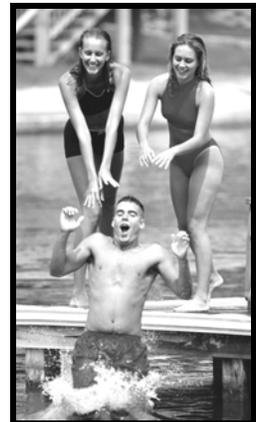


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# Asthma Burden Report New Hampshire 2010 - 2011

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## Chapter 4: Utilization of Health Care Services



## Preface

In order to get these data to you in a timely manner, the New Hampshire Asthma Control Program has decided to publish chapters of the *Asthma Burden Report – New Hampshire 2010 – 2011* as they are completed. When new chapters are published, the appendices will be updated if needed. The primary purpose of this report is to disseminate data to the Asthma Control Program’s partners, health care providers, insurers and public health professionals so this information can be used to develop, plan, implement and evaluate asthma-related activities.

## Acknowledgements

### *Primary Authors:*

Elizabeth Traore, MPH	Asthma Control Program Epidemiologist/Evaluator, Division of Public Health Services, New Hampshire Department of Health and Human Services (NH DHHS)
JoAnne Miles, MPH	Data Analyst, Office of Health Statistics and Data Management, Division of Public Health Services, NH DHHS

### *Asthma Control Program Manager:*

Lindsay Dearborn, M.Ed, MPH Division of Public Health Services, NH DHHS

### *Centers for Disease Control and Prevention:*

Jeneita Bell, MD, MPH	Epidemic Intelligence Service Officer, National Center for Environmental Health, Air Pollution & Respiratory Health Branch
Jeanne Moorman, MS	Survey Statistician, National Center for Environmental Health, Air Pollution & Respiratory Health Branch

### *Reviewers:*

Ludmila Anderson, MD, MPH	Chronic Disease Epidemiologist, Division of Public Health Services, NH DHHS
Susan Knight, MSPH	BRFSS Coordinator, Office of Health Statistics and Data Management, Division of Public Health Services, NH DHHS

### **For More Information Contact:**

Department of Health and Human Services  
Division of Public Health Services  
New Hampshire Asthma Control Program  
29 Hazen Drive  
Concord, NH 03301-6504  
Phone: (603) 271-0856 or 1-800-852-3324 ext 0856  
TDD Access: 1-800-735-2964  
Web site: [www.dhhs.nh.gov/dphs/cdpc/asthma](http://www.dhhs.nh.gov/dphs/cdpc/asthma)

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# Utilization of Health Care Services

## Highlights:

### *Primary Care Services*

- Adults with current asthma are twice as likely NOT to have seen a doctor when they needed to in the last 12 months compared with adults without asthma.
- Almost 20% of adults with asthma experience cost barriers to treating their asthma.
- Approximately 20% of children in New Hampshire, regardless of asthma status, have inadequate health insurance.

### *Hospital Services*

- From 2000-2006, there was a statistically significant decrease in the rate of emergency department visits for asthma and no change in asthma hospitalization rates.
- Rates of emergency department use for asthma appear to be higher in New Hampshire than for the US white population. Emergency department use for asthma appears to drive overall hospital utilization rates for asthma both in New Hampshire and nationally.
- The northern part of New Hampshire and the State's two largest urban areas, Manchester and Nashua, have the highest emergency department rates for asthma.
- In 2006, there were more than 16 million dollars in charges for all asthma hospital services in New Hampshire.

This chapter presents data from the 2008 New Hampshire Behavioral Risk Factor Surveillance System (NH BRFSS), 2006-2008 NH BRFSS Adult and Child Asthma Call-back Surveys, 1996-2006 NH Inpatient Hospital Discharge Dataset (IHDD) and NH Outpatient Hospital Discharge Dataset (OHDD), 2007 National Survey of Children's Health (NSCH), and 1996-2006 National Hospital Discharge Survey (NHDS) and National Hospital Ambulatory Medical Care Survey (NHAMCS). It looks at utilization of primary care services, access to primary care services, and utilization and charges for hospital discharges.

Additional definitions for each indicator used in this chapter can be found in the glossary at the end of the chapter. See Appendix A for a description of the data sources and their limitations and Appendix B for technical notes and methods used to analyze the data; these documents are located at [www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm](http://www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm).

## 4.1 Primary Care Services

Asthma is generally considered a condition that can be managed in the primary care setting and should result in few emergency department visits and hospitalizations if managed appropriately.<sup>1</sup> However, there are several barriers to receiving primary care services including medical insurance status, level of insurance coverage, and having a primary care provider.<sup>2,3</sup> Prescription medication coverage also influences the degree to which people with asthma are able to purchase the medications providers prescribe.

### *Utilization of Primary Care Services*

The national asthma guidelines recommend ongoing monitoring of asthma control to determine whether treatment goals are being met. In general, patients should be seen by a clinician approximately every six months; if they have uncontrolled and/or severe persistent asthma, they need to be seen more often.<sup>1</sup> It is important that providers periodically assess their patients' responses to their asthma treatment so they can reduce or increase medications, check their self-management techniques, and explore environmental triggers that may aggravate their asthma.<sup>1</sup>

Patients often overestimate their level of control because they have learned to accept their health status, and only after being questioned by their provider does it become clear that their asthma is not well controlled.<sup>4</sup> Because of this acceptance, providers should assess asthma control at each visit by asking specific questions about symptoms and measuring lung function as needed.<sup>1</sup>

**Table 4.1.1**  
**Percent of adults 18+ years old and children <18 years old with current asthma who had a doctor's visit in the last 12 months - New Hampshire, 2006-2008**

	Adults		Children	
	Percent	95% CI	Percent	95% CI
Had a routine doctor's visit in the last 12 months* †	<b>76.2*</b>	(71.8 - 80.6)	<b>99.6†</b>	(98.9 - 100)
Had a routine checkup for asthma in last 12 months ‡	<b>58.8</b>	(54.2 - 63.5)	<b>73.8</b>	(65.5 - 82.2)
Of those who had a routine checkup for their asthma, percent that had more than one visit ‡	<b>50.1</b>	(44.5 - 55.6)	<b>49.3</b>	(39.9 - 58.7)
Had 1 or more urgent visits due to worsening asthma symptoms in the last 12 months ‡, §	<b>20.7</b>	(17.2 - 24.3)	<b>29.3</b>	(22.1 - 36.5)

Data Source: \*2008 NH BRFSS, † 2007 NSCH, ‡ 2006-2008 NH BRFSS Adult and Child Asthma Call-back Surveys

§ Does not include emergency room visits.

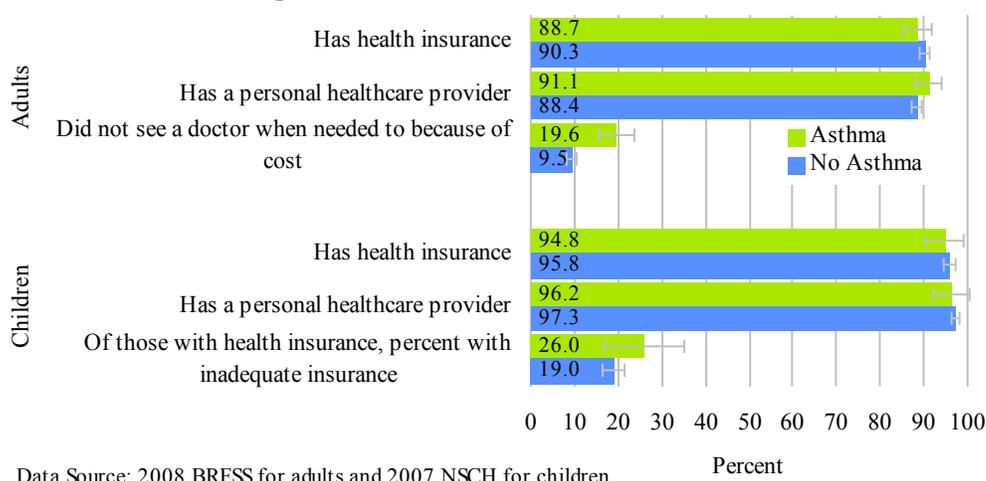
Table 4.1.1 displays several measures on utilization of primary care services among people in New Hampshire with current asthma.

- Approximately 76% of adults with current asthma and nearly 100% of children with current asthma in New Hampshire had a routine doctor's visit in the last 12 months.
- 59% of adults and 74% of children in New Hampshire with current asthma had a routine checkup for their asthma in the last 12 months.
- Of those who had a routine checkup for their asthma, approximately 50% had more than one routine asthma checkup in the last 12 months.
- 20.7% of adults and 29.3% of children had an urgent visit due to worsening asthma symptoms in the last 12 months.

## Access to Primary Care

Over the last several years, health insurance premiums have increased, which has often resulted in greater out-of-pocket cost-sharing and less comprehensive benefits for employees.<sup>5</sup> In 2007, there were approximately 45.6 million people in the United States who were uninsured.<sup>6</sup> It is estimated that an additional 25 million adults are underinsured, up 60% from 2003.<sup>7</sup> People who are uninsured and underinsured are more likely to postpone needed care compared with those who have adequate health insurance.<sup>5</sup> In the coming years, healthcare reform may address many of the barriers people face in accessing primary care services.<sup>8,9</sup>

**Figure 4.1.1**  
**Access to primary care services among adults 18+ years old and children <18 years old by asthma status - New Hampshire 2007 & 2008**



### Access to primary care services among adults 18+ years old and children <18 years old by asthma status:

- Approximately 90% of adults and 95% of children in New Hampshire have health insurance and indicate that they have one or more personal health care providers. There are no statistically significant differences in having health insurance and/or having a personal health care provider by asthma status.
- However, adults with asthma are twice as likely to indicate that they did not see a doctor when they needed to because of cost compared with people who do not have asthma; this is a statistically significant difference.
- Approximately 20% of children in New Hampshire who have insurance do not have adequate insurance. There is no statistically significant difference in the percent of children who have inadequate health insurance by asthma status. Inadequate insurance was assessed based on a series of questions from the National Survey of Children’s Health - see the Glossary at the end of the chapter for a complete definition.

See Table 4.1.3 at the end of this chapter for point estimates and confidence intervals for data presented in Figure 4.1.1.

**Table 4.1.2**  
**Percent of adults 18+ years old and children <18 years old with current asthma who experience cost barriers to receiving care for their asthma - New Hampshire, 2006-2008**

	Adults		Children	
	Percent	95% CI	Percent	95% CI
<b>In the last 12 months, cost was a barrier to:</b>				
seeing a primary care provider for asthma	<b>8.4</b>	5.8 - 10.9	<b>3.6</b>	1.5 - 5.7
seeing a specialist for asthma	<b>3.5</b>	2.0 - 5.1	<b>1.8</b>	1.2 - 2.4
buying asthma medications	<b>17.5</b>	13.7 - 21.3	<b>4.5*</b>	0.6 - 8.4
<b>Experienced any of the cost barriers listed above</b>	<b>19.7</b>	15.8 - 23.6	<b>6.9*</b>	2.8 - 11.1

Data Source: 2006-2008 NH BRFSS Adult and Child Call-back Surveys

\*Relative standard error is greater than 30% - interpret with caution.

**Cost barriers to receiving care for asthma:**

- As seen in Figure 4.1.1, approximately 20% of adults with asthma experience cost barriers to receiving care when they needed to in the last 12 months.
- Table 4.1.2 indicates that the majority of cost barriers people with asthma experience are in relation to buying asthma medications. Approximately 17.5% of adults with asthma experienced a time they were not able to buy asthma medications in the last 12 months because of the cost.

## 4.2 Hospital Services

The use of emergency department, observation and inpatient hospital services is often preventable for people who receive appropriate health care and are able to manage their asthma properly.<sup>10-14</sup> There are multiple reasons people may use hospital services as a result of an asthma episode/attack (e.g., lack of health insurance or adequate access to a primary health care provider, lack of knowledge on how to properly manage their asthma, exposure to an asthma trigger).<sup>15-19</sup> The use of these services is expensive and an indication of poorly controlled asthma.

This section presents data on the use of hospital services to treat asthma in New Hampshire from 1996 to 2006. It includes information on the number and rate of inpatient, observation and emergency department discharges; all discharges combined; and charges for services. Data were analyzed by age, gender, season of the year, payer, and county. At this time these data have not been deduplicated, which means that the data measure the number of times people use hospital services not the number of people who use them. For example, if someone uses these services on five separate occasions, they are counted five times rather than as one individual who had five visits.

The type of hospital service utilized to treat asthma patients is dependent in part on the severity and complexity of the treatment, amount of time needed to treat the patient, hospital policies and procedures, and insurance provider and coverage.<sup>20</sup> In general, services received in the emergency department are classified as emergency department services; when a patient is admitted to the hospital they are generally receiving inpatient services; for observation services the definition is less straightforward. Visits are typically classified as observation when the patient can be treated in less than 24 hours or a provider is uncertain what is causing a patient's illness and needs time to assess the patient further.

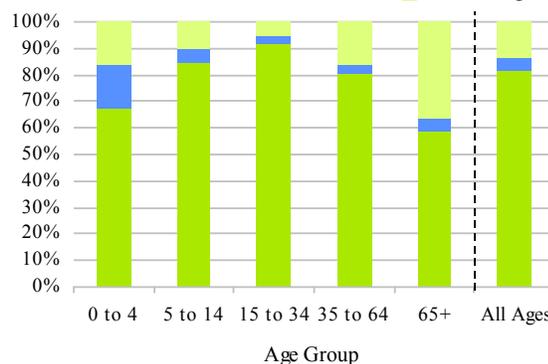
Although the definition for observation services is confusing and its use is inconsistent across hospitals, providers and health insurers, excluding these services from the report would have excluded 5% of all hospital discharges for asthma. In certain instances, observation services may be informative in understanding the use of all hospital services for asthma. For example, among children 0 to 4 years old, 17% of the hospital services utilized for asthma are for observation (see Figure 4.2.1).

When the analyses of observation services show something of interest, a graph will be displayed. Otherwise, findings will be noted in the text and no graph will be displayed. The data will be in the supporting tables at the end of the chapter for those who are interested.

As Figure 4.2.1 shows, the majority of hospital discharges for asthma are from the emergency department. However, it appears the type of hospital discharge someone has for asthma is somewhat dependent on their age.

See Table 4.2.4 at the end of this chapter for the number and percent of discharges for data presented in Figure 4.2.1.

**Figure 4.2.1**  
Percent of all hospital discharges with asthma as the principal diagnosis by discharge type and age - New Hampshire, 2002-2006

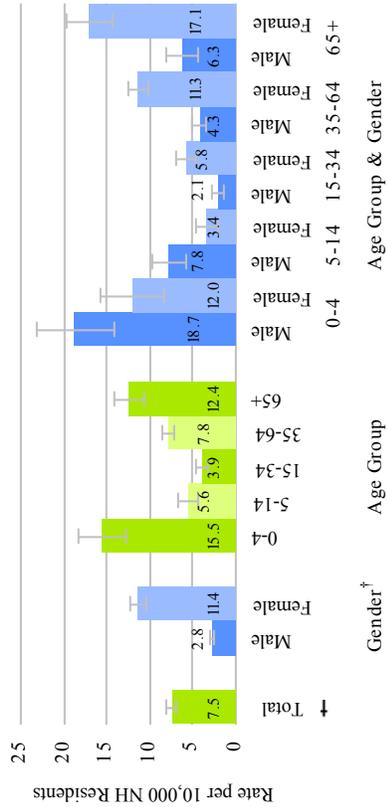


Data Source: 2002-2006 NH IHDD and OHDD  
IP = Inpatient; OB = Observation ED = Emergency Department

# Utilization of Health Care Services

**Figure 4.2.2**

**Inpatient hospital discharge rate with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**

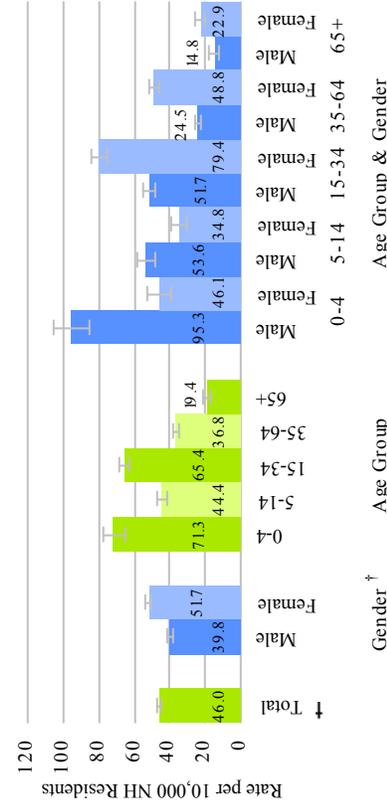


Data Source: 2006 NH IHDD

† Age-adjusted to the US 2000 standard population.

**Figure 4.2.4**

**Outpatient emergency department hospital discharge rate with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**

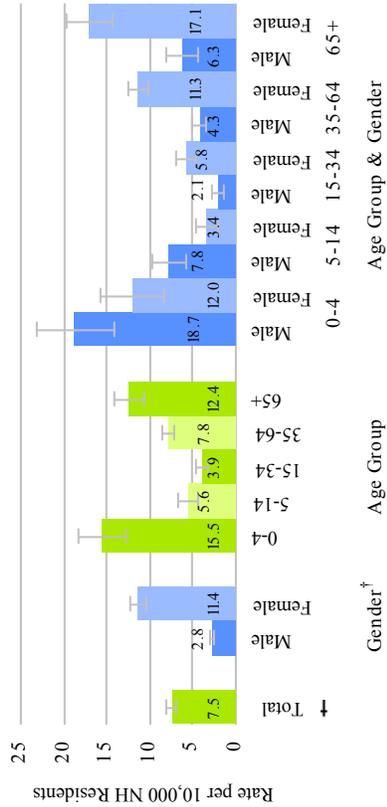


Data Source: 2006 NH OHDD

† Age-adjusted to the US 2000 standard population.

**Figure 4.2.3**

**Outpatient observation hospital discharge rate with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**

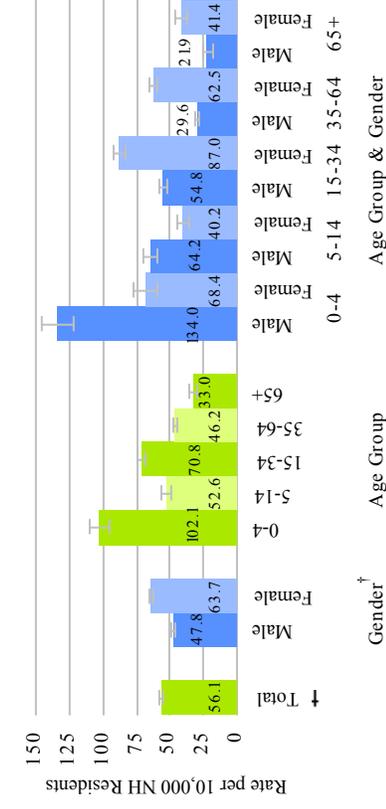


Data Source: 2006 NH OHDD

† Age-adjusted to the US 2000 standard population.

**Figure 4.2.5**

**Rate of all hospital discharges with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**



Data Source: 2006 NH IHDD and OHDD

† Age-adjusted to the US 2000 standard population.

## ***Utilization of Hospital Services for Asthma by Demographic Factors***

Data on the previous page indicate that utilization of hospital services for asthma is associated with age and gender.

*Inpatient Hospital Discharges:* In 2006, there were 7.5 inpatient hospitalizations for asthma per 10,000 New Hampshire residents. Females were 4 times more likely to be hospitalized for asthma than males, at a rate of 11.4 versus 2.8 per 10,000 New Hampshire residents. Children 0 to 4 years old and adults 65 years old and older are the two age groups that were most often hospitalized for asthma. When examining age and gender in tandem, males 0 to 4 years old and females 65 years old and older had the highest hospitalization rates. Males 0 to 14 years old had higher rates of hospitalizations than females of the same age. After age 14, females had higher hospitalization rates.

*Outpatient Observation Hospital Discharges:* In 2006, there were 2.6 observation discharges for asthma per 10,000 New Hampshire residents. There was no statistically significant difference in rates of observation discharges for asthma by gender. Children 0 to 4 years old had the highest rate of observation discharges for asthma. Male children 0 to 4 years old were twice as likely to have an observation discharge compared with females of the same age.

*Outpatient Emergency Department Hospital Discharges:* In 2006, there were 46.0 emergency department visits for asthma per 10,000 New Hampshire residents. Females were approximately 30% more likely to have an emergency department visit for asthma compared with males, at a rate of 51.7 versus 39.8 per 10,000 New Hampshire residents. Residents 0 to 4 and 15 to 34 years old had the highest rates of emergency department visits for asthma. When examining age and gender in tandem, males 0 to 4 years old and females 15 to 34 years old had the highest rates. As with the hospitalization rate, males 0 to 14 years old had higher rates than females of the same age. After age 14, females had higher emergency department visit rates.

*Utilization Rates for All Hospital Services (inpatient, observation and emergency department):* In 2006, the rate of all hospital discharges combined for asthma was 56.1 per 10,000 New Hampshire residents; the majority of these were emergency department visits. Since the majority of hospital services for asthma occur in the emergency department, the age-gender patterns are similar to those observed for emergency department discharges for asthma.

### *Utilization Rates Across Types of Hospital Services:*

- For each type of discharge, there was a switch in the age-gender pattern after age 14.
- Children 0 to 4 years old had the highest rates for each type of hospital visit and were as likely to have an observation discharge for asthma as an inpatient discharge.
- Residents 15 to 34 years old had the second highest rate of emergency department visits and the lowest rate of inpatient visits.
- For inpatient visits, adults 65 years old and older had the second highest rate of visits; however, they had the lowest rate for emergency department visits.

See Table 4.2.5 at the end of this chapter for point estimates and confidence intervals for data presented in Figures 4.2.2-5.

Figure 4.2.6

Rate\* of Inpatient Hospital Discharges with Asthma as Principal Diagnosis by County Compared with the Rest of the State New Hampshire, 2004-2006

- - Significantly higher rate than the rest of the State
- - Significantly lower rate than the rest of the State
- - No significant difference

State Rate: 7.9

Data Source: 2004-2006 NH IHDD  
\*Rate per 10,000 NH residents

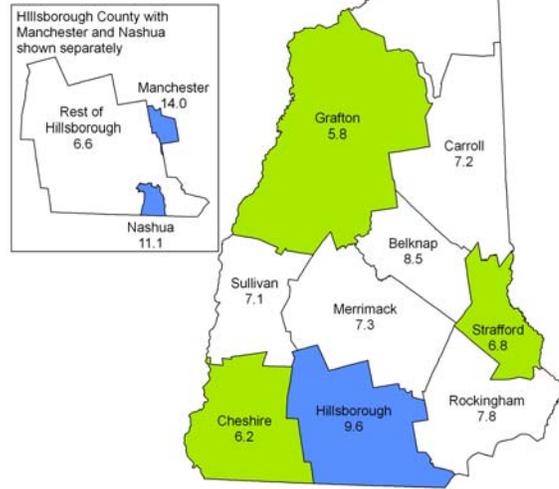


Figure 4.2.8

Rate\* of Outpatient Emergency Hospital Discharges with Asthma as Principal Diagnosis by County Compared with the Rest of the State - New Hampshire, 2004-2006

- - Significantly higher rate than the rest of the State
- - Significantly lower rate than the rest of the State
- - No significant difference

State Rate: 47.8

Data Source: 2004-2006 NH OHDD  
\*Rate per 10,000 NH residents

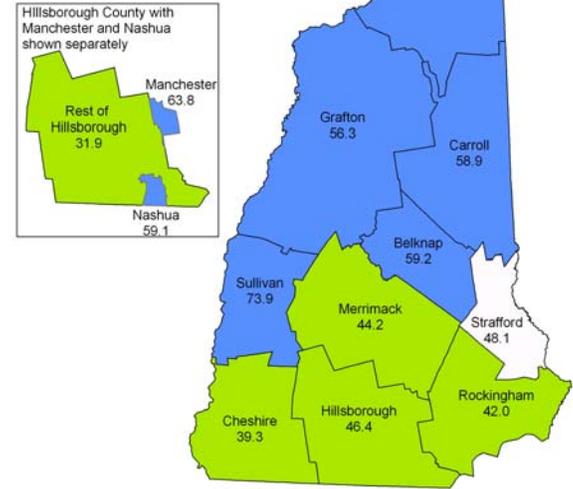


Figure 4.2.7

Rate\* of Outpatient Observation Hospital Discharges with Asthma as Principal Diagnosis by County Compared with the Rest of the State - New Hampshire, 2004-2006

- - Significantly higher rate than the rest of the State
- - Significantly lower rate than the rest of the State
- - No significant difference

State Rate: 2.9

Data Source: 2004-2006 NH OHDD  
\*Rate per 10,000 NH residents

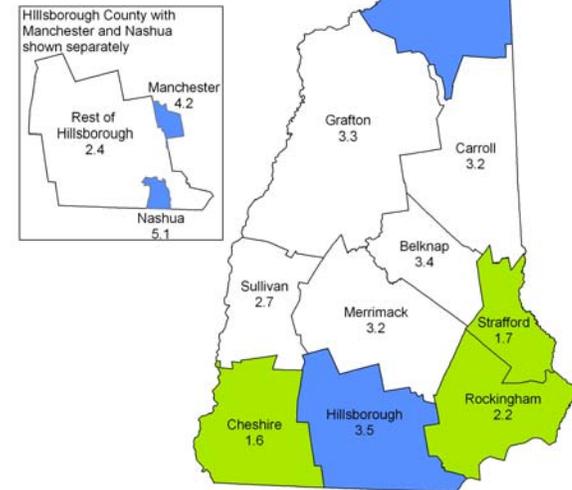


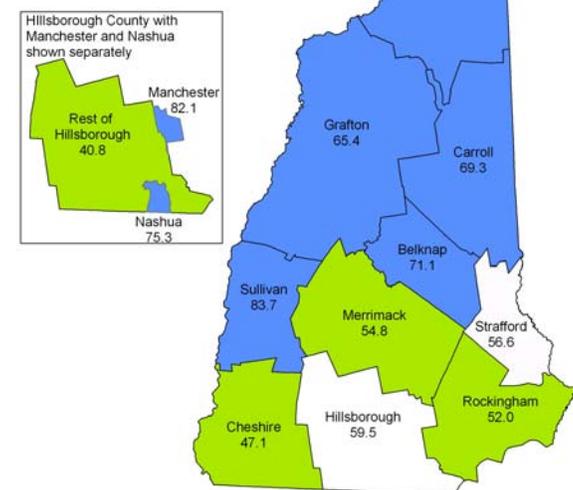
Figure 4.2.9

Rate\* of All Hospital Discharges with Asthma as Principal Diagnosis by County Compared with the Rest of the State - New Hampshire, 2004-2006

- - Significantly higher rate than the rest of the State
- - Significantly lower rate than the rest of the State
- - No significant difference

State Rate: 58.6

Data Source: 2004-2006 NH IHDD and OHDD  
\*Rate per 10,000 NH residents



## ***Map of Hospital Discharges for Asthma***

Rates for each county were compared with the rest of the State, not the State rate. For example, asthma hospitalization rates for Grafton County were compared with the combined rate for all other counties in the State. This is done so mutually exclusive groups can be compared. When county (or geographic area of interest) rates are compared with the State as a whole, the rate for the area of interest is included in the State rate, which may dilute any differences in the rates between the area of interest and the State.

*Inpatient Hospital Discharges:* Grafton, Cheshire and Strafford Counties had statistically significant lower rates of inpatient hospital discharges for asthma compared with the rest of the State. New Hampshire's two major urban areas, Manchester and Nashua, had statistically significant higher rates of inpatient hospital discharges for asthma compared with the rest of the State; rates from these two areas are the reason Hillsborough County has an overall higher rate.

*Outpatient Observation Hospital Discharges:* Coos County and the cities of Manchester and Nashua had statistically significant higher rates of observation discharges for asthma compared with the rest of the State. The rates in Manchester and Nashua are the reason Hillsborough County has a higher rate. Cheshire, Strafford and Rockingham Counties had statistically significant lower rates of observation discharges for asthma compared with the rest of the State.

*Outpatient Emergency Department Hospital Discharges:* The northern rural counties in New Hampshire (Coos, Grafton, Carroll, Belknap, and Sullivan) had statistically significant higher rates of emergency department visits for asthma compared with the rest of the State. The cities of Manchester and Nashua also did. In general, the southern counties (Merrimack, Cheshire, Rockingham, and Hillsborough—with the exception of the cities of Manchester and Nashua) had statistically significant lower rates of emergency department visits for asthma compared with the rest of the State.

*Utilization Rates for All Hospital Services (inpatient, observation and emergency department):* Since the majority of hospital services occur in the emergency department, Figure 4.2.9 looks similar to Figure 4.2.8 with the exception of Hillsborough County. When all services were combined, there were no statistically significant differences between Hillsborough County and the rest of the State.

*Utilization Rates Across Types of Hospital Services:*

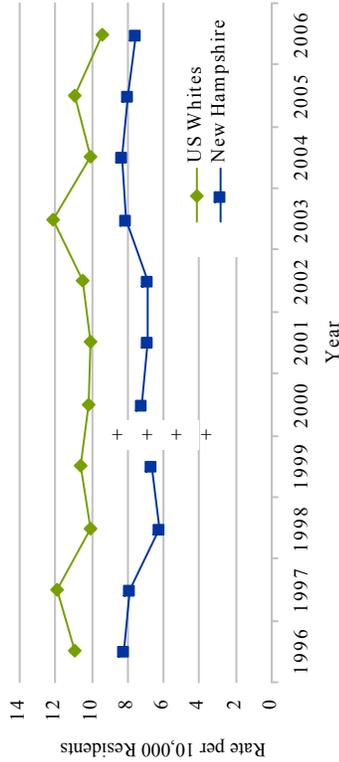
- Grafton County had a statistically significant lower inpatient hospital discharge rate compared with the rest of the State and a statistically higher emergency department discharge rate. This may be because of differences in how the hospitals in that county treat people with asthma. The academic medical center located in the area, Dartmouth Hitchcock Medical Center, may play a role in preventing unnecessary inpatient hospitalizations for asthma.
- Hillsborough County as a whole had a statistically significant higher inpatient and observation discharge rate and statistically significant lower emergency department rate compared with the rest of the State. These differences may be explained in part by variations in use related to hospital policies and procedures for treating patients with asthma.
- In general, counties with higher hospital discharge rates overlap the medically underserved areas and populations in the State. The west side of Manchester is a medically underserved area; Nashua is not.<sup>21</sup>

See Tables 4.2.6-9 at the end of this chapter for point estimates and confidence intervals for data presented in Figures 4.2.6-9.

# Utilization of Health Care Services

**Figure 4.2.10**

**Trend in the annual rate\* of inpatient hospital discharges with asthma as the principal diagnosis - New Hampshire and US whites, 1996-2006**



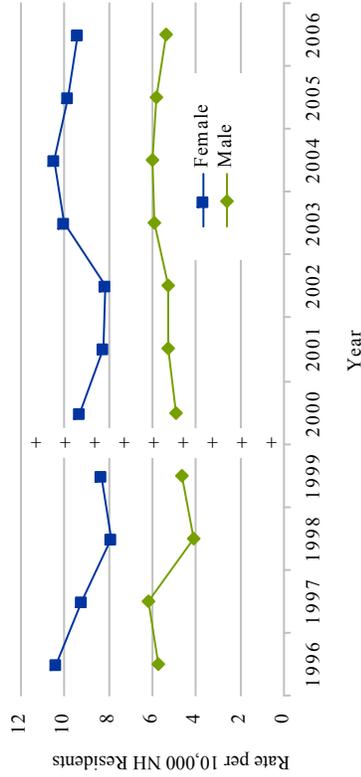
Data Source: 1996-2006 NH IHDD and 1996-2006 NHDS

\*Age-adjusted to the 2000 US standard population.

+Change in data collection; use caution if comparing NH rates prior to 2000 with rates after 2000.

**Figure 4.2.12**

**Trend in the annual rate\* of inpatient hospital discharges with asthma as the principal diagnosis by gender - New Hampshire, 1996-2006**



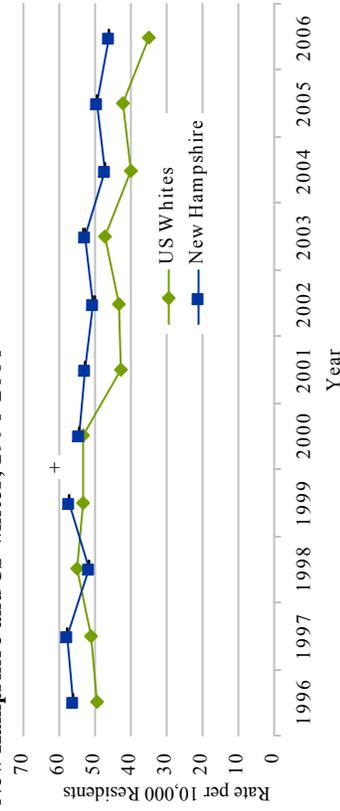
Data Source: 1996-2006 NH IHDD

\*Age-adjusted to the 2000 US standard population.

+Change in data collection; use caution if comparing NH rates prior to 2000 with rates after 2000.

**Figure 4.2.11**

**Trend in the annual rate\* of outpatient emergency department hospital discharges with asthma as the principal diagnosis - New Hampshire and US whites, 1996-2006**



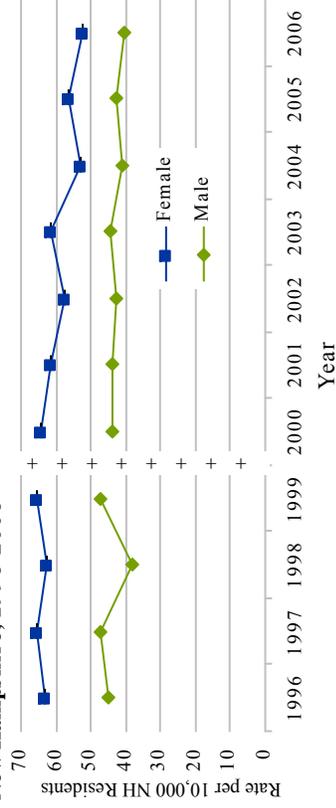
Data Source: 1996-2006 NH OHDD and 1996-2006 NHAMCS

\*Age-adjusted to the 2000 US standard population.

+Change in data collection; use caution if comparing NH rates prior to 2000 with rates after 2000.

**Figure 4.2.13**

**Trend in the annual rate\* of outpatient emergency department hospital discharges with asthma as the principal diagnosis by gender - New Hampshire, 1996-2006**



Data Source: 1996-2006 NH OHDD

\*Age-adjusted to the 2000 US standard population.

+Change in data collection; use caution if comparing NH rates prior to 2000 with rates after 2000.

## ***Trends in the Utilization of Hospital Services***

Although asthma prevalence has increased from 2000 to 2008 (see *Chapter 1: Asthma Prevalence and Incidence* available at [www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm](http://www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm)), data on the previous page indicate that the use of hospital services is either staying the same or decreasing.

*Inpatient Hospital Discharges:* New Hampshire has had a consistently lower rate of inpatient hospital discharges for asthma compared with the U.S. white population. Comparison is made with the U.S. white population because it more closely represents the population of New Hampshire than the total U.S. population; only 4.7% of New Hampshire's population is nonwhite compared with 20.4% of the U.S. population.<sup>22</sup>

Between 2000 and 2006 there were no statistically significant changes in the rate of asthma hospitalizations.

*Outpatient Observation Hospital Discharges:* The rate of observation services for asthma has remained relatively low, ranging from 2.4 to 3.4 observation discharges per 10,000 New Hampshire residents per year; there were no statistically significant changes in the rate of observation discharges from 2000 to 2006 (see Table 4.2.11 at the end of the chapter). There are no national estimates for observation services.

*Outpatient Emergency Department Hospital Discharges:* Between 2000 and 2006 there was a statistically significant decline in the rate of emergency department visits for asthma both in New Hampshire and among the U.S. white population. However, since 2001, New Hampshire's rate of emergency department discharges for asthma has been consistently higher than the rate for the U.S. white population. This difference may be due to the overall higher prevalence of asthma in New Hampshire, lack of access to primary care services due to insurance status or geographic location, issues related to comprehensive asthma management or adherence to national asthma guidelines, cost barriers to utilizing care, or other factors.

## ***Trends in the Utilization of Hospital Services by Gender***

Data on the previous page indicate that in general females are more likely to utilize hospital services for asthma compared with males.

*Inpatient Hospital Discharges:* From 2000 to 2006, the rate of inpatient hospital discharges for asthma was between 1.6 and 1.9 times higher among females compared with males. Based on the trend analysis, there was no statistically significant change in the rate of asthma hospitalizations for males or females between 2000 and 2006.

*Outpatient Observation Hospital Discharges:* Between 2000 and 2006 there were no statistically significant differences in the rate of observation discharges by gender with asthma listed as the primary diagnosis, nor were there any significant trends in the data (see Table 4.2.11 at the end of the chapter).

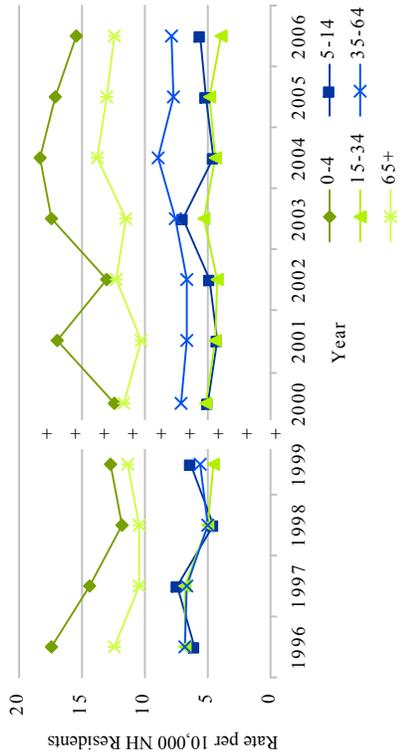
*Outpatient Emergency Department Hospital Discharges:* Based on the trend analysis for 2000-2006, there was a statistically significant decrease in the rate of emergency department visits among females with asthma listed as the primary diagnosis but not among males.

See Tables 4.2.10 and 4.2.12 at the end of this chapter for point estimates, confidence intervals, and trend analyses for data presented in Figures 4.2.10-13.

# Utilization of Health Care Services

**Figure 4.2.14**

**Trend in the annual rate of inpatient hospital discharges with asthma as the principal diagnosis by age group - New Hampshire, 1996-2006**

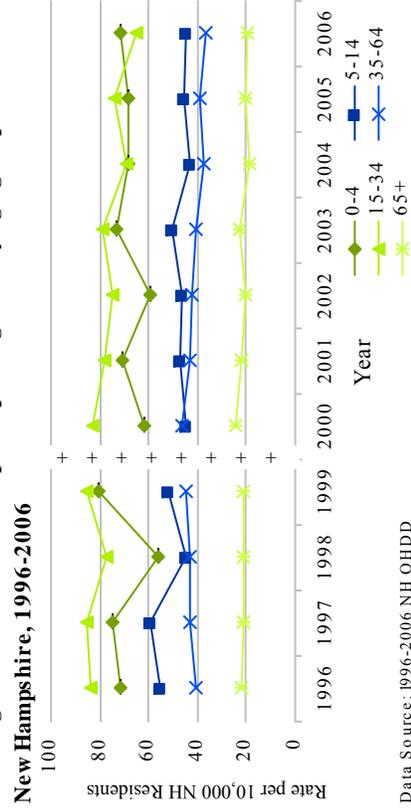


Data Source: 1996-2006 NH IHDD

+Change in data collection; use caution if comparing NH rates prior to 2000 with rates after 2000.

**Figure 4.2.16**

**Trend in the annual rate of outpatient emergency department hospital discharges with asthma as the principal diagnosis by age group - New Hampshire, 1996-2006**



Data Source: 1996-2006 NH OHDD

+Change in data collection; use caution if comparing NH rates prior to 2000 with rates after 2000.

**Figure 4.2.15**

**Trend in the annual rate of outpatient observation hospital discharges with asthma as the principal diagnosis by age group - New Hampshire, 2000-2006**

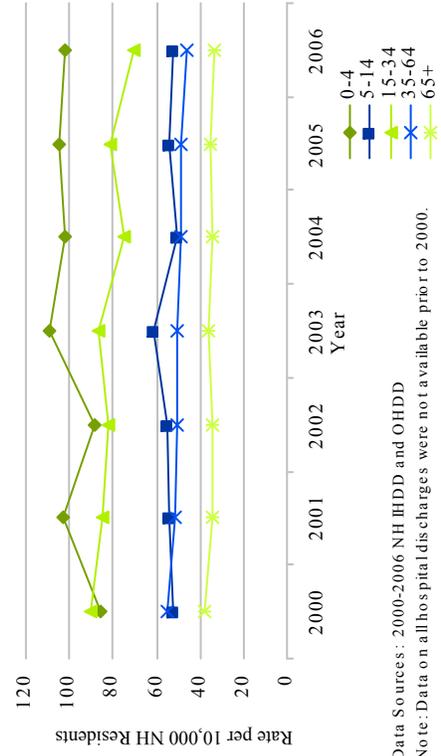


Data Source: 2000-2006 NH OHDD

Note: Data on observation bed stays were not available prior to 2000.

**Figure 4.2.17**

**Trend in the annual rate of all hospital discharges with asthma as principal diagnosis by age group - New Hampshire, 2000-2006**



Data Sources: 2000-2006 NH IHDD and OHDD

Note: Data on all hospital discharges were not available prior to 2000.

## ***Trends in the Utilization of Hospital Services by Age Group***

Data on the previous page indicate that utilization rates for hospital services have declined among some age groups but not all.

*Inpatient Hospital Discharges:* There were no statistically significant changes in the rate of asthma hospitalizations for any age group listed in Figure 4.2.14. Children 0 to 4 years old and adults 65 plus years old had consistently higher rates of asthma hospitalizations compared with other age groups.

*Outpatient Observation Hospital Discharges:* Children 0 to 4 years old had consistently higher rates of observation discharges; there were no statistically significant changes in trend from 2000 to 2006 (see Table 4.2.11 at the end of the chapter).

*Outpatient Emergency Department Hospital Discharges:* There were statistically significant decreases in the rate of emergency department visits for asthma from 2000 to 2006 for New Hampshire residents 15 to 34 years old and 35 to 64 years old; there were no statistically significant changes for the other age groups. New Hampshire residents 0 to 4 years old and 15 to 34 years old had consistently significant higher rates of emergency department visits for asthma compared with other age groups.

*Utilization Rates for All Hospital Services (inpatient, observation and emergency department):* Previous trend figures do not include data on all discharges combined because the trend basically mirrors the results of the emergency department trend since asthma is most often treated in the emergency department. However, as seen in Figure 4.2.1, the type of hospital discharge for asthma is somewhat dependent on age. As a result, the age-pattern for all discharges combined is slightly different than those observed among emergency department discharges for asthma.

- There were statistically significant decreases in the rate of all types of hospital services for asthma among New Hampshire residents age 15 to 34 and 35 to 64 years old; this decrease is driven by the decrease seen in emergency department visits for these age groups. There were no statistically significant changes for other age groups.
- Children 0 to 4 years old have the overall highest utilization rate for all hospital services for asthma.
- Children 5 to 14 years old and adults 35 to 64 years old have a similar utilization rate when looking at all types of hospital services combined, but the type of service they tend to utilize varies (e.g., inpatient versus emergency department).
- Although adults 65 years old and older have the second highest rate of inpatient hospital discharges with asthma listed as the primary diagnosis, they have the lowest rate of emergency department discharges and the lowest rate of all hospital services combined for asthma.

See Tables 4.2.10-13 at the end of this chapter for point estimates, confidence intervals, and trend analyses for data presented in Figures 4.2.14-17.

**Table 4.2.1**

**Number and percent of hospital discharges with asthma as the underlying diagnosis by primary diagnosis group and type of hospital discharge - New Hampshire, 2006**

ICD-9 Group	Primary Diagnosis Group	Type of Hospital Service					
		Inpatient		Observation		ED	
		n	Percent	n	Percent	n	Percent
001-139	Infectious and Parasitic Diseases	107	1.7	27	1.6	366	2.5
140-239	Neoplasms	347	5.5	51	3.0	7	0.0
240-279	Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders	225	3.5	61	3.6	120	0.8
280-289	Diseases of the Blood and Blood-Forming Organs	35	0.6	11	0.6	12	0.1
290-319	Diseases of the Nervous System and Sense Organs	558	8.8	34	2.0	592	4.0
390-459	Diseases of the Circulatory System	802	12.6	121	7.1	229	1.6
460-519	Diseases of the Respiratory System*	759	11.9	106	6.2	2755	18.7
520-579	Diseases of the Digestive System	728	11.5	163	9.6	772	5.2
580-629	Diseases of the Genitourinary System	291	4.6	94	5.5	508	3.5
630-679	Complications of Pregnancy, Childbirth, and the Puerperium	520	8.2	212	12.5	240	1.6
680-709	Diseases of the Skin and Subcutaneous Tissue	152	2.4	12	0.7	484	3.3
710-739	Diseases of the Musculoskeletal System and Connective Tissue	625	9.8	93	5.5	885	6.0
740-759	Congenital Anomalies	15	0.2	4	0.2	1	0.0
760-779	Certain Conditions Originating in the Prenatal Period	0	0.0	0	0.0	0	0.0
780-799	Symptoms, Signs, and Ill-Defined Conditions	331	5.2	503	29.6	3253	22.1
800-999	Injury and Poisoning	593	9.3	141	8.3	3431	23.3
E800-E999	Supplementary Classification of External Causes of Injury and Poisoning	110	1.7	12	0.7	214	1.5
Missing		158	2.5	53	3.1	842	5.7
<b>Grand Total</b>		<b>6356</b>	<b>100.0</b>	<b>1698</b>	<b>100.0</b>	<b>14711</b>	<b>100.0</b>

Data Source: 2006 NH IHDD and OHHD

\*Discharges that had a primary diagnosis of asthma were excluded from analysis.

n= number of events

## ***Utilization of Hospital Services with Asthma as an Underlying Diagnosis***

While hospitalization and emergency department rates for asthma are decreasing or staying the same, rates for asthma as an underlying diagnosis have been rapidly increasing (Data Source: 2000-2006 NH IHDD and OHDD). The primary diagnosis is determined by the chief cause responsible for the admission of the patient. Underlying diagnoses (also referred to as secondary diagnoses) are conditions that affect patient management and/or consume hospital resources.<sup>23</sup>

Table 4.2.1 shows the number and percent of hospital discharges with asthma as the underlying diagnosis by primary diagnosis group and type of hospital discharge.

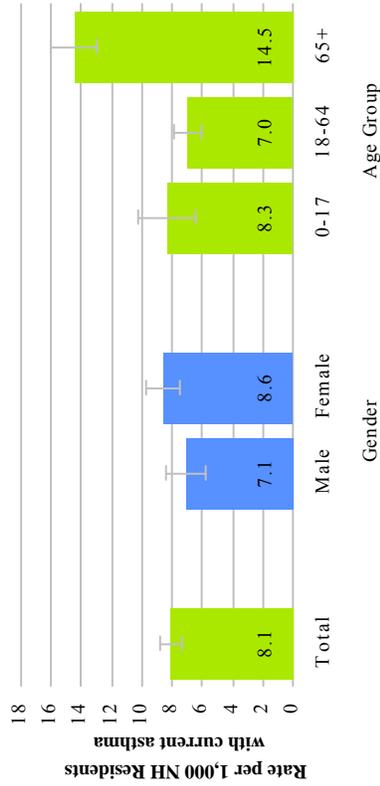
- Primary diagnosis associated with an underlying diagnosis of asthma varies by the type of hospital discharge.
- Among inpatient hospital discharges with an underlying diagnosis of asthma, diseases of the circulatory system (12.6%) and diseases of the respiratory system (11.9%) were the most common primary diagnoses. The majority of deaths with asthma listed as a *contributing* cause (41.3%) also had an *underlying* cause of death related to the circulatory system – see *Chapter 6 Asthma Mortality*.
- For patients who had an observation hospital discharge with asthma as an underlying diagnosis, symptoms, signs and ill-defined conditions was the most common group of primary diagnoses (29.6%).
- Emergency department discharges with an underlying diagnosis of asthma were likely to have injury and poisonings (23.3%), symptoms, signs and ill-defined conditions (22.1%) or diseases of the respiratory system excluding asthma (18.7%) listed as the primary diagnosis.

Further exploration of the data is needed to determine the cause of the rise in asthma as an underlying diagnosis (e.g., a change in billing and coding practices, increased awareness of asthma, increased prevalence of asthma, or other factors) and to fully understand the implications.

# Utilization of Health Care Services

**Figure 4.2.18**

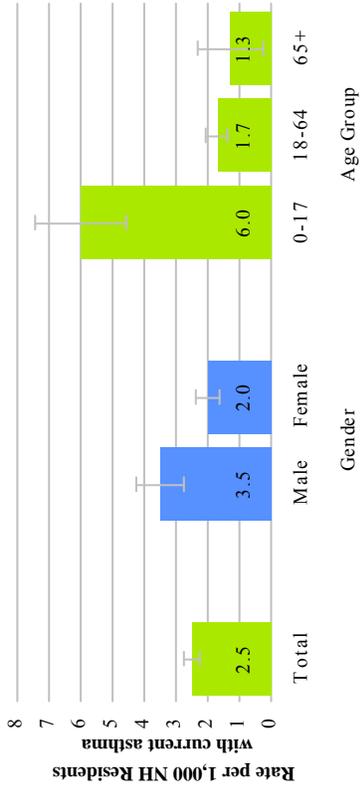
**At-risk based rates of inpatient hospital discharges with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**



Data Sources: 2006 NH IHDD and BRFSS

**Figure 4.2.19**

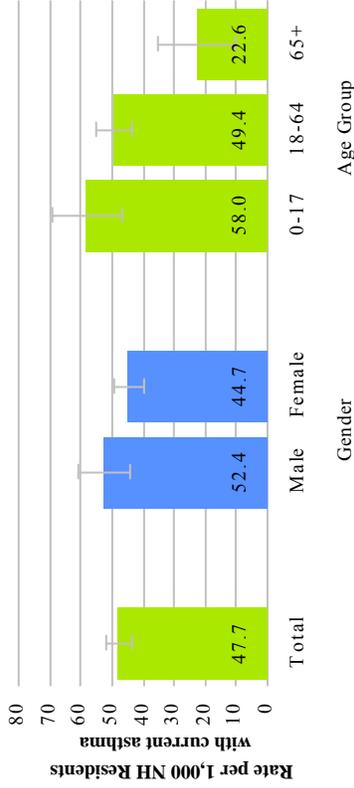
**At-risk based rates of outpatient observation hospital discharges with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**



Data Sources: 2006 NH OHDD and BRFSS

**Figure 4.2.20**

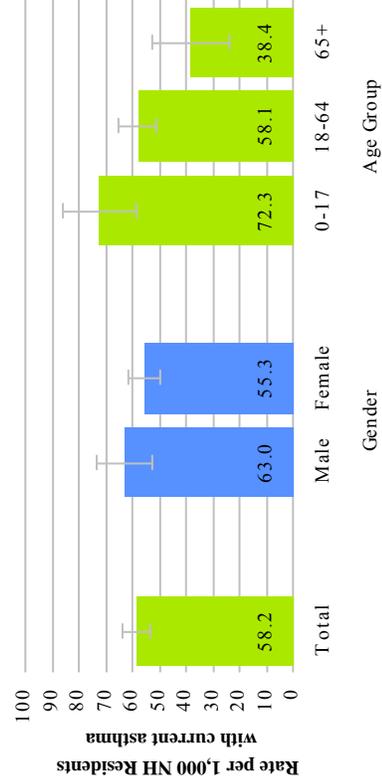
**At-risk based rates of outpatient emergency department hospital discharges with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**



Data Sources: 2006 NH OHDD and BRFSS

**Figure 4.2.21**

**At-risk based rates of all hospital services with asthma as the principal diagnosis by demographic factors - New Hampshire, 2006**



Data Sources: 2006 NH IHDD, OHDD and BRFSS

## ***At-Risk Based Utilization Rates for Hospital Services by Demographic Factors***

At-risk based rates for hospital services for asthma represent the number of asthma-related hospital services for individuals with current asthma rather than for the general population. Previous figures on utilization of hospital services display rates per 10,000 New Hampshire residents. Figures 4.2.18-21 display rates per 1,000 New Hampshire residents with current asthma. The numerator used to calculate these rates is the same but the denominator (population) used is different. See Appendix B Technical Notes and Methods at [www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm](http://www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm) for methods used to calculate these rates.

At-risk based rates can control for differences observed in the prevalence of asthma over time or between groups. By controlling for these differences, it is possible to assess if the differences in utilization of services are due to differences in prevalence. Unfortunately, trends using this measure cannot be examined at this time because multiple data sources are used to calculate at-risk based rates, and data from all necessary sources are currently available for only two calendar years (2005 and 2006).

*Utilization Rates Across Types of Hospital Services:* Figures 4.2.2-5 on page 4-6, which show rates for the general population, indicate that in general females utilize more hospital services than males. However, after calculating the at-risk based rates, which control for the differences in prevalence rates between males and females, there does not appear to be a statistically significant difference in utilization rates with the exception of observation discharges.

In general, males have a lower prevalence of asthma compared with females, but males are as likely to have an observation discharge as females, as seen in Figure 4.2.3. After controlling for the difference in prevalence between males and females, the data show that males with asthma are more likely to have an observation discharge than females with asthma.

For inpatient and emergency discharges, females have higher discharge rates, as seen in Figures 4.2.2 and 4.2.4. However, females also have a higher prevalence rate of asthma. When these two factors are taken into consideration, females with asthma appear to utilize these services at approximately the same rate as males with asthma.

Detailed age groups like those presented in Figures 4.2.2-5 on page 4-6 could not be shown for the at-risk based rates. Because the data used to estimate the population with asthma are based on survey data from the New Hampshire Behavioral Risk Factor Surveillance System (NH BRFSS), the population estimates for people with asthma become statistically unreliable when more detailed age breakouts are utilized.

See Table 4.2.14 at the end of this chapter for point estimates and confidence intervals for data presented in Figures 4.2.18-21.

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### Seasonal Trend of Hospital Services

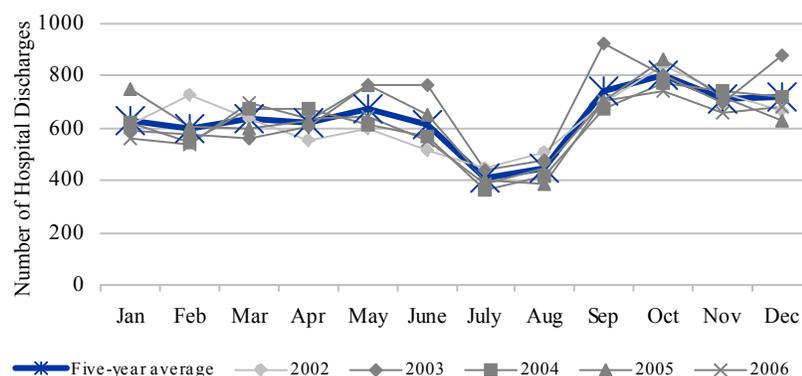
The number of hospital discharges for asthma fluctuates over the course of a year with the largest number occurring from January through April and September through December. This seasonal pattern has been relatively consistent over the last five-year period (2002-2006). Figure 4.2.22 shows the average number of all hospital services (inpatient, observation stays and emergency department) by month; a similar seasonal pattern is observed for each type of hospital service.

Although seasonality is associated with primary diagnoses of asthma, no seasonal pattern was observed with underlying diagnoses of asthma — data not shown.

Seasonality varies somewhat by age and gender, most notably among adults 65 years old and older. For female adults 65 years old and older, the number of hospital services utilized are highest in January and then steadily decline, with the lowest numbers in June, July, and August, followed by an increase from October to December. Males 65 years old and older have no apparent seasonality associated with their use of hospital services.

Providers can use this pattern of seasonality to step-up and step-down treatment. For example, timing asthma check-ups before high utilization and peak prescription fill months may improve asthma control because it would provide an opportunity for health care providers to evaluate medications, re-educate patients on proper inhaler technique, what to do when they are having issues, and so on. During decreased utilization and symptom periods, providers might step-down treatment.<sup>24</sup>

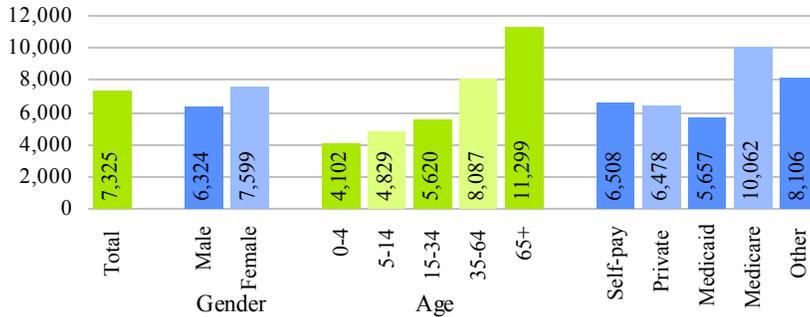
**Figure 4.2.22**  
**Five-year average number of discharges for all hospital services with asthma as the principal diagnosis by month - New Hampshire, 2002-2006**



Data Sources: 2002-2006 NH IHDD and OHDD

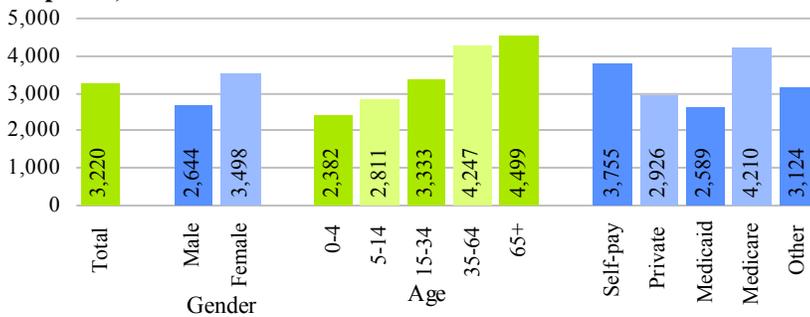
See Table 4.2.15 at the end of this chapter for data presented in Figure 4.2.22.

**Figure 4.2.23**  
**Median charges for inpatient hospital discharges with asthma as the principal diagnosis by demographic factors and expected payer - New Hampshire, 2006**



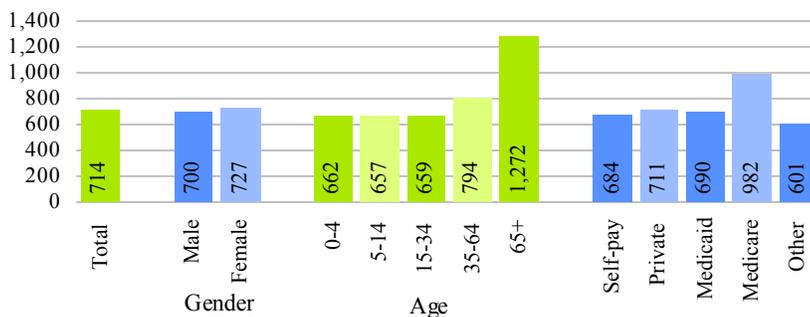
Data Source: 2006 NH IHDD  
 Expected Payer "Other" includes: Worker/s Compensation, Other government and Other.

**Figure 4.2.24**  
**Median charges for outpatient observation hospital discharges with asthma as the principal diagnosis by demographic factors and expected payer - New Hampshire, 2006**



Data Source: 2006 NH OHDD  
 Expected Payer "Other" includes: Worker/s Compensation, Other government and Other.

**Figure 4.2.25**  
**Median charges for outpatient emergency department hospital discharges with asthma as the principal diagnosis by demographic factors and expected payer - New Hampshire, 2006**



Data Source: 2006 NH OHDD  
 Expected Payer "Other" includes: Worker/s Compensation, Other government and Other.

## ***Charges for Hospital Services by Demographic Factors and Expected Payer***

Data in Figures 4.2.23-25 indicate that charges for hospital services for asthma tend to vary by gender, age and payer.

Charges include both physician and facility charges only when the physician is paid through the hospital; this results in an under-reporting of total charges.

*Inpatient Hospital Discharges:* Overall females tend to have a higher median charge and length of stay (see *Table 4.2.16* for data on length of stay) per hospitalization for asthma compared with males. In general, as age increases so does the length of stay and median charge for hospitalization. Median charge per visit is highest for Medicare with an average charge of \$10,062 per visit.

*Outpatient Observation Hospital Discharges:* For observation services, females have a higher median charge per visit compared with males. As with hospitalizations, charges increase with increasing age. Median charge per visit is highest for Medicare with an average charge of \$4,210 per visit followed by self-pay with an average charge of \$3,755 per visit.

*Outpatient Emergency Department Hospital Discharges:* Charges for emergency department visits for asthma do not tend to vary dramatically (usually less than \$30) by gender even when examining age and gender in tandem. As with other hospital services, charges increase with age. Median charge per visit is highest for Medicare with an average charge of \$982; all other payers pay approximately the same amount per emergency department discharge.

*Charges for Primary Care and Prevention:* Although we do not have population-based data on charges for primary care and prevention for asthma in New Hampshire, the State does collect cost information on paid claims from New Hampshire health insurers. Based on these data, the New Hampshire Insurance Department estimates an office visit usually costs between \$60-\$300 depending on the complexity of the visit, healthcare provider, insurance status, and insurance plan and coverage.<sup>25</sup>

See Tables 4.2.16-17 at the end of this chapter for mean, median, and total charges and length of stay for data presented in Figures 4.2.23-25

**Table 4.2.2**  
**Charges and length of stay (LOS) for inpatient hospital discharges with asthma as the principal diagnosis - New Hampshire, 2000-2006**

	n	Charges (dollars*)			LOS (days)		
		Mean	Median	Total	Mean	Median	Total
<b>2000</b>	890	5,249	4,102	4,671,415	3.1	2	2,734
<b>2001</b>	857	5,686	4,280	4,872,804	3.3	2	2,793
<b>2002</b>	868	7,083	5,182	6,148,070	3.3	3	2,916
<b>2003</b>	1,028	7,118	5,509	7,317,132	3.2	3	3,266
<b>2004</b>	1,083	8,508	6,093	9,214,600	3.5	3	3,742
<b>2005</b>	1,033	9,024	6,783	9,321,586	3.4	3	3,531
<b>2006</b>	1,003	10,242	7,325	10,272,851	3.5	3	3,563

Data Source: 2000-2006 NH IHDD

\*Unadjusted dollars

n=number of events

**Table 4.2.3**  
**Charges\* for observation and emergency department hospital discharges with asthma as the principal diagnosis by type of discharge - New Hampshire, 2000-2006**

	Observation hospital discharges				Emergency department discharges			
	n	Mean	Median	Total	n	Mean	Median	Total
<b>2000</b>	289	1,865	1,748	539,091	6,662	431	354	2,871,189
<b>2001</b>	322	2,001	1,818	644,358	6,527	472	398	3,077,657
<b>2002</b>	385	2,515	2,299	968,346	6,304	537	451	3,385,575
<b>2003</b>	411	2,655	2,363	1,091,301	6,652	623	516	4,141,378
<b>2004</b>	341	2,869	2,554	978,361	5,956	704	573	4,191,280
<b>2005</b>	394	3,130	2,799	1,233,183	6,294	765	615	4,814,509
<b>2006</b>	315	3,581	3,220	1,128,114	5,933	855	714	5,071,647

Data Source: 2000-2006 NH OHDD

\*Unadjusted dollars

n= number of events

## ***Trend in Charges and Length of Stay for Hospital Discharges***

In general, the charges associated with treating asthma in a hospital setting have increased substantially over the last seven years.

*Inpatient Hospital Discharges:* In 2006, there were 1,003 inpatient hospitalizations for asthma, resulting in 3,563 hospital days and charges of approximately \$10.3 million. The median length of stay for hospitalization was 3 days and the median charge was \$7,325 per visit. The median charge for inpatient hospitalizations for asthma has increased by 78.6% or \$3,223 from 2000 to 2006, and total charges have more than doubled.

*Outpatient Observation Hospital Discharges:* In 2006, there were 315 observation stays for asthma with a median charge of \$3,220 per stay. The median charge for an observation stay increased 84.2% or \$1,472 from 2000 to 2006, and total charges have more than doubled.

*Outpatient Emergency Department Hospital Discharges:* In 2006, there were 5,933 emergency department visits for asthma with a median charge of \$714 per visit. The median charge for an emergency department visit increased 101.6% or \$360 from 2000 to 2006, and total charges have increased 76.6%. Although there has been an overall decrease in the number and rate of asthma emergency department visits for asthma, the total annual charges for treating asthma in the emergency department continue to increase.

### *Utilization Rates Across Types of Hospital Services:*

- The charges associated with treating asthma have increased across every type of hospital visit; this is true for most other conditions as well.
- The greatest increase in charges is associated with those visits that result in hospitalization or observation discharges.
- The median charge for an emergency department visit for asthma is ten times less than the median charge for a hospitalization and 4.5 times less than the median charge for an observation discharge.

## Supporting Tables

**Table 4.1.3**

**Indicators that assess access to primary care for adults 18+ years old and children <18 years old - New Hampshire, 2007-2008** [Figure 4.1.1]

	Adults				Children			
	Current Asthma		No Asthma		Current Asthma		No Asthma	
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
<b>Has health insurance</b>								
Has health insurance	<b>88.7</b>	(85.5 - 91.9)	<b>90.3</b>	(89.1 - 91.4)	<b>94.8</b>	(90.5 - 99.1)	<b>95.8</b>	(94.4 - 97.2)
No health insurance	<b>11.3</b>	(8.1 - 14.5)	<b>9.7</b>	(8.6 - 10.9)	<b>5.2*</b>	(0.9 - 9.5)	<b>4.2</b>	(2.8 - 5.6)
<b>Has adequate health insurance</b>								
Has adequate health insurance					<b>74.0</b>	(64.6 - 83.3)	<b>81.0</b>	(78.6 - 83.4)
Has inadequate health insurance				No data available	<b>26.0</b>	(16.7 - 35.4)	<b>19.0</b>	(16.6 - 21.4)
<b>Has a personal healthcare provider</b>								
Yes	<b>91.1</b>	88.1 - 94.2	<b>88.4</b>	87.1 - 89.7	<b>96.2</b>	(91.7 - 100)	<b>97.3</b>	(96.4 - 98.2)
No	<b>8.9</b>	5.8 - 11.9	<b>11.6</b>	10.3 - 12.9	<b>3.8*</b>	(0.0 - 8.3)	<b>2.7</b>	(1.8 - 3.6)
<b>Cost barrier to seeing a doctor when needed in the last 12 months</b>								
No cost barrier	<b>80.4</b>	76.2 - 84.6	<b>90.5</b>	89.3 - 91.6				
Did not see a doctor when needed to because of cost	<b>19.6</b>	15.4 - 23.8	<b>9.5</b>	8.4 - 10.7			No data available	

Data Source: 2008 BRFSS for adults and 2007 NSCH for children

\*Relative standard error is greater than 30% - interpret with caution.

**Table 4.2.4**

**Number and percent of all hospital discharges with asthma as the principal diagnosis by discharge type and age - New Hampshire, 2002-2006** [Figure 4.2.1]

Age Group	0 to 4		5 to 14		15 to 34		35 to 64		65+		All Ages	
	n	%	n	%	n	%	n	%	n	%	n	%
IP Discharges	605	<b>16%</b>	477	<b>10%</b>	744	<b>6%</b>	2182	<b>16%</b>	1007	<b>37%</b>	5015	<b>13%</b>
OB Discharges	626	<b>17%</b>	279	<b>6%</b>	325	<b>2%</b>	482	<b>4%</b>	134	<b>5%</b>	1846	<b>5%</b>
ED Discharges	2532	<b>67%</b>	4029	<b>84%</b>	11962	<b>92%</b>	11002	<b>81%</b>	1614	<b>59%</b>	31139	<b>82%</b>
Total	3763	<b>100%</b>	4785	<b>100%</b>	13031	<b>100%</b>	13666	<b>100%</b>	2755	<b>100%</b>	38000	<b>100%</b>

Data Sources: 2002-2006 NH IHDD and OHDD

n = number of events

IP= Inpatient; OB= Observation ; ED= Emergency Department

**Table 4.2.5**  
**Number and rate (per 10,000 residents) of hospital discharges with asthma as the principal diagnosis by type of discharge - New Hampshire, 2006**

	Inpatient Discharges [Figure 4.2.2]			Observation Discharges [Figure 4.2.3]			Emergency Department Discharges [Figure 4.2.4]			All Hospital Discharges [Figure 4.2.5]		
	n	Rate*	95% CI	n	Rate*	95% CI	n	Rate*	95% CI	n	Rate*	95% CI
	<b>NH Total †</b>	1,003	<b>7.5</b>	(7.1 - 8.0)	315	<b>2.6</b>	(2.3 - 2.9)	5,933	<b>46.0</b>	(44.8 - 47.1)	7,251	<b>56.1</b>
<b>Gender †</b>												
Male	342	<b>2.8</b>	(2.5 - 3.1)	150	<b>2.5</b>	(2.1 - 2.9)	2,512	<b>39.8</b>	(38.3 - 41.4)	3,004	<b>47.8</b>	(46.1 - 49.5)
Female	661	<b>11.4</b>	(10.5 - 12.3)	165	<b>2.6</b>	(2.2 - 3.0)	3,421	<b>51.7</b>	(50.0 - 53.5)	4,247	<b>63.7</b>	(61.8 - 65.6)
<b>Age</b>												
0-4	114	<b>15.5</b>	(12.6 - 18.3)	113	<b>15.3</b>	(12.5 - 18.2)	526	<b>71.3</b>	(65.3 - 77.4)	753	<b>102.1</b>	(94.8 - 109.4)
5-14	96	<b>5.6</b>	(4.6 - 6.9)	42	<b>2.5</b>	(1.8 - 3.3)	756	<b>44.4</b>	(41.3 - 47.6)	894	<b>52.6</b>	(49.1 - 56.0)
15-34	132	<b>3.9</b>	(3.3 - 4.6)	48	<b>1.4</b>	(1.1 - 1.9)	2,202	<b>65.4</b>	(62.7 - 68.2)	2,382	<b>70.8</b>	(67.9 - 73.6)
35-64	453	<b>7.8</b>	(7.1 - 8.6)	93	<b>1.6</b>	(1.3 - 2.0)	2,124	<b>36.8</b>	(35.2 - 38.3)	2,670	<b>46.2</b>	(44.5 - 48.0)
65+	208	<b>12.4</b>	(10.7 - 14.1)	19	<b>1.1</b>	(0.7 - 1.8)	325	<b>19.4</b>	(17.3 - 21.5)	552	<b>33.0</b>	(30.3 - 35.8)
<b>Age and Gender</b>												
0-4 Male	71	<b>18.7</b>	(14.6 - 23.6)	76	<b>20.1</b>	(15.8 - 25.1)	361	<b>95.3</b>	(85.4 - 105.1)	508	<b>134.0</b>	(122.4 - 145.7)
0-4 Female	43	<b>12.0</b>	(8.7 - 16.2)	37	<b>10.3</b>	(7.3 - 14.2)	165	<b>46.1</b>	(39.0 - 53.1)	245	<b>68.4</b>	(59.8 - 77.0)
5-14 Male	68	<b>7.8</b>	(6.0 - 9.9)	25	<b>2.9</b>	(1.9 - 4.2)	468	<b>53.6</b>	(48.7 - 58.4)	561	<b>64.2</b>	(58.9 - 69.5)
5-14 Female	28	<b>3.4</b>	(2.2 - 4.9)	17	<b>2.1</b>	(1.2 - 3.3)	288	<b>34.8</b>	(30.8 - 38.8)	333	<b>40.2</b>	(35.9 - 44.6)
15-34 Male	36	<b>2.1</b>	(1.5 - 2.9)	18	<b>1.1</b>	(0.6 - 1.7)	877	<b>51.7</b>	(48.2 - 55.1)	931	<b>54.8</b>	(51.3 - 58.4)
15-34 Female	96	<b>5.8</b>	(4.7 - 7.0)	30	<b>1.8</b>	(1.2 - 2.6)	1,325	<b>79.4</b>	(75.2 - 83.7)	1,451	<b>87.0</b>	(82.5 - 91.5)
35-64 Male	122	<b>4.3</b>	(3.5 - 5.0)	25	<b>0.9</b>	(0.6 - 1.3)	700	<b>24.5</b>	(22.7 - 26.3)	847	<b>29.6</b>	(27.6 - 31.6)
35-64 Female	331	<b>11.3</b>	(10.1 - 12.6)	68	<b>2.3</b>	(1.8 - 3.0)	1,424	<b>48.8</b>	(46.3 - 51.4)	1,823	<b>62.5</b>	(59.6 - 65.4)
65+ Male	45	<b>6.3</b>	(4.6 - 8.4)	6	<b>0.8</b>	(0.3 - 1.8)	106	<b>14.8</b>	(12.0 - 17.6)	157	<b>21.9</b>	(18.5 - 25.3)
65+ Female	163	<b>17.1</b>	(14.5 - 19.7)	13	<b>1.4</b>	(0.7 - 2.3)	219	<b>22.9</b>	(19.9 - 26.0)	395	<b>41.4</b>	(37.3 - 45.5)

Data Sources: 2006 NH IHDD and OHDD

\*Rates are per 10,000 residents.

† Age-adjusted to the US 2000 standard population.

n= number of events

**Table 4.2.6**  
**Rate (per 10,000 residents) of inpatient hospital discharge with asthma as the principal diagnosis by county compared with the rest of the State - New Hampshire, 2004-2006**  
 [Figure 4.2.6]

County	County Rate*			Rate* for the Rest of the State		
	n	Rate	95% CI	n	Rate	95% CI
Belknap	158	<b>8.5</b>	(7.1 - 9.8)	2,961	<b>7.9</b>	(7.6 - 8.2)
Carroll	101	<b>7.2</b>	(5.7 - 8.7)	3,018	<b>8.0</b>	(7.7 - 8.3)
Cheshire	142	<b>6.2</b>	(5.2 - 7.3)	2,977	<b>8.0</b>	(7.7 - 8.3)
Coos	80	<b>7.4</b>	(5.9 - 9.3)	3,039	<b>7.9</b>	(7.7 - 8.2)
Grafton	147	<b>5.8</b>	(4.8 - 6.8)	2,972	<b>8.1</b>	(7.8 - 8.4)
Hillsborough	1,156	<b>9.6</b>	(9.1 - 10.2)	1,963	<b>7.2</b>	(6.8 - 7.5)
Merrimack	325	<b>7.3</b>	(6.5 - 8.1)	2,794	<b>8.0</b>	(7.7 - 8.3)
Rockingham	677	<b>7.8</b>	(7.2 - 8.4)	2,442	<b>8.0</b>	(7.7 - 8.3)
Strafford	240	<b>6.8</b>	(5.9 - 7.7)	2,879	<b>8.0</b>	(7.7 - 8.3)
Sullivan	93	<b>7.1</b>	(5.7 - 8.7)	3,026	<b>8.0</b>	(7.7 - 8.2)
<b>Urban Areas</b>						
Manchester	464	<b>14.0</b>	(12.7 - 15.3)	2,655	<b>7.4</b>	(7.1 - 7.6)
Nashua	293	<b>11.1</b>	(9.8 - 12.4)	2,826	<b>7.7</b>	(7.4 - 8.0)
Rest of Hillsborough (Hillsborough minus Nashua and Manchester)	399	<b>6.6</b>	(5.9 - 7.2)	2,362	<b>7.1</b>	(6.8 - 7.4)
<b>State Prevalence</b>	3,119	<b>7.9</b>	(7.6 - 8.2)	Not Applicable		

Data Source: 2004-2006 IHDD

\*Rate is per 10,000 NH residents and age-adjusted to 2000 standard US population.

n = number of events

**Table 4.2.7**  
**Rate (per 10,000 residents) of outpatient observation hospital discharges with asthma as the principal diagnosis by county compared with the rest of the State - New Hampshire, 2004-2006**  
 [Figure 4.2.7]

County	County Rate*			Rate* for the Rest of the State		
	n	Rate	95% CI	n	Rate	95% CI
Belknap	57	<b>3.4</b>	(2.6 - 4.4)	993	<b>2.9</b>	(2.7 - 3.1)
Carroll	40	<b>3.2</b>	(2.3 - 4.3)	1,010	<b>2.9</b>	(2.7 - 3.1)
Cheshire	31	<b>1.6</b>	(1.1 - 2.2)	1,019	<b>3.0</b>	(2.8 - 3.2)
Coos	43	<b>5.0</b>	(3.6 - 6.7)	1,007	<b>2.8</b>	(2.7 - 3.0)
Grafton	72	<b>3.3</b>	(2.6 - 4.2)	978	<b>2.9</b>	(2.7 - 3.1)
Hillsborough	398	<b>3.5</b>	(3.1 - 3.8)	652	<b>2.6</b>	(2.4 - 2.8)
Merrimack	134	<b>3.2</b>	(2.7 - 3.8)	916	<b>2.9</b>	(2.7 - 3.0)
Rockingham	186	<b>2.2</b>	(1.9 - 2.6)	864	<b>3.1</b>	(2.9 - 3.3)
Strafford	56	<b>1.7</b>	(1.3 - 2.2)	994	<b>3.0</b>	(2.8 - 3.2)
Sullivan	33	<b>2.7</b>	(1.8 - 3.7)	1,017	<b>2.9</b>	(2.7 - 3.1)
<b>Urban Areas</b>						
Manchester	130	<b>4.2</b>	(3.5 - 4.9)	920	<b>2.8</b>	(2.6 - 3.0)
Nashua	125	<b>5.1</b>	(4.2 - 6.0)	925	<b>2.7</b>	(2.6 - 2.9)
Rest of Hillsborough	143	<b>2.4</b>	(2.0 - 2.8)	798	<b>2.6</b>	(2.4 - 2.8)
<b>State Prevalence</b>	1,050	<b>2.9</b>	(2.7 - 3.1)	Not Applicable		

Data Source: 2004-2006 OHDD

\*Rate is per 10,000 NH residents and age-adjusted to 2000 standard US population.

n = number of events

**Table 4.2.8**  
**Rate (per 10,000 residents) of outpatient emergency department hospital discharges with asthma as the principal diagnosis by county compared with the rest of the State - New Hampshire, 2004-2006** [Figure 4.2.8]

County	County Rate*			Rate* for the Rest of the State		
	n	Rate	95% CI	n	Rate	95% CI
Belknap	1,026	<b>59.2</b>	(55.5 - 62.9)	17,157	<b>47.2</b>	(46.5 - 47.9)
Carroll	740	<b>58.9</b>	(54.5 - 63.3)	17,443	<b>47.4</b>	(46.7 - 48.1)
Cheshire	854	<b>39.3</b>	(36.6 - 42.0)	17,329	<b>48.3</b>	(47.6 - 49.0)
Coos	674	<b>76.0</b>	(70.1 - 81.8)	17,509	<b>47.1</b>	(46.4 - 47.8)
Grafton	1,353	<b>56.3</b>	(53.2 - 59.4)	16,830	<b>47.3</b>	(46.6 - 48.0)
Hillsborough	5,497	<b>46.4</b>	(45.1 - 47.6)	12,686	<b>48.5</b>	(47.7 - 49.4)
Merrimack	1,879	<b>44.2</b>	(42.2 - 46.2)	16,304	<b>48.2</b>	(47.5 - 49.0)
Rockingham	3,559	<b>42.0</b>	(40.6 - 43.4)	14,624	<b>49.5</b>	(48.7 - 50.3)
Strafford	1,721	<b>48.1</b>	(45.8 - 50.4)	16,462	<b>47.8</b>	(47.0 - 48.5)
Sullivan	880	<b>73.9</b>	(69.0 - 78.9)	17,303	<b>46.9</b>	(46.2 - 47.6)
<b>Urban Areas</b>						
Manchester	2,089	<b>63.8</b>	(61.1 - 66.6)	16,094	<b>46.4</b>	(45.6 - 47.1)
Nashua	1,518	<b>59.1</b>	(56.1 - 62.0)	16,665	<b>47.0</b>	(46.3 - 47.7)
Rest of Hillsborough (Hillsborough minus Nashua and Manchester)	1,890	<b>31.9</b>	(30.4 - 33.3)	14,576	<b>45.4</b>	(44.6 - 46.1)
<b>State Prevalence</b>	18,183	<b>47.8</b>	(47.1 - 48.5)	Not Applicable		

Data Source: 2004-2006 OHDD

\*Rate is per 10,000 NH residents and age-adjusted to 2000 standard US population.

n = number of events

**Table 4.2.9**  
**Rate (per 10,000 residents) of all hospital discharges with asthma as principal diagnosis by county compared with the rest of the State - New Hampshire, 2004-2006** [Figure

County	County Rate*			Rate* for the Rest of the State		
	n	Rate	95% CI	n	Rate	95% CI
Belknap	1,241	<b>71.1</b>	(67.1 - 75.1)	21,111	<b>58.0</b>	(57.2 - 58.8)
Carroll	881	<b>69.3</b>	(64.5 - 74.0)	21,471	<b>58.3</b>	(57.5 - 59.0)
Cheshire	1,027	<b>47.1</b>	(44.1 - 50.0)	21,325	<b>59.3</b>	(58.5 - 60.1)
Coos	797	<b>88.4</b>	(82.1 - 94.7)	21,555	<b>57.9</b>	(57.1 - 58.7)
Grafton	1,572	<b>65.4</b>	(62.1 - 68.7)	20,780	<b>58.2</b>	(57.4 - 59.0)
Hillsborough	7,051	<b>59.5</b>	(58.1 - 60.9)	15,301	<b>58.3</b>	(57.4 - 59.2)
Merrimack	2,338	<b>54.8</b>	(52.5 - 57.0)	20,014	<b>59.1</b>	(58.2 - 59.9)
Rockingham	4,422	<b>52.0</b>	(50.5 - 53.6)	17,930	<b>60.6</b>	(59.7 - 61.5)
Strafford	2,017	<b>56.6</b>	(54.1 - 59.1)	20,335	<b>58.8</b>	(58.0 - 59.6)
Sullivan	1,006	<b>83.7</b>	(78.5 - 89.0)	21,346	<b>57.8</b>	(57.0 - 58.6)
<b>Urban Areas</b>						
Manchester	2,683	<b>82.1</b>	(78.9 - 85.2)	19,669	<b>56.5</b>	(55.7 - 57.3)
Nashua	1,936	<b>75.3</b>	(71.9 - 78.7)	20,416	<b>57.4</b>	(56.6 - 58.2)
Rest of Hillsborough	2,432	<b>40.8</b>	(39.2 - 42.5)	17,733	<b>55.0</b>	(54.2 - 55.9)
<b>State Prevalence</b>	22,352	<b>58.6</b>	(57.8 - 59.4)	Not Applicable		

Data Source: 2004-2006 IHDD

\*Rate is per 10,000 NH residents and age-adjusted to 2000 standard US population.

n = number of events

**Table 4.2.10**  
**Trend in the annual number and rate (per 10,000 residents) of inpatient hospital discharges with asthma as the principal diagnosis - New Hampshire, 1996-2006**

		1996	1997	1998	1999	2000	2001	2002
<b>US Whites</b> † [Figure 4.2.10]								
	n	236,677	261,684	222,404	236,112	233,707	231,150	243,782
	<b>Rate*</b>	<b>10.8</b>	<b>11.7</b>	<b>9.9</b>	<b>10.4</b>	<b>10.2</b>	<b>10.1</b>	<b>10.5</b>
	95% CI	10.8 - 10.9	11.7 - 11.8	9.9 - 9.9	10.4 - 10.5	10.2 - 10.3	10.1 - 10.2	10.5 - 10.6
<b>New Hampshire</b> † [Figure 4.2.10]								
	n	956	924	732	800	890	857	868
	<b>Rate*</b>	<b>8.2</b>	<b>7.9</b>	<b>6.2</b>	<b>6.7</b>	<b>7.2</b>	<b>6.9</b>	<b>6.9</b>
	95% CI	7.9 - 9.0	7.5 - 8.5	5.9 - 6.8	6.3 - 7.2	6.7 - 7.7	6.4 - 7.3	6.4 - 7.3
<b>Gender</b> † [Figure 4.2.12]								
Male	n	323	357	238	274	291	318	321
	<b>Rate*</b>	<b>5.7</b>	<b>6.2</b>	<b>4.1</b>	<b>4.7</b>	<b>4.9</b>	<b>5.3</b>	<b>5.3</b>
	95% CI	5.1 - 6.3	5.5 - 6.8	3.6 - 4.6	4.1 - 5.3	4.3 - 5.4	4.7 - 5.9	4.7 - 5.9
Female	n	633	567	494	526	599	539	547
	<b>Rate*</b>	<b>10.4</b>	<b>9.2</b>	<b>7.9</b>	<b>8.3</b>	<b>9.3</b>	<b>8.3</b>	<b>8.2</b>
	95% CI	9.6 - 11.2	8.5 - 10.0	7.2 - 8.6	7.6 - 9.1	8.6 - 10.1	7.6 - 9.0	7.5 - 8.9
<b>Age</b> [Figure 4.2.14]								
0-4	n	139	113	91	98	95	129	98
	<b>Rate*</b>	<b>17.5</b>	<b>14.4</b>	<b>11.8</b>	<b>12.8</b>	<b>12.5</b>	<b>17.0</b>	<b>13.0</b>
	95% CI	14.4 - 20.6	11.5 - 17.3	9.5 - 14.5	10.4 - 15.6	10.1 - 15.3	14.1 - 20.0	10.6 - 15.8
5-14	n	102	128	81	112	92	77	88
	<b>Rate*</b>	<b>6.0</b>	<b>7.4</b>	<b>4.6</b>	<b>6.3</b>	<b>5.0</b>	<b>4.3</b>	<b>4.9</b>
	95% CI	4.8 - 7.2	6.1 - 8.7	3.7 - 5.7	5.1 - 7.5	4.1 - 6.2	3.4 - 5.3	3.9 - 6.0
15-34	n	229	225	163	145	163	142	135
	<b>Rate*</b>	<b>6.8</b>	<b>6.8</b>	<b>5.0</b>	<b>4.5</b>	<b>5.1</b>	<b>4.4</b>	<b>4.2</b>
	95% CI	5.9 - 7.7	5.9 - 7.7	4.3 - 5.8	3.8 - 5.2	4.4 - 5.9	3.7 - 5.2	3.5 - 4.9
35-64	n	312	312	246	280	368	353	357
	<b>Rate*</b>	<b>6.8</b>	<b>6.6</b>	<b>5.0</b>	<b>5.6</b>	<b>7.1</b>	<b>6.7</b>	<b>6.6</b>
	95% CI	6.0 - 7.5	5.8 - 7.3	4.4 - 5.7	4.9 - 6.3	6.4 - 7.8	6.0 - 7.4	5.9 - 7.3
65+	n	174	146	151	165	172	156	190
	<b>Rate*</b>	<b>12.5</b>	<b>10.4</b>	<b>10.5</b>	<b>11.3</b>	<b>11.6</b>	<b>10.3</b>	<b>12.3</b>
	95% CI	10.7 - 14.4	8.7 - 12.1	8.8 - 12.2	9.6 - 13.1	9.9 - 13.3	8.7 - 11.9	10.6 - 14.1

Data Sources: 1996-2006 NH IHDD and 1996-2006 NHDS

‡ Change in data collection; use caution when comparing rates prior to 2000 to rates after 2000.

\* Rates are per 10,000 residents.

† Age-adjusted to the 2000 US standard population.

‡ Unless otherwise noted, the trend analyses were conducted from 2000 to 2006.

n= number of events (e.g., number of asthma hospitalizations)

Slope (slope of the best line of fit calculated using JoinPoint Software)= the average percentage point increase or decrease per year (e.g., a slope of 1.0 indicates that the rate of hospital discharges increased on average 1 visit per 10,000 NH Residents per year).

P-value gives the probability of finding no trend. A p-value of 0.05 or less is considered statistically significant because there is less than a 5% chance that there is no trend in the data.

Table 4.2.10 - continued

					Trend Analysis ‡			
		2003	2004	2005	2006	Slope	95% CI of Slope	P-value
<b>US Whites † [Figure 4.2.10]</b>								
n		283,858	236,129	262,905	228,411			
<b>Rate*</b>		<b>12.1</b>	<b>10.0</b>	<b>10.9</b>	<b>9.4</b>	-0.07	( -0.42 , 0..28)	0.72
95% CI		12.1 - 12.2	9.9 - 10.0	10.9 - 11.0	9.4 - 9.5			
<b>New Hampshire † [Figure 4.2.10]</b>								
n		1,028	1,083	1,033	1,003			
<b>Rate*</b>		<b>8.0</b>	<b>8.3</b>	<b>7.9</b>	<b>7.6</b>	0.15	( -0.01 , 0.31)	0.13
95% CI		7.6 - 8.6	7.8 - 8.8	7.4 - 8.4	7.1 - 8.0			
<b>Gender † [Figure 4.2.12]</b>								
Male	n	361	368	359	342			
	<b>Rate*</b>	<b>5.9</b>	<b>6.0</b>	<b>5.8</b>	<b>5.4</b>	0.21	( -0.09 , 0.51)	0.24
	95% CI	5.3 - 6.5	5.3 - 6.9	5.2 - 6.4	4.9 - 6.0			
Female	n	667	715	674	661			
	<b>Rate*</b>	<b>10.0</b>	<b>10.5</b>	<b>9.8</b>	<b>9.4</b>	0.10	( -0.01 , 0.22)	0.14
	95% CI	9.3 - 10.8	9.7 - 11.2	9.1 - 10.6	8.7 - 10.1			
<b>Age [Figure 4.2.14]</b>								
0-4	n	131	136	126	114			
	<b>Rate*</b>	<b>17.5</b>	<b>18.3</b>	<b>17.1</b>	<b>15.5</b>	0.56	( -0.23 , 1.35)	0.22
	95% CI	14.5 - 20.5	15.2 - 21.4	14.1 - 20.1	12.6 - 18.3			
5-14	n	122	81	90	96			
	<b>Rate*</b>	<b>6.9</b>	<b>4.6</b>	<b>5.2</b>	<b>5.6</b>	0.12	( -0.19 , 0.43)	0.47
	95% CI	5.7 - 8.1	3.7 - 5.8	4.2 - 6.4	4.6 - 6.9			
15-34	n	173	144	160	132			
	<b>Rate*</b>	<b>5.3</b>	<b>4.4</b>	<b>4.8</b>	<b>3.9</b>	-0.10	( -0.28 , 0.09)	0.34
	95% CI	4.5 - 6.1	3.7 - 5.1	4.1 - 5.6	3.3 - 4.6			
35-64	n	422	503	447	453			
	<b>Rate*</b>	<b>7.6</b>	<b>9.0</b>	<b>7.8</b>	<b>7.8</b>	0.24	( -0.01 , 0.49)	0.12
	95% CI	6.9 - 8.4	8.2 - 9.7	7.1 - 8.6	7.1 - 8.6			
65+	n	180	219	210	208			
	<b>Rate*</b>	<b>11.5</b>	<b>13.8</b>	<b>13.0</b>	<b>12.4</b>	0.34	( -0.02 , 0.69)	0.12
	95% CI	9.8 - 13.2	11.9 - 15.6	11.3 - 14.8	10.7 - 14.1			

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**Table 4.2.11**  
**Trend in the annual number and rate (per 10,000 residents) of outpatient observation hospital discharges for asthma as principal diagnosis - New Hampshire, 2000-2006**

Trend Analysis‡

	2000	2001	2002	2003	2004	2005	2006	Slope	95% CI of slope	P-value
<b>US Whites †</b>										
n	No Available US Data									
<b>Rate *</b>	No Available US Data									
95% CI	No Available US Data									
<b>New Hampshire †</b>										
n	289	322	385	411	341	394	315			
<b>Rate *</b>	<b>2.4</b>	<b>2.7</b>	<b>3.2</b>	<b>3.4</b>	<b>2.8</b>	<b>3.3</b>	<b>2.6</b>	0.05	( -0.09 , 0.19)	0.54
95% CI	2.1 - 2.7	2.4 - 3.0	2.9 - 3.5	3.1 - 3.7	2.5 - 3.1	2.9 - 3.6	2.3 - 2.9			
<b>Gender †</b>										
<b>Male</b>										
n	135	157	204	205	162	176	150			
<b>Rate *</b>	<b>2.3</b>	<b>2.7</b>	<b>3.4</b>	<b>3.4</b>	<b>2.7</b>	<b>3.0</b>	<b>2.5</b>	0.04	( -0.13 , 0.20)	0.69
95% CI	1.9 - 2.7	2.3 - 3.1	3.0 - 3.9	3.0 - 3.9	2.3 - 3.1	2.6 - 3.4	2.1 - 2.9			
<b>Female</b>										
n	154	165	181	206	179	218	165			
<b>Rate *</b>	<b>2.5</b>	<b>2.6</b>	<b>2.9</b>	<b>3.3</b>	<b>2.9</b>	<b>3.5</b>	<b>2.6</b>	0.06	( -0.07 , 0.19)	0.42
95% CI	2.1 - 2.9	2.2 - 3.1	2.5 - 3.3	2.8 - 3.7	2.5 - 3.3	3.0 - 4.0	2.2 - 3.0			
<b>Age [Figure 4.2.15]</b>										
<b>0-4</b>										
n	88	114	118	135	117	143	113			
<b>Rate *</b>	<b>11.6</b>	<b>15.0</b>	<b>15.6</b>	<b>18.0</b>	<b>15.8</b>	<b>19.4</b>	<b>15.3</b>	0.65	( -0.03 , 1.32)	0.12
95% CI	9.3 - 14.3	12.3 - 17.8	12.8 - 18.5	15.0 - 21.1	12.9 - 18.6	16.3 - 22.6	12.5 - 18.2			
<b>5-14</b>										
n	60	50	59	67	55	56	42			
<b>Rate *</b>	<b>3.3</b>	<b>2.8</b>	<b>3.3</b>	<b>3.8</b>	<b>3.1</b>	<b>3.2</b>	<b>2.5</b>	-0.06	( -0.20 , 0.08)	0.43
95% CI	2.5 - 4.2	2.0 - 3.6	2.5 - 4.2	2.9 - 4.8	2.4 - 4.1	2.5 - 4.2	1.8 - 3.3			
<b>15-34</b>										
n	55	58	81	69	58	69	48			
<b>Rate *</b>	<b>1.7</b>	<b>1.8</b>	<b>2.5</b>	<b>2.1</b>	<b>1.8</b>	<b>2.1</b>	<b>1.4</b>	-0.04	( -0.15 , 0.07)	0.51
95% CI	1.3 - 2.3	1.4 - 2.3	2.0 - 3.1	1.6 - 2.7	1.3 - 2.3	1.6 - 2.6	1.1 - 1.9			
<b>35-64</b>										
n	69	74	98	110	87	94	93			
<b>Rate *</b>	<b>1.3</b>	<b>1.4</b>	<b>1.8</b>	<b>2.0</b>	<b>1.5</b>	<b>1.6</b>	<b>1.6</b>	0.04	( -0.03 , 0.11)	0.34
95% CI	1.0 - 1.7	1.1 - 1.8	1.5 - 2.2	1.6 - 2.4	1.2 - 1.9	1.3 - 2.0	1.3 - 2.0			
<b>65+</b>										
n	17	26	29	30	24	32	19			
<b>Rate *</b>	<b>1.1</b>	<b>1.7</b>	<b>1.9</b>	<b>1.9</b>	<b>1.5</b>	<b>2.0</b>	<b>1.1</b>	0.00	( -0.11 , 0.11)	1.00
95% CI	0.7 - 1.8	1.1 - 2.5	1.3 - 2.7	1.3 - 2.7	1.0 - 2.2	1.4 - 2.8	0.7 - 1.8			

Data Source: 2000-2006 NH OHDD

\* Rates are per 10,000 residents.

† Age-adjusted to the 2000 US standard population.

‡ Unless otherwise noted, the trend analyses were conducted from 2000 to 2006.

n= number of events (e.g., number of asthma hospitalizations)

Slope (slope of the best line of fit calculated using JoinPoint Software)= the average percentage point increase or decrease per year (e.g., a slope of 1.0 indicates that the rate of hospital discharges increased on average 1 visit per 10,000 NH Residents per year).

P-value gives the probability of finding no trend. A p-value of 0.05 or less is considered statistically significant because there is less than a 5% chance that there is no trend in the data.

**Table 4.2.12**  
**Trend in the annual number and rate (per 10,000 residents) of emergency department hospital discharges with asthma as the principal diagnosis - New Hampshire, 1996-2006**

		1996	1997	1998	1999	2000	2001	2002
<b>US Whites</b> † [Figure 4.2.12]								
	n	1,185,686	1,262,633	1,278,206	1,312,702	1,300,939	1,048,412	1,026,364
	<b>Rate *</b>	<b>49.2</b>	<b>51.1</b>	<b>55.1</b>	<b>53.4</b>	<b>53.3</b>	<b>42.8</b>	<b>43.4</b>
	95% CI	49.1 - 49.2	51.0 - 51.1	55.1 - 55.2	53.3 - 53.4	53.3 - 53.4	42.8 - 42.9	43.3 - 43.4
<b>New Hampshire</b> † [Figure 4.2.12]								
	n	6,485	6,795	6,136	6,853	6,662	6,527	6,304
	<b>Rate *</b>	<b>55.9</b>	<b>57.9</b>	<b>51.6</b>	<b>57.1</b>	<b>54.3</b>	<b>52.7</b>	<b>50.3</b>
	95% CI	54.4 - 57.2	56.4 - 59.2	50.3 - 52.9	55.8 - 58.5	53.3 - 55.2	51.8 - 53.6	49.5 - 51.2
<b>Gender</b> † [Figure 4.2.13]								
Male	n	2,671	2,819	2,301	2,833	2,645	2,663	2,643
	<b>Rate *</b>	<b>45.1</b>	<b>47.4</b>	<b>38.4</b>	<b>47.1</b>	<b>43.7</b>	<b>43.6</b>	<b>42.7</b>
	95% CI	43.4 - 46.8	45.6 - 49.2	36.8 - 40.1	45.4 - 48.8	42.3 - 45.2	42.1 - 45.0	41.4 - 44.0
Female	n	3,814	3,976	3,835	4,020	4,017	3,864	3,661
	<b>Rate *</b>	<b>63.2</b>	<b>65.5</b>	<b>62.6</b>	<b>65.6</b>	<b>64.5</b>	<b>61.5</b>	<b>57.7</b>
	95% CI	61.2 - 65.2	63.5 - 67.5	60.6 - 64.6	63.6 - 67.6	63.2 - 65.8	60.2 - 62.8	56.5 - 58.9
<b>Age</b> [Figure 4.2.16]								
0-4	n	569	585	433	618	469	537	449
	<b>Rate *</b>	<b>71.8</b>	<b>74.7</b>	<b>55.9</b>	<b>80.7</b>	<b>61.7</b>	<b>70.9</b>	<b>59.5</b>
	95% CI	65.5 - 78.1	68.2 - 81.2	50.3 - 61.5	74.1 - 87.3	56.1 - 67.3	64.9 - 76.9	54.0 - 65.0
5-14	n	943	1,032	788	935	809	853	838
	<b>Rate *</b>	<b>55.5</b>	<b>59.7</b>	<b>44.8</b>	<b>52.3</b>	<b>44.3</b>	<b>47.1</b>	<b>46.7</b>
	95% CI	52.0 - 59.0	56.1 - 63.3	41.7 - 47.9	48.9 - 55.7	41.3 - 47.4	43.9 - 50.3	43.5 - 49.9
15-34	n	2,812	2,824	2,511	2,745	2,630	2,516	2,437
	<b>Rate *</b>	<b>84.0</b>	<b>85.5</b>	<b>77.2</b>	<b>85.7</b>	<b>83.0</b>	<b>78.4</b>	<b>75.2</b>
	95% CI	80.9 - 87.1	82.3 - 88.7	74.2 - 80.2	82.6 - 88.8	79.9 - 86.2	75.4 - 81.5	72.2 - 78.2
35-64	n	1,862	2,059	2,099	2,252	2,387	2,289	2,272
	<b>Rate *</b>	<b>40.3</b>	<b>43.3</b>	<b>43.0</b>	<b>44.9</b>	<b>46.2</b>	<b>43.2</b>	<b>42.0</b>
	95% CI	38.4 - 42.2	41.3 - 45.3	41.1 - 44.9	42.9 - 46.9	44.3 - 48.0	41.5 - 45.0	40.2 - 43.7
65+	n	299	295	305	303	367	332	308
	<b>Rate *</b>	<b>21.6</b>	<b>20.9</b>	<b>21.3</b>	<b>20.8</b>	<b>24.7</b>	<b>21.9</b>	<b>20.0</b>
	95% CI	19.2 - 24.0	18.5 - 23.3	18.9 - 23.7	18.4 - 23.2	22.2 - 27.2	19.6 - 24.3	17.7 - 22.2

Data Sources: 1996-2006 NH OHDD and 1996-2006 NHAMCS

‡ Change in data collection; use caution when comparing rates prior to 2000 to rates after 2000.

\* Rates are per 10,000 residents.

† Age-adjusted to the 2000 US standard population.

‡ Unless otherwise noted, the trend analyses were conducted from 2000 to 2006.

n= number of events (e.g., number of asthma hospitalizations)

Slope (slope of the best line of fit calculated using JoinPoint Software)= the average percentage point increase or decrease per year (e.g., a slope of 1.0 indicates that the rate of hospital discharges increased on average 1 visit per 10,000 NH Residents per year).

P-value gives the probability of finding no trend. A p-value of 0.05 or less is considered statistically significant because there is less than a 5% chance that there is no trend in the data.

Table 4.2.12- continued

					Trend Analysis ‡			
		2003	2004	2005	2006	Slope	95% CI of slope	P-value
<b>US Whites</b> † [Figure 4.2.12]								
n		1,128,158	1,010,417	1,019,245	886,688			
<b>Rate *</b>		<b>47.1</b>	<b>40.1</b>	<b>42.3</b>	<b>34.8</b>	-2.33	( -3.56 , -1.10 )	0.01
95% CI		47.1 - 47.2	40.0 - 40.1	42.2 - 42.3	34.8 - 34.8			
<b>New Hampshire</b> † [Figure 4.2.12]								
n		6,652	5,956	6,294	5,933			
<b>Rate *</b>		<b>53.0</b>	<b>47.2</b>	<b>49.7</b>	<b>46.0</b>	-1.16	( -1.89 , -0.43 )	0.03
95% CI		52.1 - 53.9	46.3 - 48.0	48.8 - 50.5	44.8 - 47.1			
<b>Gender</b> † [Figure 4.2.13]								
<b>Male</b>								
n		2,723	2,549	2,655	2,512			
<b>Rate *</b>		<b>44.3</b>	<b>41.0</b>	<b>42.7</b>	<b>40.2</b>	-0.46	( -0.91 , -0.02 )	0.10
95% CI		42.9 - 45.7	39.8 - 42.2	41.5 - 43.8	38.6 - 41.7			
<b>Female</b>								
n		3,929	3,407	3,639	3,421			
<b>Rate *</b>		<b>61.4</b>	<b>53.0</b>	<b>56.3</b>	<b>52.5</b>	-1.80	( -2.87 , -0.74 )	0.02
95% CI		60.2 - 62.7	51.8 - 54.1	55.1 - 57.5	50.7 - 54.3			
<b>Age</b> [Figure 4.2.16]								
<b>0-4</b>								
n		550	505	502	526			
<b>Rate *</b>		<b>73.5</b>	<b>68.0</b>	<b>68.3</b>	<b>71.3</b>	1.22	( -0.64 , 3.08 )	0.25
95% CI		67.3 - 79.6	62.1 - 74.0	62.3 - 74.2	65.2 - 77.4			
<b>5-14</b>								
n		897	747	791	756			
<b>Rate *</b>		<b>50.6</b>	<b>42.7</b>	<b>45.9</b>	<b>44.4</b>	-0.21	( -1.20 , 0.78 )	0.70
95% CI		47.3 - 53.9	39.7 - 45.8	42.7 - 49.1	41.3 - 47.6			
<b>15-34</b>								
n		2,587	2,279	2,457	2,202			
<b>Rate *</b>		<b>79.1</b>	<b>69.2</b>	<b>74.1</b>	<b>65.4</b>	-2.44	( -3.69 , -1.18 )	0.01
95% CI		76.1 - 82.2	66.4 - 72.0	71.2 - 77.0	62.7 - 68.2			
<b>35-64</b>								
n		2,263	2,123	2,220	2,124			
<b>Rate *</b>		<b>41.0</b>	<b>37.8</b>	<b>38.9</b>	<b>36.8</b>	-1.44	( -1.82 , -1.07 )	0.00
95% CI		39.3 - 42.7	36.2 - 39.4	37.3 - 40.5	35.2 - 38.3			
<b>65+</b>								
n		355	302	324	325			
<b>Rate *</b>		<b>22.6</b>	<b>19.0</b>	<b>20.1</b>	<b>19.4</b>	-0.70	( -1.23 , -0.16 )	0.05
95% CI		20.3 - 25.0	16.8 - 21.1	17.9 - 22.3	17.3 - 21.5			

**Table 4.2.13**  
**Trend in the annual number and rate (per 10,000 residents) of all hospital discharges with asthma as the principal diagnosis - New Hampshire, 2000-2006**

								Trend Analysis ‡			
		2000	2001	2002	2003	2004	2005	2006	Slope	95% CI for slope	P-value
<b>US Whites †</b>											
n		No Available US Data									
<b>Rate *</b>		No Available US Data									
95% CI		No Available US Data									
<b>New Hampshire *</b>											
n		7,841	7,706	7,557	8,091	7,380	7,721	7,251			
<b>Rate *</b>		<b>64.0</b>	<b>62.2</b>	<b>60.2</b>	<b>64.2</b>	<b>58.0</b>	<b>60.4</b>	<b>56.1</b>	-1.07	( -1.86 , -0.29 )	0.04
95% CI		62.6 - 65.4	60.8 - 63.6	58.9 - 61.6	62.8 - 65.6	56.6 - 59.3	59.0 - 61.8	54.8 - 57.4			
<b>Gender †</b>											
<b>Male</b>											
n		3,071	3,138	3,168	3,289	3,079	3,190	3,004			
<b>Rate *</b>		<b>50.9</b>	<b>51.4</b>	<b>51.3</b>	<b>53.5</b>	<b>49.4</b>	<b>51.2</b>	<b>47.8</b>	-0.43	( -1.05 , 0.18 )	0.23
95% CI		49.1 - 52.7	49.6 - 53.2	49.5 - 53.1	51.6 - 55.3	47.7 - 51.2	49.4 - 53.0	46.1 - 49.5			
<b>Female</b>											
n		4,770	4,568	4,389	4,802	4,301	4,531	4,247			
<b>Rate *</b>		<b>76.4</b>	<b>72.4</b>	<b>68.5</b>	<b>74.3</b>	<b>65.9</b>	<b>69.0</b>	<b>63.7</b>	-1.70	( -2.79 , -0.60 )	0.03
95% CI		74.3 - 78.6	70.2 - 74.5	66.5 - 70.6	72.2 - 76.4	63.9 - 67.9	67.0 - 71.0	61.8 - 65.6			
<b>Age [Figure 4.2.17]</b>											
<b>0-4</b>											
n		652	780	665	816	758	771	753			
<b>Rate *</b>		<b>85.8</b>	<b>102.9</b>	<b>88.2</b>	<b>109.0</b>	<b>102.1</b>	<b>104.8</b>	<b>102.1</b>	2.55	( -0.30 , 5.40 )	0.14
95% CI		79.2 - 92.4	95.7 - 110.2	81.5 - 94.9	101.5 - 116.5	94.9 - 109.4	97.4 - 112.2	94.8 - 109.4			
<b>5-14</b>											
n		961	980	985	1,086	883	937	894			
<b>Rate *</b>		<b>52.7</b>	<b>54.1</b>	<b>54.9</b>	<b>61.3</b>	<b>50.5</b>	<b>54.4</b>	<b>52.6</b>	-0.14	( -1.46 , 1.17 )	0.84
95% CI		49.3 - 56.0	50.7 - 57.5	51.5 - 58.3	57.6 - 64.9	47.2 - 53.8	50.9 - 57.8	49.1 - 56.0			
<b>15-34</b>											
n		2,848	2,716	2,653	2,829	2,481	2,686	2,382			
<b>Rate *</b>		<b>89.9</b>	<b>84.7</b>	<b>81.8</b>	<b>86.5</b>	<b>75.3</b>	<b>81.0</b>	<b>70.8</b>	-2.60	( -4.06 , -1.13 )	0.02
95% CI		86.6 - 93.2	81.5 - 87.9	78.7 - 84.9	83.3 - 89.7	72.4 - 78.3	77.9 - 84.1	67.9 - 73.6			
<b>35-64</b>											
n		2,824	2,716	2,727	2,795	2,713	2,761	2,670			
<b>Rate *</b>		<b>54.6</b>	<b>51.3</b>	<b>50.4</b>	<b>50.6</b>	<b>48.3</b>	<b>48.3</b>	<b>46.2</b>	-1.18	( -1.50 , -0.85 )	<0.001
95% CI		52.6 - 56.7	49.4 - 53.2	48.5 - 52.3	48.8 - 52.5	46.5 - 50.1	46.5 - 50.2	44.5 - 48.0			
<b>65+</b>											
n		556	514	527	565	545	566	552			
<b>Rate *</b>		<b>37.5</b>	<b>33.9</b>	<b>34.2</b>	<b>36.0</b>	<b>34.3</b>	<b>35.1</b>	<b>33.0</b>	-0.38	( -0.87 , 0.11 )	0.19
95% CI		34.3 - 40.6	31.0 - 36.9	31.2 - 37.1	33.1 - 39.0	31.4 - 37.1	32.2 - 38.0	30.3 - 35.8			

Data Sources: 2000-2006 NH IHDD and OHDD

\* Rates are per 10,000 residents.

† Age-adjusted to the 2000 US standard population.

‡ Unless otherwise noted, the trend analyses were conducted from 2000 to 2006.

n= number of events (e.g., number of asthma hospitalizations)

Slope (slope of the best line of fit calculated using JoinPoint Software)= the average percentage point increase or decrease per year (e.g., a slope of 1.0 indicates that the rate of hospital discharges increased on average 1 visit per 10,000 NH Residents per year).

P-value gives the probability of finding no trend. A p-value of 0.05 or less is considered statistically significant because there is less than a 5% chance that there is no trend in the data.

**Table 4.2.14**

**At-risk based rates (per 1,000 residents) of hospital discharges with asthma as the principal diagnosis - New Hampshire, 2006**

		Inpatient Discharges	Observation Discharges	Emergency Department Discharges	All Hospital Discharges
		[Figure 4.2.18]	[Figure 4.2.19]	[Figure 4.2.20]	[Figure 4.2.21]
<b>Total</b>	Number of events	1,003	315	5,933	7,251
	Population with current asthma	124,505	124,505	124,505	124,505
	<b>At-Risk based rate *</b>	<b>8.1</b>	<b>2.5</b>	<b>47.7</b>	<b>58.2</b>
	95% CI	7.3 - 8.8	2.3 - 2.8	43.4 - 51.9	53.1 - 63.4
<b>Gender</b>					
<b>Male</b>	Number of events	342	165	2,512	3,019
	Population with current asthma	47,924	47,925	47,926	47,927
	<b>At-Risk based rate *</b>	<b>7.1</b>	<b>3.5</b>	<b>52.4</b>	<b>63.0</b>
	95% CI	5.8 - 8.5	2.7 - 4.2	43.9 - 60.9	52.8 - 73.2
<b>Female</b>	Number of events	661	150	3,421	4,232
	Population with current asthma	76,580	76,581	76,582	76,583
	<b>At-Risk based rate *</b>	<b>8.6</b>	<b>2.0</b>	<b>44.7</b>	<b>55.3</b>
	95% CI	7.5 - 9.7	1.6 - 2.3	39.9 - 49.4	49.4 - 61.1
<b>Age</b>					
<b>0-17</b>	Number of events	224	161	1,565	1,950
	Population with current asthma	26,981	26,981	26,981	26,981
	<b>At-Risk based rate *</b>	<b>8.3</b>	<b>6.0</b>	<b>58.0</b>	<b>72.3</b>
	95% CI	6.4 - 10.2	4.5 - 7.4	46.8 - 69.2	58.4 - 86.2
<b>18-64</b>	Number of events	571	135	4,043	4,749
	Population with current asthma	81,773	81,773	81,773	81,773
	<b>At-Risk based rate *</b>	<b>7.0</b>	<b>1.7</b>	<b>49.4</b>	<b>58.1</b>
	95% CI	6.0 - 7.9	1.3 - 2.0	43.6 - 55.2	51.3 - 64.9
<b>65+</b>	Number of events	208	19	325	552
	Population with current asthma	14,367	14,368	14,369	14,370
	<b>At-Risk based rate *</b>	<b>14.5</b>	<b>1.3</b>	<b>22.6</b>	<b>38.4</b>
	95% CI	12.9 - 16.0	0.3 - 2.4	10.3 - 35.0	24.0 - 52.8

Data Sources: 2006 NH IHDD, OHDD, BRFSS

\*At-Risk based rates are per 1,000 residents.

**Table 4.2.15**

**Number of discharges for all hospital services with asthma as the principal diagnosis by month - New Hampshire, 2002-2006 [Figure 4.2.22]**

Month	2002	2003	2004	2005	2006	Five-year average 2002-2006
Jan	613	588	621	749	561	626
Feb	730	578	543	607	538	599
Mar	637	564	671	601	694	633
Apr	555	608	673	631	635	620
May	602	763	613	765	643	677
June	518	767	567	654	556	612
July	449	440	365	403	387	409
Aug	506	477	418	387	447	447
Sep	700	921	675	707	708	742
Oct	841	805	773	866	739	805
Nov	736	698	739	723	660	711
Dec	670	882	722	628	683	717
<b>Total</b>	<b>7,557</b>	<b>8,091</b>	<b>7,380</b>	<b>7,721</b>	<b>7,251</b>	<b>7,600</b>

Data Sources: 2002-2006 NH IHDD and OHDD

**Table 4.2.16**  
**Charges and length of stay (LOS) for inpatient hospital discharges with**  
**asthma as the principal diagnosis by demographic factors and expected**  
**payer - New Hampshire, 2006 [Figure 4.2.23]**

	n	Charges (dollars*)			LOS (days)		
		Mean	Median	Total	Mean	Median	Total
<b>Total</b>	1,003	10,242	7,325	10,272,851	3.5	3	3,563
<b>Gender</b>							
Male	342	9,067	6,324	3,100,867	3.0	2	1,025
Female	661	10,850	7,599	7,171,984	3.8	3	2,538
<b>Age</b>							
0-4	114	4,890	4,102	557,461	2.0	2	229
5-14	96	6,690	4,829	642,279	2.4	2	226
15-34	132	6,870	5,620	906,810	2.5	2	335
35-64	453	11,039	8,087	5,000,763	3.7	3	1,667
65+	208	15,219	11,299	3,165,538	5.3	4	1,106
<b>Age and Gender</b>							
0-4 Male	71	4,871	4,128	345,860	2.0	2	141
Female	43	4,921	4,076	211,601	2.0	2	88
5-14 Male	68	6,991	5,086	475,399	2.3	2	158
Female	28	5,960	4,144	166,880	2.4	2	68
15-34 Male	36	7,114	5,774	256,120	2.4	2	85
Female	96	6,778	5,525	650,690	2.6	2	250
35-64 Male	122	10,186	8,361	1,242,747	3.3	3	397
Female	331	11,354	8,039	3,758,016	3.8	3	1,270
65+ Male	45	17,350	11,883	780,741	5.4	4	244
Female	163	14,631	10,786	2,384,797	5.3	4	862
<b>Expected Payer</b>							
Self-pay	108	8,093	6,508	874,043	3.1	3	330
Private	435	8,842	6,478	3,846,274	3.0	2	1,301
Medicaid	149	8,683	5,657	1,293,699	2.9	2	438
Medicare	304	13,820	10,062	4,201,322	4.8	4	1,468
Other †	7	8,216	8,106	57,513	3.7	4	26

Data Source: 2006 NH IHDD

\*Unadjusted dollars

† Expected Payer "Other" includes: Worker/s Compensation, Other government and Other.

n = number of events

**Table 4.2.17**  
**Charges\* for outpatient observation and emergency department hospital discharges with asthma as the principal diagnosis by demographic factors and expected payer - New Hampshire, 2006**

	Observation Discharges [Figure 4.2.24]				Emergency Department Discharges [Figure 4.2.25]			
	n	Mean	Median	Total	n	Mean	Median	Total
	<b>Total</b>	315	3,581	3,220	1,128,114	5,933	855	714
<b>Gender</b>								
Male	150	3,203	2,644	480,382	2,512	820	700	2,059,870
Female	165	3,926	3,498	647,732	3,421	880	727	3,011,777
<b>Age</b>								
0-4	113	2,571	2,382	290,561	526	737	662	387,657
5-14	42	3,105	2,811	130,413	756	683	657	516,639
15-34	48	3,535	3,333	169,659	2,202	777	659	1,711,915
35-64	93	4,708	4,247	437,863	2,124	949	794	2,015,141
65+	19	5,243	4,499	99,618	325	1,355	1,272	440,295
<b>Age and Gender</b>								
0-4 Male	76	2,505	2,304	190,391	361	734	663	264,805
Female	37	2,707	2,841	100,170	165	745	661	122,852
5-14 Male	25	2,801	2,501	70,030	468	684	660	319,965
Female	17	3,552	3,227	60,383	288	683	643	196,674
15-34 Male	18	3,760	3,171	67,675	877	769	647	674,650
Female	30	3,399	3,386	101,984	1,325	783	664	1,037,265
35-64 Male	25	4,963	4,750	124,074	700	944	779	660,953
Female	68	4,615	4,186	313,789	1,424	951	799	1,354,188
65+ Male	6	4,702	3,834	28,212	106	1,316	1,267	139,497
Female	13	5,493	4,536	71,406	219	1,374	1,272	300,798
<b>Expected Payer</b>								
Self-pay	50	4,127	3,755	206,368	1,405	800	684	1,123,923
Private	160	3,351	2,926	536,155	2,654	841	711	2,232,522
Medicaid	64	2,988	2,589	191,225	1,147	803	690	921,437
Medicare	37	4,878	4,210	180,504	652	1,128	982	735,371
Other †	4	3,466	3,124	13,862	75	779	601	58,394

Data Source: 2006 NH OHDD

\*Unadjusted dollars

† Expected Payer "Other" includes: Worker/s Compensation, Other government and Other.

n = number of events

**Glossary**

- Current Asthma = Proportion of respondents who answered "Yes" to both "Have you ever been told by a doctor, nurse or other health professional that you had asthma?" and "Do you still have asthma?"  
Data Sources: NH BRFSS and NH BRFSS Adult and Child Asthma Call-back Surveys
- No Asthma = Proportion of respondents who answered "No" to "Have you ever been told by a doctor, nurse or other health professional that you had asthma?"  
Data Sources: NH BRFSS and NH BRFSS Adult and Child Asthma Call-back Surveys
- Former Asthma = Proportion of respondents who answered "Yes" to "Have you ever been told by a doctor, nurse or other health professional that you had asthma?" and "No" to "Do you still have asthma?" Since the number of people who report having former asthma is relatively small, results for people with former asthma are not included in this report.  
Data Sources: NH BRFSS and NH BRFSS Adult and Child Asthma Call-back Surveys
- Principal Diagnosis of Asthma = Hospital discharges with a principal discharge diagnosis of asthma (ICD-9 CM code 493.00-493.99).  
Data Sources: NH IHDD and OHDD
- Underlying Diagnosis of Asthma = Hospital discharges with a secondary discharge diagnosis of asthma (ICD-9 CM code 493.00-493.99).  
Data Sources: NH IHDD and OHDD

**Utilization of Primary Care Services**

- Had a Routine Doctor’s Visit in the Last 12 Months = Proportion of respondents who answered “within past year” to “About how long has it been since you last visited a doctor for a routine checkup? Within past year (anytime less than 12 months ago), Within past 2 years (1 year but less than 2 years ago), Within past 5 years (2 years but less than 5 years ago), 5 or more years ago, or Never.”  
Data Source: NH BRFSS - Table 4.1.1
- Or  
Proportion of respondents who answered “1 or more times” to “During the past 12 months/[Since [his/her] birth], how many times did [child’s name] see a doctor, nurse, or other health care provider for preventive medical care such as a physical exam or well-child checkup?”  
Data Source: NSCH - Table 4.1.1
- Had a Routine Checkup for Asthma in the Last 12 Months = Proportion of respondents who answered “1 or more times” to “During the past 12 months, how many times did you/[child] see a doctor or other health professional for a routine checkup for your/their asthma?”  
Data Source: NH BRFSS Adult and Child Call-back Surveys- Table 4.1.1
- Of Those who had a Routine Checkup for Asthma, Percent that Had more than one Visit in the Last 12 Months = Of the respondents who answered “1 or more times” to “During the past 12 months, how many times did you/[child] see a doctor or other health professional for a routine checkup for your/their asthma?” the proportion who answered “2 or more times” to “During the past 12 months, how many times did you/[child] see a doctor or other health professional for a routine checkup for your/[child’s] asthma?”  
Data Source: NH BRFSS Adult and Child Call-back Surveys- Table 4.1.1
- Had 1 or More Urgent Visits due to Worsening Asthma Symptoms in the Last 12 Months = Proportion of respondents who answered “1 or more times” to “Besides those emergency room or urgent care center visits, during the last 12 months, how many times did you see a doctor or other health professional for urgent treatment of worsening asthma symptoms or for an asthma episode or attack?”  
Data Source: NH BRFSS Adult and Child Call-back Surveys- Table 4.1.1

**Access to Primary Care**

**Has Health Insurance** Proportion of respondents who answered “Yes” to “Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?  
Data Source: NH BRFSS - Figure 4.1.1

Or

Proportion of respondents who answered “Yes” to “Does [child’s name] have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicaid?”  
Data Source: NSCH- Figure 4.1.1

**Has a Personal Healthcare Provider** Proportion of respondents who answered “Yes” to “Do you have one person you think of as your personal doctor or health care provider?” Or “Yes” to “Is there more than one or is there no person who you think of as your personal doctor or health care provider?”  
Data Source: NH BRFSS - Figure 4.1.1

Or

Proportion of respondents who answered “Yes” to “Do you have one or more persons you think of as [child’s name] personal doctor or nurse?”  
Data Source: NSCH - Figure 4.1.1

**Did Not See a Doctor When Needed to Because of Cost** Proportion of respondents who answered “Yes” to “Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?”  
Data Source: NH BRFSS - Figure 4.1.1

**Has Inadequate Insurance** = Five questions were used to create a measure to look at whether or not those with insurance had adequate insurance: current health insurance coverage; whether coverage is sufficient to meet the child’s needs; whether the family pays some health care costs out-of-pocket and how often these costs were reasonable; and whether insurance allows the child to see needed health care providers.

Inadequate insurance is based on the proportion of respondents who answered “Yes” to “Does [child’s name] have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicaid?” AND

Responds

- “Never” or Sometimes” to “Does [child name]’s health insurance offer benefits or cover services that meet his/her needs?” OR
- “Never” or Sometimes” to “Does [child name]’s health insurance allow him/her to see the health care providers he/she needs?” OR
- “Yes” to “Not including health insurance premiums or costs that are covered by insurance, do you pay any money for [child name]’s health care?” AND “Never” or Sometimes” to “Are the out of pocket costs for [child name]’s health care reasonable?”

Inadequate insurance is defined as a child who currently has health insurance coverage AND their benefits never or sometimes meet the child’s needs OR never or sometimes allow the child to see needed providers OR have out-of-pocket expenses that are never or sometimes reasonable.

Data Source: NSCH - Figure 4.1.1

## Access to Primary Care - continued

In the Last 12 Months, Cost was a Barrier to Seeing a Primary Care Provider for Asthma = Proportion of respondents who answered “Yes” to “Was there a time in the past 12 months when you/[child's name] needed to see your primary care doctor for your/[his/her] asthma but could not because of the cost?”  
Data Source: NH BRFSS Adult and Child Call-back Surveys- Table 4.1.2

In the Last 12 Months, Cost was a Barrier to Seeing a Specialist for Asthma = Proportion of respondents who answered “Yes” to “Was there a time in the past 12 months when you/[child's name] were/was referred to a specialist for your/[his/her] asthma care but could not go because of the cost?”  
Data Source: NH BRFSS Adult and Child Call-back Surveys- Table 4.1.2

In the Last 12 Months, Cost was a Barrier to Buying Asthma Medications = Proportion of respondents who answered “Yes” to “Was there a time in the past 12 months when you/[he/she] needed medication for your/[his/her] asthma, but you could not buy it because of the cost?”  
Data Source: NH BRFSS Adult and Child Call-back Surveys- Table 4.1.2

Experienced Any Cost Barriers to Treating Asthma = Proportion of respondents who answered “Yes” to “Was there a time in the past 12 months when you/[child's name] needed to see your primary care doctor for your/[his/her] asthma but could not because of the cost?” and/or “Yes” to “Was there a time in the past 12 months when you/[child's name] were/was referred to a specialist for your/[his/her] asthma care but could not go because of the cost?” and/or “Yes” to “Was there a time in the past 12 months when you/[he/she] needed medication for your/[his/her] asthma, but you could not buy it because of the cost?”  
Data Source: NH BRFSS Adult and Child Call-back Surveys- Table 4.1.2

## Hospital Services

Asthma as the Principal Diagnosis = Refers to discharges with asthma (ICD-9 CM code 493.00-493.99) listed as the primary diagnosis. The primary diagnosis is determined by the chief cause responsible for the admission of a patient.<sup>21</sup>  
Data Sources: NH IHDD and OHDD, NHDS, NHAMCS- Figures 4.2.1-17

Asthma as an Underlying Diagnosis = Underlying diagnoses (also referred to as secondary diagnoses) are typically additional conditions that affect patient care in terms of requiring clinical evaluation; or therapeutic treatment; or diagnostic procedures; or extended length of hospital stay; or increased nursing care and/or monitoring.<sup>20, 21</sup>  
Conditions classified as secondary diagnoses are basically conditions that affect patient management and/or consume hospital resources.

Underlying diagnoses for asthma are hospital discharges with a secondary discharge diagnosis of asthma (ICD-9 CM code 493.00-493.99). A discharge can have up to 8 secondary diagnoses. If a discharge has one or more secondary diagnoses of asthma, then it is classified as having an underlying diagnosis of asthma. Discharges that have both a primary and secondary diagnosis of asthma are classified only as having a primary diagnosis of asthma; they are not classified as having an underlying diagnosis of asthma.  
Data Sources: NH IHDD and OHDD– Table 4.2.1

**Hospital Services - continued**

- Inpatient Hospital Discharge** = Result from an admission to the hospital for treatment that requires at least one overnight stay.  
Data Sources: NH IHDD and OHDD, NHDS, NHAMCS- Figures 4.2.2, 4.2.6, 4.2.10, 4.2.12, 4.2.14, 4.2.18, 4.2.23 and Table 4.2.2
- Outpatient Observation Hospital Discharge** = Observation is a billing technique which permits patients, who have problems that normally do not qualify for admission to the hospital, to stay in the hospital usually 24 hours but some payers allow up to 48 hours. This status is reserved for conditions that can normally be treated in 24 hours or when the cause of a condition has not been determined. However, different payers have different amounts of time that are covered in observation before a decision on whether or not to admit to the hospital needs to be made. For Medicare it is usually within 24 hours, Medicaid up to 48 hours, and private insurance varies but it is usually within 24 hours. Most of the time a patient will not know they have an observation status rather than an inpatient status; the same treatment is usually given in both cases, the difference determined during the billing of services.<sup>20</sup>  
Data Sources: NH IHDD and OHDD- Figures 4.2.3, 4.2.7, 4.2.15, 4.2.19, 4.2.24 and Tables 4.2.1 and 4.2.3
- Outpatient Emergency Department Hospital Discharge** = Result from treatment received in an emergency department.  
Data Sources: NH IHDD and OHDD, NHDS, NHAMCS- Figures 4.2.4, 4.2.8, 4.2.11, 4.2.13, 4.2.16, 4.2.20, 4.2.25 and Tables 4.2.3
- All Hospital Services** = Includes inpatient hospital discharges, outpatient observation hospital discharges, and outpatient emergency department hospital discharges. If someone enters the hospital through the emergency department and is subsequently admitted to the hospital, they are counted only in the inpatient discharges. As a result this measure counts each visit to the hospital once and gives a total rate for the use of all hospital services with a few exceptions. See Appendix A Description of Data Sources at <http://www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm> for limitations of the data sources used to calculate this measure.  
Data Sources: NH IHDD and OHDD- Figures 4.2.1, 4.2.5, 4.2.9, 4.2.17, 4.2.21, and 4.2.22
- At-risk Based Rates** = At-risk based rates for asthma hospital discharges represent the number of asthma-related hospital services for individuals with current asthma rather than for the general population. The numerator used to calculate this rate is the same as for calculating the population based rates but the denominator (population) used is different. See Appendix B Technical Notes and Methods at <http://www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm> for methods used to calculate these rates.  
Data Sources: NH IHDD and OHDD, BRFS- Figures 4.2.18-21
- Charges** = Includes both facility and physician charges when the physician is paid through the hospital. Charges do not capture all charges associated with the use of hospital services because some physicians are not paid through the hospital.  
Data Sources: NH IHDD and OHDD- Figures 4.2.23-25 and Tables 4.2.2-3
- Length of Stay** = The number of days someone was in the hospital.  
Data Source: NH IHDD – Table 4.2.2
- Payer** = The primary health insurance that is expected to pay for hospital services.  
Data Sources: NH IHDD and OHDD- Figures 4.2.23-25

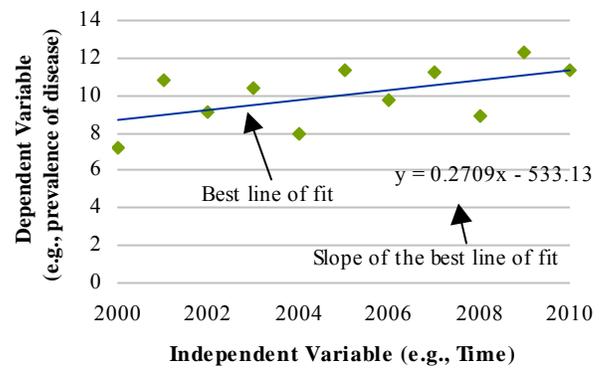
**Technical Definitions** - See Appendix B at <http://www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm> for additional technical notes and definitions.

Best Line of Fit	Sometimes referred to as a trend or regression line, is a line that best represents the data on a scatter plot (see Example 1 below). This line may pass through some of the points, none of the points, or all the points. It is used to see if there is a relationship between a dependent variable (e.g. prevalence of a disease) and an independent variable (e.g., time). In this document the best line of fit was calculated using JoinPoint Software. This software not only looks for one but several best lines of fit and tries to determine if there have been changes in the trend over time. For example, if there is an upward trend for 5 years followed by a downward trend for 8 years, this software will essentially calculate two best lines of fit - one representing the upward trend and one representing the downward trend.
Slope of the Best Line of Fit	The steepness, incline, or grade of the best line of fit. In the slope-intercept formula for a straight line, $y = mx + b$ , "m" is the slope and "b" gives the y-intercept.
Trend	The slope of the best line of fit is used to determine if there is an increasing or decreasing trend. A positive slope indicates an increasing trend; a negative slope indicates a decreasing trend.

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**Example 1: Scatter Plot**



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29 Hazen Drive, Concord, NH 03301-6504  
Phone: 603-271-0856 or 1-800-852-3345 ext. 0856  
TDD Access: 1-8000-735-2964  
Web: [www.dhhs.nh.gov/dphs/cdpc/asthma/index.htm](http://www.dhhs.nh.gov/dphs/cdpc/asthma/index.htm)