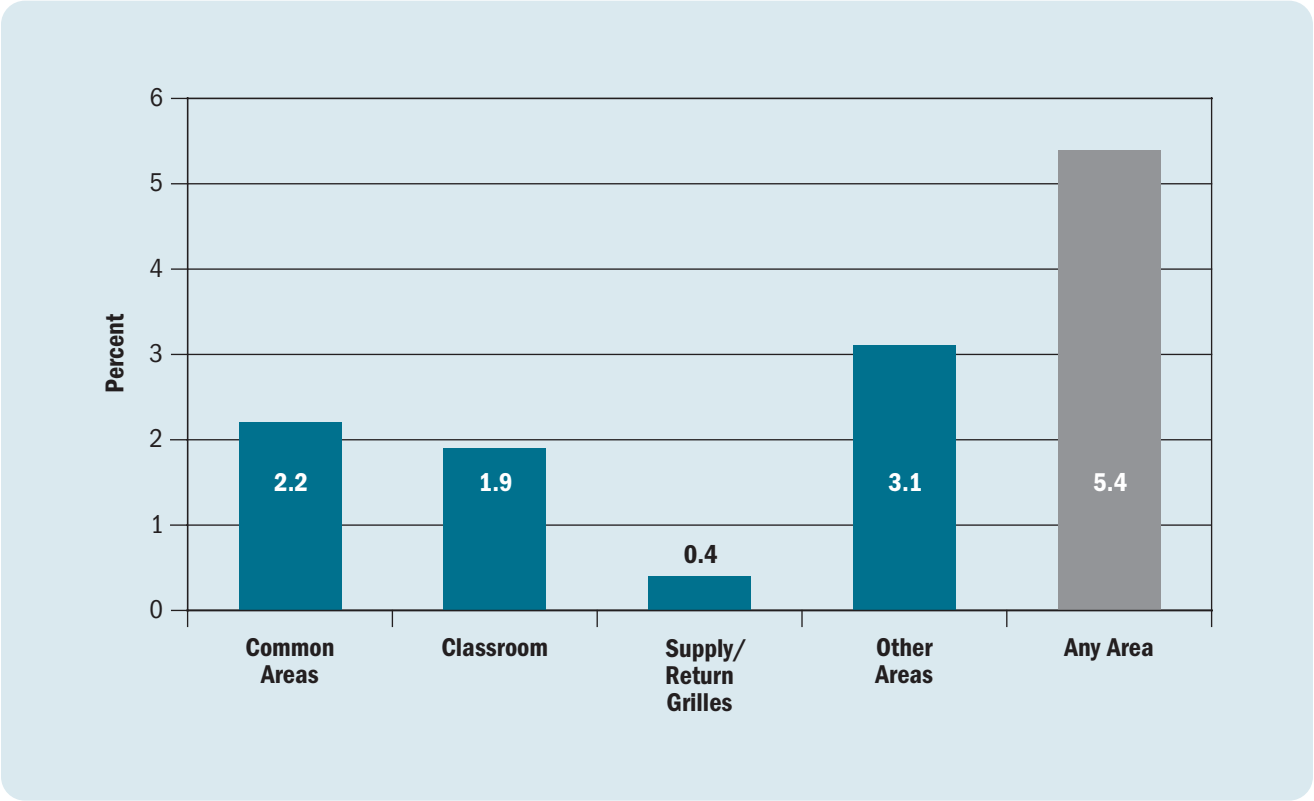
Figure 12-1
Percentage of Public School Buildings Reporting Ventilation System Problems, New York State (Excluding New York City), 2005 (N=3,271)



The proportion of missing values for individual problems ranges from 7.3%–15.3%.

Schools provided information about the presence of several different problems related to the ventilation system. The most commonly reported problem was potential diesel intrusion (14.7% of school buildings). This was measured by asking whether fresh air intakes were near sources of diesel pollution, including school bus loading areas, truck delivery areas or garbage storage or disposal areas. The next most commonly reported problem was dampers not functioning as designed (11.9% of school buildings). Dampers are important for regulating the flow of fresh air into the building. Dust, dirt or debris near fresh air intakes or ductwork was reported by 11.3% of school buildings and blocked air intakes were reported by 9.6% of buildings. Though less than 10% of buildings reported having an inadequate supply of outside air, this problem may be more common than indicated, since more than one-third of buildings (36.2%) reported not knowing if enough outside air was being provided (Figure 12-1).

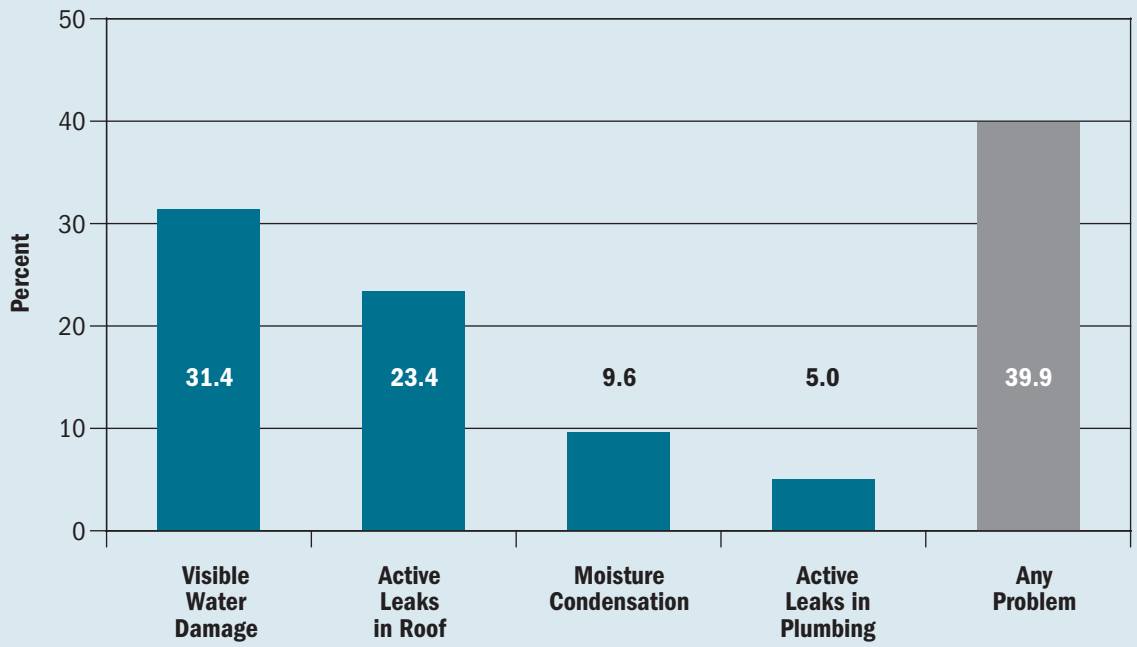
Figure 12-2
Percentage of Public School Buildings Reporting Visible Mold, New York State (Excluding New York City), 2005 (N=3,271)



The proportion of missing values for individual mold variables is less than 5.0%.

Schools provided information about the presence of visible mold in different areas of the building. Only 5.4% reported seeing mold anywhere in the building. Fewer than 5% reported mold in a particular area, with 1.9% reporting mold in classrooms, 2.2% reporting mold in common areas, less than 1% reporting mold in supply or return grills and 3.1% reporting mold in other areas (Figure 12-2).

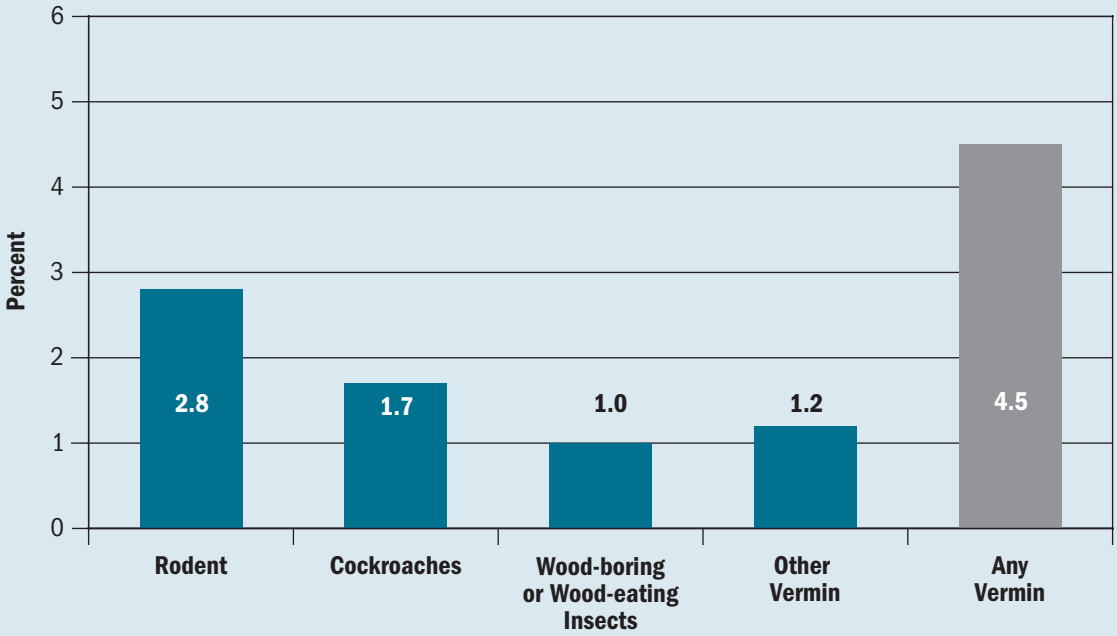
Figure 12-3
Percentage of Public School Buildings Reporting Moisture or Humidity Problems, by Type of Problem, New York State (Excluding New York City), 2005 (N=3,271)



Percent of buildings unable to determine if a problem exists is less than 5%.

Although most schools did not report visible mold, almost 40% reported at least one type of moisture problem in the building. Visible water damage was the most commonly reported problem (31.4% of buildings), followed by active roof leaks (23.4% of buildings), moisture condensation (9.6% of buildings) and active plumbing leaks (5.0% of buildings). These conditions can indicate past or present problems (Figure 12-3).

Figure 12-4
Percentage of Public School Buildings Reporting Active Infestations of Vermin, New York State (Excluding New York City) Public School Buildings, 2005 (N=3,271)



Schools indicated whether there was evidence of active infestations of various types of vermin or pests. Fewer than 5% (4.5%) reported one or more types of infestation. Rodent infestations were the most commonly reported (2.8%), followed by cockroaches (1.7%), and wood-boring or wood-eating insects (1.0%). Other types of vermin were reported in 1.2% of buildings (Figure 12-4).

Methodology

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.[42, 45]

- *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 (or ppm).
- *Particulate Matter* ($PM_{2.5}$, also called fine particulate matter) are particles or droplets in the air that are less than 2.5 microns wide (i.e., about thirty times smaller than width of a human hair). Outside, they come primarily from combustion sources such as motor vehicle exhausts, power plants and wild fires, 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 $\mu g/m^3$.

The United States Environmental Protection Agency (EPA) regulates the levels of both of these pollutants through National Ambient Air Quality Standards (NAAQS) that are 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 parts per million (ppm, equivalent to 75 parts per billion) measured as a maximum daily eight-hour rolling average. The current level of the $PM_{2.5}$ NAAQS is 35 $\mu g/m^3$ as a 24-hour average. These values are used below to summarize trends in NYS air quality in terms of potential public health effects. The regulatory framework governing criteria air pollutants, such as NAAQS implementation and determining NAAQS attainment, involves other factors in addition to the level of the NAAQS. The summaries presented below are not intended to address regulatory issues of standards attainment or implementation.

The New York State 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 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 sited in sparsely populated areas to determine background and regionally transported pollutant concentrations. 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. Data from fewer ozone and fine particulate monitors are represented in this summary than in the 2007 asthma surveillance summary report.[30]

Ozone

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 2005 to 2007 where 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 22 ozone monitors that had valid data for at least 75% of all observations for every year from 1997 to 2007. These data are presented in figures with the temperature data from the same time period for New York City (NYC) and for New York State excluding New York City (outside NYC). For each year, the number of days that ambient ozone levels were unhealthy for asthmatics at each of the 22 monitors was determined, and the averages over all monitors in NYC and outside of NYC for that year are presented. The average summer temperatures for NYC and outside NYC 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).[47]

Fine Particulate Matter ($PM_{2.5}$)

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 2005 to 2007 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 asthmatics. 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 the 14 particulate monitors that had valid data for at least 75% of all observations for every year from 2000 to 2007. These data are presented in a figure showing the trend in NYC and outside NYC. For each year, the number of days that ambient fine particulate levels were unhealthy for asthmatics at each of the 14 monitors is determined, by estimating the expected total for the every-third-day monitors as described above (N=12) or by using the entire set of observations for the continuous monitors (N=2). A weighted average over all monitors was used to plot the time trend in NYC.*** For the time trend outside of NYC, a simple arithmetic average of all monitors is presented to avoid over-weighting the one continuous monitor outside NYC, which is sited to reflect rural background air quality.

Air Quality Health Advisories

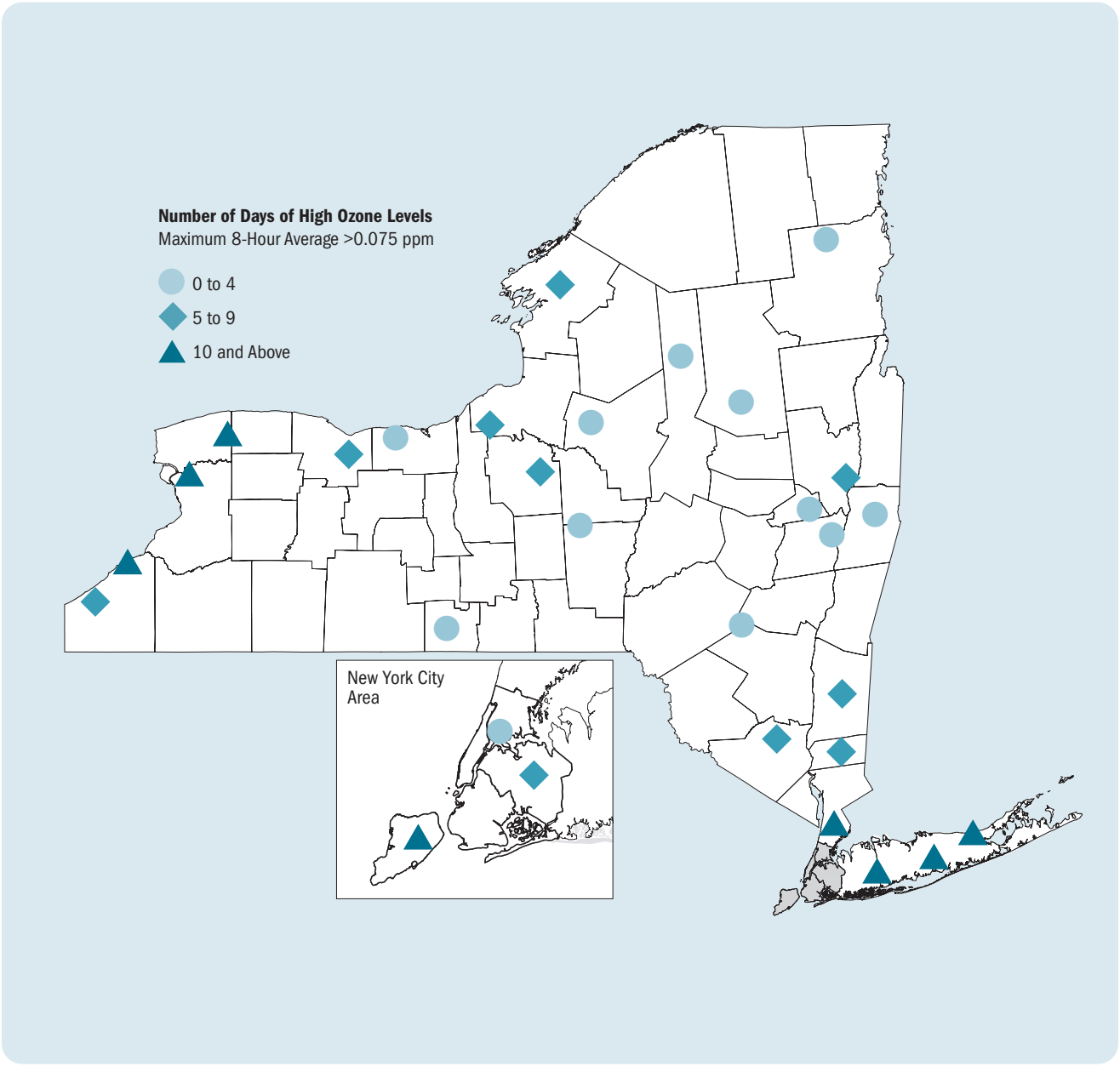
The NYSDEC and NYSDOH issue "Air Quality Health Advisories" when air pollutant concentrations are forecast to increase above levels that pose health risks to sensitive groups such as asthmatics. These levels are based on the NAAQS for 8-hour ozone and daily $PM_{2.5}$ concentrations. Air quality health advisories for ozone and $PM_{2.5}$ can occur on the same day, but this has been uncommon since high ozone levels are confined to the summer season while high particle days can occur at any time of year. On unhealthy ozone days, asthmatics can reduce symptoms by limiting their strenuous outdoor activity for 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. Asthmatics 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.state.ny.us/environmental/air_quality. Air pollution forecasts and monitoring results are posted on the NYSDEC's web site (see www.dec.ny.gov/chemical/4985.html).

*Because of differences in rounding procedures, the previous standard was effectively 0.084 ppm (equivalent to 84 parts per billion).

**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 NYC 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 12-5
Average Number of Days per Year That Ozone Levels Were Unhealthy for Asthmatics, New York State, 2005-2007

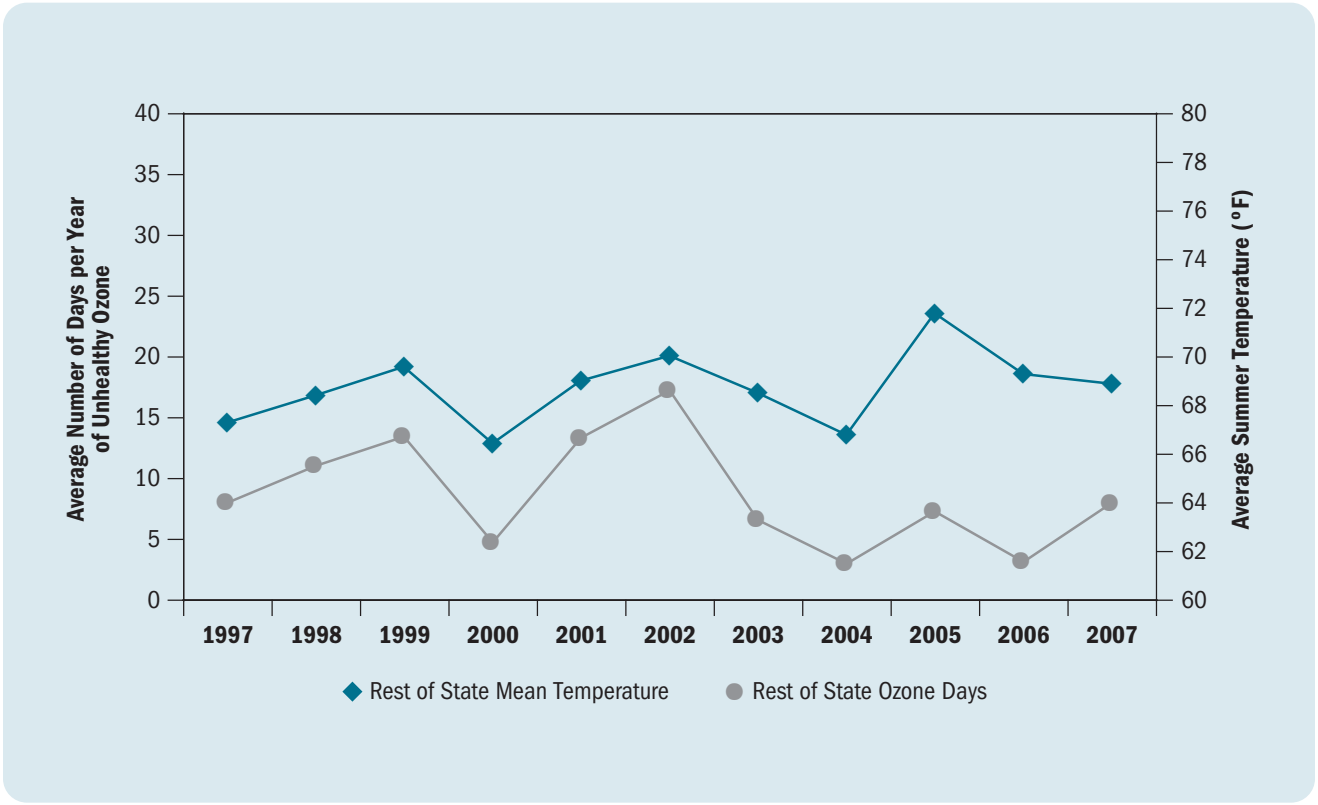


Note: The National Ambient Air Quality Standard (NAAQS) for eight-hour ozone was reduced from 0.08 parts per million to 0.075 parts per million in 2008. The revised NAAQS was used for all years.

There were typically 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. 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. Unhealthy ozone days mainly occur during May through September (Figure 12-5).

Figure 12-6

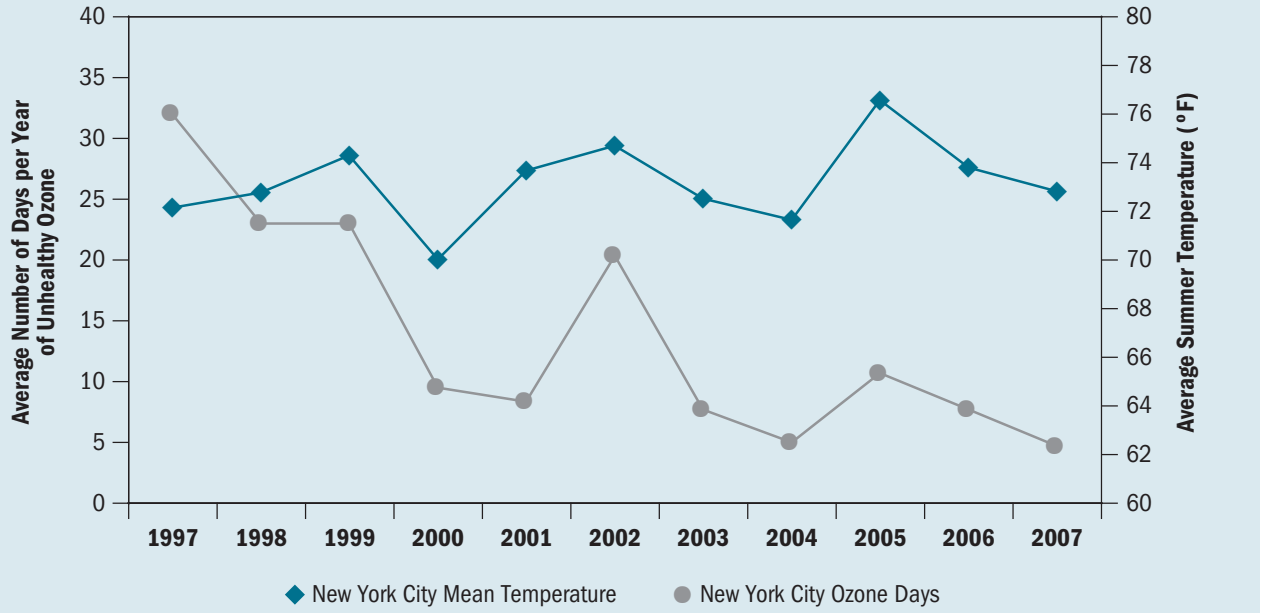
Trends in Average Summer Temperature and Average Number of Days per Year That Ambient Ozone Levels Were Unhealthy for Asthmatics, New York State (Excluding New York City), 1997-2007



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 1997 to 2007, the average number of unhealthy ozone days per year averaged across monitors in New York State excluding New York City ranged from 3 to 17. There are generally more unhealthy ozone days in years with hotter summers (Figure 12-6).

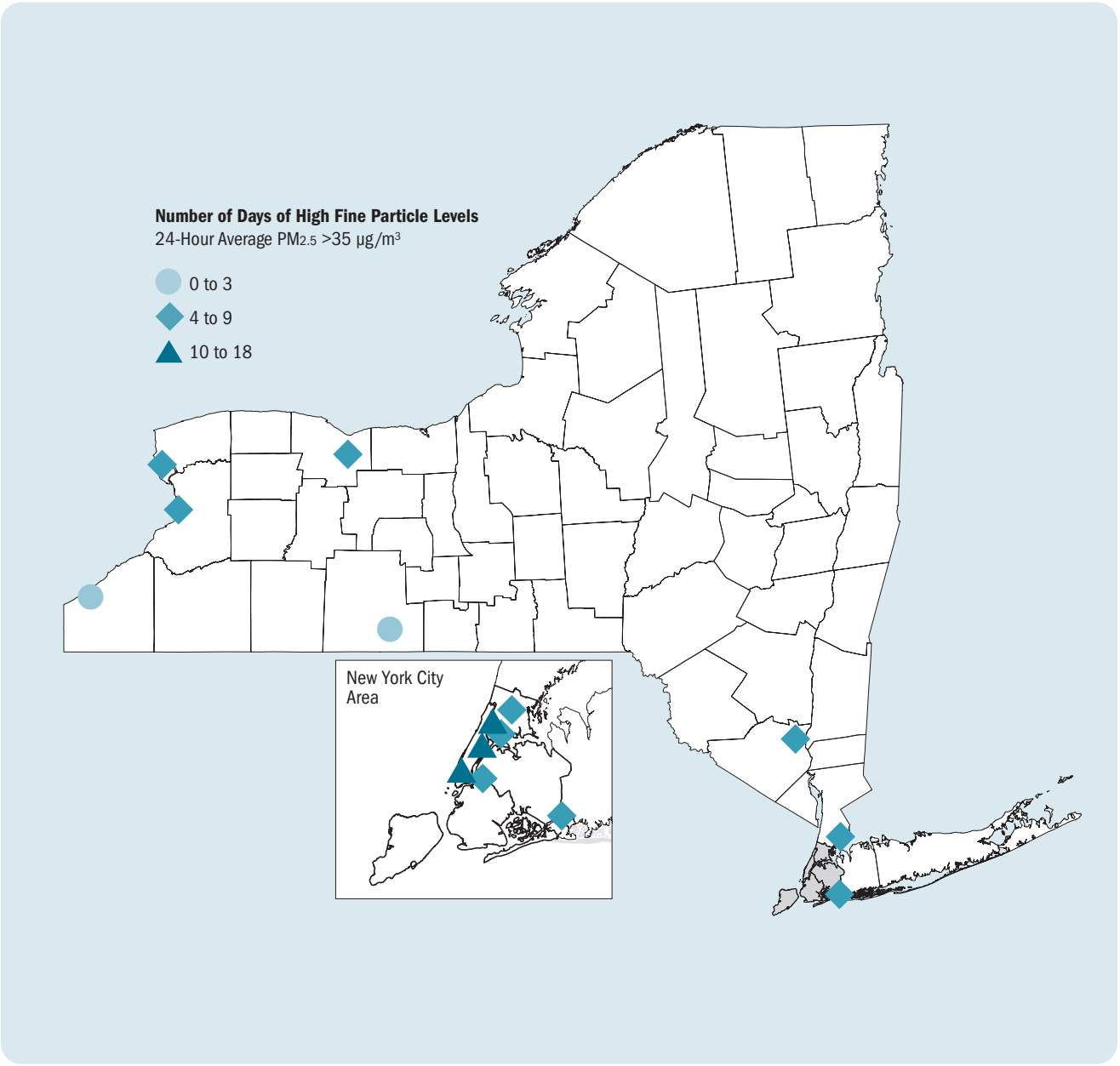
Figure 12-7
Trends in Average Summer Temperature and Average Number of Days per Year That Ambient Ozone Levels Were Unhealthy for Asthmatics, New York City, 1997-2007



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 1997 to 2007, the average number of unhealthy ozone days per year averaged across monitors in New York City ranged from 5 to 32. There are generally more unhealthy ozone days in years with hotter summers. Additionally, the average number of unhealthy ozone days per year in NYC declined over the period (Figure 12-7).

Figure 12-8
Estimated Average Number of Days per Year that Fine Particles Were Unhealthy for Asthmatics, New York State, 2005-2007



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 12-8).

Figure 12-9
Trends in Estimated Average Number of Days per Year That Fine Particles Were Unhealthy for Asthmatics by Region and Year, New York State, 2000-2007

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 2007, the average number of days per year that fine particles were unhealthy for asthmatics ranged from 8 to 18 averaged across monitors in New York City, and from 1 to 8 averaged across monitors located in the rest of New York State (excluding New York City) (Figure 12-9). The average number of unhealthy days per year in NYC has tended to decline over the period.

References

1. Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance System (BRFSS) Prevalence Data.* Available from: http://www.cdc.gov/asthma/brfss/07/current/tablec1.htm [Last accessed: June 17, 2009].

2. Centers for Disease Control and Prevention. *Summary Health Statistics for U.S. Children: National Health Interview Survey, 2007 (Table 1)*. Available from: http://www.cdc.gov/nchs/data/series/sr_10/sr10_239.pdf [Last accessed: June 17, 2009].

3. Moorman JE, Rudd RA, Johnson CA, King M, Minor P, Bailey C, Scalia MR, Akinbami LJ, *National Surveillance for Asthma – United States, 1980 –2004.* Morbidity & Mortality Weekly Report, 2007. 56(SS08): p. 1-14; 18-54. Available from: http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5608a1.htm [Last accessed: June 17, 2009].

4. Akinbami LJ, *The State of Childhood Asthma, United States, 1980–2005.* Advance data from vital and health statistics; no 381, Hyattsville, MD: National Center for Health Statistics. 2006. Available from: http://www.cdc.gov/nchs/data/ad/ad381.pdf [Last accessed: June 17, 2009].

5. Akinbami L, *Asthma Prevalence, Health Care Use and Mortality: United States, 2003-05*. National Center for Health Statistics. Available from: http://www.cdc.gov/nchs/products/pubs/pubd/hestats/asthma03-05/asthma03-05.htm [Last accessed: June 17, 2009].

6. DeFrances CJ, Lucas CA, Buie VC, Golosinskiy A. *2006 National Hospital Discharge Survey (Table 2, 3).* National health statistics reports; no 5. Hyattsville, MD: National Center for Health Statistics. 2008. Available from: http://www.cdc.gov/nchs/data/nhsr/nhsr005.pdf [Last accessed: June 17, 2009].

7. Heron M, Hoyert DL, Murphy SL, Xu J, Kochanek KD, Tejada-Vera B, *Deaths: Final Data for 2006.* National Vital Statistics Reports; v 57. Hyattsville, MD: National Center for Health Statistics. 2009. Available from: http://www.cdc.gov/nchs/data/nvsr/nvsr57/nvsr57_14.pdf [Last accessed: June 17, 2009].

8. Smart BA, *"The costs of asthma and allergy." Allergy and Asthma Advocate: Fall 2004.* American Academy of Allergy, Asthma and Immunology. Available from: http://www.aaaai.org/patients/advocate/2004/fall/costs.stm [Last accessed: June 17, 2009].

9. Centers for Disease Control and Prevention National Asthma Control Program, *America Breathing Easier*. Available from: http://www.cdc.gov/asthma/pdfs/breathing_easier_brochure.pdf [Last accessed: June 17, 2009].

10. New York State Department of Health, Public Health Information Group, *National Asthma Survey – New York State Summary Report*. Available from: http://www.health.state.ny.us/statistics/ny_asthma/pdf/national_asthma_survey_nys.pdf [Last accessed: June 17, 2009].

11. "The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement." IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement; 2003. Available from: http://www.njha.com/qualityinstitute/pdf/628200421024PM94.pdf [Last accessed: June 17, 2009].

12. Centers for Disease Control and Prevention. *About Healthy People 2010*. Available from: http://www.healthypeople.gov/about/ [Last accessed: June 17, 2009].

13. Centers for Disease Control and Prevention. *Healthy People 2010 Objectives*. Available from: http://www.healthypeople.gov/Search/objectives.htm [Last accessed: June 17, 2009].

14. Centers for Disease Control and Prevention. *Healthy People 2010 Database*. Available from: http://wonder.cdc.gov/data2010/ [Last accessed: June 17, 2009].

15. Centers for Disease Control and Prevention. *Asthma Survey Questions*. Available from: http://www.cdc.gov/asthma/questions.htm [Last accessed: June 17, 2009].

16. Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, *Prevalence and Trends Data*. Available from: http://apps.nccd.cdc.gov/brfss/ [Last accessed: June 17, 2009].

17. Centers for Disease Control and Prevention, Youth Risk Behavior Surveillance System, *Youth Online: Comprehensive Results*. Available from: http://apps.nccd.cdc.gov/yrbss/ [Last accessed: June 17, 2009].

18. Kish L, *Survey Sampling*. New York: John Wiley, 1965.

19. Korn EL, Graubard BI, *Analysis of Health Surveys*, New York: Wiley, 1999.

20. Brian MM, Pugh TF, *Epidemiology Principles and Methods*, Boston: Little Brown, 1970.

21. Rudd RA, Moorman JE, *Asthma Incidence: Data from the National Health Interview Survey, 1980-1996*. Journal of Asthma, 2007. 44: p. 65-70.

22. National Committee for Quality Assurance. *HEDIS 2007 Volume 2: Technical Specifications*. Washington, DC: National Committee for Quality Assurance, 2006.

23. National Committee for Quality Assurance. *HEDIS 2008 Volume 2: Technical Specifications*. Washington, DC: National Committee for Quality Assurance, 2007.

24. National Committee for Quality Assurance. *HEDIS 2006 Volume 2: Technical Specifications*. Washington, DC: National Committee for Quality Assurance, 2005.

25. Friedman-Jimenez G, Beckett WS, Szeinuk J, Petsonk EL, *Clinical Evaluation, Management, and Prevention of Work Related Asthma*. Journal of Industrial Medicine, 2000. 37: p. 121-141.

26. Blanc PD, Toren K, *How much adult asthma can be attributed to occupational factors?* American Journal of Medicine, 1999. 107: p. 580-587.

27. United States Department of Health and Human Services National Occupational Research Agenda. 1996: Cincinnati: DHHS (NIOSH).

28. Chan-Yeung M, Malo J-L, *Table of major inducers of occupational asthma in Asthma in the Workplace, part IV*, Bernstein IL, Chan-Yeung M, Malo J-L, Bernstein DI, Editor. 1999, Marcel Dekker: New York, NY. p. 683-721.

29. Mapp, CE, *Agents, Old and New, Causing Occupational Asthma*. Occupational and Environmental Medicine, 2001. 58: p. 354-360.

30. New York State Department of Health, Public Health Information Group. *New York State Asthma Surveillance Summary Report*, October 2007.

31. Consumer Price Index (CPI) for All Urban Consumers, Medical Care category. Available from: http://www.bls.gov/cpi/cpi_dr.htm#2007 [Last accessed: June 17, 2009].

32. U.S. Environmental Protection Agency, *IAQ Tools for Schools Action Kit*, EPA 402K05001 (hard copy) or EPA402C05001 (CDROM version). Available from: http://www.epa.gov/iaq/schools/index.html [Last accessed: June 17, 2009].

33. U.S. General Accounting Office, *School Facilities: Conditions of America's Schools*. February, 1995, GAO/HEHS9561.

34. Moglia D, Smith A, MacIntosh DL, Somers JL, *Prevalence and Implementation of IAQ Programs in U.S. Schools*. Environmental Health Perspectives, 2006. 114(1): p. 141-146.

35. Jones EJ, Axelrad R, Wattigney WA. *Healthy and Safe School Environment, Part II, Physical School Environment: Results from the School Health Policies and Programs Study 2006*. Journal of School Health, 2007. 77(8): 544-556.

36. Dautel PJ, Whitehead L, Tortolero S, Abramson S, Sockrider MM, *Asthma triggers in the elementary school environment: a pilot study*. Journal of Asthma, 1999. 36(8): p. 691-702.

37. Tortolero SR, Bartholomew LK, Tyrrell S, Abramson SL, Sockrider MM, Markham CM, Whitehead LW, Parcel GS, *Environmental allergens and irritants in schools: a focus on asthma*. Journal of School Health, 2002. 72(1): p. 33-38.

38. Chew GL, Correa JC, Perzanowski MS, *Mouse and cockroach allergens in the dust and air in northeastern United States inner-city public high schools*. Indoor Air, 2005. 15(4): p. 228-234.

39. Daisey JM, Angell WJ, Apte MG, *Indoor air quality, ventilation and health symptoms in schools: an analysis of existing information*. Indoor Air, 2003. 13(1): p. 53-56.

40. Ramachandran G, Adgate JL, Banerjee S, Church TR, Jones D, Fredrickson A, Sexton K, *Indoor air quality in two urban elementary schools – measurements of airborne fungi, carpet allergens, CO2, temperature, and relative humidity*. Journal of Occupational and Environmental Hygiene, 2005. 2(11): p. 553-566.

41. U.S. Environmental Protection Agency, *What You Should Know About Reducing Diesel Exhaust from School Buses*. November 2003, EPA 420F03038.

42. U.S. Environmental Protection Agency, *Air Quality Criteria for Ozone and Related Photochemical Oxidants – Volumes I, II & III*. February 2006, EPA/600/R05/004aF.

43. Jorres RA, Magnussen H, *Atmospheric pollutants, in Asthma: Basic Mechanisms and Clinical Management (3rd Ed)*, Barnes P, Roger IW, Thomson NC, Editor. 1998, Academic Press: London. p. 589-596.

44. Trasande L, Thurston GD, *The role of air pollution in asthma and other pediatric morbidities*. Journal of Allergy and Clinical Immunology, 2005. 115: p. 689-699.

45. U.S. Environmental Protection Agency, *Air Quality Criteria for Particulate Matter – Volumes I & II*. October 2004, EPA/600/P99/002aF.

46. New York State Department of Environmental Conservation, *Ambient Air Quality monitoring data*. Available from: http://www.dec.ny.gov/chemical/8406.html [Last accessed: June 17, 2009].

47. U.S. Environmental Protection Agency, *Technology Transfer Network (TTN) Air Quality System (AQS) Data Mart*. Available from: http://www.epa.gov/ttn/airs/aqsdatamart/ [Last accessed: June 17, 2009].

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 that allow areas with different age structures to be compared (see Technical Notes).

Asthma

A lung disease characterized by airway constriction, mucus secretion, and chronic inflammation, which results 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 is the number of deaths due to asthma divided by the estimated number of people with current asthma in the population.

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 of time.

Emergency Department (ED) Visit Rate, 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 a 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.

Health Plan Effectiveness Data and Information Set (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 of time.

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.

$$\frac{\text{Number of new individuals developing disease/condition in given time period}}{\text{Population at risk for the same time period}}$$

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 1,000,000 population for a specified period of time.

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 (ROS)

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 (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 (1998-2007) from the Consumer Price Index (CPI) for All Urban Consumers were obtained from the United States Department of Labor to use in this adjustment procedure. The 2007 annual average CPI for the Medical Care category was used as the reference year. The cost adjustment factors were calculated by dividing the 2007 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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