

# Asthma Data 2007

Research, Epidemiology & Evaluation  
March 2009



# Data Pages

## Asthma Data 2007

# Prevalence

## Asthma Data 2007

## Adult Demographics

**Among Vermont adults, the highest rates of asthma are observed in non-whites, those with less education or lower income, and those that have health insurance.**

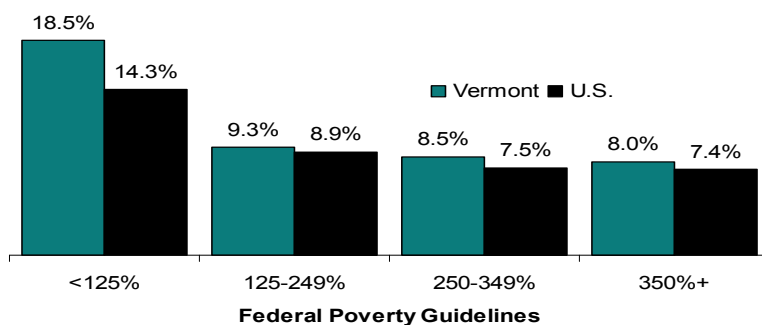
**Prevalence:** In 2007, 9.6%, or approximately 47,000 adult Vermonters have current asthma according the Behavioral Risk Factor Surveillance System.

**Age/Gender:** Asthma prevalence varies by age and gender. The overall prevalence of asthma among adult men in 2007 is 7.2% compared to a significantly higher rate in women, of 12.0% (See Table 1).

**Race:** In 2006-2007, whites have lower rates of asthma (9.3%) than non-whites (12.0%). This relationship is inconsistent with U.S. trends, which show whites having higher rates of asthma than non-whites (Table 1).

**Income/Education:** Adults with the lowest incomes and educational background have the highest rates of asthma. In Vermont, 18.5% of those making less than 125% of the Federal Poverty Level have asthma compared to only 8.0% in those making 350% or more of the Federal Poverty Level; 16.7% of Vermonters with less than a high school diploma have asthma compared to 10.0% of those with a college degree or higher (Figure 2).

**Figure 2. Prevalence of current asthma by income (as a measure of Federal Poverty Level) – Vermont and U.S. White non-Hispanic adult residents, 2007.**



**Health Insurance:** Rates of asthma are higher among those with health insurance compared to the uninsured (10.1% versus 7.2%). This may be a result of an increased need for health insurance in those with asthma or an increased awareness of their diagnosis due to physician recognition.

## Adult Demographics

**Table 1. Prevalence of current asthma by demographics – Vermont and U.S. adult residents, 2007.**

	<b>Vermont</b>	<b>US</b>
	<b>% (95% CI)</b>	<b>% (95% CI)</b>
Total	9.6 (8.6-10.7)	8.6 (8.4-8.8)
<b>Gender / Age</b>		
<b>Male</b>	7.2 (8.8-8.8)	6.6 (6.3-6.9)
18-24	10.2 (6.0-16.8)	8.7 (7.0-10.7)
25-44	7.1 (5.9-8.7)	6.7 (6.1-7.4)
45-64	6.6 (5.6-7.6)	6.0 (5.5-6.4)
65+	5.1 (4.0-6.6)	6.2 (5.7-6.7)
<b>Female</b>	12.0 (10.7-13.4)	10.5 (10.2-10.8)
18-24	16.0 (11.7-21.6)	12.8 (11.0-14.9)
25-44	12.1 (10.7-13.7)	10.6 (10.1-11.3)
45-64	11.8 (10.7-13.1)	10.7 (10.2-11.1)
65+	8.2 (7.0-9.4)	8.4 (7.9-8.9)
<b>Race</b>		
White	9.3 (8.7-10.0)*	8.7 (8.4-8.9)
Non-white	12.0 (8.6-16.4)*	7.6 (7.2-7.9)
<b>Household income</b>		
<125% FPL	18.5 (14.8-22.9)	14.3 (13.5-15.0)
125-249% FPL	9.3 (7.8-11.0)	8.9 (8.5-9.4)
250-349% FPL	8.5 (6.4-11.1)	7.5 (7.0-7.9)
350%+ FPL	8.0 (6.2-10.3)	7.4 (7.0-7.8)
<b>Education</b>		
Less than high school	16.7 (11.4-23.9)	13.4 (12.4-14.3)
High school or G.E.D.	8.8 (7.3-10.6)	8.5 (8.2-8.9)
Some college or technical school	10.1 (8.4-11.9)	9.1 (8.7-9.5)
College degree or greater	10.0 (7.9-12.5)	7.6 (7.2-8.0)
<b>Health insurance</b>		
Yes	10.1 (8.9-11.4)	8.6 (8.4-8.9)
No	7.2 (5.2-10.0)	8.9 (8.3-9.6)

Data source: BRFSS

Age-adjusted rates for all except sex/age groups. US data restricted to White non-Hispanic except for race calculations.

\*2006-2007 data combined due to small numbers.

## County-level Prevalence

*Although some variation is observed in asthma prevalence rates by county, when developing asthma prevention and control programs, it is important to target populations with known risk factors for asthma: income, education, health insurance, race, and age/gender.*

There is little variation in adult asthma prevalence between counties in Vermont according to BRFSS data from years 2003-2007 combined. When comparisons are made against the rest of the state, current asthma prevalence in Chittenden and Lamoille counties are significantly lower than the rest of the state.

### DATA TABLES

**Table 2. Prevalence of current asthma by county – Vermont adult residents, 2003-2007.**

	<b>2003-2007</b>
	<b><u>% (95% CI)</u></b>
<b>Addison</b>	9.7 (7.8-12.1)
<b>Bennington</b>	11.0 (9.1-13.3)
<b>Caledonia</b>	10.7 (8.8-12.8)
<b>Chittenden*</b>	8.2 (7.4-9.1)
<b>Essex</b>	8.5 (5.7-12.2)
<b>Franklin</b>	9.7 (8.1-11.7)
<b>Grand Isle</b>	9.8 (6.9-13.8)
<b>Lamoille*</b>	7.6 (6.0-9.5)
<b>Orange</b>	8.6 (7.1-10.4)
<b>Orleans</b>	10.2 (8.3-12.4)
<b>Rutland</b>	9.2 (8.0-10.5)
<b>Washington</b>	8.5 (7.3-9.8)
<b>Windham</b>	9.4 (8.1-10.9)
<b>Windsor</b>	10.11 (8.8-11.7)

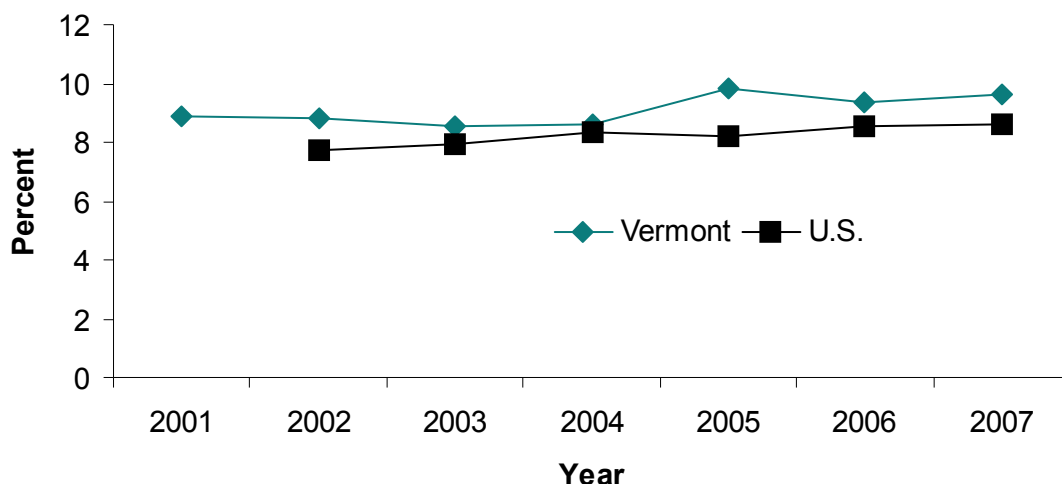
## Adults - Time Trends

**With consistently higher rates of asthma in Vermont and throughout New England compared to the United States, preventing and controlling asthma is a top priority in Vermont.**

Based on the latest findings of the Asthma Regional Council, among adults, the prevalence of asthma in New England increased significantly between 2001 and 2004. However, when looking at only Vermont data, there have been no statistically significant changes in asthma prevalence in Vermont between 2001 and 2007.

The Asthma Regional Council also indicates that asthma rates in New England are consistently higher for both adults and children compared to the rest of the country. In 2005, the prevalence of current asthma in Vermont was statistically significantly higher than the U.S. White non-Hispanic rate.

**Figure 2. Prevalence of current asthma – Vermont and U.S. white non-Hispanic adult residents, 2001-2007, age-adjusted rates.**



### DATA TABLES

**Table 3. Prevalence of current asthma – Vermont and U.S. adult residents, 2001-2007, crude and age-adjusted rates.**

	Vermont		U.S. White non-Hisp
	Crude	Age-adjusted	Age-adjusted
	% (95% CI)	% (95% CI)	% (95% CI)
2001	8.8 (7.9-9.9)	8.9 (7.9-9.9)	*
2002	8.7 (7.7-9.7)	8.8 (7.8-9.8)	7.7 (7.5-7.9)
2003	8.4 (7.4-9.4)	8.6 (7.6-9.7)	7.9 (7.7-8.1)
2004	8.5 (7.8-9.3)	8.6 (7.8-9.4)	8.3 (8.1-8.6)
2005	9.8 (8.9-10.8)	9.9 (8.9-10.9)	8.2 (8.0-8.4)
2006	9.3 (8.5-10.2)	9.4 (8.5-10.3)	8.6 (8.3-8.8)
2007	9.6 (8.6-10.6)	9.6 (8.6-10.7)	8.6 (8.4-8.8)

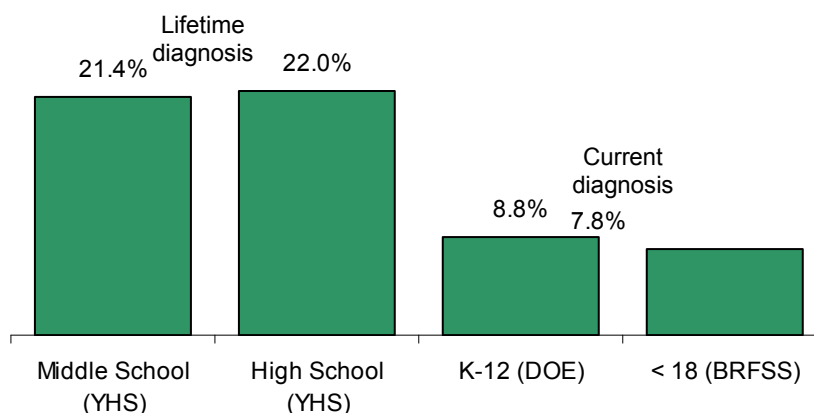
## Prevalence in Youth

**Approximately 1 in 10 students currently has asthma, and 1 in 5 students has ever had asthma.**

The Vermont Department of Health uses a variety of sources to collect asthma data among students. Figure 4 presents all of our school-level asthma data.

- ◆ The **Youth Health Survey (YHS)** only collects lifetime prevalence (having ever been diagnosed) among high school and middle school students. 21.4 percent of all middle school students and 22.0 percent of all high school students have ever been diagnosed with asthma.
- ◆ The **Behavioral Risk Factor Surveillance System (BRFSS)** estimates current asthma prevalence for youth under age 18. Approximately 7.8% (or 10,000) youth under 18 years of age have current asthma.
- ◆ The **Department of Education** collected data on asthma prevalence as part of their School Nurse Reports during the 2006-2007 school year. Based on nurse reports, current asthma prevalence in Vermont schools (K-12) is 8.8%.

**Figure 3. Prevalence of lifetime and current asthma among youth—2006-2007.**



### DATA TABLES

**Table 4. Prevalence of lifetime asthma—Middle and high school students, 2002-2006.**

	2002	2004	2006**
	% (95% CI)	% (95% CI)	% (95% CI)
<b>Middle school (YHS)</b>	18.1 (16.5-19.7)	19.5 (17.3-22.0)	21.4 (18.9-24.1)
Male	18.8 (16.3-21.6)	20.5 (17.2-24.3)	19.7 (16.6-23.3)
Female	17.3 (14.9-20.1)	18.3 (16.0-21.4)	23.2 (19.3-27.6)
<b>High school (YHS)</b>	*	24.3 (21.2-27.7)	22.0 (19.4-24.8)
Male	*	24.3 (20.5-28.1)	20.9 (17.5-24.8)
Female	*	24.1 (20.2-28.4)	23.0 (19.6-26.8)

\* High school students not included in the survey in 2002. 3/13/2009  
 \*\* Question wording and response categories slightly different on 2006 YHS  
 Crude rates. Data source = YHS and Department of Education.



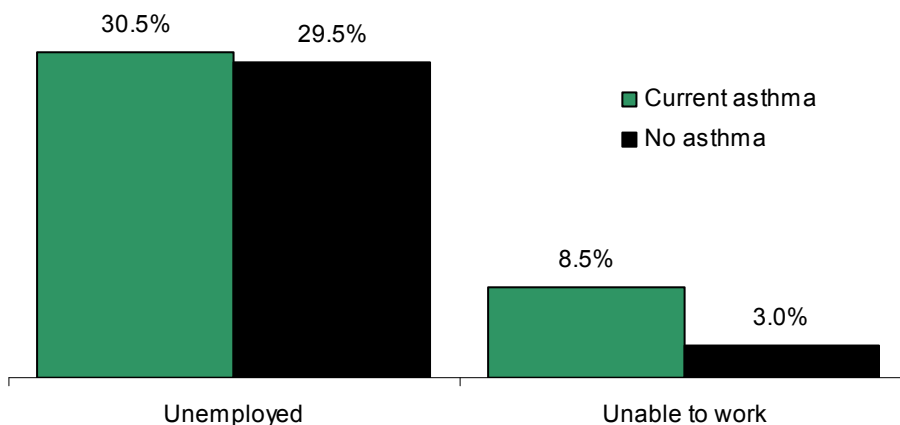
# Morbidity

## Asthma Data 2007

## Impairment in Daily Function

*Having asthma may impair one's ability to effectively work and sleep.*

**Figure 4. Employment status by asthma status – Vermont adult residents, 2007.**



**Employment Status:** As shown in Figure 5, persons with asthma report being unable to work at three times the rate of people who do not have asthma.

**Impaired Sleep:** 46% of Vermonters with asthma reported that their asthma symptoms made it difficult for them to stay asleep for one or more days in the past 30 days (2006 BRFSS Asthma Callback).

### DATA TABLES

**Table 5. Employment status by asthma status – Vermont adult residents, 2007.**

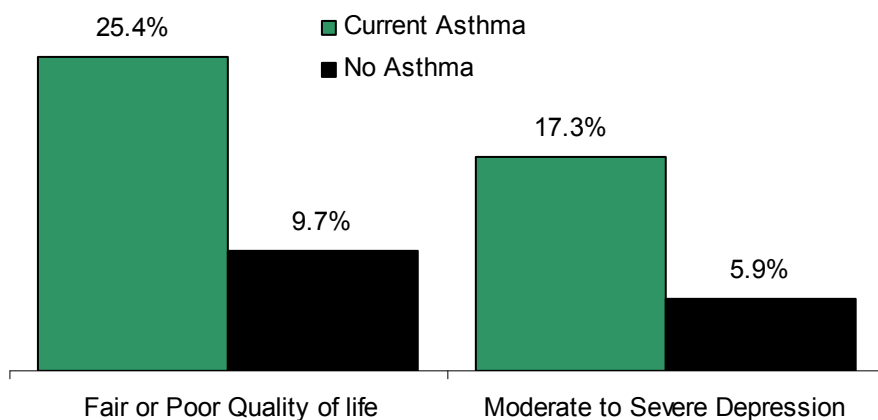
	Total population	Current asthma	No asthma
	<u>% (95% CI)</u>	<u>% (95% CI)</u>	<u>% (95% CI)</u>
Employed*	66.8%	61.0%	67.5%
Unemployed**	29.7%	30.5%	29.5%
Unable to work	3.5%	8.5%	3.0%

\* employed = employed for wages or self-employed, \*\* unemployed = out of work, student, homemaker, retired  
 Data source: BRFSS  
 Age-adjusted rates

## Quality of Life and Depression

*Programs aimed at improving the quality of life of those with asthma should incorporate activities to promote both physical and mental health, as data show Vermonters with asthma are more likely to report being depressed or having a fair or poor quality of life.*

**Figure 5. Percent reporting “fair” or “poor” quality of life and moderate to severe depression by asthma status – Vermont adult residents, 2007.**



**Quality of Life:** In Vermont, people with asthma report having a “fair” or “poor” quality of life at significantly higher rates than people without asthma (25.4% versus 9.7%).

**Depression:** In Vermont, people with asthma report moderate to severe depression at significantly higher rates than people without asthma (17.3% versus 5.9%).

### DATA TABLES

**Table 6. Percent reporting “fair” or “poor” quality of life and moderate to severe depression by asthma status – Vermont adult residents, 2007.**

	Fair or Poor Quality of Life	Moderate to Severe Depression
	<u>% (95% CI)</u>	<u>% (95% CI)</u>
<b>Current asthma</b>	25.4 (21.8-29.4)	17.3 (13.9-21.4)
<b>No asthma</b>	9.7 (8.8-10.7)	5.9 (5.1-6.8)
<b>Total population</b>	11.1 (10.3-12.1)	7.1 (6.3-8.0)

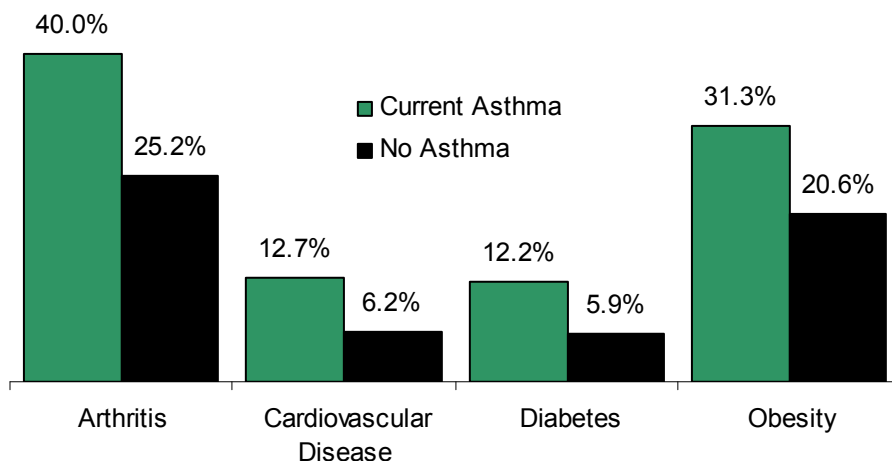
Data source: BRFSS  
Age-adjusted rates

## Co-morbidities

**Given that people with asthma may be dealing with multiple chronic conditions, initiatives aimed at reducing chronic disease will benefit from working together.**

Because many chronic diseases have similar risk factors, it is not surprising to find people with more than one chronic disease. Compared to Vermonters without asthma, Vermonters with asthma are significantly more likely to have arthritis, cardiovascular disease, diabetes, and obesity.

**Figure 6. Asthma and chronic disease co-morbidities - Vermont adult residents, 2007.**



### DATA TABLES

**Table 7. Asthma and chronic disease co-morbidities - Vermont adult residents, 2007.**

	Total population % (95% CI)	Current asthma % (95% CI)	No asthma % (95% CI)
Arthritis	26.6 (25.5-27.8)	40.0 (35.4-44.8)	25.2 (24.1-26.4)
Cardiovascular Disease	6.8 (6.1-7.6)	12.7 (9.3-17.2)	6.2 (5.6-6.8)
Diabetes	6.5 (5.8-7.3)	12.2 (8.7-16.8)	5.9 (5.3-6.5)
Obesity	21.7 (20.5-23.0)*	20.6 (19.4-22.0)	31.3 (27.0-35.8)

Data source: BRFSS

Age-adjusted rates

\*Data for obesity are often presented for 20+

# Risk Factors

Asthma Data  
2007

## ***Workplace and School Exposure***

***Additional education and resources should be provided to schools in order to create and maintain healthy learning environments for all children.***

There is increasing concern and research regarding the possible role of environmental and occupational exposures in the development and exacerbation of asthma.

According to the 2006 Behavioral Risk Factor Surveillance System– Asthma Callback Study,:

- ◆ 10.4% of Vermonters with asthma were told by a health professional that their asthma was related to a job they have had.
- ◆ 11.5% of Vermonters with asthma told a health professional that their asthma was related to a job they had had.
- ◆ 9.1% of Vermonters with asthma reported that their asthma was caused by chemicals, smoke, fumes, or dust in their current job
- ◆ 24.5% reported that their asthma was made worse by chemicals, smoke, fumes, or dust in their current job.

**ENVISION:** Efforts to improve environmental health are also carried out through the “ENVISION—Promoting Healthy School Environments” program. ENVISION is a direct result of the passing of the Act 125 Legislation which directs the Commissioners’ of Health, of Education, and of Buildings and General Services to:

- create and maintain a clearinghouse of environmental health information on the Department of Health’s website
- provide technical assistance to schools
- provide workshops on environmental health for school personnel
- to develop a model environmental health plan and policy
- to encourage and assist schools in developing programs that will enable them to address and prevent environmental health issues through the voluntary participation of schools.

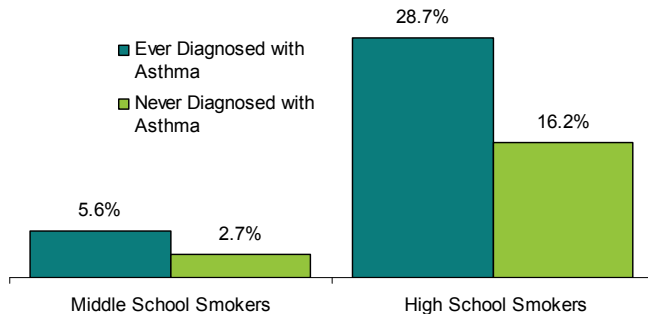
# Cigarette Smoking

**Programs must work to decrease smoking rates in Vermont, particularly among students, with 1 in 10 middle school and 1 in 5 high school students currently smoking.**

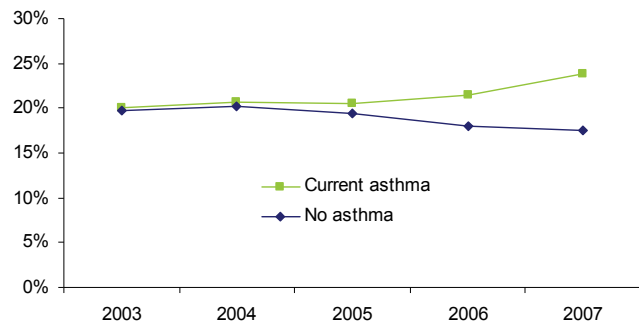
Smoking can exacerbate existing asthma, resulting in increased frequency and severity of symptoms.

**Adults:** As shown in Figure 8, the disparity in rates of smoking between students with and without asthma is growing.

**Figure 8. Current smoking status by lifetime asthma diagnosis - Vermont middle and high School students, 2006.**



**Figure 7. Current smokers by asthma status - Vermont adult residents, 2003-2007.**



**Youth:** Roughly twice as many middle and high school students with asthma smoke compared to those without asthma. The difference in smoking status among high school students with asthma compared to those without asthma is statistically significantly different.

## DATA TABLES

**Table 9. Current smokers by asthma status - Vermont residents, 2003-2007.**

	Total current smokers	People with asthma who are current smokers	People without asthma who are current smokers
Adults	% (95% CI)	% (95% CI)	% (95% CI)
2003	19.8 (18.3-21.3)	20.1 (16.1-24.8)	19.8 (18.3-21.4)
2004	20.2 (19.0-21.4)	20.7 (17.1-24.9)	20.2 (18.9-21.5)
2005	19.6 (18.4-20.9)	20.6 (16.7-25.2)	19.4 (18.2-20.7)
2006	18.4 (17.2-19.7)	21.4 (17.9-25.4)	18.0 (16.7-19.4)
2007	18.1 (16.8-19.5)	23.9 (19.3-29.2)	17.6 (16.3-19.0)
Youth			
HS - 2006	14.?	28.7 (21.4-37.2)	16.2 (13.7-19.1)
MS - 2006	9.?	5.6 (3.2-9.6)	2.7 (1.5-4.8)

# Self– and Clinical Care Management

Asthma Data  
2007

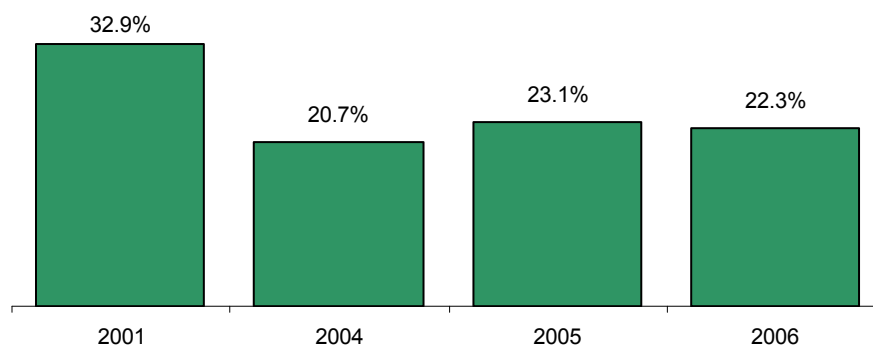


## Written Management Plans

**With only 1 in 5 Vermonters with asthma on a written asthma management plan, programs must work to increase use and awareness of the importance of these plans among both adults and youth.**

The National Heart, Lung, and Blood Institute recommends that seeing a physician for regular check-ups, using medications as directed by a doctor, and **following an asthma action plan prescribed by a doctor** can prevent or decrease asthma symptoms. (source: National Heart, Lung, and Blood Institute).

**Figure 9. Asthma self-management plan use – Vermont residents with asthma, 2001, 2004-2008.**



**Adults:** Use of written asthma management plans has decreased significantly among adult Vermonters from 32.9% in 2001 to 22.3% in 2006 (Figure 11).

**Youth:** The Department of Education also collected data on use of the Vermont Asthma Action Plan (VAAP) in schools. School nurses reported similar rates of use of asthma management plans (21.4%) among their students compared to the rate observed among adults.

### DATA TABLES

**Table 10. Asthma self-management plan use – Vermont residents with asthma, 2001, 2004-2006.**

	2001	2004	2005	2006	2007-2008
Written Asthma Plan:	<u>% (95% CI)</u>	<u>% (95% CI)</u>	<u>% (95% CI)</u>	<u>% (95% CI)</u>	<u>%</u>
<b>Adults*</b>	32.9 (27.9-38.2)	20.7 (17.2-24.8)	23.1 (19.5-27.2)	22.3 (17.6-27.8)	
<b>Students**</b>					21.4

Data sources: BRFSS and BRFSS-Asthma Callback (adults) and Department of Education, School Nurse Survey (students)  
 BRFSS: Age-adjusted rates, School Nurse Survey: Crude rates

\*Respondents indicated they and their doctor or other health care provider had worked out a written plan for taking care of their asthma in the past 12 months (written asthma plans can include information about medicines, asthma triggers, and what to do when you have an attack).

\*\*Nurse reported Asthma Action Plan on file.

## Routine Care Visits and Asthma Education

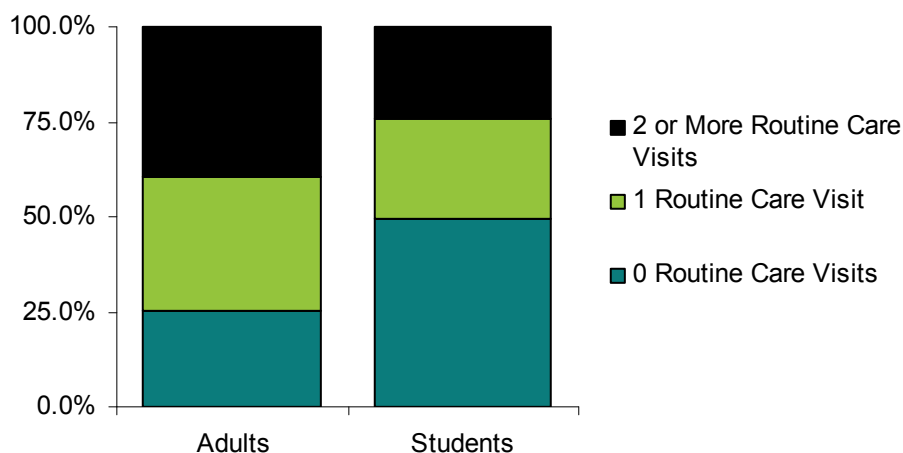
**With less than half of Vermonters with asthma visiting their physician for routine care in the past year, physicians, other health care professionals, and patients must be educated on the importance of routine care visits for persons with asthma.**

The National Heart, Lung, and Blood Institute recommends that **seeing a physician for regular check-ups**, using medications as directed by a doctor, and following an asthma action plan prescribed by a doctor can prevent or decrease asthma symptoms. (source: National Heart, Lung, and Blood Institute).

### Routine Care Visits

**Adults:** Almost one quarter of Vermonters with asthma did not see a physician for a routine care visit in the past year (Figure 10).

**Figure 10. Frequency of routine care visits in past year for asthma - Vermont residents with current asthma, 2006.**



### Asthma Education

#### Adults with asthma:

- ◆ 7.4% had ever taken a course on how to manage their asthma
- ◆ 62.3% had been taught how to recognize early signs and symptoms of an asthma episode
- ◆ 76.8% had been taught what to do during an asthma attack
- ◆ 40.7% had been taught how to use a peak flow meter to adjust their daily medications.

## DATA TABLES

**Table 11. Frequency of routine care visits in past year for asthma - Vermont residents with current asthma, 2006.**

	0 routine care visits	1 routine care visit	2 or more routine care visits
	<u>% (95% CI)</u>	<u>% (95% CI)</u>	<u>% (95% CI)</u>
<b>Adults</b>	25.5 (19.4-32.7)	34.9 (28.8-41.7)	39.6 (33.0-46.5)
<b>Middle and Highschool Students</b>	43.0	23.0	21.0

# Indications of Poor Asthma Management

Asthma Data  
2007

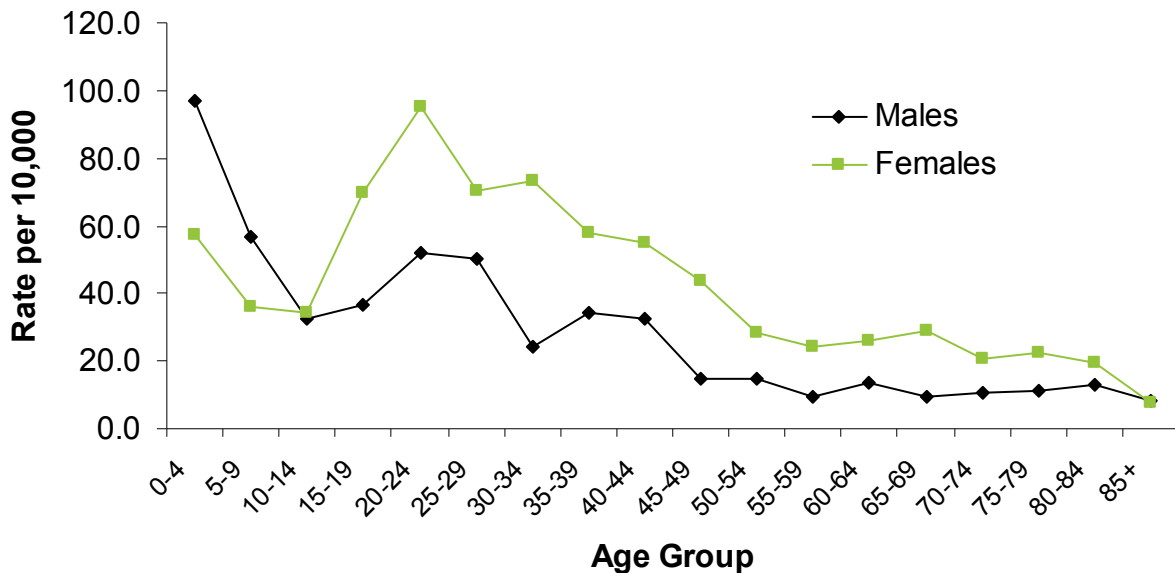
## Emergency Room Visits by Age and Sex

*The age and sex distribution of ER visits mirrors prevalence trends, suggesting asthma severity does not vary by age or sex.*

There were a total of 2447 visits (39.2 per 10,000) to the Emergency room by Vermont residents in 2006.

In addition to having overall higher prevalence rates than men, females visited the ER for their asthma more often than males in 2006, with 1476 visits or 46.6 visits per 10,000 population compared to 971 visits, or 31.6 visits per 10,000 among males. Within each gender, females aged 20-39 and males aged 0-9 had the highest rates of ER visits. This age/gender distribution is similar to what is seen nationally. Vermont data tables are presented on the following page.

**Figure 11. Emergency room visits for asthma by age and sex – Vermont residents, 2006.**



Data source: Hospital Discharge Data  
 NOTE: ER visits that result in a hospital admittance are excluded

## Emergency Room Visits by Age and Sex

Table 12. Emergency room visits for asthma by age and sex – Vermont residents, 2006.

Age group	Total		Males		Females	
	#	Rate (per 10,000)	#	Rate (per 10,000)	#	Rate (per 10,000)
0-4	253	77.9	163	96.9	90	57.4
5-9	159	46.6	99	56.9	60	35.9
10-14	131	33.2	65	32.3	66	34.1
15-19	244	52.9	87	36.8	157	69.8
20-24	315	73.0	116	52.0	199	95.5
25-29	220	59.9	95	50.3	125	70.2
30-34	170	48.8	42	24.1	128	73.6
35-39	193	46.4	70	34.4	123	57.9
40-44	215	44.0	77	32.2	138	55.2
45-49	158	29.6	39	15.0	119	43.7
50-54	110	21.6	37	14.8	73	28.1
55-59	78	16.9	22	9.5	56	24.3
60-64	65	19.7	22	13.5	43	25.8
65-69	47	19.8	11	9.6	36	29.2
70-74	30	16.0	9	10.4	21	20.8
75-79	29	17.7	8	11.3	21	22.7
80-84	21	17.0	6	12.8	15	19.7
85+	9	7.7	3	8.3	6	7.4
<b>All ages</b>	<b>2447</b>	<b>39.2</b>	<b>971</b>	<b>31.6</b>	<b>1476</b>	<b>46.6</b>

Indications of Poor Asthma Management

Data source: Hospital Discharge Data

NOTE: ER visits that result in a hospital admittance are excluded

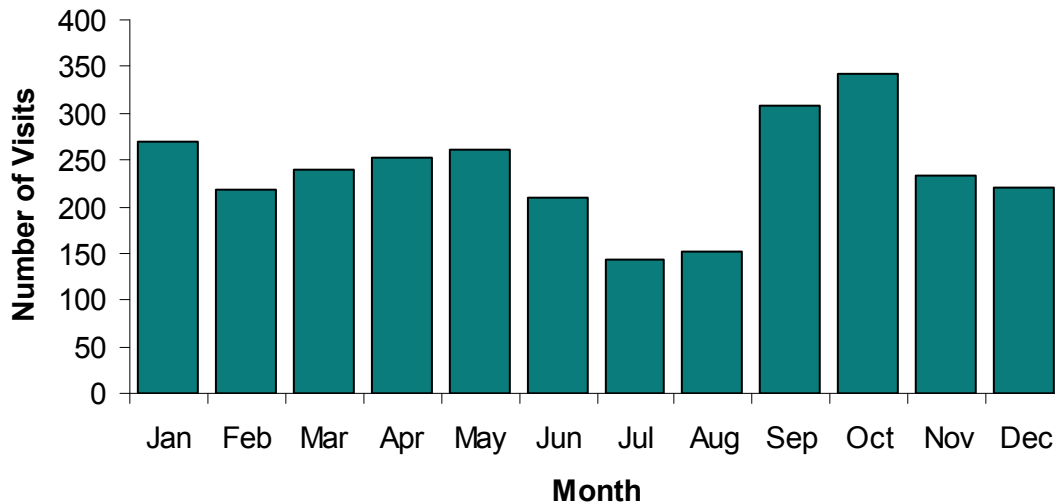
## Temporal Patterns of Emergency Room Visits

*With the seasonal variation in asthma-related ER visits in Vermont, the media could play a valuable role in publicizing the importance of asthma self- and clinical care management during times of the year with the highest rates of ER visits.*

Frequency of ER visits among people with asthma often vary by the time of year. The reason for this variation remains unclear however there are several known causes of asthma attacks that may correspond with seasonal patterns. Tree and grass pollen, known allergens that can cause asthma attacks, have the highest counts in spring and early fall. Cold air, or changes in weather may also cause asthma attacks. (source: National Heart, Lung, and Blood Institute)

In Vermont, ER visits for asthma peak in September and October, as demonstrated in Figure 16.

**Figure 12. Emergency Room visits for asthma by month – Vermont residents, 2005.**



### DATA TABLES

**Table 13. Emergency Room visits for asthma by month – Vermont residents, 2005.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	#	#	#	#	#	#	#	#	#	#	#	#
<b>2006</b>	270	219	240	252	261	210	143	151	308	343	233	221

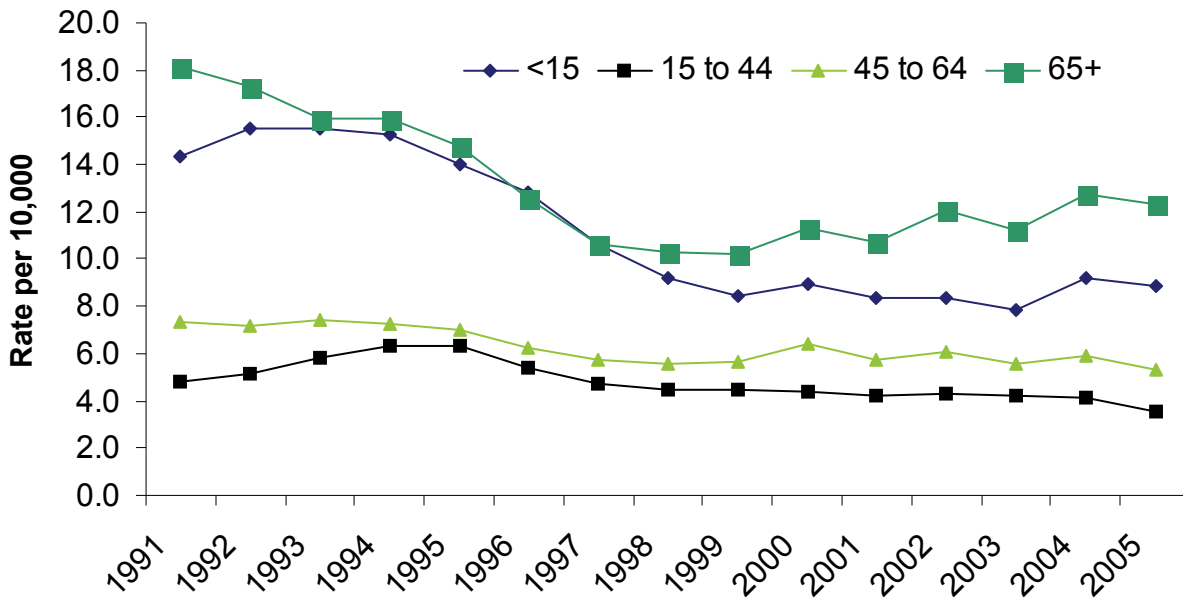
## Hospitalizations and Deaths

**As rates of hospitalizations for asthma have become relatively stable in the past five years, increased efforts are needed to continue the decline observed in the 1990s. Efforts to decrease the number of hospitalizations related to asthma should focus on the youngest and oldest age groups.**

Hospitalization for asthma is a sign of ineffective management of the disease.

There were 355 hospitalizations for asthma among Vermonters in 2006. CDC's national objective is to decrease hospitalization rates for asthma by 9% from 2000 to 2009. Vermont made significant progress in decreasing hospitalization rates between 1990 and 2000, mainly due to large decreases in hospitalizations among youth under 15 and adults 65 and older. Since 2000, hospitalization rates for asthma have remained relatively unchanged, except among those 65 and older, who have experienced a slight increase in rates. Vermont data tables are presented on the following page.

**Figure 14. Asthma hospital discharge rates by age group, 3-year moving averages - Vermont residents, 1990-2006.**



**Deaths:** Between 1999 and 2006 there were 59 deaths due to asthma in Vermont. Because of small numbers, data cannot be presented by year or other demographic breakdown. Research has suggested that following an asthma management plan may prevent deaths related to asthma.

Data source: Hospital Discharge Data

NOTE: These data include ER visits when the ER visit resulted in a hospital admittance

Data source: Vermont Vital Statistics

## Hospitalizations

**Table 15. Asthma hospital discharge rates by age group - Vermont residents, 1989-2006.**

	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Total number of hospitalizations</b>	486	525	503	551	581	546	486	396	350
<b>Rate per 10,000</b>									
<b>&lt;15</b>	12.8	15.4	15.0	16.1	15.4	14.4	12.3	1.8	7.7
<b>15-44</b>	4.5	4.7	5.1	5.6	6.8	6.5	5.6	4.1	4.4
<b>45-64</b>	8.4	7.0	6.7	7.9	7.7	6.3	7.1	5.3	4.7
<b>65+</b>	18.4	20.3	15.8	15.8	16.2	15.9	12.3	9.5	10.0
<b>Total</b>	8.6	9.3	8.8	9.5	9.9	9.2	8.1	6.6	5.8

	1999	2000	2001	2002	2003	2004	2005	2006
<b>Total number of hospitalizations</b>	408	380	428	336	444	364	355	429
<b>Rate per 10,000</b>								
<b>&lt;15</b>	8.1	9.5	9.2	6.5	9.4	7.6	10.6	8.5
<b>15-44</b>	4.9	4.2	4.2	4.2	4.6	3.9	3.8	2.9
<b>45-64</b>	6.6	5.6	7.0	4.6	6.7	5.4	5.7	5.0
<b>65+</b>	11.4	9.4	13.0	9.7	13.4	10.6	14.3	11.9
<b>Total</b>	6.8	6.2	7.0	5.5	7.2	5.9	6.9	5.7

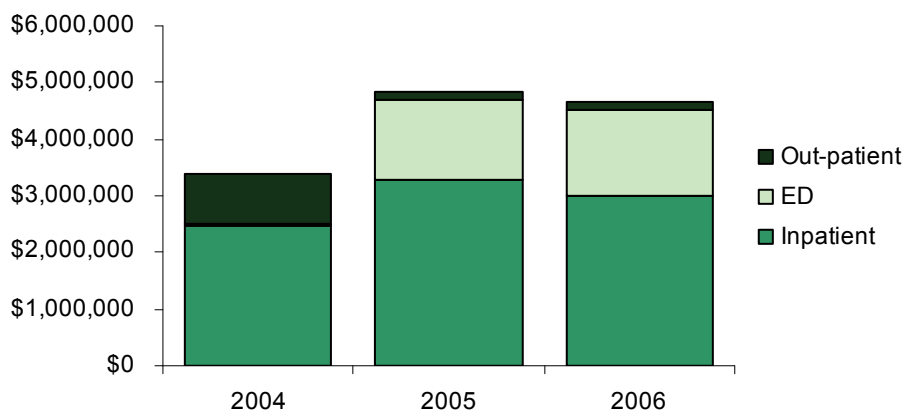
Indications of Poor Asthma Manage-



## Costs

**Improvements in asthma management will result in decreases in the number of hospitalizations and emergency room visits related to asthma. In addition to improving the overall quality of life of those suffering from asthma, these efforts will dramatically decrease health care costs related to asthma.**

**Figure 15. Costs related to asthma hospital visits – Vermont, 2004-2006.**



Hospital charges related to asthma were approximately \$4.6 million in Vermont for 2006.

### DATA TABLES

**Table 16. Costs related to asthma hospital visits – Vermont, 2004-2006.**

	<u>2004</u>	<u>2005</u>	<u>2006</u>
<b>In-patient</b>	\$2,454,523	\$3,294,589	\$3,004,688
<b>Out-patient</b>	\$34,624	\$1,410,219	\$1,517,217
<b>Emergency room</b>	\$914,517	\$115,875	\$123,904
<b>Total</b>	\$3,543,207	\$4,820,684	\$4,645,809

Data source: Hospital Discharge Data